GUIDE TO

Field Crop Protection 2025

Weeds

Plant Diseases

Insects

$10.00 (including GST)

**This publication is only a guide.
Always refer to the product label
for application details and precautions.**

Manitoba

Crop Protection Companies

ADAMA Canada
www.adama.com/Canada
1-855-264-6262

Advantage Crop Protection
advantagecropprotection.ag/
1-888-931-2530

AEF Global
www.aefglobal.com
1-866-622-3222

Ag-Services
www.agservices.ca
1-866-890-4990

AgraCity Crop & Nutrition
www.agracity.com
1-844-269-3276

Albaugh/AgriStar
www.albaughllc.ca
1-877-924-9378

Amvac Chemical Corporation
www.amvac.com
1-888-462-6822

Andermatt Canada
www.andermattcanada.com
1-506-444-5690

BASF
agriculture.basf.ca/west
1-877-371-2273

Bayer
www.cropscience.bayer.ca
1-888-283-6847

Belchim Crop Protection Canada
www.belchimcanada.com
1-866-613-3336

BioSafe Systems
www.biosafesystems.com
1-888-273-3088

Corteva Agriscience
www.corteva.ca
1-800-667-3852

Degesch America Inc
www.degeschamerica.com
1-800-330-2525

Envu
www.ca.envu.com
1-800-331-2867

Farmers Business Network Canada
www.fbn.com/ca-en
1-844-200-3276

Federated Co-operatives
1-833-946-4726

FMC Canada
www.ag.fmc.com/ca/en
1-833-362-7722

Gowan Canada
ca.gowanco.com
1-800-960-4318

Heads Up Plant Protectants
www.headsupst.com
1-866-368-9306

Hedley Technologies
www.hedleytech.com
1-888-476-4473

ISK Biosciences Corporation
1-877-706-4640

Innovis
www.innoviscrop.com
1-888-466-0056

IPCO
www.ipco.ca
1-833-946-4726

Loveland Products Canada
www.lovelandproducts.ca
1-800-328-4678

M & R Durango
www.nolobait.com
970-884-9936

N. M. Bartlett
www.bartlett.ca
1-800-263-1287

Norac Concepts
www.noracconcepts.com
519-821-3633

Nova Source
www.novasource.com
1-800-525-2803

Nufarm
www.nufarm.com/ca
1-800-868-5444

Peacock Industries
www.peacockcorp.com
306-225-4691

RHI
1-888-466-0056

Sharda CropChem
www.shardacropchem.com
1-844-810-5720

Syngenta Canada
www.syngenta.ca/
1-877-964-3682

Tessenderlo Kerley/ NovaSource
www.novasource.com
1-800-525-2803

UPL AgroSolutions Canada Inc.
www.upl-ltd.com
1-866-761-9397

Valent Canada
www.valent.ca
1-800-868-5444

Viking
www.vikingcropproduction.com
1-587-743-1029

Vincere
1-888-466-0056

Winfield United
www.winfieldunited.ca
1-888-975-4769

For more information on weeds, diseases and insects, visit the Manitoba Agriculture website at **www.manitoba.ca/agriculture**

Manitoba Agriculture

Please dial toll free 1-844-769-6224

Northwest

Dauphin	1-833-206-0459
Swan River	1-833-206-0476

Southwest

Brandon	1-833-206-0455
Killarney	1-833-206-0466
Neepawa	1-833-206-0469

Central

Morden	1-833-206-0479
Portage la Prairie	1-833-206-0470

East

Headlingley	1-833-206-0465
Steinbach	1-833-206-0480

Interlake

Arborg	1-833-206-0451

Manitoba Weed Supervisor Offices

Central Region

Carman	204-745-2483
Cartwright	204-529-2363
Elm Creek	204-436-2014
Holland	204-526-5849
Letellier	204-737-2271
MacGregor	204-685-2050
Portage la Prairie	204-857-4439
Sanford	204-736-2214
Somerset	431-275-5314

Eastern/Interlake Region

Arborg	204-376-3313
Beausejour	431-343-0308
Dominion City	204-427-2557
East St. Paul	204-668-8336
Selkirk	204-785-3638
Springfield/Tache	204-408-1452
St-Pierre-Jolys	204-326-0280
Steinbach	204-346-7129
Stonewall	204-467-4704
Vita	204-425-3218
Whitemouth	204-348-2815

Western Region

Birtle	204-851-5186
Boissevain	204-534-8436
Carberry	204-834-6600
Dauphin	204-638-4531
Deloraine	204-747-2572
Forrest	204-728-7834
Glenboro	204-827-2602
Hamiota	431-235-3152
Hartney	204-264-0060
Killarney	204-523-5275
Melita	204-264-0970
Onanole	204-848-0112
Pipestone	204-877-3327
Russell	204-773-2279
Swan River	204-734-3344
Virden	204-748-1239

EMERGENCY NUMBERS

POISON CONTROL CENTRE
1-855-776-4766

PESTICIDE SPILL LINE
1-204-944-4888 1-855-944-4888 (TOLL-FREE)

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Guide to Crop Protection 2025

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Table 1: Metric Conversion Factors* (Approximate)

Metric Unit	Metric to Imperial	Imperial Unit	Imperial to Metric	Metric Unit
Linear		Linear		Linear
centimetre (cm)	x 0.39	inch	x 2.54	centimetre (cm)
Area		Area		Area
square metre (m^2)	x 1.2	square yard	x 0.84	square metre (m^2)
hectare (ha)	x 2.5	acres	x 0.4	hectare (ha)
Volume		Volume		Volume
litre (L)	x 0.22	gallon	x 4.55	litre (L)
Pressure		Pressure		Pressure
kilopascals (kPa)	x 0.14	psi	x 6.9	kilopascals (kPa)
Weight		Weight		Weight
gram (g)	x 0.04	ounce (oz)	x 28.35	gram (g)
kilogram (kg)	x 2.2	pound (lb)	x 0.454	kilogram (kg)
Agricultural		Agricultural		Agricultural
litres per hectare (L/ha)	x 0.089	gallons/acre	x 11.23	litres per hectare (L/ha)
litres per hectare (L/ha)	x 0.357	quarts/acre	x 2.81	litres per hectare (L/ha)
litres per hectare (L/ha)	x 0.71	pints/acre	x 1.41	litres per hectare (L/ha)
millilitres per hectare (mL/ha)	x 0.014	fluid ounces (fl. oz)/acre	x 70.22	millilitres per hectare (mL/ha)
kilograms per hectare (kg/ha)	x 0.89	pounds (lb)/acre	x 1.12	kilograms per hectare (kg/ha)
grams per hectare (g/ha)	x 0.014	ounces (oz)/acre	x 70	grams per hectare (g/ha)

***EXAMPLE: To convert centimetres to inches, multiply by 0.39; conversely, to convert inches to centimetres, multiply by 2.54.**
CAUTION: Herbicide labels are in metric units only. Conversion between the Metric and Imperial system may result in confusion. It is recommended to use metric units only.

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Introduction

How to Use This Book

This publication is only a guide. Always refer to the product label for application details and precautions. If the information in this publication differs from the label information, follow label instructions.

The *Guide to Crop Protection* is divided into five chapters: (1) Introduction; (2) Weed Control; (3) Foliar Fungicides; (4) Seed Treatments; and (5) Insect Control.

To use the information in each of these sections, use the following process:

1. Turn to the charts at the beginning of each section. There is a set of charts for weeds, plant diseases and insect control. Select the chart for the crop you want or plan to grow. Use the chart to match your weed, disease or insect problems with the products available for that crop.
2. Once you have narrowed your product choices down to a few candidates, go to the recommendation section for that product. Products are listed alphabetically. Read the recommendations thoroughly for each product you are considering.
3. Read the product label attached to the container for detailed instructions on application.

This publication is intended to be used as a guide only. Information contained herein is that available at the time of printing.

While every effort has been made to ensure accuracy, the provincial government does not accept responsibility for label changes. When more than one trade name is listed, not all weeds or tank mixes may appear on all labels. Consult product labels attached to pesticide containers for final detailed instructions.

Certain recommendations in this publication are given in quantity of commercial product per acre (mL, L, g or kg/acre). Product labels are given in quantity of product per hectare (mL, L, g or kg/ha). To avoid application errors be sure to read and understand label recommendations.

The *Guide to Crop Protection* includes the most recent recommendations for weed, plant disease and insect control in field and forage crops. These recommendations are based on the uses registered under the Pest Management Regulatory Agency's *Pest Control Products Act*. It is an offence under *The Pest Control Products Act* to apply any chemical in a manner not consistent with the product label. If you have any doubts regarding the instructions in this publication, or on the product label, contact the company representative, your local agricultural office or the Pest Management Regulatory Agency for further advice.

Product Labels and PCP Numbers

On each Product Page you will see a Registration or PCP number, so named because it is mandated by the *Pest Control Products Act*. Under the Act, every pesticide requires a unique identifier – the product's Registration or PCP number. That number must also appear on the product's label.

The pesticide label packaged with the product is the authoritative source of information on use of the product and will contain more detailed information than is included in this Guide. Some products have a number of trade names for the same active ingredient. However, each product will have its own Registration (PCP) number and these appear next to the registrants' names. Users who are seeking more detailed information than is provided in this guide, prior to purchase, can use the Registration (PCP) number to access a sample product label online through the Pest Management Regulatory Agency's (PMRA) website or they can contact the PMRA Hotline by phone at 1-800-267-6315.

Visit **http://pr-rp.hc-sc.gc.ca/ls-re/index-eng.php** to access the Electronic Label Search Tool. The PMRA Product Information database can be searched by a product's trade name, active ingredient, company name or Registration (PCP) number. Since several products can contain the same active ingredient and there are often several versions of the same or similar labels on this database, using the PCP number is the most direct route to finding the label that links to the product page in this Guide. ***There may be some differences between a label found on the package and the sample labels found on the PMRA-Label Search web site so always refer to the packaged product label when applying the product.***

Once the product is located, you may click on its number to view an Adobe Acrobat (PDF) document containing the label and any supplemental registrations. Some of these documents run to many pages but you can use the 'Find' capabilities of the Acrobat Reader plug-in for your browser to jump to specific areas of interest. If you do not have Adobe Acrobat Reader installed on your computer, you can download a free version from **www.adobe.com**.

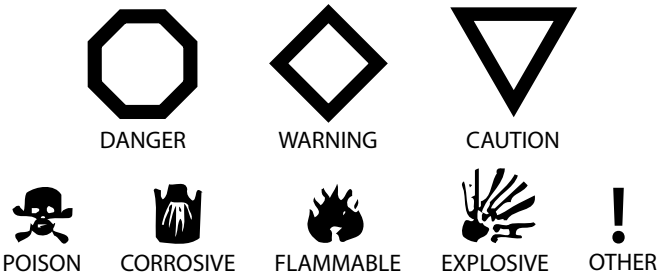
Safe Use of Herbicides, Fungicides and Insecticides

Herbicides, fungicides and insecticides are classified according to the use hazard and risk involved. The categories of hazard are:

- toxicity
- flammability
- explosive potential
- corrosivity
- other

The degree of risk is represented by symbols taken from common traffic sign shapes represented by the stop, caution and yield signs. The signal word for each of the signs is danger (high risk), warning (moderate risk) and caution (low risk). Where the risk is minimal, no designation is required. The label on the container will carry the appropriate signs for the protection of the user. Degree of risk symbols for herbicides, insecticides and fungicides used in field and forage crops are included in the product directory. The symbols are illustrated in Figure 1.

Figure 1. Degree of Risk and Hazard Symbols



LD_{50} values are used to rate the toxicity of pesticides. The LD_{50} refers to the dose of pesticide (in mg per kg of the test animal's body weight) that is lethal to 50 percent of the group of test animals. For example, if a pesticide has an LD_{50} value of 10 mg per kg, and the test animals each weigh 1 kg, then 50 percent of the animals would die if they each ate 10 mg of the pesticide.

Table 2. Oral LD_{50} Values as they relate to the Risk/Hazard Symbols

DANGER POISON
LD_{50} less than 500 mg per kg
Indicates high toxicity

WARNING POISON
LD_{50} 500 to 1000 mg per kg
Indicates moderate toxicity

CAUTION POISON
LD_{50} 1000 to 2500 mg/kg
Indicates low toxicity

SYMBOL ABSENT
LD_{50} greater than 2500 mg per kg
Indicates very low toxicity

Different types of protective equipment are required for pesticides that differ in toxicity. Special equipment requirements are described on the product label, but in general the following precautions must be taken when using pesticides of different hazard ratings.

- **Danger Poison** – requires goggles, respirator, gloves and skin protection, avoid fumes and spray mist.
- **Warning Poison** – requires goggles, gloves and skin protection, avoid fumes and spray mist.
- **Caution Poison** – requires gloves and skin protection, avoid fumes and spray mist.

The absence of a hazard symbol on a pesticide label indicates low toxicity to mammals. Nevertheless, protective clothing should be worn when using pesticides that do not have a hazard symbol.

Protecting Yourself from Exposure to Herbicides, Fungicides and Insecticides

The use of protective equipment and sound safety procedures will help minimize your exposure to herbicides, fungicides and insecticides. Follow the 10 rules for safe application listed below, and wear the safety equipment recommended.

10 Rules for Safe Application

1. Never smoke or eat while applying pesticides.
2. Avoid inhaling sprays or dusts. Wear protective clothing and a respirator.
3. Sprayer lines carrying chemicals should not enter the operator's cab.
4. Have soap, water and a towel available. Should concentrated product spill on skin, hands, face or eyes, wash immediately.
5. Wash hands and face when leaving the treated area, before break periods, lunch or urination.
6. Bathe or shower and change into clean clothing after working with pesticides. Wash clothing each day before re-use.
7. Call a physician or get the patient to a hospital immediately if symptoms of illness occur during or shortly after pesticide application. Be sure to take along the product label or container.
8. Store pesticides out of reach of children and where there is no chance of contact with human food or livestock feeds. Do not store herbicides with insecticides and avoid cross-contamination. Storage areas should be locked.
9. Keep chemicals in their original containers, never in unmarked containers or bottles used for food or drink.
10. Follow proper container disposal methods. All containers should be triple rinsed or pressure rinsed, punctured to render the container non-reusable, and delivered to designated disposal sites.

Protective Clothing

Wear protective equipment as described in the chart to reduce exposure.

EQUIPMENT	PROTECTION	HOW TO WEAR IT
Coveralls	There are two types of coveralls: disposable and reusable. Disposable coveralls are lightweight and comfortable on warm days. They can be worn for mixing and applying pesticides, then discarded at the day's end. If they become contaminated, they should be discarded at once. The second type of coverall is made of washable fabric and may be reused many times. These fabric coveralls are adequate for use with all but the most highly toxic and concentrated pesticides.	Button (or zip) right up to the neck. Loose coveralls around the neck will suck and blow pesticide in and out of the interior of the coveralls as you bend and move. Wear coveralls over a long-sleeved shirt and pants.

EQUIPMENT	PROTECTION	HOW TO WEAR IT
Aprons	When pouring or otherwise handling concentrated pesticides, it makes good sense to wear protection in the form of an apron. The apron protects the front of your body from spills or splashes of the concentrate. The apron should be made of rubber or synthetic liquid-proof material that will resist the solvents.	Make sure the apron covers your body from your chest to your boots.
Gloves	Protect your hands by wearing chemical-resistant gloves. Neoprene gloves provide the best protection. Natural rubber gloves may be used when handling organo-phosphorus or carbamate pesticides. Be sure that they are designed for use with solvents and pesticides. Never use lined gloves, gloves with wristbands or leather gloves.	Put gloves on and roll up the first inch or two of the cuff. That way when you lift your hands, any liquid on the gloves won't drip down your arms.
Hats	Use a chemical-resistant hat, preferably made of washable plastic. The hat may be a hard hat or made of flexible plastic. In either case, it should have a plastic sweatband. Wash and dry entire hat after each use and before storing. Ordinary baseball caps with cloth sweatbands are dangerous as they absorb the pesticide and recontaminate the forehead each time you wear them. Even small amounts of moderately or slightly toxic pesticides may cause severe skin irritation or other illness if exposure continues for several days.	
Boots	Wear chemical-resistant, unlined boots. These boots are available in a variety of styles and materials. Neoprene boots are the best. Knee-length boots offer greater protection because they extend above the lower end of the apron. Avoid leather or fabric boots and shoes because these will absorb pesticides and cannot be cleaned effectively.	Wear your pant legs outside the top of your boots. This will prevent spills and splashes from running into the boot and onto your leg.

Protecting Your Eyes, Face and Lungs

Wear the following equipment to protect your facial area from exposure.

EQUIPMENT	PROTECTION	HOW TO WEAR IT
Goggles	Chemical-resistant goggles keep your eyes safe from both splashing and, if using dry formulations, dusts or granules. Don't use goggles with cloth or elastic headbands as these will absorb pesticides.	Wear goggles snugly on your face so that the sides of your head are protected from splashes. If you wear glasses, make sure you purchase goggles that fit snugly over them. Never wear contact lenses when working around pesticides.
Respirators	Only NIOSH-approved respirators should be used. Do not exchange parts of different respirators. (For example, do not use a cartridge produced by Company "A" with a respirator produced by Company "B" as the combination may not provide adequate protection to the user). Dust masks are ineffective in protecting against herbicide vapours. Similarly, the filters on tractor cabs are intended to remove dust and are not designed to protect against herbicide vapours or mists. Chemical cartridge respirators are recommended for outdoor use when mixing and applying herbicides.	When carrying out operations, change filters each day. The cartridge should be replaced when chemical odour becomes apparent or when breathing becomes difficult. New cartridges should always be installed at the beginning of the spray season. Prior to commencing work, check the face seal while the respirator is on the wearer's face. Regardless of design, respirators cannot be worn securely by people wearing beards, moustaches or sideburns.
Face Shields	Goggles offer some protection, but frequently full-face protection is advised or required according to the pesticide label. It is especially important to protect your eyes and face when pouring or mixing liquid concentrates. Effective face shields are made of clear plastic.	Since the shield attaches to the hard hat, you can raise or lower it as needed.

Understanding Maximum Residue Limit Statements in the Guide

To ensure the safety of Canadian food, maximum residue limits (MRLs) set the maximum allowable amount of a pesticide residue on a crop or in a processed crop product (e.g. oil or flour). Residue levels are typically assessed for pesticides registered on crops grown for food. MRLs even exist on imported food for pesticides or pesticide uses not registered in Canada.

Health Canada's Pest Management Regulatory Agency (PMRA) is responsible for setting MRLs in Canada. Similarly, importing countries set their own MRLs (also referred to as 'import tolerances') that Canadian crop exports are subject to. Trade issues between importing and exporting countries can arise due to variability in MRLs or a lack of established MRLs.

Crop pesticide uses that may contribute to trade irritations have been flagged on product pages in the Guide to Crop Protection with the statement: **'Note: As of January 1, 2025 http://keepitclean.ca indicates that the use of this product on certain crop type may have market access concerns. Please see pg 13 for more information AND consult potential grain buyer(s) before using this product'.** Manitoba Agriculture and Saskatchewan Ministry of Agriculture have included such statements on products uses with known or potential MRL issues. However, this may not be a complete list of product uses with potential trade issues.

Producers can follow these practices to help prevent exceeding MRLs:

- Read and follow product labels, especially with respect to registered crops, maximum application rates, maximum number of applications per season, crop stage and pre-harvest intervals.
- Talk to your commodity buyer before applying a pesticide, especially for new pesticide chemistries, new products and products registered on new crops.

More information on MRLs and 'flagged' products is available at **http://keepingitclean.ca/**.

Avoiding Spray Drift

To minimize the risk of drift, follow these guidelines:

1. Do not spray in winds above 16 km per hour (10 miles per hour).
2. Do not spray under dead calm conditions in early morning, night, or late evening. These are often associated with temperature inversions, and the combination of these factors can result in long-distance spray drift (2 km or more). Fog or dust that seems to hang in the air is a good indicator of an inversion.
3. Avoid nozzle pressures above 45 psi (310 kPa) for conventional flat fan tips.
4. Use a minimum of 45 L per acre water for all pesticides unless otherwise specified for the product.
5. Take note of buffer zones identified in the "Restrictions" section of this guide. Do not spray when the wind is blowing towards a nearby sensitive crop, shelterbelt, garden, or water body.
6. Use amine formulations of 2,4-D or MCPA where possible. Use special care when applying volatile herbicides (most herbicides in Group 3 and Group 4, particularly ester formulations). Avoid spraying these products on or immediately before hot days.
7. Ensure that air flow from air assisted sprayers is properly set to minimize airblast rebound and drift for different crop canopies.
8. Operate nozzles at their minimum recommended height. For 80° tips, this is 18" (45 cm), and for 110° tips, this is 12" (35 cm). Orienting nozzles forward allows further height reductions.
9. Special nozzles are now available that create coarse, low-drift sprays. Pre-orifice, Turbo-TeeJet, or venturi-type nozzles are available from a number of manufacturers, and these reduce drift by 50 to 95 percent. (Refer to the section entitled **Herbicide Efficacy with Low-Drift Nozzles**).
10. Consider equipping your sprayer with protective shrouds. A number of different designs are available that can reduce drift between 35 and 75 percent.
11. Reduce travel speeds. Rapid air movement over nozzle tips increases the risk of fine droplets prone to drift and turbulence from the sprayer itself can increase the uncertainty of spray deposition.

For more on reducing drift, visit: **www.Sprayers101.com**.

Herbicide Efficacy with Low-drift Nozzles

A number of low-drift nozzles are now available from different suppliers. Well established nozzles, such as the Turbo TeeJet, reduce drift by about 50 percent and provide equivalent efficacy to a standard flat fan nozzle. Newer nozzles ("venturi" types) are best known for their dramatic ability to reduce drift (50 to 95 percent). Research suggests that these nozzles perform well at conventional carrier volumes, travel speeds, and product rates. Some aspects require special attention:

Pressure: Some venturi-type nozzles require higher pressures to operate properly. Below 40 psi (275 kPa), patterns for these designs may deteriorate rapidly resulting in poor overlaps and erratic control. Design improvements have resulted in venturi nozzles that require less pressure to operate effectively. When using automatic rate controllers, make sure your pressures match the recommended pressure ranges for good nozzle performance.

Water Volume: Droplet size becomes more important at lower water volumes. Little is known about low-drift nozzle performance at or below 5 gallons per acre (23 L per acre). Since low-drift nozzles generate fewer droplets than conventional nozzles, ensure that water volumes are high enough for coverage when using coarse sprays.

Weed Type: Difficult-to-wet weeds, such as wild oats, green foxtail, lamb's-quarters, and cleavers, typically require finer sprays for effective coverage. When using venturi nozzles on these weeds, make sure your pressure is high enough to achieve good coverage. Larger weeds and reduced product rates typically make chemical control more difficult, and these conditions may also reveal some performance differences between nozzles.

Herbicide Type: Herbicides that belong to herbicide Groups 2, 4, and 9 perform well with venturi nozzles, even at normal pressures (40 psi). Application of herbicides in Groups 1, 6, 8, 10 and 14 may require higher pressures with venturi nozzles to maintain good performance, especially under challenging conditions. Wild oat control may be reduced with the coarsest sprays, even when applied at high pressure.

Check with your chemical representative to see if the manufacturer supports the use of low-drift nozzles with their products.

More information is available in the fact sheet "Pesticide Application and Choosing the Right Nozzles," available from your local extension office or at the Saskatchewan Ministry of Agriculture Website: **Saskatchewan.ca/agriculture**.

Handling a Drift Complaint

When spray drift occurs, it is important to take the right steps to resolve the complaint. If you suspect that your crop or property has been damaged because of spray drift, use the following guidelines for resolving the situation.

1. Contact the suspected applicator as soon as possible. View the damage with the suspected applicator and determine if that person did, in fact, cause the damage.
2. Are you sure that the symptoms or damage you see has been caused by spray drift? Contact your local agriculture office or agronomist to discuss the injury symptoms.
3. If the damage was caused by the applicator, determine the extent of the damage and the level of compensation (if any) with the applicator.
4. If the situation cannot be resolved quickly because of disagreements on the extent of damage, cause of the damage, or level of compensation, contact your local agricultural office to discuss options on how to proceed. Documentation will be required, particularly if insurance companies are involved.
5. The involvement of a private consultant is recommended if documentation is required. Required documentation often includes samples of the damaged plants, photographs, and yield comparisons to determine losses. Your agricultural office can provide you with a list of private consultants in your area.
6. The best approach is to start an open and honest line of communication with the suspected applicator. The majority of drift complaints are resolved quickly and efficiently by communicating with the applicator, without the involvement of outside parties.

Mixing Pesticides

The ability to control a broad range of weeds or other pests in one pass is the advantage that a mix of two or more products allows. The mixing of pesticides is restricted to those products specifically indicated on each pesticide label, or if the labels of each and every product to be mixed contain the following general mixing statement:

"This product may be tank mixed with (a fertilizer, a supplement, or with) registered pest control products, whose labels also allow tank mixing, provided the entirety of both labels, including Directions For Use, Precautions, Restrictions, Environmental Precautions, and Spray Buffer Zones are followed for each product. In cases where these requirements differ between the tank mix partner labels, the most restrictive label must be followed. Do not tank mix products containing the same active ingredient unless specifically listed on this label.

In some cases, tank mixing pest control products can result in reduced pesticide efficacy or increased host crop injury. The user should contact [manufacturer name] at [insert manufacturer contact information] for information before applying any tank mix that is not specifically recommended on this label."

If tank mixing is not done in the correct order, the result could be a tank-load of material that may not control the target pests, cause injury to the crop, plug nozzles, or leave an undesirable residue in the tank that will require extensive cleaning. Mistakes like these are costly, could put the user at unnecessary risk of exposure to the products, or create an environmental disposal problem.

To avoid mixing that may result in incompatibilities, **always consult the label of the products that are being used** to learn the correct order. **Remember to add all like components at the same stage of mixing.** The list below is a general rule-of-thumb for mixing pesticides:

1. Fill the spray tank with 1/4 to 3/4 the amount of water required for the application and turn on the sprayer agitation. Check the products that are being used for the correct amount to add. Once agitation has begun, maintain until the tank is emptied.
2. Add any water conditioner (fertilizer or pH adjuster) additives to the tank.
3. Add any wettable powders, or water dispersible granules (DF, DG, or WDG). Add dry products slowly to prevent clogged return lines. Allow sprayer to agitate for a few minutes, allowing the product to become completely suspended in the tank, before adding the next component.
4. Shake any containers of liquid pesticide thoroughly before adding to ensure they are well mixed.
5. Add any oil dispersions (OD) or flowable liquid suspensions (F, SC) to the tank. Allow to mix.
6. Add emulsifiable concentrates (EC) or emulsions (ME, SE) to the tank and allow to mix.
7. Add any pesticides that are solutions (SN) (i.e. amines and salts)
8. Add any surfactants or other adjuvants.

Remember to always consult the label for compatible mixes and recommended mixing order.

Many pesticides will break down if left in the tank for an extended period. Try not to mix any more than you can spray at one time.

If you need to stop spraying for a short time, leave the sprayer agitation running to keep products from settling or separating in the tank.

Container Disposal

Proper disposal of used containers and unused pesticides is important to protect the environment and prevent contamination of soil and water resources. Rinse all containers prior to disposal to reduce environmental contamination caused by open dumping of unwanted containers. Only mix as much pesticide solution as is needed to treat the desired area.

Triple Rinsing

Triple rinsing renders used pesticide containers (metal, plastic, glass) more than 99.9 percent free of residues, in most cases. Here are the steps that should be followed:

1. Empty contents of the container into the spray tank and drain in a vertical position for 30 seconds.
2. Add a measured amount of rinse water or other diluent until container is about one-fifth full.
3. Rinse the container thoroughly and pour the rinsate into the spray tank.
4. Repeat the procedure twice (it should take only about 5 minutes in total).
5. Puncture or break triple rinsed containers to render them non-reusable. Paper bags should be rinsed once prior to disposal.

Pressure Rinsing

Pressure rinsers can be used to rinse any size of empty pesticide container that can be lifted into position over the spray tank. A 30 second rinse with a pressure rinser is convenient and just as effective as triple rinsing. Pressure rinsers are constructed to be thrust into the bottom of a metal can or plastic jug. Holes, situated laterally in the rinser tip, direct water from a pressurized source against the inner sides of the container and effectively wash the residual pesticide into the spray tank. Some farmers have found it convenient to attach a rinser to the pump on their large water storage tank to minimize container handling. Pressure rinsers have the added advantage of rendering containers useless by automatically puncturing them.

Disposal of Containers

Properly rinsed containers, totes and drums can be returned to a local collection site for recycling. See www.cleanfarms.ca for more information and locations.

Sprayer Cleaning

When pesticide application is completed each day it is important to empty and clean the sprayer thoroughly to prevent the breakdown of certain pesticides, prevent adhesion of the pesticide to the sprayer, and to maintain the sprayer parts in good condition. Certain pesticides break down very quickly when left in solution, and several pesticide solutions can be corrosive to sprayer parts. Sprayer cleaning is especially important when changing from one crop to another or from one pesticide to another. Each year several reports are logged of herbicide damage cause by carryover of product residue in the tank. To avoid the risk of contamination, sprayers should be cleaned as soon as possible after application is completed.

Do not clean sprayers where rinsate can run off into ditches or other water bodies, near sensitive plants or shelterbelts, or where other people or animals are likely to walk, to avoid unnecessary exposure to people, animals and the environment.

There are three basic types of rinse solution for cleaning sprayer tanks. Their recipes and basic procedures are outlined below:

- **The Ammonia Rinse** – Fill spray tank and add 1 L of household ammonia (3 percent) for every 100 L of clean water needed for the rinse and begin agitation. Allow solution to flush through the booms until the boom is completely filled with ammonia solution and top up the tank with water. Circulate the ammonia solution through the tank and pump system for 15 minutes. Flush hoses and booms with ammonia rinse solution again (minimum 5 minutes) before emptying. Remove nozzles and screens and scrub with 0.1 L household ammonia per 10 L clean water and an old toothbrush. Perform clean water rinse to remove ammonia solution prior to next spray load. Some herbicides recommend leaving the ammonia rinse in the tank over night to improve cleaning potential.
- **The Fresh Water Rinse** – The spray tank cleaning should begin and end with a fresh water rinse to remove the majority of potential contaminants prior to the cleansing process or prior to the next round of spraying. Drain the tank of its previous contents and fill the tank with clean water. Open nozzle valves and pump clean water through the booms and hoses. Top up the tank with more clean water and circulate/agitate for at least 10 minutes and empty the tank of waste water. If this is the first rinse after spraying, a high pressure hose could be used to clean residue from all surfaces in the tank. Do not enter the tank during the cleaning process.
- **The Detergent Rinse** – After rinsing with clean water, fill spray tank and add a heavy-duty detergent at 0.25 L per 100 L of water (some suggest a non-ionic surfactant such as Agral 90 or Agsurf at 0.6 L per 100 L of water). Circulate the mixture for a minimum of 5 minutes and spray out through sprayer nozzles. Nozzles and screens are removed and cleaned individually with the same detergent solution in a small container. Soaking in this solution for several hours also helps to loosen any deposits.

The above solutions are just components of the overall sprayer cleaning process. Typical rinse instructions will repeat a combination of one or two or all of these basic rinses. Below we will give some generic rinse instructions utilizing the basic rinses as components of the larger cleaning procedure. Never enter the tank during the cleaning process as some cleansers may release dangerous gases.

- **Method A** – Drain contents of tank – 1 to 2 x Water Rinse – 2 x Ammonia Rinse – 2 x Water Rinse (one just prior to the next spraying event)
- **Method B** – Drain contents of tank – 2 x Water Rinse – 2 x Detergent Rinse – 2 x Water Rinse
- **Method C** – Drain contents of tank – Several repetitions of the Water Rinse with nozzles and screens removed and checked for debris. Products: *Adrenalin, Altitude, Amitrol 240, Ares*.

The above directions are general processes based on the similarities of tank cleaning recommendations between products in each of the herbicide groupings. Always follow the specific instructions on the product label.

Several products in the guide do not have label instructions regarding tank cleaning. In the case of products that have no cleaning recommendations on the label, there are some basic principals that can be applied. Products that are water based formulations can usually be cleaned from spray tanks using **Method C** above. Products that are formulated as an EC, SC or F (flowable) or use a petroleum based adjuvant should at least use **Method B**. The detergent breaks down the oil that may be sticking to the side of the tank. Products in Group 2 (most will already have a recommendation), with the exception of the 'IMI' products (See Table 8 on page 60), will require the use of **Method A**. The ammonia in **Method A** either increases the solubility of the product allowing it to be easily removed from the tank surfaces or speeds the breakdown of these products in water. If the product that is to be cleaned out of the tank is a combination of these elements, use a combination of Methods to clean the tank. In these cases, use a good commercial tank-cleaning product from a recognized source, with both ammonia and detergent as components.

Group 2 compounds are highly active on sensitive plants so even a small amount remaining in the sprayer can present a risk of injury. They can also occasionally be trapped on the tank walls and plumbing by petroleum based formulations or adjuvants when tank mixed with other products, resulting in tank residues that may be tougher to remove. A way to reduce the chance of this occurring is to add detergent at 0.25 L per 100 L to the Ammonia Rinse portion to assist with the breakdown of the petroleum coating so that the ammonia may rid the tank of Group 2 product.

It is very important to clean sprayers immediately after every use. With a more diverse rotation, the likelihood of damage from lack of care increases dramatically.

How to Identify Crop and Weed Leaf Stages

Recognition of plant growth stages is essential for effective weed and disease control. Many herbicides and fungicides are safe on a crop only when applied at a specific growth stage. Similarly, weeds are controlled only when they are at certain growth stages.

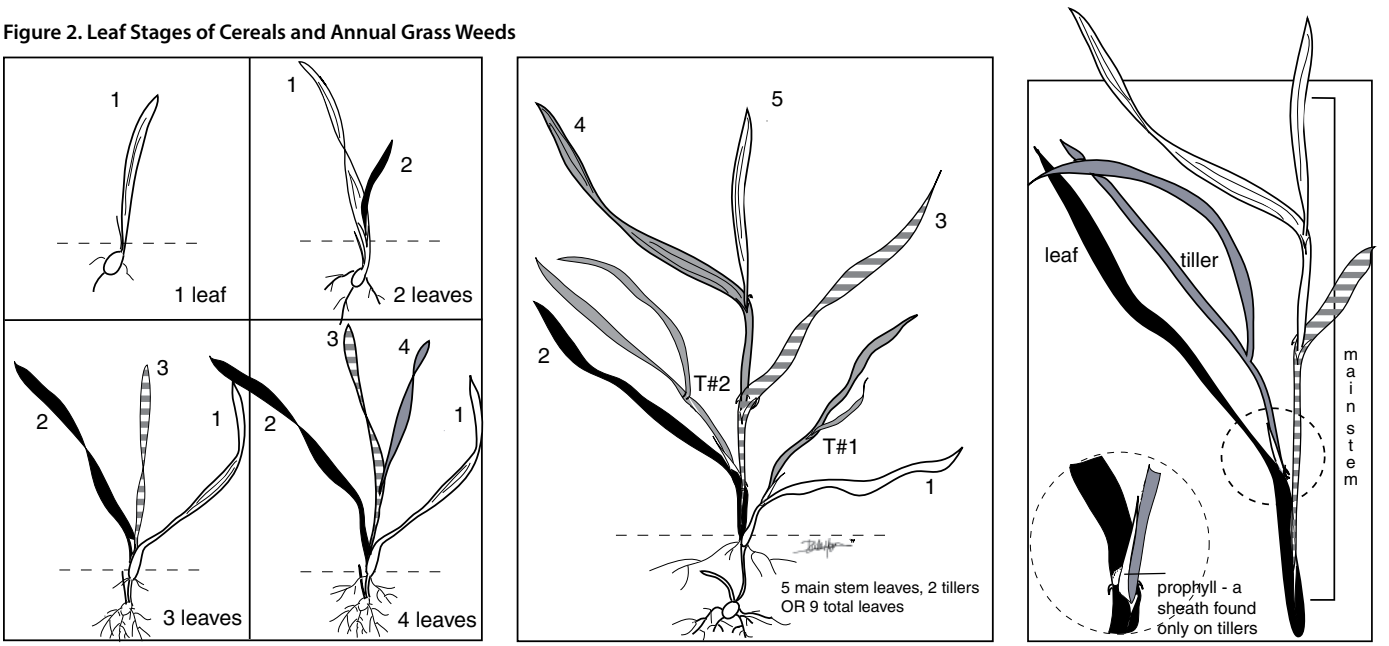
For most post-emergent products, growth stages are described by the number of leaves. The following is a description of how to count leaves for staging.

Cereals and Annual Grass Weeds

Manufacturers generally use two different systems of staging for grasses. The minimum stages of application are similar, while the later stages may differ.

Some manufacturers use "Total Leaf Count" stages based on the number of leaves on the entire plant, including tillers or secondary shoots. Most recommendations are based on the number of main stem leaves and tillers. Tillers or stools are the secondary shoots or stems of a grass plant. Similar to the branches of a broadleaf plant, tillers will emerge from the axils between the leaf and main shoot. Tillers usually begin to appear at the 3 or 4 leaf stage. When staging a plant in this manner, be sure to identify the tillers first, then count only leaves that originate from the main shoot.

Figure 2. Leaf Stages of Cereals and Annual Grass Weeds



Broadleaf Weeds

Cotyledons – These are the seed leaves that usually emerge above ground. On some plants, such as faba beans, lentils and peas, they stay below the soil surface. Cotyledons are not true leaves and are not counted when determining leaf number. They are a different shape than the true leaves and may dry up and disappear at an early stage.

Alternate leaves – Some plants have one leaf at each node on the stem. The next leaf emerges at the next higher node and extends away from the stem in the opposite direction. These plants (lamb's quarters and wild mustard are good examples) are said to have alternate leaves.
To determine the leaf stage, simply count the number of leaves present (Figure 3).

Opposite leaves – Plants with two leaves at each node, one on each side of the stem, are said to have opposite leaves. The next pair of leaves on the next node are rotated about 45° so that they are not directly over the previous pair. Plants with opposite leaves have even-leaf numbers only. When counting, the leaf number progresses from cotyledons to
2 leaf, 4 leaf, etc. These plants generally appear shorter than plants with alternate leaves at a similar leaf stage. **Be sure to count each pair as two leaves.** Hemp nettle is a weed that has opposite leaves (Figure 3).

Whorled leaves – More complex plants like cleavers may have whorled leaves. These plants have three or more leaves at each node on the stem. The leaf number in each whorl may vary, so be sure to count each individual leaf unless the Guide or label recommendation refers to the number of leaf whorls (Figure 3).

Figure 3. Leaf Stages of Broadleaf Weeds and Crops

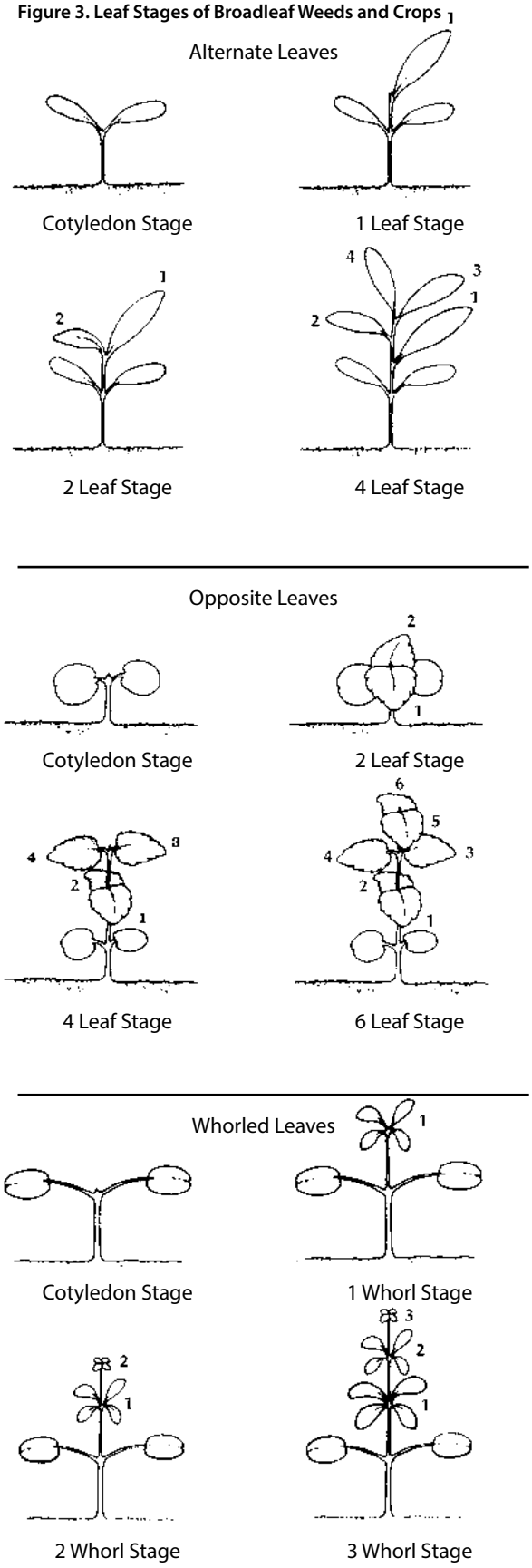
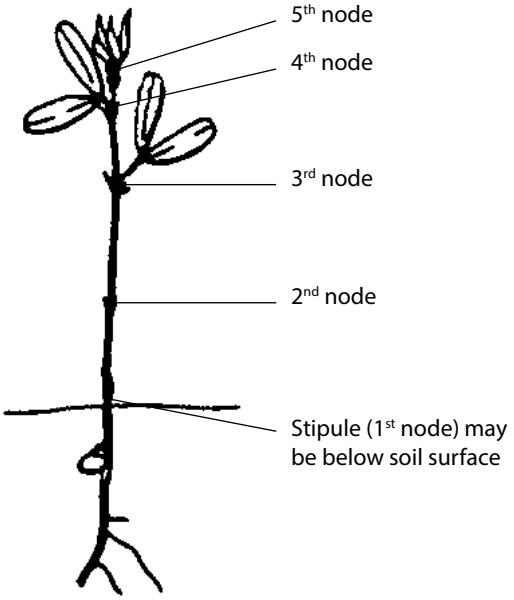
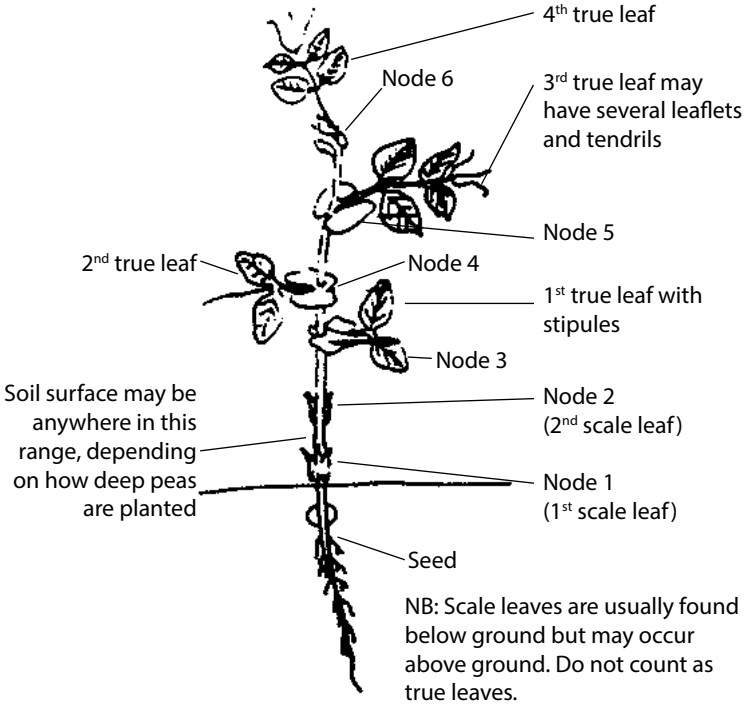


Figure 4. Leaf Stages of Certain Special Crops and Forages

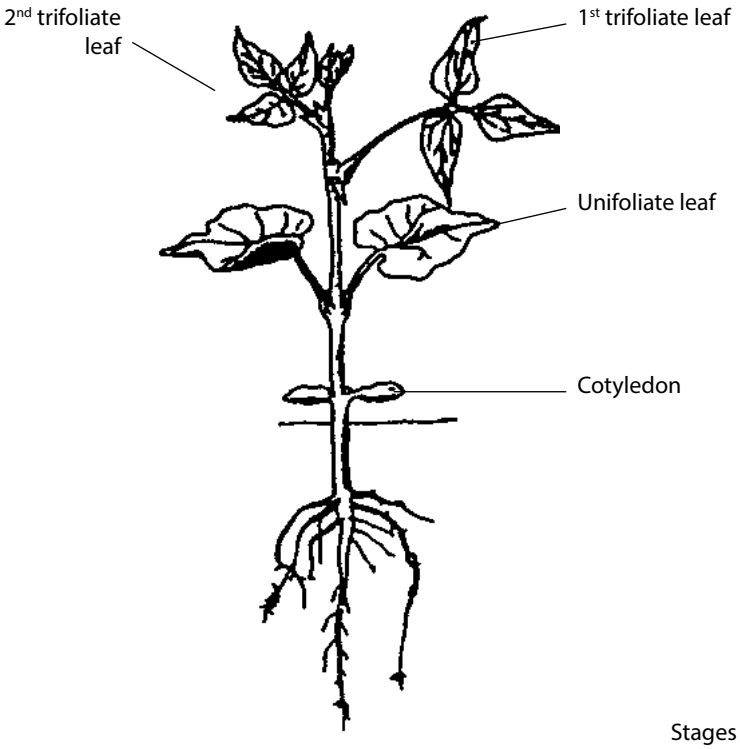
Lentil Seedling



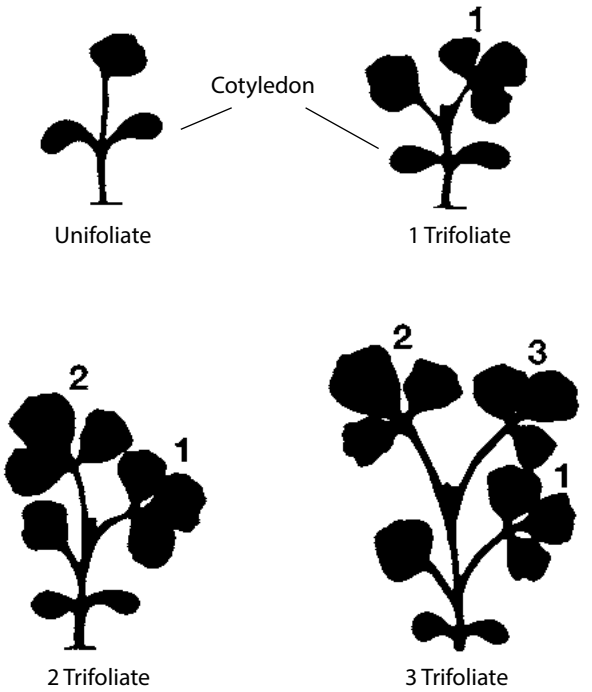
Field Pea Seedling



Dry Bean Seedling



Forage Legume Seedling



Stages of alfalfa, red clover and alsike clover leaf development

Trade Names, Active Ingredients and Formulations

Legend: (F) = formulated component; (B) = blended granules; (DC) = divided container

WP	wettable powder	EC	emulsifiable concentrate	SP	water soluble powder	SL	soluble concentrate	A	amine
WG	water dispersible granule	G	granule	EW	emulsion, oil in water	OD	oil dispersion	E	ester
TB	Tablet	SC	suspension concentrate	DS	powder/dust for dry seed treatment	FS	flowable concentrate for seed treatment	LS	solution for seed treatment
SG	water soluble granule	AS	aqueous suspension	SE	suspension emulsion	WGR	wettable granule		

Herbicides

(Component 1) Active Ingredient* - Formulation	(Component 2) Active Ingredient* - Formulation	(Component 3) Active Ingredient* - Formulation	(Component 4) Active Ingredient* - Formulation	Product	Company
2,4-D Amine - 600 g/L SL				*USHA6*	Sharda Cropchem
2,4-D Amine - 600, 700 g/L SL				*2,4-D Amine or Ester*	Various
2,4-D Amine - 400 g/L SL (F)	aminopyralid - 50 g/L SL (F)			*Restore II*	Corteva Agriscience
2,4-D Choline - 454 g/L SL				*Enlist 1*	Corteva Agriscience
2,4-D Choline - 194 g/L SL (F)	glyphosate DMA - 204 g/L SL (F)			*Enlist Duo*	Corteva Agriscience
2,4-D Choline - 360 g/L SL (F)	picloram - 97.5 g/L SL (F)			*Grazon XC*	Corteva Agriscience
2,4-D Ester - 660 g/L EC				*Lima 660EC*	Sharda Cropchem
2,4-D Ester - 660 g/L EC				*Salvo*	UAP
2,4-D Ester - 660 g/L EC				*Viking 2,4-D Ester*	Viking
2,4-DB Ester - 625 g/L EC				*Caliber*	Loveland Products
2,4-DB Ester - 625 g/L EC				*Cobutox 625*	IPCO
2,4-DB Ester - 625 g/L EC				*Embutox 625*	Nufarm Agriculture
2,4-D Ester - 225 g/L EC (F)	bromoxynil - 225 g/L EC (F)			*Leader*	Interprovincial Cooperative (IPCO)
2,4-D Ester - 225 g/L EC (F)	bromoxynil - 225 g/L EC (F)			*Thrasher II*	ADAMA
2,4-D Ester - 240 g/L EC (F)	bromoxynil - 90 g/L EC (F)	fluroxypyr - 80 g/L EC (F)		*Enforcer D*	Nufarm Agriculture
2,4-D Ester - 280 g/L EC (F)	bromoxynil - 280 g/L EC (F)			*Swipe*	Sharda Cropchem
2,4-D Ester - 280 g/L EC (F)	bromoxynil - 280 g/L EC (F)			*Thumper*	Bayer
2,4-D Ester - 284 g/L EC (F)	dichlorprop - 284 g/L EC (F)	pyraflufen - 7.3 g/L EC (F)		*Blackhawk EVO*	Nufarm Agriculture
2,4-D Ester - 300 g/L EC (F)	florasulam - 6 g/L EC (F)	halauxifen - 6 g/L EC (F)		*Extinguish XL*	Corteva Agriscience
2,4-D Ester - 360 g/L EC (F)	fluroxypyr - 90 g/L EC (F)			*OcTTain XL*	Corteva Agriscience
2,4-D Ester - 360 g/L EC (F)	fluroxypyr - 90 g/L EC (F)			*Osim Plus*	Sharda Cropchem
2,4-D Ester - 360 g/L EC (F)	fluroxypyr - 90 g/L EC (F)			*Rush 24 All In*	ADAMA
2,4-D Ester - 360 g/L EC	fluroxypyr - 90 g/L EC (F)			*Foxxy Pro*	AgraCity
2,4-D Ester - 360 g/L EC (F2)	fluroxypyr - 90 g/L EC (F2)	clodinafop - 25 g/L EC (F1)	pinoxaden - 25 g/L EC (F1)	*TraxosTwo*	Syngenta
2,4-D Ester - 400 g/L EC (F)	dichlorprop-P - 210 g/L EC (F)			*Dichlorprop-DX*	IPCO
2,4-D Ester - 400 g/L EC (F)	dichlorprop-P - 210 g/L EC (F)			*Estaprop XT*	Nufarm Agriculture
2,4-D Ester - 473 g/L (F)	pyraflufen - 6.1 g/L (F)			*BlackHawk*	Nufarm Agriculture
2,4-D Ester - 564 g/L EC	thifensulfuron: tribenuron - 50%:25% WG	fluroxypyr - 180 g/L EC		*Foxxy Pro RX*	Agracity
2,4-D Ester - 564 g/L EC	thifensulfuron:tribenuron - 33.3%:16.7% SG	fluroxypyr - 333 g/L EC		*Retain SG*	Loveland Products
2,4-D Ester - 660 g/L EC	aminopyralid - 52.5% WG (F)	metsulfuron - 9.45% WG (F)		*Reclaim II*	Corteva Agriscience
2,4-D Ester - 660 g/L EC	carfentrazone - 240 g/L EC			*CO-OP/IPCO Convex*	IPCO
2,4-D Ester - 660 g/L EC	carfentrazone - 240 g/L EC			*Revenge Pro*	Agracity
2,4-D Ester - 660 g/L EC	carfentrazone - 240 g/L EC			*Viking Solna*	Viking
2,4-D Ester - 660 g/L EC	fluroxypyr - 180 g/L EC			*Flurox-24*	Nufarm Agriculture
2,4-D Ester - 660 g/L EC	fluroxypyr - 180 g/L EC			*Foxxy Pro*	Agracity
2,4-D Ester - 660 g/L EC	fluroxypry - 180 g/L EC			*Foxxy Extreme*	Agracity
2,4-D Ester - 660 g/L EC	fluroxypyr - 180 g/L EC			*Rush 24 All In*	ADAMA
2,4-D Ester - 660 g/L EC	fluroxypyr - 180 g/L EC			*Viking Kalmar*	Viking
2,4-D Ester - 660 g/L EC	fluroxypyr - 333 g/L EC			*Attain XC*	Corteva Agriscience

(Component 1) Active Ingredient* - Formulation	(Component 2) Active Ingredient* - Formulation	(Component 3) Active Ingredient* - Formulation	(Component 4) Active Ingredient* - Formulation	Product	Company
2,4-D Ester - 660 g/L EC	pyroxsulam - 15% WG (F)	halauxifen - 5% WG (F)		*Rexade*	Corteva Agriscience
2,4-D Ester - 660g/L EC	thifensulfuron: tribenuron - 50%:25% WG	dicamba - 480 g/L SL		*Ammo DR*	Agracity
2,4-D Ester - 660g/L EC	tribenuron - 8.25% WG (F)	dicamba - 58.45% WG (F)		*Triton K*	FMC
acifluorfen - 240 g/L SL				*Ultra Blazer*	UPL AgroSolutions
acifluorfen - 240 g/L SL (F)	bentazon - 320 g/L SL (F)			*Hurricane*	UPL AgroSolutions
aminocyclopyrachlor - 39.5% WG (F)	metsulfuron - 12.6% WG (F)			*Navius Flex*	Envu Canada
aminocyclopyrachlor - 39.5% WG (F)	metsulfuron - 12.6% WG (F)			*TruRange*	Envu Canada
aminopyralid - 240 g/L SL				*Milestone*	Corteva Agriscience
aminopyralid - 50 g/L SL (F)	2,4-D Amine - 400 g/L SL (F)			*Restore II*	Corteva Agriscience
aminopyralid - 80 g/L SL (F)	florpyrauxifen - 6.36 g/L SL (F)			*Restore NXT*	Corteva Agriscience
aminopyralid - 52.5% WG (F)	metsulfuron - 9.45% WG (F)	2,4-D Ester - 660 g/L EC		*Reclaim II*	Corteva Agriscience
aminopyralid - 52.5% WG (F)	metsulfuron - 9.45% WG (F)	fluroxypyr - 333 g/L EC		*Sightline*	Corteva Agriscience
aminopyralid - 52.5% WG (F)	metsulfuron - 9.45% WG (F)			*ClearView*	Corteva Agriscience
ammonium salt of fatty acids - 36% SN				*Axxe*	BioSafe Systems
atrazine - 480 g/L SC				*AAtrex Liquid*	Syngenta
atrazine - 320 g/L SC (F)	metolachlor - 400 g/L SC (F)			*Primextra II Magnum*	Syngenta
bentazon - 480 g/L SL				*Basagran*	BASF
bentazon - 480 g/L SL				*Basagran Forté*	BASF
bentazon - 480 g/L SL				*Benta Super*	Sharda Cropchem
bentazon - 480 g/L SL				*Beserk*	Nufarm Agriculture
bentazon - 480 g/L SL				*Boa*	Agracity
bentazon - 480 g/L SL				*Broadloom*	UPL AgroSolutions
bentazon - 480 g/L SL				*Viking Bentazon*	Viking
bentazon - 320 g/L SL (F)	acifluorfen - 240 g/L SL (F)			*Hurricane*	UPL AgroSolutions
bentazon - 429 g/L SL (F)	imazamox - 20 g/L SL (F)			*Benz*	Sharda Cropchem
bentazon - 429 g/L SL (F)	imazamox - 20 g/L SL (F)			*Viper ADV*	BASF
bentazon - 440 g/L SL (F)	imazamox 20.6 g/L SL (F)			*Ransack*	Nufarm Agriculture
bentazon - 480 g/L SL	imazamox - 70% WG	quizalofop-p - 96 g/L EC		*Anaconda*	Agracity
bentazon - 480 g/L SL	imazamox - 70% WG			*Boa Pro*	Agracity
bentazon - 480 g/L SL	imazamox - 70% WG			*Taipan*	Agracity
bentazon - 480 g/L SL	imazamox - 80 g/L SL			*Python*	ADAMA
bentazon - 480 g/L SL	quizalofop-p - 96 g/L EC			*Boa IQ*	Agracity
bicyclopyrone - 37.5 g/L EC (F)	bromoxynil - 175 g/L EC (F)			*Talinor*	Syngenta
bicyclopyrone - 37.5 g/L EC (F1)	bromoxynil - 175 g/L EC (F1)	pinoxaden - 50 g/L EC (F2)	fluroxypyr - 87.5 g/L EC (F2)	*Axial Maxx*	Syngenta
bromoxynil - 235g/L EC				*Koril 235*	Nufarm Agriculture
bromoxynil - 240 g/L EC				*Bromotril*	ADAMA
bromoxynil - 240 g/L EC				*Brox 240*	Albaugh
bromoxynil - 240 g/L EC				*Brotex*	IPCO
bromoxynil - 240 g/L EC				*Starbuck*	Winfield United
bromoxynil - 280 g/L EC				*Pardner*	Bayer
bromoxynil - 480 g/L SL				*Brotex 480, Brotex 4AT*	IPCO
bromoxynil - 174 g/L EC (F)	dichlorprop - 435 g/L EC (F)			*Oxbow*	Nufarm Agriculture
bromoxynil - 174.3 g/l EC (F)	pyrasulfotole - 31.1 g/L EC (F)	fluroxypyr - 72 g/L EC (F)		*Infinity FX*	Bayer
bromoxynil - 175 g/L EC (F)	bicyclopyrone 37.5 g/L EC (F)			*Talinor*	Syngenta
bromoxynil - 175 g/L EC (F)	pyrasulfotole - 31.3 g/L EC (F)	thiencarbazone - 5 g/L SC (F)		*Velocity m3*	Bayer
bromoxynil - 200 g/L EC (F)	fluroxypyr - 80 g/L EC (F)	MCPA Ester - 225 g/L EC (F)		*CO-OP/IPCO Emit*	IPCO
bromoxynil - 200 g/L EC (F)	fluroxypyr - 80 g/L EC (F)	MCPA Ester - 225 g/L EC (F)		*Enforcer M*	Nufarm Agriculture
bromoxynil - 200 g/L EC (F)	fluroxypyr - 80 g/L EC (F)	MCPA Ester - 225 g/L EC (F)		*Pierce*	Sharda Cropchem
bromoxynil - 210 g/L EC (F)	pyrasulfotole - 37.5 g/L EC (F)	fluroxypyr - 87.5 g/L EC (F)	pinoxaden - 50 g/L EC (F)	*Axial Xtreme iPak*	Syngenta
bromoxynil - 210 g/L EC (F)	pyrasulfotole - 37.5 g/L EC (F)			*Infinity*	Bayer

(Component 1) Active Ingredient* - Formulation	(Component 2) Active Ingredient* - Formulation	(Component 3) Active Ingredient* - Formulation	(Component 4) Active Ingredient* - Formulation	Product	Company
bromoxynil - 197 g/L SC (F)	flucarbazone - 16.7 g/L SC (F)	fluroxypyr - 74.1 g/L SC (F)	MCPA ester - 197 g/L SC (F)	*Batalium*	UPL AgroSolutions
bromoxynil - 225 g/L EC (F)	2,4-D Ester - 225 g/L EC (F)			*Leader*	IPCO
bromoxynil - 225 g/L EC (F)	2,4-D Ester - 225 g/L EC (F)			*Thrasher II*	ADAMA
bromoxynil - 225 g/L EC (F)	MCPA Ester - 225 g/L EC (F)			Brox M	Albaugh
bromoxynil - 225 g/L EC (F)	MCPA Ester - 225 g/L EC (F)			*Double Trouble*	Albaugh
bromoxynil - 225 g/L EC (F)	MCPA Ester - 225 g/L EC (F)			*Badge*	ADAMA
bromoxynil - 225 g/L EC (F)	MCPA Ester - 225 g/L EC (F)			*Logic M*	IPCO
bromoxynil - 225 g/L EC (F)	MCPA Ester - 225 g/L EC (F)			*Mextrol 450*	Nufarm Agriculture
bromoxynil - 200 g/L EC (F)	MCPA Ester - 200 g/L EC (F)	fluroxypyr - 80 g/L EC		*ForceFighter All In*	ADAMA
bromoxynil - 235g/L EC	topremazone - 336 g/L SC			*Certitude*	BASF
bromoxynil - 280 g/L EC (F)	MCPA Ester - 280 g/L EC (F)	fluroxypyr - 180 g/L EC		*Foxxy Canuck*	Agracity
bromoxynil - 280 g/L EC (F)	MCPA Ester - 280 g/L EC (F)	fluroxypyr - 180 g/L EC		*Viking Trycka*	Viking
bromoxynil - 235g/L EC	carfentrazone - 240 g/L EC	clomazone - 360 g/L ME		*IPCO Trigon*	IPCO
bromoxynil - 240 g/L EC	carfentrazone - 240 g/L EC			*Revenge B Extreme*	Agracity
bromoxynil - 240g/L EC	carfentrazone - 240 g/L EC			*Emphasis*	ADAMA
bromoxynil - 480g/L EC	carfentrazone - 240 g/L EC			*CO-OP/IPCO Octagon*	IPCO
bromoxynil - 280g/L EC	carfentrazone - 240 g/L EC			*Revenge B*	Agracity
bromoxynil - 280 g/L EC (F)	2,4-D Ester - 280 g/L EC (F)			Swipe	Sharda Cropchem
bromoxynil - 280 g/L EC (F)	2,4-D Ester - 280 g/L EC (F)			*Thumper*	Bayer
bromoxynil - 280 g/L EC	carfentrazone - 240 g/L EC			*Viking Vardo*	Viking
bromoxynil - 280 g/L EC (F)	MCPA Ester - 280 g/L EC (F)	fluroxypyr - 180 g/L EC		*Foxxy Canuck*	Agracity
bromoxynil - 280 g/L EC (F)	MCPA Ester - 280 g/L EC (F)			*Brilliant*	Sharda Cropchem
bromoxynil - 280 g/L EC (F)	MCPA Ester - 280 g/L EC (F)			*Buctril M*	Bayer
bromoxynil - 280 g/L EC (F)	MCPA Ester - 280 g/L EC (F)			*Canuck*	Agracity
bromoxynil - 280 g/L (EC) (F)	pyrasulfatole - 25 g/L (EC) (F)			*Huskie PRE*	Bayer
bromoxynil - 280 g/L (F)	MCPA Ester - 280 g/L EC (F)			*Viking Hamar*	Viking
bromoxynil - 467g/L EC (F)	pyraflufen - 15 EC (F)			*Conquer II*	Nufarm Agriculture
bromoxynil - 87.5 g/L EC (F)	fenoxaprop-p - 46 g/L EC (F)	pyrasulfotole - 15.5 g/L EC (F)		*Tundra*	Bayer
bromoxynil - 90 g/L EC (F)	fluroxypyr - 80 g/L EC (F)	2,4-D Ester - 240 g/L EC (F)		*Enforcer D*	Nufarm Agriculture
bromoxynil - 175 g/L EC (F1)	bicyclopyrone - 37.5 g/L EC (F1)	pinoxaden - 50 g/L EC (F2)	fluroxypyr - 87.5 g/L EC (F2)	*Axial Maxx*	Syngenta
bromoxynil - 186.6 g/L EC (F)	tolpyralate - 18.7 g/L EC (F)			*OnDeck*	Corteva Agriscience
carfentrazone - 240 g/L EC				*Foremost*	WinField United
carfentrazone - 240 g/L EC				*InStep*	Albaugh
carfentrazone - 240 g/L EC				*IPCO C-Zone*	IPCO
carfentrazone - 240 g/L EC				*Revenge*	Agracity
carfentrazone - 240 g/L EC				*Viking Carfentrazone*	Viking
carfentrazone - 175 g/L EC (F)	flucarbazone - 141 g/L SC (F)	florasulam - 50 g/L SC (F)		*Inferno Trio*	UPL AgroSolutions
carfentrazone - 240 g/L EC	bromoxynil - 240 g/L EC			*Revenge B Extreme*	Agracity
carfentrazone - 240 g/L EC	bromoxynil 280 g/L EC			*Viking Vardo*	Viking
carfentrazone - 240 g/L EC	2,4-D Ester - 660 g/L EC			*Viking Solna*	Viking
carfentrazone - 240 g/L EC	2,4-D Ester - 660 g/L EC			*CO-OP/IPCO Convex*	IPCO
carfentrazone - 240 g/L EC	2,4-D Ester - 660 g/L EC			*Revenge Pro*	Agracity
carfentrazone - 240 g/L EC	bromoxynil - 235g/L EC	clomazone - 360 g/L ME		*IPCO Trigon*	IPCO
carfentrazone - 240 g/L EC	bromoxynil - 280g/L EC			*Emphasis*	ADAMA
carfentrazone - 240 g/L EC	bromoxynil - 480/L EC			*CO-OP/IPCO Octagon*	IPCO
carfentrazone - 240 g/L EC	bromoxynil - 240g/L EC			*Revenge B*	Agracity
carfentrazone - 240 g/L EC	clomazone - 360 g/L ME			*Command Charge*	FMC
carfentrazone - 240 g/L EC	tribenuron - 6.52% WG (F)	dicamba - 60.9% WG (F)		*Intruvix*	FMC
carfentrazone - 240 g/L EC	tribenuron - 75% WG			*Revenge E*	Agracity
carfentrazone - 27.97 g/L EC (F)	halauxifen - 15 g/L EC (F)			*Prospect*	Corteva Agriscience
carfentrazone - 42 g/L SE (F)	sulfentrazone - 380 g/L SE (F)			*Authority Strike*	FMC
carfentrazone - 53 g/L SE (F)	pyroxasulfone - 447 g/L SE (F)			*Focus*	FMC
carfentrazone - 240 g/L EC (F1)	sulfentrazone - 480 g/L SC (F2)			*Throne II Revenge*	Agracity
carfentrazone - 11.25% WGR (B)	dicamba - 43.75% WGR (B)	tribenuron - 4.69% WGR (B)		*Intruvix II*	FMC

(Component 1) Active Ingredient* - Formulation	(Component 2) Active Ingredient* - Formulation	(Component 3) Active Ingredient* - Formulation	(Component 4) Active Ingredient* - Formulation	Product	Company
chlormequat chloride - 620 g/L SL				*Manipulator*	Taminco/Belchim Crop Protection
chorsulfuron - 75% WG				*Telar XP*	Envu Canada
clethodim - 120 g/L EC				*Arrow-All-In*	ADAMA
clethodim - 120 g/L EC				*CO-OP Patron Complete*	IPCO
clethodim - 120 g/L EC				*IPCO GraminX Complete*	IPCO
clethodim - 120 g/L EC				*Shadow XL*	Loveland Products
clethodim - 120 g/L EC				*Centurion ADV*	BASF
clethodim - 240 g/L EC				*Antler 240EC*	WinField United
clethodim - 240 g/L EC				*Arrow*	ADAMA
clethodim - 240 g/L EC				*Centurion*	BASF
clethodim - 240 g/L EC				*Clethodim 240*	Albaugh
clethodim - 240 g/L EC				*CO-OP Patron 240EC*	IPCO
clethodim - 240 g/L EC				*Deputy*	Albaugh
clethodim - 240 g/L EC				*Independence*	Agracity
clethodim - 240 g/L EC				*IPCO GraminX*	IPCO
clethodim - 240 g/L EC				*Select*	UPL AgroSolutions
clethodim - 240 g/L EC				*Shadow RTM*	Loveland Products
clethodim - 240 g/L EC				*Statue*	Nufarm Agriculture
clethodim - 240 g/L EC				*Viking Clethodim*	Viking
clethodim - 240 g/L EC				*Advantage Clethodim 240*	Advantage Crop Protection
clethodim - 360 g/L EC				*Antler Unpacked*	WinField United
clethodim - 240 g/L EC	imazamox - 35% WG (F)	imazethapyr - 35% WG (F)		*Viknig Floro*	Viking
clethodim - 240 g/L EC	imazamox - 70% WG			*Samauri Master*	Agracity
clethodim - 240 g/L EC	imazethapyr - 35% WG (F)	imazamox - 35% WG (F)		*Ninja Master*	Agracity
clethodim - 240 g/L EC (F)	quizalofop - 120 g/L EC (F)			*Select Plus*	UPL AgroSolutions Canada
clodinafop - 112 g/L EC (F)	fluroxypyr - 217 g/L EC (F)	thifensulfuron:tribenuron - 50%:25% SG		*Signal FSU*	Nufarm Agriculture
clodinafop - 60 g/L EC				*Foothills NG*	Loveland Products
clodinafop - 60 g/L EC				*Horizon NG*	Syngenta
clodinafop - 80 g/L EC				*Cadillac One*	WinField United
clodinafop - 80 g/L EC				*Ladder All In*	ADAMA
clodinafop - 240 g/L EC				*Aurora*	Agracity
clodinafop - 240 g/L EC				*Cadillac Unpacked*	WinField United
clodinafop - 240 g/L EC				*Foax*	FBN
clodinafop - 240 g/L EC				*Ladder*	ADAMA
clodinafop - 240 g/L EC				*Signal*	Nufarm Agriculture
clodinafop - 240 g/L EC				*Slam'R*	Albaugh
clodinafop - 240 g/L EC				*Viking Clodinafop*	Viking
clodinafop - 240 g/L EC				*Winner*	Albaugh
clodinafop - 25 g/L EC (F)	pinoxaden - 25 g/L EC (F)			*Traxos*	Syngenta
clodinafop - 25 g/L EC (F1)	pinoxaden - 25 g/L EC (F1)	2,4-D Ester - 360 g/L EC (F2)	fluroxypyr - 90 g/L EC (F2)	*TraxosTwo*	Syngenta
clomazone - 360 g/L ME				*Command 360 ME*	FMC
clomazone - 360 g/L ME				*Czar*	Sharda Cropchem
clomazone - 360 g/L ME				*IPCO Clomazone*	IPCO
clomazone - 360 g/L ME	carfentrazone - 240 g/L EC	bromoxynil - 235g/L EC		*IPCO Trigon*	IPCO
clomazone - 360 g/L ME	carfentrazone - 240 g/L EC			*Command Charge*	FMC
clopyralid - 360 g/L SL				*Advantage Clopyralid 360*	Advantage Crop Protection
clopyralid - 360 g/L SL				*Clobber*	Agracity
clopyralid - 360 g/L SL				*Pyralid*	Sharda Cropchem
clopyralid - 360 g/L SL				*Spur*	Albaugh

(Component 1) Active Ingredient* - Formulation	(Component 2) Active Ingredient* - Formulation	(Component 3) Active Ingredient* - Formulation	(Component 4) Active Ingredient* - Formulation	Product	Company
clopyralid - 360 g/L SL				*Viking Clopyralid*	Viking
clopyralid - 600 g/L SL				*Lontrel XC*	Corteva Agriscience
clopyralid - 360 g/L EC	fluroxypyr - 180 g/L EC	MCPA Ester - 600 g/L EC		*Esteem*	ADAMA
clopyralid - 360 g/L SL	glyphosate - 480 g/L SL			*Eclipse XC*	Corteva Agriscience
clopyralid - 360 g/L SL	halauxifen - 16.2 g/L EC (F)	florasulam - 20% WG (F)		*Cirpreme*	Corteva Agriscience
clopyralid - 360 g/L SL	thifensulfuron: tribenuron - 50%:25% WG	fluroxypyr - 180 g/L EC		*Foxxy CRX*	Agracity
thifensulfuron: tribenuron - 50%:25% WG	fluroxypyr - 180 g/L EC	clopyralid - 360 g/L EC		*Viking Larvik*	Viking
clopyralid - 40 g/L EC (F)	fluroxypyr - 59.7 g/L EC (F)	MCPA - 240.5 g/L EC (F)		*Esteem All In*	ADAMA
clopyralid - 42.7 g/L EC (F)	fluroxypyr - 61.6 g/L EC (F)	MCPA - 239.5 g/L EC (F)		*Repute*	Sharda Cropchem
clopyralid - 42.7 g/L EC (F)	fluroxypyr - 61.6 g/L EC (F)	MCPA Ester - 240 g/L EC (F)		*Prestige XL*	Corteva Agriscience
clopyralid - 50 g/L EC (F)	fluroxypyr - 333 g/L EC	MCPA Ester - 280 g/L EC (F)		*Prestige XC*	Corteva Agriscience
clopyralid - 50 g/L EC (F)	fluroxypyr - 180 g/L EC (F)	MCPA Ester - 280 g/L EC		*Foxxy CM*	Agracity
clopryalid - 50 g/L EC (F)	fluroxypry - 180 g/L EC	MCPA Ester - 280 g/L EC (F)		*Viking Stavanger*	Viking
clopyralid - 50 g/L EC (F)	MCPA Ester - 280 g/L EC (F)			*Certain*	Sharda Cropchem
clopyralid - 50 g/L EC (F)	MCPA Ester - 280 g/L EC (F)			*Clobber M*	Agracity
clopyralid - 50 g/L EC (F)	MCPA Ester - 280 g/L EC (F)			*Curtail M*	Nufarm Agriculture
clopyralid - 50 g/L EC (F)	MCPA Ester - 280 g/L EC (F)			*Spur-M*	Albaugh
clopyralid - 50 g/L EC (F)	MCPA Ester - 280 g/L EC (F)			*Viking Drammen*	Viking
clopyralid - 60 g/L EC (F)	fluroxypyr - 77 g/L EC (F)	MCPA Ester - 210 g/L EC (F)		*CO-OP/IPCO State*	IPCO
clopyralid - 60 g/L EC (F)	fluroxypyr - 77 g/L EC (F)	MCPA Ester - 210 g/L EC (F)		*Truslate Pro*	Nufarm Agriculture
clopyralid - 600 g/L SL	halauxifen - 16.2 g/L EC (F)	florasulam - 20% WG (F)		*Cirpreme XC*	Corteva Agriscience
clopyralid - 80 g/L EC (F)	fluroxypyr - 100 g/L SC (F)	florasulam - 2.5 g/L SC (F)		*Akito*	UPL AgroSolutions
clopyralid - 90 g/L EC (F)	fluroxypyr - 90 g/L EC (F)			*Inertia*	Sharda Cropchem
clopyralid - 90g/L SL (F)	fluroxypyr - 90 g/L EC (F)			*Momentum*	Loveland Products
clopyralid - 97.8 g/L ME (F)	halauxifen - 4.7 g/L ME (F)	fluroxypyr - 122.2 g/L ME (F)		*Prominex*	Corteva Agriscience
dicamba - 120 g/L SL (F)	glyphosate - 240 g/L SL (F)			*Roundup Xtend*	Bayer
dicamba - 159 g/L SL (F)	glyphosate - 317 g/L SL (F)			*Roundup Xtend 2*	Bayer
dicamba - 350 g/L SL				*FeXapan*	Corteva Agriscience
dicamba - 350 g/L SL				*Xtendimax*	Bayer
dicamba - 474 g/L SL				*Xtendimax 2*	Bayer
dicamba - 480 g/L SL				*Ammo*	Agracity
dicamba - 480 g/L SL				*Vanquish*	Syngenta
dicamba - 480 g/L SL				*Banvel VM*	BASF
dicamba - 480 g/L SL				*Oracle*	Gharda (UAP)
dicamba - 480 g/L SL				*Viking Dicamba*	Viking
dicamba - 600 g/L SL				*Engenia*	BASF
dicamba - 480 g/L SL	florasulam - 25% WG			*Korrex II*	Corteva Agriscience
dicamba - 480 g/L SL	thifensulfuron: tribenuron - 50%:25% WG	2,4-D Ester - 660g/L EC		*Ammo DR*	Agracity
dicamba - 480 g/L WG (F)	tribenuron - 50% WG (F)			*Express FX*	FMC
dicamba - 43.75% WGR (B)	carfentrazone - 11.25% WGR (B)	tribenuron - 4.69% WGR (B)		*Intruvix II*	FMC
dicamba - 50% WG (F)	diflufenzopyr - 20% WG (F)			*Distinct*	BASF
dicamba - 50% WG (F)	diflufenzopyr - 20% WG (F)			*Overdrive*	BASF
dicamba - 58.45% WG (F)	tribenuron - 8.25% WG (F)	2,4-D Ester - 660g/L EC		*Triton K*	FMC
dicamba - 60.9% WG (F)	tribenuron - 6.52% WG (F)	carfentrazone - 240 g/L EC		*Intruvix*	FMC
dicamba - 62.5 g/L SL (F)	mecoprop-P - 62.5 g/L SL (F)	MCPA Amine - 275 g/L SL (F)		*Sword*	Loveland Products
dicamba - 62.5 g/L SL (F)	mecoprop-P - 62.5 g/L SL (F)	MCPA Amine - 275 g/L SL (F)		*Tracker XP*	IPCO
dicamba - 87 g/L EC (F)	fluroxypyr - 113 g/L EC (F)			*DiFlux*	Sharda Cropchem
dicamba - 87 g/L EC (F)	fluroxypyr - 113 g/L EC (F)			*Pulsar*	Syngenta
dichlobenil - 4% G	bromoxynil - 174 g/L EC (F)			*Casoron*	UPL AgroSolutions
dichlorprop-P - 210 g/L EC (F)	2,4-D Ester - 400 g/L EC (F)			*Dichlorprop-DX*	IPCO
dichlorprop-P - 210 g/L EC (F)	2,4-D Ester - 400 g/L EC (F)			*Estaprop XT*	Nufarm Agriculture

(Component 1) Active Ingredient* - Formulation	(Component 2) Active Ingredient* - Formulation	(Component 3) Active Ingredient* - Formulation	(Component 4) Active Ingredient* - Formulation	Product	Company
dichlorprop-P - 284 g/L EC (F)	2,4-D Ester - 284 g/L EC (F)	pyraflufen - 7.3 g/L EC (F)		*Blackhawk EVO*	Nufarm Agriculture
dichlorprop-P - 310 g/L SL (F)	MCPA Amine - 160 g/L SL (F)	mecoprop-P - 130 g/L SL (F)		*Optica Trio*	UAP
dichlorprop - 435 g/L EC (F)	bromoxynil - 174 g/L EC (F)			*Oxbow*	Nufarm Agriculture
diflufenzopyr - 20% WG (F)	dicamba - 50% WG (F)			*Distinct*	BASF
diflufenzopyr - 20% WG (F)	dicamba - 50% WG (F)			*Overdrive*	BASF
dimethanamid-P - 720g/L EC				*Frontier Max*	BASF
diquat - 200 g/L SL				*Reward* (Aquatic only)	Syngenta
diquat - 200 g/L SL				*Armory All In*	ADAMA
diquat - 240 g/L SL				*Advantage Diquat 240*	Advantage Crop Protection
diquat - 240 g/L SL				*Armory*	ADAMA
diquat - 240 g/L SL				*Clone*	Agracity
diquat - 240 g/L SL				*CO-OP Bolster*	IPCO
diquat - 240 g/L SL				*Craven*	WinField United
diquat - 240 g/L SL				*Desica*	Syngenta
diquat - 240 g/L SL				*Dessicash Desiccant*	Sharda Cropchem
diquat - 240 g/L SL				*DriFast*	Nufarm Agriculture
diquat - 240 g/L SL				*Reglone Desiccant*	Syngenta
diquat - 240 g/L SL				*Reglone Ion*	Syngenta
diquat - 240 g/L SL				*Stage*	Loveland Products
diquat - 240 g/L SL				*Viking Diquat*	Viking
diquat - 240 g/L SL				*Innovis Diquat 240 Havrest*	Innovis Crop Protection Limited
EPTC - 800 g/L EC				*Aide*	Gowan Company
ethalfluralin - 10% G				*Eptam Liquid EC*	Gowan Company
ethalfluralin - 10% G				*Edge MicroActiv*	Gowan Company
				YieldShield Resflura	Rath Holdco Inc.
ethametsulfuron- 75% WG				*Soilsorb*	
fenoxaprop-p - 90 g/L EC				*Muster*	FMC
fenoxaprop-p - 120 g/L EC				*Puma Advance*	Bayer
fenoxaprop-p - 120 g/L EC				*HellCat*	Agracity
fenoxaprop-p - 120 g/L EC				*Vigil WB*	IPCO
fenoxaprop-p - 46 g/L EC (F)	bromoxynil - 87.5 g/L EC (F)	pyrasulfotole - 15.5 g/L EC (F)		*Viking Fenoxaprop*	Viking
fenoxaprop-p - 50 g/L EC (F)	pinoxaden - 50 g/L EC (F)			*Tundra*	Bayer
florasulam - 25% WG				*Cirray*	Bayer
florasulam - 25% WG				*PrePass Flex*	Corteva Agriscience
florasulam - 50 g/L SC				*Start 25 WDG*	Sharda Cropchem
florasulam - 50 g/L SC				*Battlefront*	Agracity
florasulam - 50 g/L SC				*Bombard 50 SC*	Loveland Products Canada
florasulam - 50 g/L SC				*Clorvante*	Albaugh
florasulam - 50 g/L SC				*Blitz*	Loveland Products
florasulam - 50 g/L SC				*Flora*	Sharda CropChem
florasulam - 50 g/L SC				*Priority*	ADAMA
florasulam - 50 g/L SC				*Viking Florasulam*	Viking
florasulam - 50 g/L SC				*Advantage Florasulam 50 SC*	Advantage Crop Protection
florasulam - 2.5 g/L SC (F)	clopyralid - 80 g/L EC (F)	fluroxypyr - 100 g/L SC (F)		*Akito*	UPL AgroSolutions
florasulam - 2.5 g/L SC (F)	fluroxypyr - 100 g/L SC (F)	MCPA Ester - 600 g ae/L EC		*Outshine*	ADAMA
florasulam - 2.5 g/L SC (F)	fluroxypyr - 100 g/L SC (F)	MCPA Ester - 600 g/L EC		*Stellar*	Corteva Agriscience
florasulam - 2.5 g/L EC (F)	fluroxypyr - 100 g/L EC (F)	MCPA - 350 g/L EC (F)		*Sabatis*	Syngenta
florasulam - 2.5 g/L EC (F)	fluroxypyr - 100 g/L EC (F)	MCPA - 350 g/L EC (F)		*Sabatis*	Syngenta
florasulam - 2.5 g/L SC (F)	fluroxypyr - 100 g/L SC (F)			*Battlestar*	Agracity
florasulam - 2.5 g/L SC (F)	fluroxypyr - 100 g/L SC (F)			*Alloy*	Sharda Cropchem
florasulam - 2.5 g/L SC (F)	fluroxypyr - 100 g/L SC (F)			*Steel*	Sharda Cropchem

(Component 1) Active Ingredient* - Formulation	(Component 2) Active Ingredient* - Formulation	(Component 3) Active Ingredient* - Formulation	(Component 4) Active Ingredient* - Formulation	Product	Company
florasulam - 2.5 g/L SC (F)	fluroxypyr - 100 g/L SC (F)			*Stellar Unpacked*	WinField United
florasulam - 2.5 g/L SC (F)	fluroxypyr - 100 g/L SC (F)			*Viking Bodo*	Viking
florasulam - 2.5 g/L SC (F)	MCPA Ester - 350 g/L EC (F)	fluroxypyr - 100 g/L SC (F)		*Stellar XL*	Corteva Agriscience
florasulam - 6 g/L EC (F)	halauxifen - 6 g/L EC (F)	2,4-D ester - 300 g/L EC (F)		*Extinguish XL*	Corteva Agriscience
florasulam - 20% WG (F)	clopyralid - 360 g/L SL	halauxifen - 16.2 g/L EC (F)		*Cirpreme*	Corteva Agriscience
florasulam - 20% WG (F)	clopyralid - 600 g/L SL	halauxifen - 16.2 g/L EC (F)		*Cirpreme XC*	Corteva Agriscience
florasulam - 20% WG (F)	halauxifen - 20% WG (F)	MCPA Ester - 600 g/L EC		*Exhilarate*	Corteva Agriscience
florasulam - 20% WG (F)	halauxifen - 20% WG (F)			*Paradigm PRE*	Corteva Agriscience
florasulam - 20% WG (F)	MCPA Ester - 600 g/L EC	halauxifen - 20% WG (F)		*CO-OP/IPCO Exhilarate*	IPCO
florasulam - 25% WG	dicamba - 480 g/L SL			*Korrex II*	Corteva Agriscience
florasulam - 5 g/L SC (F)	fluroxypyr - 100 g/L SC (F)	pinoxaden - 50g/L EC		*Avenza*	Corteva Agriscience
florasulam - 50 g/L SC	bromoxynil - 240 g/L EC			*Hot Shot*	ADAMA
florasulam - 50 g/L SC	flucarbazone - 66% WDG			*Himalaya Pass*	Agracity
florasulam - 50 g/L SC	fluroxypyr - 180 g/L EC			*Deathstar*	Agracity
florasulam - 50 g/L SC	fluroxypyr - 180 g/L EC			*Viking Askim*	Viking
florasulam - 50 g/L SC	glyphosate - 480 g/L SL			*PrePass XC*	Corteva Agriscience
florasulam - 50 g/L SC	MCPA Ester - 420 g/L EC (F)	pyraflufen - 13.5 g/L (F)		*Thunderhawk*	Nufarm Agriculture
florasulam - 50 g/L SC	MCPA Ester - 600 g/L EC			*Topline*	ADAMA
florasulam - 50 g/L SC (F)	carfentrazone - 175 g/L EC (F)	flucarbazone - 141 g/L SC (F)		*Inferno Trio*	UPL AgroSolutions
florasulam - 7.7 g/L EC (F)	pinoxaden - 92.7 g/L EC (F)			*Broadband*	Syngenta
florpyrauxifen - 6.36 g/L SL (F)	aminopyralid - 80 g/L SL (F)			*Restore NXT*	Corteva Agriscience
flucarbazone - 141 g/L SC (F)	florasulam - 50 g/L SC (F)	carfentrazone - 175 g/L EC (F)		*Inferno Trio*	UPL AgroSolutions
flucarbazone - 200 g/L SC				*Everest 3.0 AG*	UPL AgroSolutions
flucarbazone - 200 g/L SC				*Sierra 3.0 AG*	Syngenta
flucarbazone - 66 % WDG				*Himalaya*	Agracity
flucarbazone - 66 % WDG				*Viking Flucarbazone*	Viking
flucarbazone - 45% WG (F)	tribenuron - 25% WG (F)			*Inferno Duo*	UPL AgroSolutions
flucarbazone - 66% WDG	florasulam - 50 g/L SC			*Himalaya Pass*	Agracity
flucarbazone - 66 % WDG	tribenuron - 75% WG			*Himalaya Extra*	Agracity
flucarbazone - 66 % WDG	tribenuron - 75% WG			*Viking Visby*	Viking
flucarbazone - 16.7 g/L SC (F)	fluroxypyr - 74.1 g/L SC (F)	MCPA ester - 197 g/L SC (F)	bromoxynil - 197 g/L SC (F)	*Batalium*	UPL AgroSolutions
flumioxazin - 479 g/L SC				*Chateau EZ*	Valent
flumioxazin - 479 g/L SC				*Valtera EZ*	Valent
flumioxazin - 51% WG				*Chateau*	Valent
flumioxazin - 51% WG				*Valtera*	Valent
flumioxazin - 160 g/L SC (F)	pyroxasulfone -203 g/L SC (F)			*Fierce EZ*	Valent
flumioxazin - 160 g/L SC (F)	pyroxasulfone -203 g/L SC (F)			*Torpedo EZ*	Valent
flumioxazin - 33.5% WG (F)	pyroxasulfone - 44.5% WG (F)			*Fierce*	Valent
flumioxazin - 33.5% WG (F)	pyroxasulfone - 44.5% WG (F)			*Torpedo*	Valent
flumioxazin - 77.6 g/L SC (F)	metribuzin - 347 g/L SC (F)			*IPCO Bifecta EZ*	IPCO
fluroxypyr - 333 g/L EC				*Fluro Star max*	Albaugh
fluroxypyr - 333 g/L EC				*Advantage Fluroxypyr 333 EC*	Advantage Crop Protection
fluroxypyr - 333 g/L EC				*Cavalier*	WinField United
fluroxypyr - 72 g/L EC (F)	pyrasulfotole - 31.1 g/L EC (F)	bromoxynil 174.3 g/L EC (F)		*Infinity FX*	Bayer
fluroxypyr - 100 g/L SC (F)	florasulam - 2.5 g/L SC (F)			*Battlestar*	Agracity
fluroxypyr - 100 g/L SC (F)	florasulam - 2.5 g/L SC (F)			*Steel*	Sharda Cropchem
fluroxypyr - 100 g/L SC (F)	florasulam - 2.5 g/L SC (F)			*Viking Bodo*	Viking
fluroxypyr - 100 g/L SC (F)	florasulam - 2.5 g/L SC (F)	clopyralid - 80 g/L EC (F)		*Akito*	UPL AgroSolutions
fluroxypyr - 100 g/L SC (F)	florasulam - 5 g/L SC (F)	pinoxaden - 50g/L EC		*Avenza*	Corteva Agriscience
fluroxypyr - 100 g/L SC (F)	florasulam - 2.5 g/L SC (F)	MCPA Ester - 600 g ae/L EC		*Outshine*	ADAMA
fluroxypyr - 100 g/L SC (F)	florasulam - 2.5 g/L SC (F)	MCPA Ester - 600 g/L EC		*Stellar*	Corteva Agriscience
fluroxypyr - 100 g/L SC (F)	florasulam - 2.5 g/L SC (F)	MCPA Ester - 350 g/L EC (F)		*Stellar XL*	Corteva Agriscience
fluroxypyr - 100 g/L EC (F)	florasulam - 2.5 g/L EC (F	MCPA - 350 g/L EC (F)		*Sabatis*	Syngenta

(Component 1) Active Ingredient* - Formulation	(Component 2) Active Ingredient* - Formulation	(Component 3) Active Ingredient* - Formulation	(Component 4) Active Ingredient* - Formulation	Product	Company
fluroxypyr - 113 g/L EC (F)	dicamba - 87 g/L EC (F)			*DiFlux*	Sharda Cropchem
fluroxypyr - 113 g/L EC (F)	dicamba - 87 g/L EC (F)			*Pulsar*	Syngenta
fluroxypyr - 113.5 g/L SC (F)	pyroxsulam - 12.8 g/L SC (F)			*Erebus Xtreme*	Syngenta
fluroxypyr - 118 g/L EC (F)	thiencarbazone-methyl - 5 g/L EC (F)			*Varro FX*	Bayer
fluroxypyr - 122.2 g/L ME (F)	clopyralid - 97.8 g/L ME (F)	halauxifen - 4.7 g/L ME (F)		*Prominex*	Corteva Agriscience
fluroxypyr - 150 g/L SC (F)	thifensulfuron - 30 g/L SC (F)	metsulfuron - 3 g/L SC (F)		*Travallas*	FMC
fluroxypyr - 150 g/L SC (F)	thifensulfuron - 30 g/L SC (F)			*Sentrallas*	FMC
fluroxypyr - 180 g/L EC	2,4-D Ester - 564 g/L EC	thifensulfuron: tribenuron - 50%:25% WG		*Foxxy Pro RX*	Agracity
fluroxypyr - 180 g/L EC	bromoxynil - 280 g/L EC (F)	MCPA Ester - 280 g/L EC (F)		*Foxxy Canuck*	Agracity
fluroxypyr - 180 g/L EC	clopyralid - 360 g/L EC	MCPA Ester - 600 g/L EC		*Esteem*	ADAMA
fluroxypyr - 180 g/L EC	clopyralid - 360 g/L SL	thifensulfuron: tribenuron - 50%:25% WG		*Foxxy CRX*	Agracity
thifensulfuron: tribenuron - 50%:25% WG	fluroxypyr - 180 g/L EC	clopyralid - 360 g/L EC		*Viking Larvik*	Viking
fluroxypyr - 180 g/L EC	clopyralid - 50 g/L EC (F)	MCPA Ester - 280 g/L EC (F)		*Foxxy CM*	Agracity
fluroxypyr - 180 g/L EC	florasulam - 50 g/L SC			*Deathstar*	Agracity
florasulam - 50 g/L SC	fluroxypyr - 180 g/L EC			*Viking Askim*	Viking
fluroxypyr - 80 g/L EC	MCPA Ester - 200 g/L EC (F)	bromoxynil - 200 g/L EC (F)		*ForceFighter All In*	ADAMA
fluroxypyr - 180 g/L EC	MCPA Ester - 280 g/L EC (F)	bromoxynil - 280 g/L EC (F)		*Viking Trycka*	Viking
fluroxypyr - 180 g/L EC	clopryalid - 50 g/L EC (F)	MCPA Ester - 280 g/L EC (F)		*Viking Stavanger*	Viking
fluroxypyr - 180 g/L EC	MCPA Ester - 600 g/L EC			*Foxxy M*	Agracity
fluroxypyr - 180 g/L EC	MCPA Ester - 600 g/L EC			*Trophy*	Nufarm Agriculture
fluroxypyr - 180 g/L EC	MCPA Ester - 600 g/L EC			*Viking Lidingo*	Viking
fluroxypyr - 180 g/L EC	thifensulfuron: tribenuron - 50%:25% WG			*Audible*	Albaugh
fluroxypyr - 180 g/L EC	thifensulfuron:tribenuron - 25%:25% SG			*Foxxy R*	Agracity
fluroxypyr - 180 g/L EC	thifensulfuron:tribenuron - 25%:25% SG			*Foxxy RCK*	Agracity
fluroxypyr - 180 g/L EC	thifensulfuron:tribenuron - 25%:25% SG	MCPA Ester - 600 g/L EC		*Foxxy MR*	Agracity
fluroxypyr - 180 g/L EC	2,4-D Ester - 660 g/L EC			*Foxxy Pro*	Agracity
fluroxypyr - 180 g/L EC	2,4-D Ester - 660 g/L EC			*Foxxy Extreme*	Agracity
fluroxypyr - 180 g/L EC				*Fluro Star*	Albaugh
fluroxypyr - 180 g/L EC	2,4-D Ester - 660 g/L EC			*Flurox-24*	Nufarm Agriculture
fluroxypyr - 180 g/L EC				*Ikwin*	FBN
fluroxypyr - 180 g/L EC	2,4-D Ester - 660 g/L EC			*Rush All in*	ADAMA
fluroxypyr - 180 g/L EC	2,4-D Ester - 660 g/L EC			*Viking Kalmar*	Viking
fluroxypyr - 217 g/L EC (F)	clodinafop - 112 g/L (F)	thifensulfuron:tribenuron - 50%:25% SG		*Signal FSU*	Nufarm Agriculture
fluroxypyr - 250 g/L EC(F)	MCPA Ester - 600 g/L EC	halauxifen - 16.2 g/L EC (F)		*Pixxaro*	Corteva Agriscience
fluroxypyr - 250 g/L EC(F)	pinoxaden - 50 g/L EC (F)	halauxifen - 16.2 g/L EC (F)		*Rezuvant*	Corteva Agriscience
fluroxypyr - 333 g/L EC	imazamox - 120 g/L SL			*Altitude FX3*	BASF
fluroxypyr - 333 g/L EC	2,4-D E - 660 g/L EC			*Attain XC*	Corteva Agriscience
fluroxypyr - 333 g/L EC	clopyralid - 50 g/L EC (F)	MCPA Ester - 280 g/L EC (F)		*Prestige XC*	Corteva Agriscience
fluroxypyr - 333 g/L EC	metsulfuron - 9.45% WG (F)	aminopyralid - 52.5% WG (F)		*Sightline*	Corteva Agriscience
fluroxypyr - 333 g/L EC	pyroxsulam - 30 g/L OD			*Tandem*	Corteva Agriscience
fluroxypyr - 333 g/L EC	thifensulfuron:tribenuron - 25%:25% SG			*Barricade II*	FMC

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fluroxypyr - 333 g/L EC	thifensulfuron:tribenuron - 25%:25% SG	thiencarbazone - 10 g/L SC	MCPA Ester - 600 g/L EC	*Predicade*	FMC
fluroxypyr - 333 g/L EC	thifensulfuron:tribenuron - 33.3%:16.7% SG	2,4-D Ester - 564 g/L EC		*Retain SG*	Loveland Products
fluroxypyr - 333 g/L EC	thifensulfuron:tribenuron - 25%:25% SG	MCPA Ester - 600 g/L EC		*Barricade M*	FMC
fluroxypyr - 59.7 g/L EC (F)	clopyralid - 40 g/L EC (F)	MCPA - 240.5 g/L EC (F)		*Esteem All In*	ADAMA
fluroxypyr - 61.6 g/L EC (F)	clopyralid - 42.7 g/L EC (F)	MCPA - 239.5 g/L EC (F)		*Repute*	Sharda Cropchem
fluroxypyr - 61.6 g/L EC (F)	clopyralid - 42.7 g/L EC (F)	MCPA Ester - 240 g/L EC (F)		*Prestige XL*	Corteva Agriscience
fluroxypyr - 77 g/L EC (F)	clopyralid - 60 g/L EC (F)	MCPA Ester - 210 g/L EC (F)		*CO-OP/IPCO State*	IPCO
fluroxypyr - 77 g/L EC (F)	clopyralid - 60 g/L EC (F)	MCPA Ester - 210 g/L EC (F)		*Truslate Pro*	Nufarm Agriculture
fluroxypyr - 80 g/L EC (F)	2,4-D Ester - 240 g/L EC (F)	bromoxynil - 90 g/L EC (F)		*Enforcer D*	Nufarm Agriculture
fluroxypyr - 80 g/L EC (F)	MCPA Ester - 200 g/L EC (F)	bromoxynil - 200g/L EC (F)		*CO-OP/IPCO Emit*	IPCO
fluroxypyr - 80 g/L EC (F)	MCPA Ester - 200 g/L EC (F)	bromoxynil - 200g/L EC (F)		*Enforcer M*	Nufarm Agriculture
fluroxypyr - 80 g/L EC (F)	MCPA Ester - 200 g/L EC (F)	bromoxynil - 200g/L EC (F)		*Pierce*	Sharda Cropchem
fluroxypyr - 87.5 g/L EC (F)	pinoxaden - 50 g/L EC (F)			*Axial Xtreme*	Syngenta
fluroxypyr - 87.5 g/L EC (F)	pinoxaden - 50 g/L EC (F)	bromoxynil - 210 g/L EC (F)	pyrasulfotole - 37.5 g/L EC (F)	*Axial Xtreme iPak*	Syngenta
fluroxypyr - 87.5 g/L EC (F)	pinoxaden - 50 g/L EC (F)			*Kingpin*	Sharda Cropchem
fluroxypyr - 87.5 g/L EC (F1)	pinoxaden - 50 g/L EC (F1)	bicyclopyrone - 37.5 g/L EC (F2)	bromoxynil - 175 g/L EC (F2)	*Axial Maxx*	Syngenta
fluroxypyr - 90 g/L EC (F)	2,4-D Ester - 360 g/L EC (F)			*OcTTain XL*	Corteva Agriscience
fluroxypyr - 90 g/L EC (F)	2,4-D Ester - 360 g/L EC (F)			*Osim Plus*	Sharda Cropchem
fluroxypyr - 90 g/L EC (F)	2,4-D Ester - 360 g/L EC (F)			*Rush 24 All In*	ADAMA
fluroxypyr - 90 g/L EC (F)	2,4-D Ester - 360 g/L EC			*Foxxy Pro*	AgraCity
fluroxypyr - 90 g/L EC (F)	clopyralid - 90 g/L EC (F)			*Inertia*	Sharda Cropchem
fluroxypyr - 90 g/L EC (F)	clopyralid - 90g/L SL (F)			*Momentum*	Loveland Products
fluroxypyr - 90 g/L EC (F2)	2,4-D Ester - 360 g/L EC (F2)	pinoxaden - 25 g/L EC (F1)	clodinafop - 25 g/L EC (F1)	*TraxosTwo*	Syngenta
fluroxypyr - 74.1 g/L SC (F)	MCPA ester - 197 g/L SC (F)	bromoxynil - 197 g/L SC (F)	flucarbazone - 16.7 g/L SC (F)	*Batalium*	UPL AgroSolutions
fomesafen - 240 g/L SL				*Reflex*	Syngenta
fomesafen - 67 g/L SL (F)	glyphosate - 271 g/L SL (F)			*FlexStar GT*	Syngenta
foramsulfuron - 22.5 g/L OD				*Option 2.25 OD*	Bayer
glufosinate - 150 g/L SL				*Granata*	Nufarm Agriculture
glufosinate - 150 g/L SL				*Advantage Glufosinate 150*	Advantage Crop Protection Inc.
glufosinate - 150 g/L SL				*Innovis Glufosinate-ammonium 150 SN*	Innovis Crop Protection Limited
glufosinate - 150 g/L SL				*Interline*	UPL AgroSolutions
glufosinate - 150 g/L SL				*IPCO Glufosinate 150*	IPCO
glufosinate - 150 g/L SL				*RHI Glufosinate Ammonium 150*	Rath Holdco Inc.
glufosinate - 150 g/L SL				*Justice*	WinField United
glufosinate - 150 g/L SL				*Vigor*	Agracity
glufosinate - 150 g/L SL				*Viking Glufosinate 150*	Viking
glufosinate - 150 g/L SL				*Liberty 150 SN*	BASF
glufosinate - 150 g/L SL				*Opportunity 15 SL*	Sharda Cropchem
glufosinate - 150 g/L S				*ADAMA Glufosinate 150 SL*	ADAMA
glufosinate - 200 g/L SL				*Innovis Glufosinate 200 SN*	Innovis Crop Protection Limited
glufosinate - 200 g/L SL				*Liberty 200 SN*	BASF
glufosinate - 200 g/L SL				*Vigor 200 SN*	Agracity
glufosinate - 280 g/L SL				*SyntheSIZE 280 HE*	Innovis Crop Protection Limited

(Component 1) Active Ingredient* - Formulation	(Component 2) Active Ingredient* - Formulation	(Component 3) Active Ingredient* - Formulation	(Component 4) Active Ingredient* - Formulation	Product	Company
glufosinate - 146 g/L SL (F)	quinclorac - 15 g/L (SL) (F)			Advantage Glufosinate Plus	Advantage Crop Protection
glufosinate - 280 g/L SL				*RHI Glufosinate 280*	Rath Holdco Inc
glyphosate - 360 g/L SL				*Crush'R Plus*	Albaugh
glyphosate - 360 g/L SL				*Smoke*	FBN
glyphosate - 360 g/L SL				*Shotgun 360,*	Albaugh
glyphosate - 360 g/L SL				*Sharda Glyphosate*	Sharda Cropchem
glyphosate - 480 g/L SL				*Matrix*	IPCO
glyphosate - 540 g/L SL				*Advantage Glyphosate 540*	Advantage Crop Protection
glyphosate - 540 g/L SL				*Credit Xtreme*	Nufarm Agriculture
glyphosate - 540 g/L SL				*Crush'R 540*	Albaugh
glyphosate - 540 g/L SL				*Disruptor 540*	Agracity
glyphosate - 540 g/L SL				*Destroyer 540*	Agracity
glyphosate - 540 g/L SL				*Factor 540*	IPCO
glyphosate - 540 g/L SL				*Gallop*	Sharda Cropchem
glyphosate - 540 g/L SL				*Glyforce WDG*	Sharda Cropchem
glyphosate - 540 g/L SL				*R/T 540*	Bayer
glyphosate - 540 g/L SL				*Roundup Transorb HC*	Bayer
glyphosate - 540 g/L SL				*Roundup WeatherMax*	Bayer
glyphosate - 540 g/L SL				*Shotgun 540*	Albaugh
glyphosate - 540 g/L SL				*Start Up*	Loveland Products
glyphosate - 540 g/L SL				*Stonewall*	WinField United
glyphosate - 540 g/L SL				*Vector 540*	Federated Co-op
glyphosate - 540 g/L SL				*Viking 540 Glyphosate*	Viking
glyphosate - 540 g/L SL				*J-Maxx 540*	Vincere Agri Solutions Ltd.
glyphosate - 540 g/L SL				*Glycere 540*	Vincere Agri Solutions Ltd.
glyphosate - 240 g/L SL (F)	dicamba - 120 g/L SL (F)			*Roundup Xtend*	Bayer
glyphosate - 271 g/L SL (F)	fomesafen - 67 g/L SL (F)			*FlexStar GT*	Syngenta
glyphosate - 317 g/L SL (F)	dicamba - 159 g/L SL (F)			*Roundup Xtend 2*	Bayer
glyphosate - 360 g/L SL				*Advantage Glyphosate 360*	Advantage Crop Protection
glyphosate - 480 g/L SL	clopyralid - 360 g/L SL			*Eclipse XC*	Corteva Agriscience
glyphosate - 480 g/L SL	florasulam - 50 g/L SC			*PrePass XC*	Corteva Agriscience
glyphosate DMA - 204 g/L SL (F)	2,4-D Choline - 194 g/L SL (F)			*Enlist Duo*	Corteva Agriscience
halauxifen - 15 g/L EC (F)	carfentrazone - 27.97 g/L EC (F)			*Prospect*	Corteva Agriscience
halauxifen - 16.2 g/L EC (F)	florasulam - 20% WG (F)	clopyralid - 360 g/L SL		*Cirpreme*	Corteva Agriscience
halauxifen - 16.2 g/L EC (F)	florasulam - 20% WG (F)	clopyralid - 600 g/L SL		*Cirpreme XC*	Corteva Agriscience
halauxifen - 16.2 g/L EC (F)	fluroxypyr - 250 g/L EC (F)	MCPA Ester - 600 g/L EC		*Pixxaro*	Corteva Agriscience
halauxifen - 16.2 g/L EC (F)	fluroxypyr - 250 g/L EC (F)	pinoxaden - 50 g/L EC		*Rezuvant*	Corteva Agriscience
halauxifen - 20% WG (F)	florasulam - 20% WG (F)	MCPA Ester - 600 g/L EC		*CO-OP/IPCO Exhilarate*	IPCO
halauxifen - 20% WG (F)	florasulam - 20% WG (F)	MCPA Ester - 600 g/L EC		*Exhilarate*	Corteva Agriscience
halauxifen - 20% WG (F)	florasulam - 20% WG (F)			*Paradigm PRE*	Corteva Agriscience
halauxifen - 4.7 g/L ME (F)	fluroxypyr - 122.2 g/L ME (F)	clopyralid - 97.8 g/L ME (F)		*Prominex*	Corteva Agriscience
halauxifen - 5% WG (F)	pyroxsulam - 15% WG (F)	2,4-D Ester - 660 g/L EC		*Rexade*	Corteva Agriscience
halauxifen - 6 g/L EC (F)	florasulam - 6 g/L EC (F)	2,4-D ester - 300 g/L EC (F)		*Extinguish XL*	Corteva Agriscience
halosulfuron - 72.6% WG				*Permit*	Gowan
hexazinone - 75% WG				*Velpar DF CU*	Tessenderlo Kerley Inc.
imazamox - 120 g/L SL				*Image*	Sharda Cropchem
imazamox - 20.6 g/L SL (F)				*Ransack*	Nufarm Agriculture
imazamox - 20.6 G/L SL				*Nelatic*	Syngenta

(Component 1) Active Ingredient* - Formulation	(Component 2) Active Ingredient* - Formulation	(Component 3) Active Ingredient* - Formulation	(Component 4) Active Ingredient* - Formulation	Product	Company
imazamox - 25 g/L SL				*Solo ADV*	BASF
imazamox - 350 g/L SL				*Venim*	Nufarm Agriculture
imazamox - 70% WG				*Amity WDG*	Corteva Agriscience
imazamox - 70% WG				*Dakota*	Albaugh
imazamox - 70% WG				*Next*	Sharda Cropchem
imazamox - 70% WG				*Samauri*	Agracity
imazamox - 70% WG				*Viking Imazamox*	Viking
imazamox - 80 g/L SL				*Davai 80SL*	ADAMA
imazamox - 80g/L SL				*Canvista*	Syngenta
imazamox - 80g/L SL				*Canvista*	Syngenta
imazamox - 120 g/L SL	fluroxypyr - 333 g/L EC			*Altitude FX3*	BASF
imazamox - 20 g/L SL (F)	bentazon - 429 g/L SL (F)			*Benz*	Sharda Cropchem
imazamox - 20 g/L SL (F)	bentazon - 429 g/L SL (F)			*Viper ADV*	BASF
imazamox - 25 g/L SL	quizalofop - 96 g/L EC			*Solo Ultra Q*	BASF
imazamox - 80 g/L SL	quizalofop100 g/L EC			*Davai Q Plus*	ADAMA
imazamox - 33 g/L SL (F)	imazapyr - 15 g/L SL (F)			*Ares SN*	Corteva Agriscience
imazamox - 35% WG (F)	imazethapyr - 35% WG (F)	clethodim - 240 g/L EC		*Ninja Master*	Agracity
imazamox - 35% WG (F)	imazethapyr - 35% WG (F)	clethodim - 240 g/L EC		*Viknig Floro*	Viking
imazamox - 35% WG (F)	imazethapyr - 35% WG (F)	quizalofop - 96 g/L EC		*Odyssey Ultra Q*	BASF
imazamox - 35% WG (F)	imazethapyr - 35% WG (F)			*Judo*	Sharda Cropchem
imazamox - 35% WG (F)	imazethapyr - 35% WG (F)			*Ninja*	Agracity
imazamox - 35% WG (F)	imazethapyr - 35% WG (F)			*Odyssey NXT*	BASF
imazamox - 35% WG (F)	imazethapyr - 35% WG (F)			*Viking Skien*	Viking
imazamox - 70% WG	bentazon - 480 g/L SL	quizalofop-p - 96 g/L EC		*Anaconda*	Agracity
imazamox - 70% WG	bentazon - 480 g/L SL			*Boa Pro*	Agracity
imazamox - 70% WG	bentazon - 480 g/L SL			*Taipan*	Agracity
imazamox - 70% WG	clethodim - 240 g/L EC			*Samauri Master*	Agracity
imazamox - 80 g/L SL	bentazon - 480 g/L SL			*Python*	ADAMA
imazamox - 80 g/L SL	imazethapyr - 240 g/L SL			*Quasar*	ADAMA
imazapyr - 240 g/L SL				*Arsenal*	BASF
imazapyr - 15 g/L SL (F)	imazamox - 33 g/L SL (F)			*Ares SN*	Corteva Agriscience
imazethapyr - 240 g/L SL				*Kamikaze*	Agracity
imazethapyr - 240 g/L SL				*Phantom*	ADAMA
imazethapyr - 240 g/L SL				*Pursuit*	BASF
imazethapyr - 240 g/L SL				*Viking Imazethapyr*	Viking
imazethapyr - 240 g/L SL	imazamox - 80 g/L SL			*Quasar*	ADAMA
imazethapyr - 35% WG (F)	imazamox - 35% WG (F)	clethodim - 240 g/L EC		*Ninja Master*	Agracity
imazethapyr - 35% WG (F)	imazamox - 35% WG (F)	clethodim - 240 g/L EC		*Viknig Floro*	Viking
imazethapyr - 35% WG (F)	imazamox - 35% WG (F)			*Judo*	Sharda Cropchem
imazethapyr - 35% WG (F)	imazamox - 35% WG (F)			*Ninja*	Agracity
imazethapyr - 35% WG (F)	imazamox - 35% WG (F)			*Odyssey NXT*	BASF
imazethapyr - 35% WG (F)	imazamox - 35% WG (F)	quizalofop - 96 g/L EC		*Odyssey Ultra Q*	BASF
imazethapyr - 35% WG (F)	imazamox - 35% WG (F)			*Viking Skien*	Viking
indaziflam - 200 g/L SC				*Esplanade*	Bayer
linuron - 480 g/L SC				*Lorox L*	Tessenderlo Kerley Inc.
MCPA Amine - 160 g/L SL (F)	mecoprop-P - 130 g/L SL (F)	dichlorprop-P - 310 g/L SL (F)		*Optica Trio*	UAP
MCPA Amine - 275 g/L SL (F)	dicamba - 62.5 g/L SL (F)	mecoprop-P - 62.5 g/L SL (F)		*Sword*	Loveland Products
MCPA Amine - 275 g/L SL (F)	dicamba - 62.5 g/L SL (F)	mecoprop-P - 62.5 g/L SL (F)		*Tracker XP*	IPCO
MCPA Amine - 500, 600 g/L SL				*MCPA Amine*	Various
MCPA Ester - 200 g/L EC (F)	bromoxynil - 200g/L EC (F)	fluroxypyr - 80 g/L EC (F)		*CO-OP/IPCO Emit*	IPCO
MCPA Ester - 200 g/L EC (F)	bromoxynil - 200g/L EC (F)	fluroxypyr - 80 g/L EC (F)		*Enforcer M*	Nufarm Agriculture
MCPA Ester - 200 g/L EC (F)	bromoxynil - 200g/L EC (F)	fluroxypyr - 80 g/L EC (F)		*Pierce*	Sharda Cropchem
MCPA Ester - 200 g/L EC (F)	bromoxynil - 200 g/L EC (F)	fluroxypyr - 80 g/L EC		*ForceFighter All In*	ADAMA
MCPA Ester - 210 g/L EC (F)	fluroxypyr - 77 g/L EC (F)	clopyralid - 60 g/L EC (F)		*CO-OP/IPCO State*	IPCO
MCPA Ester - 210 g/L EC (F)	fluroxypyr - 77 g/L EC (F)	clopyralid - 60 g/L EC (F)		*Truslate Pro*	Nufarm Agriculture

(Component 1) Active Ingredient* - Formulation	(Component 2) Active Ingredient* - Formulation	(Component 3) Active Ingredient* - Formulation	(Component 4) Active Ingredient* - Formulation	Product	Company
MCPA Ester - 225 g/L EC (F)	bromoxynil - 225 g/L EC (F)			*Badge*	ADAMA
MCPA Ester - 225 g/L EC (F)	bromoxynil - 225 g/L EC (F)			*Brox M*	Albaugh
MCPA Ester - 225 g/L EC (F)	bromoxynil - 225 g/L EC (F)			*Double Trouble*	Albaugh
MCPA Ester - 225 g/L EC (F)	bromoxynil - 225 g/L EC (F)			*Logic M*	IPCO
MCPA Ester - 225 g/L EC (F)	bromoxynil - 225 g/L EC (F)			*Mextrol 450*	Nufarm Agriculture
MCPA Ester - 240 g/L EC (F)	fluroxypyr - 61.6 g/L EC (F)	clopyralid - 42.7 g/L EC (F)		*Prestige XL*	Corteva Agriscience
MCPA Ester - 280 g/L EC (F)	bromoxynil - 280 g/L EC (F)	fluroxypyr - 180 g/L EC		*Foxxy Canuck*	Agracity
MCPA Ester - 280 g/L EC (F)	bromoxynil - 280 g/L EC (F)			*Brilliant*	Sharda Cropchem
MCPA Ester - 280 g/L EC (F)	bromoxynil - 280 g/L EC (F)			*Buctril M*	Bayer
MCPA Ester - 280 g/L EC (F)	bromoxynil - 280 g/L EC (F)			*Canuck*	Agracity
MCPA Ester - 280 g/L EC (F)	bromoxynil - 280 g/L (F)			*Viking Hamar*	Viking
MCPA Ester - 280 g/L EC (F)	bromoxynil - 280 g/L EC (F)	fluroxypyr - 180 g/L EC		*Viking Trycka*	Viking
MCPA Ester - 280 g/L EC (F)	clopryalid - 50 g/L EC (F)	fluroxypry - 180 g/L EC		*Viking Stavanger*	Viking
MCPA Ester - 280 g/L EC (F)	clopyralid - 50 g/L EC (F)	fluroxypyr - 180 g/L EC		*Foxxy CM*	Agracity
MCPA Ester - 280 g/L EC (F)	clopyralid - 50 g/L EC (F)			*Certain*	Sharda Cropchem
MCPA Ester - 280 g/L EC (F)	clopyralid - 50 g/L EC (F)			*Clobber M*	Agracity
MCPA Ester - 280 g/L EC (F)	clopyralid - 50 g/L EC (F)			*Curtail M*	Nufarm Agriculture
MCPA Ester - 280 g/L EC (F)	clopyralid - 50 g/L EC (F)			*Spur-M*	Albaugh
MCPA Ester - 280 g/L EC (F)	clopyralid - 50 g/L EC (F)			*Viking Drammen*	Viking
MCPA Ester - 280 g/L EC (F)	fluroxypyr - 333 g/L EC	clopyralid - 50 g/L EC (F)		*Prestige XC*	Corteva Agriscience
MCPA Ester - 350 g/L (F)	fluroxypyr - 100 g/L SC (F)	florasulam - 2.5 g/L SC (F)		*Stellar XL*	Corteva Agriscience
MCPA Ester - 420 g/L (F)	pyraflufen - 13.5 g/L (F)	florasulam - 50 g/L SC		*Thunderhawk*	Nufarm Agriculture
MCPA Ester - 420 g/L (F)	pyraflufen - 13.5 g/L (F)			*Goldwing*	Nufarm Agriculture
MCPA Ester - 500 or 600 g/L EC	thifensulfuron: tribenuron - 33.3%:16.7% SG			*BroadSide*	Loveland Products
MCPA Ester - 500 or 600 g/L EC	thifensulfuron: tribenuron - 33.3%:16.7% SG			*Refine M*	FMC
MCPA Ester - 500, 600 g/L EC				*MCPA Ester*	Various
MCPA Ester - 600 g ae/L EC	florasulam - 2.5 g/L SC (F)	fluroxypyr - 100 g/L SC (F)		*Outshine*	ADAMA
MCPA Ester - 600 g/L	florasulam - 2.5 g/L SC (F)	fluroxypyr - 100 g/L SC (F)		*Stellar*	Corteva Agriscience
MCPA Ester - 600 g/L EC	florasulam - 20% WG (F)	halauxifen - 20% WG (F)		CO-OP/IPCO Exhilarate	IPCO
MCPA Ester - 600 g/L EC	florasulam - 20% WG (F)	halauxifen - 20% WG (F)		*Exhilarate*	Corteva Agriscience
MCPA Ester - 600 g/L EC	florasulam - 50 g/L SC			*Topline*	ADAMA
MCPA Ester - 600 g/L EC	fluroxypyr - 180 g/L EC	clopyralid - 360 g/L EC		*Esteem*	ADAMA
MCPA Ester - 600 g/L EC	fluroxypyr - 180 g/L EC			*Foxxy M*	Agracity
MCPA Ester - 600 g/L EC	fluroxypyr - 180 g/L EC			*Viking Lidingo*	Viking
MCPA Ester - 600 g/L EC	fluroxypyr - 180 g/L EC			*Trophy*	Nufarm Agriculture
MCPA Ester - 600 g/L EC	halauxifen - 16.2 g/L EC (F)	fluroxypyr - 250 g/L EC(F)		*Pixxaro*	Corteva Agriscience
MCPA Ester - 600 g/L EC	thifensulfuron: tribenuron - 25%:25% SG	fluroxypyr - 180 g/L EC		*Foxxy MR*	Agracity
MCPA Ester - 600 g/L EC	thifensulfuron: tribenuron - 25%:25% SG	fluroxypyr - 333 g/L EC		*Barricade M*	FMC
MCPA Ester - 600 g/L EC	thifensulfuron: tribenuron - 25%:25% SG	fluroxypyr - 333 g/L EC	thiencarbazone - 10 g/L SC	*Predicade*	FMC
MCPA Ester - 197 g/L SC (F)	bromoxynil - 197 g/L SC (F)	flucarbazone - 16.7 g/L SC (F)	fluroxypyr - 74.1 g/L SC (F)	*Batalium*	UPL AgroSolutions
MCPA - 239.5 g/L EC (F)	clopyralid - 42.7 g/L EC (F)	fluroxypyr - 61.6 g/L EC (F)		*Repute*	Sharda Cropchem
MCPA - 240.5 g/L EC (F)	clopyralid - 40 g/L EC (F)	fluroxypyr - 59.7 g/L EC (F)		*Esteem All In*	ADAMA
MCPA - 350 g/L EC (F)	fluroxypyr - 100 g/L EC (F)	florasulam - 2.5 g/L EC (F)		*Sabatis*	Syngenta
MCPA K+ - 25 g/L SL (F)	MCPB - 375 g/L SL (F)			*Topside*	Loveland Products
MCPA K+ - 25 g/L SL (F)	MCPB - 375 g/L SL (F)			*Tropotox Plus*	Nufarm Agriculture
MCPA K+ - 400 g/L SL				*MCPA K+*	Various
MCPA Na+ - 25 g/L SL (F)	MCPB - 375 g/L SL (F)			*Clovitox Plus*	IPCO
MCPA Na+ - 300 g/L SL				*MCPA Na*	Various
MCPB - 375 g/L SL (F)	MCPA Na+ - 25 g/L SL (F)			*Clovitox Plus*	IPCO

(Component 1) Active Ingredient* - Formulation	(Component 2) Active Ingredient* - Formulation	(Component 3) Active Ingredient* - Formulation	(Component 4) Active Ingredient* - Formulation	Product	Company
MCPB - 375 g/L SL (F)	MCPA K+ - 25 g/L SL (F)			*Topside*	Loveland Products
MCPB - 375 g/L SL (F)	MCPA K+ - 25 g/L SL (F)			*Tropotox Plus*	Nufarm Agriculture
mecoprop-P - 150 g/L SL				*Mecoprop-P*	UAP
mecoprop-P - 130 g/L SL (F)	MCPA Amine - 160 g/L SL (F)	dichlorprop-P - 310 g/L SL (F)		*Optica Trio*	UAP
mecoprop-P - 62.5 g/L SL (F)	dicamba - 62.5 g/L SL (F)	MCPA Amine - 275 g/L SL (F)		*Sword*	Loveland Products
mecoprop-P - 62.5 g/L SL (F)	dicamba - 62.5 g/L SL (F)	MCPA Amine - 275 g/L SL (F)		*Tracker XP*	IPCO
mesotrione - 480 g/L SL				*Callisto 480 SC*	Syngenta Canada
metolachlor - 915 g/L EC				*Dual II Magnum*	Syngenta
metolachlor - 915 g/L EC				*Komodo*	UPL AgroSolutions
metolachlor - 915 g/L EC				*Metallica*	Sharda Cropchem
metolachlor - 915 g/L EC				*Stallion*	Agracity
metolachlor - 400 g/L SC (F)	atrazine - 320 g/L SC (F)			*Primextra II Magnum*	Syngenta
metolachlor - 405 g/L EC (F)	metribuzin - 135 g/L EC (F)			*Strim MTZ*	UPL AgroSolutions
metribuzin - 70% WG				*Buzzin*	Sharda Cropchem
metribuzin - 75% WG				*Meteor*	Agracity
metribuzin - 75% WG				*Meter 75 DF*	Sharda Cropchem
metribuzin - 75% WG				*Sencor 75DF*	Bayer
metribuzin - 75% WG				*Squadron II*	ADAMA
metribuzin - 75% WG				*Squadron*	ADAMA
metribuzin - 75% WG				*TriCor 75DF*	UPL AgroSolutions
metribuzin - 75% WG				*Viking Metribuzin*	Viking
metribuzin - 480 g/L SC				*Metrix SC*	Sharda Cropchem
metribuzin - 480 g/L SC				*Sencor 480 F*	Bayer
metribuzin - 480 g/L SC				*TriCor LQ*	UPL AgroSolutions
metribuzin - 135 g/L EC (F)	metolachlor - 405 g/L EC (F)			*Strim MTZ*	UPL AgroSolutions
metribuzin - 347 g/L SC (F)	flumioxazin - 77.6 g/L SC (F)			*IPCO Bifecta EZ*	IPCO
metsulfuron - 60% WG				*Ally*	FMC
metsulfuron - 60% WG				*Ally Toss-N-Go*	FMC
metsulfuron - 60% WG				*Escort*	Envu Canada
metsulfuron - 60% WG				*MPOWER Pro*	AgraCity
metsulfuron - 60% WG				*Plotter*	Albaugh
metsulfuron - 12.6% WG (F)	aminocyclopyrachlor - 39.5% WG (F)			*TruRange*	Envu Canada
metsulfuron - 12.6% WG (F)	aminocyclopyrachlor - 39.5% WG (F)			*Navius Flex*	Envu Canada
metsulfuron - 3 g/L SC (F)	thifensulfuron - 30 g/L SC (F)	fluroxypyr - 150 g/L SC (F)		*Travallas*	FMC
metsulfuron - 8.6% SG (B)	tribenuron - 42.9% SG (B)			*Express Pro*	FMC
metsulfuron - 9.45% WG (F)	aminopyralid - 52.5% WG (F)	fluroxypyr - 333 g/L EC		*Sightline*	Corteva Agriscience
metsulfuron - 9.45% WG (F)	aminopyralid - 52.5% WG (F)			*ClearView*	Corteva Agriscience
metsulfuron - 9.45% WG (F)	aminopyralid - 52.5% WG (F)	2,4-D Ester - 660 g/L EC		*Reclaim II*	Corteva Agriscience
metsulfuron - 5.4% WG (F)	saflufenacil - 64.6% WG (F)			*Smoulder*	BASF
nicosulfuron - 54.55% WG				*Accent IS*	Corteva Agriscience
nicosulfuron - 75% WG				*Accent*	Corteva Agriscience
nicosulfuron - 75% WG				*Nicosh*	Sharda CropChem
nicosulfuron - 75% WG				*Primero*	Albaugh
nicosulfuron - 25% WG (F)	rimsulfuron - 12.5% WG (F)			*Steadfast IS*	Corteva Agriscience
pelergonic acid - 500/680 g/L EC				*Beloukha*	Belchim Crop Protection
picloram - 240 g/L SL				*Tordon 22K*	Corteva Agriscience
picloram - 97.5 g/L SL (F)	2,4-D Choline - 360 g/L SL (F)			*Grazon XC*	Corteva Agriscience
pinoxaden - 50 g/L EC				*Ace 50*	AgraCity
pinoxaden - 50g/L EC				*Axial*	Syngenta
pinoxaden - 50g/L EC				*Pina*	Sharda Cropchem
pinoxaden - 50g/L EC				*Viking Pinoxaden 50*	Viking
pinoxaden - 50 g/L EC				*Brazen All In*	ADAMA

(Component 1) Active Ingredient* - Formulation	(Component 2) Active Ingredient* - Formulation	(Component 3) Active Ingredient* - Formulation	(Component 4) Active Ingredient* - Formulation	Product	Company
pinoxaden - 100 g/L EC				*Advantage Pinoxaden*	Advantage Crop Protection
pinoxaden - 100 g/L EC				*Brazen II*	ADAMA
pinoxaden - 100 g/L EC				*CO-OP/IPCO Avant*	IPCO
pinoxaden - 100 g/L EC				*Epic*	Nufarm Agriculture
pinoxaden - 100 g/L EC				*Epic II*	Nufarm Agriculture
pinoxaden - 100 g/L EC				*Trondus*	Syngenta
pinoxaden - 25 g/L EC (F)	clodinafop - 25 g/L EC (F)			*Traxos*	Syngenta
pinoxaden - 25 g/L EC (F1)	clodinafop - 25 g/L EC (F1)	fluroxypyr - 90 g/L EC (F2)	2,4-D Ester - 360 g/L EC (F2)	*TraxosTwo*	Syngenta
pinoxaden - 50 g/L EC	fluroxypyr - 250 g/L EC(F)	halauxifen - 16.2 g/L EC (F)		*Rezuvant*	Corteva Agriscience
pinoxaden - 50 g/L EC (F)	fenoxaprop-p - 50 g/L EC (F)			*Cirray*	Bayer
pinoxaden - 50 g/L EC (F1)	fluroxypyr - 87.5 g/L EC (F1)	bicyclopyrone - 37.5 g/L EC (F2)	bromoxynil - 175 g/L EC (F2)	*Axial Maxx*	Syngenta
pinoxaden - 50 g/L EC (F)	fluroxypyr - 87.5 g/L EC (F)			*Kingpin*	Sharda Cropchem
pinoxaden - 50 g/L EC (F)	fluroxypyr - 87.5 g/L EC (F)			*Axial Xtreme*	Syngenta
pinoxaden - 50 g/L EC (F1)	fluroxypyr - 87.5 g/L EC (F1)	pyrasulfotole - 37.5 g/L EC (F2)	bromoxynil - 210 g/L EC (F2)	*Axial Xtreme iPak*	Syngenta
pinoxaden - 50 g/L EC	florasulam - 5 g/L SC (F)	fluroxypyr - 100 g/L SC (F)		*Avenza*	Corteva Agriscience
pinoxaden - 92.7 g/L EC (F)	florasulam - 7.7 g/L EC (F)			*Broadband*	Syngenta
propoxycarbazone - 70% WG				*Olympus*	Bayer
propyzamide - 400 g/L SC				*Kerb SC*	Corteva Agriscience
pyraflufen - 7.3 g/L EC (F)	dichlorprop - 284 g/L EC (F)	2,4-D Ester - 284 g/L EC (F)		*Blackhawk EVO*	Nufarm Agriculture
pyraflufen - 13.5 g/L (F)	MCPA Ester - 420 g/L (F)	florasulam - 50 g/L SC		*Thunderhawk*	Nufarm Agriculture
pyraflufen - 13.5 g/L (F)	MCPA Ester - 420 g/L (F)			*Goldwing*	Nufarm Agriculture
pyraflufen - 6.1 g/L (F)	2,4-D Ester - 473 g/L (F)			*BlackHawk*	Nufarm Agriculture
pyraflufen - 15 EC (F)	bromoxynil - 467g/L EC (F)			*Conquer II*	Nufarm Agriculture
pyrasulfotole - 15.5 g/L EC (F)	fenoxaprop-p - 46 g/L EC (F)	bromoxynil - 87.5 g/L EC (F)		*Tundra*	Bayer
pyrasulfatole - 25 g/L (EC) (F)	bromoxynil - 280 g/L (EC) (F)			*Huskie PRE*	Bayer
pyrasulfotole - 31.1 g/L EC (F)	bromoxynil - 174.3 g/L EC (F)	fluroxypyr - 72 g/L EC (F)		*Infinity FX*	Bayer
pyrasulfotole - 31.3 g/L EC (F)	thiencarbazone - 5 g/L SC (F)	bromoxynil - 175 g/L EC (F)		*Velocity m^3*	Bayer
pyrasulfotole - 37.5 g/L EC (F)	bromoxynil - 210 g/L EC (F)			*Infinity*	Bayer
pyrasulfotole - 37.5 g/L EC (F)	bromoxynil - 210 g/L EC (F)	pinoxaden - 50 g/L EC (F1)	fluroxypyr - 87.5 g/L EC (F1)	*Axial Xtreme iPak*	Syngenta
pyridate - 600 g/L EC				*Tough EC*	Belchim Crop Protection
pyroxasulfone - 500 g/L				*Zidua SC*	BASF
pyroxasulfone - 203 g/L SC (F)	flumioxazin - 160 g/L SC (F)			*Fierce EZ*	Valent
pyroxasulfone - 203 g/L SC (F)	flumioxazin - 160 g/L SC (F)			*Torpedo EZ*	Valent
pyroxasulfone - 250 g/L SC (F)	sulfentrazone - 250 g/L SC (F)			*Authority Supreme*	FMC
pyroxasulfone - 44.5% WG (F)	flumioxazin - 33.5% WG (F)			*Fierce*	Valent
pyroxasulfone - 44.5% WG (F)	flumioxazin - 33.5% WG (F)			*Torpedo*	Valent
pyroxasulfone - 447 g/L SE (F)	carfentrazone - 53 g/L SE (F)			*Focus*	FMC
pyroxasulfone - 500 g/L	trifludimoxazin 125 g/L SC (F)	saflufenacil 250 g/L (SC) (F)		*Voraxor Complete*	BASF
pyroxsulam - 21.5% WG				*Simplicity GoDRI*	Corteva Agriscience
pyroxsulam - 30 g/L SC				*Simplicity OD*	Corteva Agriscience
pyroxsulam - 12.8 g/L SC (F)	fluroxypyr - 113.5 g/L SC (F)			*Erebus Xtreme*	Syngenta
pyroxsulam - 15% WG (F)	halauxifen - 5% WG (F)	2,4-D Ester - 660 g/L EC		*Rexade*	Corteva Agriscience
pyroxsulam - 30 g/L OD	fluroxypyr - 333 g/L EC			*Tandem*	Corteva Agriscience
quinclorac - 75% WDG				*Clever*	FBN Canada
quinclorac - 75% WDG				*Ingenious*	UAP
quinclorac - 180 g/L SL				*Facet L*	BASF
quinclorac - 15 g/L (SL) (F)	glufosinate - 146 g/L SL (F)			*Advantage Glufosinate Plus*	Advantage Crop Protection
quizalofop-p - 96 g/L EC				*Assure II*	AMVAC Canada
quizalofop-p - 96 g/L EC				*Viking Quizalofop*	Viking
quizalofop-p - 96 g/L EC				*Caziva Ultra Q*	BASF
quizalofop-p - 96 g/L EC				*CO-OP/IPCO Contender II*	IPCO

(Component 1) Active Ingredient* - Formulation	(Component 2) Active Ingredient* - Formulation	(Component 3) Active Ingredient* - Formulation	(Component 4) Active Ingredient* - Formulation	Product	Company
quizalofop-p - 96 g/L EC				*Elegant 10EC*	Sharda Cropchem
quizalofop-p - 96 g/L EC				*Idol*	Nufarm Agriculture
quizalofop-p - 96 g/L EC				*Marshall*	WinField United
quizalofop-p - 96 g/L EC				*Quiz*	Agracity
quizalofop-p - 96 g/L EC				*Yuma GL*	Gowan
quizalofop-p - 100 g/L EC				*Leopard*	ADAMA
quizalofop - 96 g/L EC	imazamox - 25 g/L SL			*Solo Ultra Q*	BASF
quizalofop - 96 g/L EC	imazamox - 35% WG (F)	imazethapyr - 35% WG (F)		*Odyssey Ultra Q*	BASF
quizalofop-p -100 g/L EC	imazamox- 80 g/L SL			*Davai Q Plus*	ADAMA
quizalofop-p - 96 g/L EC	bentazon - 480 g/L SL			*Boa IQ*	Agracity
quizalofop-p - 96 g/L EC	bentazon - 480 g/L SL	imazamox - 70% WG		*Anaconda*	Agracity
quizalofop - 120 g/L EC (F)	clethodim - 240 g/L EC (F)			*Select Plus*	UPL AgroSolutions Canada
rimsulfuron - 12.5% WG (F)	nicosulfuron - 25% WG (F)			*Steadfast IS*	Corteva Agriscience
rimsulfuron - 20% WG				*Sortan IS*	Corteva Agriscience
rimsulfuron - 25% SG				*Prism SG*	Corteva Agriscience
rimsulfuron - 25% WG				*Hinge*	Albaugh
rimsulfuron - 25% WG				*Sharda Rimsulfuron*	Sharda Cropchem
saflufenacil - 342 g/L SC				*Detail*	BASF
saflufenacil - 342 g/L SC				*Heat LQ*	BASF
saflufenacil - 70% SG				*Heat WG*	BASF
saflufenacil - 64.6% WG (F)	metsulfuron - 5.4% WG (F)			*Smoulder*	BASF
saflufenacil - 250 g/L (SC) (F)	pyroxasulfone - 500 g/L	trifludimoxazin 125 g/L SC (F)		*Voraxor Complete*	BASF
saflufenacil - 250 g/L (SC) (F)	trifludimoxazin 125 g/L SC (F)			*Voraxor*	BASF
simazine - 480 g/L SC				*Simazine 480*	Loveland Products
simazine - 90% WG				*Princep Nine T*	Syngenta
sulfentrazone - 480 g/L SC				*Authority*	FMC
sulfentrazone - 480 g/L SC				*Sulfentra*	FMC
sulfentrazone - 480 g/L SC				*Intensa*	Sharda Cropchem
sulfentrazone - 480 g/L SC				*IPCO Tactic*	IPCO
sulfentrazone - 480 g/L SC				*CO-OP Governor*	CO-OP
sulfentrazone - 480 g/L SC				*Viking Sulfentrazone*	Viking
sulfentrazone - 250 g/L SC (F)	pyroxasulfone - 250 g/L SC (F)			*Authority Supreme*	FMC
sulfentrazone - 380 g/L SE (F)	carfentrazone - 42 g/L SE (F)			*Authority Strike*	FMC
sulfentrazone - 480 g/L SC (F1)	carfentrazone - 240 g/L EC (F2)			*Throne II Revenge*	Agracity
tembotrione - 420 g/L SC				*Laudis*	Bayer
thiencarbazone - 10 g/L SC	fluroxypyr - 333 g/L EC	thifensulfuron: tribenuron - 25%:25% SG	MCPA Ester - 600 g/L EC	*Predicade*	FMC
thiencarbazone - 10 g/L SC				*Varro*	Bayer
thiencarbazone - 5 g/L SC (F)	pyrasulfotole - 31.3 g/L EC (F)	bromoxynil - 175 g/L EC (F)		*Velocity m3*	Bayer
thiencarbazone - 5 g/L EC (F)	fluroxypyr - 118 g/L EC (F)			*Varro FX*	Bayer
thifensulfuron - 30 g/L SC (F)	fluroxypyr - 150 g/L SC (F)			*Sentrallas*	FMC
thifensulfuron - 30 g/L SC (F)	fluroxypyr - 150 g/L SC (F)	metsulfuron - 3 g/L SC (F)		*Travallas*	FMC
thifensulfuron - 50% SG				*Pinnacle SG*	FMC
thifensulfuron - 50% SG				*Pinnacle SG Toss-n-Go*	FMC
thifensulfuron - 75% WG				*Volta*	Albaugh
thifensulfuron: tribenuron - 33.3%:16.7% SG				*Refine SG*	FMC
thifensulfuron: tribenuron - 33.3%:16.7% SG	MCPA Ester - 500 or 600 g/L EC			*BroadSide*	Loveland Products
thifensulfuron: tribenuron - 33.3%:16.7% SG	MCPA Ester - 500 or 600 g/L EC			*Refine M*	FMC
thifensulfuron: tribenuron - 33.3%:16.7% SG	fluroxypyr - 333 g/L EC	2,4-D Ester - 564 g/L EC		*Retain SG*	Loveland Products

(Component 1) Active Ingredient* - Formulation	(Component 2) Active Ingredient* - Formulation	(Component 3) Active Ingredient* - Formulation	(Component 4) Active Ingredient* - Formulation	Product	Company
thifensulfuron: tribenuron - 50%:25% SG				*MPOWER RX*	Agracity
thifensulfuron: tribenuron - 50%:25% SG				*Viking Navik*	Viking
thifensulfuron: tribenuron - 50%:25% WG				*Draft*	Albaugh
thifensulfuron: tribenuron - 50%:25% SG	clodinafop - 112 g/L (F)	fluroxypyr - 217 g/L EC (F)		*Signal FSU*	Nufarm Agriculture
thifensulfuron: tribenuron - 50%:25% WG	fluroxypyr - 180 g/L EC	2,4-D Ester - 564 g/L EC		*Foxxy Pro RX*	Agracity
thifensulfuron: tribenuron - 50%:25% WG	dicamba - 480 g/L SL	2,4-D Ester - 660g/L EC		*Ammo DR*	Agracity
thifensulfuron: tribenuron - 50%:25% WG	fluroxypyr - 180 g/L EC	clopyralid - 360 g/L SL		*Foxxy CRX*	Agracity
thifensulfuron: tribenuron - 50%:25% WG	fluroxypyr - 180 g/L EC	clopyralid - 360 g/L EC		*Viking Larvik*	Viking
thifensulfuron: tribenuron - 50%:25% WG	fluroxypyr - 180 g/L EC			*Audible*	Albaugh
thifensulfuron: tribenuron - 25%:25% SG	fluroxypyr - 180 g/L EC			*Foxxy R*	Agracity
thifensulfuron: tribenuron - 25%:25% SG	fluroxypyr - 333 g/L EC	MCPA Ester - 600 g/L EC		*Barricade M*	FMC
25%:25%	fluroxypyr - 333 g/L EC			*Barricade II*	FMC
thifensulfuron: tribenuron - 25%:25% SG	fluroxypyr - 180 g/L EC	MCPA Ester - 600 g/L EC		*Foxxy MR*	Agracity
thifensulfuron: tribenuron - 25%:25% SG	fluroxypyr - 333 g/L EC	thiencarbazone - 10 g/L SC	MCPA Ester - 600 g/L EC	*Predicade*	FMC
thifensulfuron: tribenuron - 25%:25% SG	fluroxypyr - 180 g/L EC			*Foxxy RCK*	Agracity
tiafenacil - 339 g/L SC				*Insight SC*	Gowan
tolpyralate - 400 g/L SC				*Shieldex 400SC*	Gowan
tolpyralate - 18.7 g/L EC (F)	bromoxynil - 186.6 g/L EC (F)			*OnDeck*	Corteva Agriscience
topremazone - 336 g/L SC				*Armezon*	BASF
topremazone - 336 g/L SC				*Impact*	UAP
topramezone - 336 g/L SC				*Topple*	Sharda Cropchem
topremazone - 336 g/L SC	bromoxynil - 235 g/L EC			*Certitude*	BASF
tralkoxydim - 400 g/L SC				*Achieve (Liquid Achieve)*	Corteva Agriscience
tralkoxydim - 400 g/L SC				*Bison*	ADAMA
tralkoxydim - 400 g/L SC				*Marengo*	Loveland Products
tralkoxydim - 400 g/L SC				*Nufarm Tralkoxydim*	Nufarm Agriculture
triallate - 10% G				*YieldShield Resiliant Soilsorb*	Rath Holdco Inc.
triallate - 10% G				*Avadex MicroActiv*	Gowan
triallate - 480 g/L EC				*Avadex Liquid EC*	Gowan
triallate - 480 g/L EC				*RHI Triallate 480 EC*	Rath Holdco Inc.
triallate - 10% G (F)	trifluralin - 4% G (F)			*RHI Triallate 10%-Trifluralin 4%*	Rath Holdco Inc.
triallate - 10% G (F)	trifluralin - 4% G (F)			*Fortress MicroActiv*	Gowan
tribenuron - 50% SG				*Express SG*	FMC
tribenuron - 50% WG				*Involve 50 WDG*	ADAMA
tribenuron - 75% WG				*Cleat*	Albaugh
tribenuron - 75% WG				*Inferno*	UPL AgroSolutions

(Component 1) Active Ingredient* - Formulation	(Component 2) Active Ingredient* - Formulation	(Component 3) Active Ingredient* - Formulation	(Component 4) Active Ingredient* - Formulation	Product	Company
tribenuron - 75% WG				*MPOWER Extra*	Agracity
tribenuron - 75% WG				*Tribe 75 WDG*	Sharda Cropchem
tribenuron - 75% WG				*Viking Tribenuron*	Viking
tribenuron - 25% WG (F)	flucarbazone - 45 %WG (F)			*Inferno Duo*	UPL AgroSolutions
tribenuron - 42.9% SG (B)	metsulfuron - 8.6% SG (B)			*Express Pro*	FMC
tribenuron - 50% WG (F)	dicamba - 480 g/L WG (F)			*Express FX*	FMC
tribenuron - 4.69% WGR (B)	dicamba - 43.75% WGR (B)	carfentrazone - 11.25% WGR(B)		*Intruvix II*	FMC
tribenuron - 6.52% WG (F)	dicamba - 60.9% WG (F)	carfentrazone - 240 g/L EC		*Intruvix*	FMC
tribenuron - 75% WG	carfentrazone - 240 g/L EC			*Revenge E*	Agracity
tribenuron - 75% WG	flucarbazone - 66 % WDG			Viking Visby	Viking
tribenuron - 75% WG	flucarbazone - 66 % WG			*Himalaya Extra*	Agracity
tribenuron - 8.25% WG (F)	dicamba - 58.45% WG (F)	2,4-D Ester - 660g/L EC		*Triton K*	FMC
trifludimoxazin 125 g/L SC (F)	saflufenacil 250 g/L (SC) (F)	pyroxasulfone - 500 g/L		*Voraxor Complete*	BASF
trifludimoxazin 125 g/L SC (F)	saflufenacil 250 g/L (SC) (F)			*Voraxor*	BASF
trifluralin - 10% G				*Yieldshield Respectra Soilsorb*	Rath Holdco Inc.
trifluralin - 10% G				*Bonanza 10G*	UAP
trifluralin - 10% G				*Bonita*	Sharda Cropchem
trifluralin - 10% G				*Rival 10G*	Nufarm Agriculture
trifluralin - 10% G				*Treflan MicroActiv*	Gowan
trifluralin - 480 g/L EC				*RHI Trifluralin 480 EC*	Rath Holdco Inc.
trifluralin - 480 g/L EC				*Bonanza 480 Liquid*	UAP
trifluralin - 480 g/L EC				*Thrill*	Sharda Cropchem
trifluralin - 480 g/L EC				*Treflan Liquid EC*	Gowan
trifluralin - 500 g/L EC				*Rival EC*	Nufarm Agriculture
Trinexapac-ethyl - 113 g/L EC				*Moddus*	Syngenta

Foliar Fungicides

(Component 1) Active Ingredient* - Formulation	(Component 2) Active Ingredient* - Formulation	(Component 3) Active Ingredient* - Formulation	(Component 4) Active Ingredient* - Formulation	Product	Company
ametoctradin - 300 g/L SC (F)	dimethomorph - 225 g/L SC (F)			*Zampro*	BASF
azoxystrobin - 75 g/L SC (F)	propiconazole - 125g/L SC (F)	benzovindiflupyr - 100 g/L EC		*Trivapro*	Syngenta
azoxystrobin - 75 g/L SC (F)	propiconazole - 125 g/L SC (F)			*Quilt*	Syngenta
azoxystrobin - 100 g/L SC	propiconazole - 125 g/L SC	pydiflumetofen - 75 g/L SC		*Miravis Neo 300SE*	Syngenta
azoxystrobin - 120 g/L EC	prothioconazole- 90 g/L EC			*Maxentis*	Adama Agricultural Canada
azoxystrobin - 120 g/L SC	Tebuconazole - 200 g/L SC			*Custodia*	ADAMA
azoxystrobin - 143 g/L SC (F)	propiconazole - 124 g/L SC (F)			*Topnotch*	ADAMA
azoxystrobin - 150 g/L EC	prothioconazole - 150 g/L EC			*Gauntlet*	Nufarm Agriculture
azoxystrobin - 200 g/L SC (F)	difenoconazole - 125 g/L SC (F)			*Quadris Top*	Syngenta
azoxystrobin - 250 g/L SC	benzovindiflupyr - 100 g/L EC			*Elatus*	Syngenta
azoxystrobin - 250 g/L SC				*Azoshy 250SC*	Sharda Crop Chem
azoxystrobin - 250 g/L SC				*Quadris*	Syngenta
azoxystrobin - 250 g/L SC				*Quasi*	AgraCity
azoxystrobin - 250 g/L SC	propiconazole - 250 g/L SC (F)			*Quasimodo*	AgraCity
azoxystrobin - 250 g/L SC				*Emissarius*	UAP Canada
azoxystrobin - 250 g/L SC				*Razor*	Albaugh
azoxystrobin - 250 g/L SC				VIKING Azoxystrobin	Viking Crop Production Partners Inc.
azoxystrobin - 390 g/L SC				*AZteroid FC*	UAP Canada
Bacillus amyloliquefaciens - $5x10^{10}$ spores/mL AS				*Double Nickel LC*	UAP
Bacillus amyloliquefaciens - $5.5x10^{10}$ spores/mL AS				*Serifel*	BASF
Bacillus amyloliquefaciens - $1x10^{10}$ spores/mL AS				*Double Nickel 55*	UAP
Bacillus mycoides - 40% WG				*LifeGard WG*	UAP
Bacillus subtilis - $1x10^{9}$ CFU/g AS				*Serenade SOIL*	Bayer
Bacillus subtilis - 1.31×10^{10} CFU/g WP				*Serenade OPTI*	Bayer
benzovindiflupyr - 78 g/L EC (F)	difenoconazole - 117g/L EC (F)			*Aprovia Top*	Syngenta
benzovindiflupyr - 100 g/L EC	azoxystrobin - 75 g/L SC (F)	propiconazole - 125g/L SC (F)		*Trivapro*	Syngenta
benzovindiflupyr - 100 g/L EC	azoxystrobin - 250 g/L SC			*Elatus*	Syngenta
boscalid - 250 g/L SC (F)	prothioconazole - 150 g/L SC (F)			*Cotegra*	BASF
boscalid - 70% WG	pyraclostrobin - 250 g/L EC			*Lance AG*	BASF
boscalid - 70% WG				*Cantus WDG*	BASF
boscalid - 70% WG				*Lance WDG*	BASF
boscalid - 70% WG				*Cabil*	Sharda CropChem
boscalid - 70% WG				*Shaft*	Sharda CropChem
chlorothalonil - 500 g/L SC				*Bravo 500*	Syngenta
chlorothalonil - 500 g/L SC				*Bravo ZN*	Syngenta
chlorothalonil - 720 g/L SC				*Echo 720*	UAP
chlorothalonil - 720 g/L SC				*Echo NP*	UAP
chlorothalonil - 90% WG				*Echo 90WSP*	UAP
chlorothalonil - 500 g/L SC (DC)	metalaxyl-M - 480 g/L EC (DC)			*Ridomil Gold / Bravo*	Syngenta
chlorothalonil - 500 g/L SC (DC)	metalaxyl-M - 480 g/L EC (DC)			*Ridomil Gold SL / Bravo*	Syngenta
Coniothyrium minitans - 5.3% WG				*LALSTOP Contans WG*	UAP
copper hydroxide - 24.4% WG				*Parasol FL*	Nufarm Agriculture
copper hydroxide - 50% WG				*Parasol WG*	Nufarm Agriculture
copper hydroxide - 50% WG				*HyCop*	Sharda CropChem
copper octanoate - 1.8% SL				*Cueva*	Belchim Crop Protection

(Component 1) Active Ingredient* - Formulation	(Component 2) Active Ingredient* - Formulation	(Component 3) Active Ingredient* - Formulation	(Component 4) Active Ingredient* - Formulation	Product	Company
copper sulphate / copper oxychloride - 53% WP				*Copper 53W*	Loveland Products
copper sulphate / copper oxychloride - 50% WP				*Corbanza*	Sharda CropChem
copper sulphate / copper oxychloride - 50% WP				*Copper Spray*	Loveland Products
cyazofamid - 400 g/L SC				*Ranman 400SC*	UAP
cymoxanil - 60% WG				*Curzate*	Corteva Agriscience
cymoxanil - 25% WG (F)	famoxadone - 25% WG (F)			*Tanos*	Corteva Agriscience
difenoconazole - 125 g/L SC (F)	azoxystrobin - 200 g/L SC (F)			*Quadris Top*	Syngenta
difenoconazole - 125 g/L SC	pydiflumentofen - 75 g/L SC			*Miravis Duo*	Syngenta
difenoconazole - 117 g/L EC (F)	benzovindiflupyr - 78 g/L EC (F)			*Aprovia Top*	Syngenta
dimethomorph - 500 g/L SC				*Forum*	BASF
dimethomorph - 225 g/L SC (F)	ametoctradin - 300 g/L SC (F)			*Zampro*	BASF
famoxadone - 25% WG (F)	cymoxanil - 25% WG (F)			*Tanos*	Corteva Agriscience
fenamidone - 500 g/L SC				*Reason 500SC*	Gowan
florylpicoxamid - 50 g/L EC	pyraclostrobin - 100 g/L EC			*Zetigo PRM*	Corteva Agriscience
fluazinam - 40% SC				*Allegro 500F*	Syngenta
fluazinam - 40% SC				*Downforce AG*	Sipcam Agro USA
fludioxinil - 150 g/L SC	pydiflumetofen - 100 g/L SC			*Miravis Star*	Syngenta Canada Inc
fluopyram - 100 g/L SC	prothioconazole - 200 g/L SC	tebuconazole - 100 g/L SC		*Prosaro PRO*	Bayer
fluopyram - 125 g/L SC (F)	pyrimethanil - 375 g/L SC (F)			*Luna Tranquility*	Bayer
fluopyram - 128 g/L SC	prothioconazole - 176.2 g/L SC	trifloxystrobin - 154 g/L SC		*Delaro Complete*	Bayer
fluopyram - 200 g/L SC (F)	prothioconazole - 200 g/L SC (F)			*Propulse*	Bayer
fluopyram - 200 g/L SC (F)	prothioconazole - 200 g/L SC (F)			*Proline Gold*	Bayer
fluopyram - 250 g/L SC	penflufen - 106 g/L SC			*Velum Rise*	Bayer
fluopyram - 500 g/L SC				*Velum Prime*	Bayer
fluoxastrobin - 200 g/L SC	tetraconazole - 200 g/L (ME)			*Zolera FX*	UPL AgroSolutions
fluoxastrobin - 480 g/L SC				*Evito 480*	UPL AgroSolutions
flutriafol - 125.08 g/L SC				*Fullback 125 SC*	FMC
fluxapyroxad - 30 g/L EC (F)	pyraclostrobin - 200 g/L EC (F)	propiconazole - 125 g/L EC (F)		*Nexicor*	BASF
fluxapyroxad - 167 g/L SC (F)	pyraclostrobin - 333 g/L SC (F)			*Priaxor*	BASF
fluxapyroxad - 250 g/L SC (F)	pyraclostrobin - 250 g/L SC (F)			*Dyax*	BASF
fluxapyroxad - 300 g/L SC				*Sercadis*	BASF
hydrogen peroxide 27%	peroxyacetic acid - 2.5%			*OxiDate FC*	BioSafe Systems
isofetamid - 400 g/L SC				*Kenja 400SC*	Belchim Crop Protection
mancozeb - 66.7% WG (F)	zoxamide - 8.43% WG (F)			*Gavel 75 DF*	Gowan
mancozeb - 75% WG				*Dithane Rainshield*	Corteva Agriscience
mancozeb - 75% WG				*Manzate Pro-Stick*	UPL AgroSolutions
mancozeb - 75% WG				*Penncozeb 75DF*	UPL AgroSolutions
mancozeb - 480 g/L F				*Manzate Max*	UPL AgroSolutions
mandipropamid - 250 g/L SC				*Revus*	Syngenta
mandipropamid - 250 g/L SC	oxathiopiprolin - 30 g/L SC			*Orondis Ultra*	Syngenta
mefentrifluconazole - 50 g/L EC	prothioconazole - 100 g/L EC			*RevyPro*	BASF Canada
mefentrifluconazole - 400 g/L (SC)				*Cevya*	BASF
mefentrifluconazole - 200 g/L (SC)	pyraclostrobin - 200 g/L (SC)			*Veltyma*	BASF
metalaxyl-M - 480 g/L EC				*Ridomil Gold 480 EC*	Syngenta
metalaxyl-M - 480 g/L SL				*Ridomil Gold 480 SL*	Syngenta
metalaxyl-M - 480 g/L EC (DC)	chlorothalonil - 500 g/L SC (DC)			*Ridomil Gold / Bravo*	Syngenta
metalaxyl-M - 480 g/L SL (DC)	chlorothalonil - 500 g/L SC (DC)			*Ridomil Gold SL / Bravo*	Syngenta
metconazole - 113 g/L (EC)	prothioconazole - 188 g/L (EC)			*Sphaerex*	BASF

(Component 1) Active Ingredient* - Formulation	(Component 2) Active Ingredient* - Formulation	(Component 3) Active Ingredient* - Formulation	(Component 4) Active Ingredient* - Formulation	Product	Company
metconazole - 480g/L SC				*Quash SC*	Valent
metconazole - 90 g/L EC				*Caramba*	BASF
metconazole - 80 g/L EC (F)	pyraclostrobin - 130 g/L EC (F)			*Twinline*	BASF
mono/di-potassium salts of phosphorous acid - 53% SL				*Confine Extra*	Winfield United
mono/di-potassium salts of phosphorous acid - 53% SL				*Rampart*	Loveland Products
oxathiopiprolin - 30 g/L SC	mandipropamid - 250 g/L SC			*Orondis Ultra*	Syngenta
penflufen - 106 g/L SC	fluopyram - 250 g/L SC			*Velum Rise*	Bayer
penthiopyrad - 200 g/L SC				*Fontelis*	Corteva Agriscience
picoxystrobin - 187.5 g/L SC	prothioconazole - 62.5 g/L SC			*Viatude*	Corteva Agriscience
picoxystrobin - 250 g/L SC				*Acapela*	Corteva Agriscience
picoxystrobin - 250 g/L SC	propiconazole - 435 g/L EC			*Cerefit*	Corteva Agriscience
Polyoxin D Zinc Salt - 5.0% SC				*Diplomat 5SC Fungicide*	Belchim Crop Protection Canada Inc.
propiconazole - 125 g/L EC (F)	pyraclostrobin - 200 g/L EC (F)	fluxapyroxad - 30 g/L EC (F)		*Nexicor*	BASF
propiconazole - 125 g/L	pydiflumetofen - 150 g per L			*MIRAVIS Ace*	Syngenta
propiconazole - 250 g/L EC	azoxystrobin - 250 g/L SC (F)			*Quasimodo*	AgraCity
propiconazole - 250 g/L EC				*Tilt 250E*	Syngenta
propiconazole - 250 g/L EC				*Modo*	AgraCity
propiconazole - 250 g/L EC				*Propel*	Syngenta
propiconazole - 250 g/L EC				*Propi Super 25 EC*	Sharda CropChem
propiconazole - 250 g/L EC				*VIKING Propiconazole*	Viking Crop Production Partners Inc.
propiconazole - 432 g/L EC				*Bumper 432 EC*	ADAMA
propiconazole - 435 g/L EC	picoxystrobin - 250 g/L SC			*Cerefit*	Corteva Agriscience
propiconazole - 418 g/L EC				*Co-Op Pivot*	Federated Co-operatives
propiconazole - 418 g/L EC				*Princeton*	Sharda CropChem
propiconazole - 418 g/L EC				*Fitness*	Loveland Products
propiconazole - 418 g/L EC				*Pivot 418EC*	IPCO
propiconazole - 124 g/L SC (F)	azoxystrobin - 143 g/L SC (F)			*Topnotch*	ADAMA
propiconazole - 125 g/L SC (F)	azoxystrobin - 75 g/L SC (F)			*Quilt*	Syngenta
propiconazole - 125 g / L SC	azoxystrobin 100 g per L SC	pydiflumetofen - 75 g per L SC		*MIRAVIS Neo 300SE*	Syngenta
propiconazole - 125g/L SC (F)	azoxystrobin - 75 g/L SC (F)	benzovindiflupyr - 100 g/L EC		*Trivapro*	Syngenta
prothioconazole - 62.5 g/L SC	picoxystrobin - 187.5 g/L SC			*Viatude*	Corteva Agriscience
prothioconazole - 80 g/L EC	tebuconazole - 160 g/L EC			*TilMOR 240 EC*	Bayer
prothioconazole- 90 g/L EC	azoxystrobin - 120 g/L EC			Maxentis	Adama Agricultural Canada
prothioconazole - 100 g/L EC	mefentrifluconazole - 50 g/L EC			*RevyPro*	BASF Canada
prothioconazole - 125 g/L EC	tebuconazole - 125 g/L EC			*Advantage Prothio +Teb 250 EC*	Advantage Crop Protection Inc.
prothioconazole - 125 g/L EC (F)	tebuconazole - 125 g/L EC (F)			*Shalimar*	Sharda CropChem
prothioconazole - 125 g/L EC (F)	tebuconazole - 125 g/L EC (F)			*StarPro*	Albaugh
prothioconazole - 125 g/L EC	tebuconazole - 125 g/L EC			*VIKING Tromso*	Viking Crop Production Partners Inc.
prothioconazole - 150 g/L EC	azoxystrobin - 150 g/L EC			*Gauntlet*	Nufarm Agriculture
prothioconazole - 150 g/L SC (F)	boscalid - 250 g/L SC (F)			*Cotegra*	BASF
prothioconazole - 175 g/L SC (F)	trifloxystrobin - 150 g/L SC (F)			*Delaro 325 SC*	Bayer
prothioconazole - 176.2 g/L SC	fluopyram - 128 g/L SC	trifloxystrobin - 154 g/L SC		*Delaro Complete*	Bayer
prothioconazole - 188 g/L (EC)	metconazole - 113 g/L (EC)	metconazole - 113 g/L (EC)		*Sphaerex*	BASF
prothioconazole - 200 g/L SC (F)	fluopyram - 200 g/L SC (F)			*Propulse*	Bayer
prothioconazole - 200 g/L SC (F)	fluopyram - 200 g/L SC (F)			*Proline GOLD*	Bayer
prothioconazole - 200 g/L SC	tebuconazole - 100 g/L SC	fluopyram - 100 g/L SC		*Prosaro PRO*	Bayer

(Component 1) Active Ingredient* - Formulation	(Component 2) Active Ingredient* - Formulation	(Component 3) Active Ingredient* - Formulation	(Component 4) Active Ingredient* - Formulation	Product	Company
prothioconazole - 250 g/L EC				*Joust*	Nufarm Agriculture
prothioconazole - 250 g/L EC	tebuconazole - 430 g/L SC			*Duplex*	Loveland Products
prothioconazole - 250 g/L EC	tebuconazole - 430 g/L SC			*Soraduo*	ADAMA
prothioconazole - 250 g/L EC	pydiflumetofen - 200 g/L SC			*Miravis Era*	Syngenta
prothioconazole - 250 g/L EC				*Soratel*	ADAMA
prothioconazole - 480 g/L SC				*Advantage*	Advantage Crop Protection Inc.
prothioconazole - 480 g/L SC				*Prothioconazole 480 SC*	Winfield United
prothioconazole - 480 g/L SC				*Holdfast*	Albaugh
prothioconazole - 480 g/L SC				*Pavise 480SC*	Bayer
prothioconazole - 480 g/L SC				*Proline 480SC*	Sharda Crop Chem
prothioconazole - 480 g/L SC				*Taj*	NewAgco Inc
prothioconazole - 480 g/L SC				*Rambler*	VIKING Crop Production Partners Inc.
prothioconazole - 480 g/L SC				*VIKING Prothioconazole*	VIKING Crop Production Partners Inc.
prothioconazole - 480 g/L SC	pyraclostrobin - 250 g/L EC			*VIKING Vaasa*	NewAgco Inc
prothioconazole - 480 g/L SC	pyraclostrobin - 250 g/L EC			*Spaxor*	Syngenta Canada Inc
pydiflumetofen - 100 g/L SC	fludioxinil - 150 g/L SC			*Miravis Star*	Syngenta
pydiflumetofen - 150 g per L	propiconazole - 125 g per L			*MIRAVIS Ace*	Syngenta
pydiflumetofen - 200 g/L SC				*MIRAVIS Bold*	Syngenta
pydiflumetofen - 200 g/L SC	prothioconazole - 250 g/L EC			*Miravis Era*	Syngenta
pydiflumetofen - 75 g per L	azoxystrobin 100 g per L	propiconazole - 125 g per L		*MIRAVIS Neo 300SE*	Syngenta
pydiflumentofen - 75 g/L SC	difenoconazole - 125 g/L SC			*MIRAVIS Duo*	Corteva Agriscience
pyraclostrobin - 100 g/L EC	florylpicoxamid - 50 g/L EC			*Zetigo PRM*	BASF
pyraclostrobin - 130 g/L EC (F)	metconazole - 80 g/L EC (F)			*Twinline*	BASF
pyraclostrobin - 200 g/L EC (F)	propiconazole - 125 g/L EC (F)	fluxapyroxad - 30 g/L EC (F)		*Nexicor*	BASF
pyraclostrobin - 250 g/L EC				*Headline EC*	AgraCity
pyraclostrobin - 250 g/L EC				*MPOWER Spade*	Albaugh
pyraclostrobin - 250 g/L EC				*Raclos*	BASF
pyraclostrobin - 250 g/L EC	boscalid - 70% WG			*Lance AG*	Sharda Cropchem
pyraclostrobin - 250 g/L EC				*Preach*	BASF
pyraclostrobin - 250 g/L SC (F)	fluxapyroxad - 250 g/L SC (F)			*Dyax*	AgraCity
pyraclostrobin - 250 g/L (EC)	tebuconazole - 250 g/L (EW)			*Tornado Pro*	NewAgco Inc
pyraclostrobin - 250 g/L EC	prothioconazole - 480 g/L SC			*Spaxor*	VIKING Crop Production Partners Inc.
pyraclostrobin - 250 g/L EC	prothioconazole - 480 g/L SC			*VIKING Vaasa*	VIKING Crop Production Partners Inc.
pyraclostrobin - 250 g/L EC	tebuconazole - 250 g/L SC			*VIKING Drobak*	BASF
pyraclostrobin - 250 g/L (SC)	mefentrifluconazole - 250 g/L (SC)			*Veltyma*	Viking Crop Production Partners Inc.
pyraclostrobin - 250 g/L EC				*VIKING Pyraclostrobin*	BASF
pyraclostrobin - 333 g/L SC (F)	fluxapyroxad - 167 g/L SC (F)			*Priaxor*	Bayer
pyrimethanil - 400 g/L SC				*Scala SC*	Sharda Cropchem
pyrimethanil - 400 g/L SC				*Shape SC*	Bayer
pyrimethanil - 375 g/L SC (F)	fluopyram - 125 g/L SC (F)			*Luna Tranquility*	Marrone Bio Innovations
Reynoutria sachalinensis - 20% SC				*Regalia Maxx*	Belchim Crop Protection
sodium/potassium/ammonium phosphites - 53.6% SL				*Phostrol*	Belchim Crop Protection
sulphur - 80% WG				*Cosavet DF Edge*	Bayer
tebuconazole - 100 g/L SC	prothioconazole - 200 g/L SC	fluopyram - 100 g/L SC		*Prosaro PRO*	

(Component 1) Active Ingredient* - Formulation	(Component 2) Active Ingredient* - Formulation	(Component 3) Active Ingredient* - Formulation	(Component 4) Active Ingredient* - Formulation	Product	Company
tebuconazole - 125 g/L EC	prothioconazole - 125 g/L EC			*Advantage Prothio +Teb 250 EC*	Advantage Crop Protection Inc.
tebuconazole - 125 g/L EC (F)	prothioconazole - 125 g/L EC (F)			*Shalimar*	Sharda Cropchem
tebuconazole - 125 g/L EC (F)	prothioconazole - 125 g/L EC (F)			*StarPro*	Albaugh
tebuconazole - 125 g/L EC (F)	prothioconazole - 125 g/L EC (F)			*Prosaro XTR*	Bayer
tebuconazole - 125 g/L EC	prothioconazole - 125 g/L EC			*VIKING Tromso*	Viking Crop Production Partners Inc.
tebuconazole - 160 g/L EC	prothioconazole - 80 g/L EC			*Tilmore 240 EC*	Bayer
tebuconazole - 200 g/L SC	azoxystrobin - 120 g/L SC			*Custodia*	ADAMA
tebuconazole - 250 g/L EW				*FBN Tebuconazole 250*	Farmers Business Networks Canada, Inc.
tebuconazole - 250 g/L EC				*Advantage Tebuconazole 250*	Advantage Crop Protection
tebuconazole - 250 g/L EC				*Toledo 250 EW*	Rotam North America, Inc.
tebuconazole - 250 g/L EC				*Tebbie*	Sharda Cropchem
tebuconazole - 250 g/L EW				*Tornado*	AgraCity
tebuconazole - 250 g/L (EW)	pyraclostrobin - 250 g/L (EC)			*Tornado Pro*	AgraCity
tebuconazole - 250 g/L EC	pyraclostrobin - 250 g/L EC			*VIKING Drobak*	VIKING Crop Production Partners Inc.
tebuconazole - 250 g/L EC				*VIKING Tebuconazole*	Viking Crop Production Partners Inc.
tebuconazole - 430 g/L SC	prothioconazole - 250 g/L EC			*Duplex*	Loveland Products
tebuconazole - 430 g/L SC				*Orius 430 SC*	ADAMA
tebuconazole - 430 g/L SC	prothioconazole - 250 g/L EC			*Soraduo*	ADAMA
tebuconazole - 432 g/L SC				*Hornet 432 F*	Nufarm Agriculture Inc.
tebuconazole - 432 g/L SC				*Palliser*	Bayer
tetraconazole - 200 g/L (ME)				*Roxar*	UPL AgroSolutions
tetraconazole - 200 g/L (ME)	fluoxastrobin - 200 g/L (ME)			*Zolera FX*	UPL AgroSolutions
trifloxystrobin - 150 g/L SC (F)	prothioconazole - 175 g/L SC (F)			*Delaro 325 SC*	Bayer
trifloxystrobin - 154 g/L SC	fluopyram - 128 g/L SC	Prothioconazole - 176.2 g/L SC		*Delaro Complete*	Bayer
zoxamide - 8.43% WG (F)	mancozeb - 66.7% WG (F)			*Gavel 75 DF*	Gowan

Seed Treatments

(Component 1) Active Ingredient* - Formulation	(Component 2) Active Ingredient* - Formulation	(Component 3) Active Ingredient* - Formulation	(Component 4) Active Ingredient* - Formulation	Product	Company
azoxystrobin - 143 g/L SC	fludioxonil - 143 g/L SC	difenoconazole - 112 g/L SC		*Stadium*	Syngenta
azoxystrobin - 390 g/L SC				*AZteroid FC*	UAP
azoxystrobin - 1.33% FS	fludioxonil - 3.32% FS	metalaxyl-m+s - 2.65% FS	thiabendazole - 26.5% FS	*Maxim Quattro*	Syngenta
azoxystrobin - 1.33% FS	fludioxonil - 3.32% FS	metalaxyl-m+s - 2.65% FS	thiabendazole: thiamethoxam - 26.5%: 47.6% FS	*Cruiser Maxx Corn*	Syngenta
broflanilide - 100 g/L SC				*Cimegra*	BASF
broflanilide - 16.7 g/L SC	triticonazole -16.7 g/L SC	metalaxyl - 10.0 g/L SC	fluxapyroxad: pyraclostrobin - 8.35 g/L: 16.7 g/L SC	*Teraxxa F4*	BASF
captan - 30% FS				*Agrox FL*	Norac Concepts
carbathiin - 87.5 g/L FS	ipconazole - 9.38 g/L FS			*Rancona V RS*	UPL AgroSolutions
carbathiin - 133.33 g/L FS	metalaxyl - 13.33 g/L FS	ipconazole - 5.0 g/L FS		*Rancona Trio*	UPL AgroSolutions
carbathiin - 15.59% FS	thiram - 13.25% FS			*Vitaflo 280*	UPL AgroSolutions
carbathiin - 15.59% FS	thiram - 13.25% FS			*Vitaflo SP Fungicide*	IPCO
carbathiin - 15.59% FS	thiram - 13.25% FS			*Vitaflo Fungicide*	IPCO
clothianidin - 600 g/L FS				*NipsIt INSIDE 600 Insecticide*	Valent
clothianidin - 600 g/L FS				*Poncho 600FS*	BASF
clothianidin - 600 g/L FS				*Titan*	BASF
clothianidin - 600g/L FS				*Poncho® 600 FS*	BASF
clothianidin - 29.5 g/L	ethaboxam - 14.7 g/L	metalaxyl - 8.82 g/L	metaconazole - 4.41 g/L	*INTEGO SUITE Cereals OF*	Valent
clothianidin - 30.7 g/L FS	metalaxyl - 9.24 g/L FS	metconazole - 4.92 g/L FS		*NipsIt SUITE Cereals OF Seed Protectant*	Valent
clothianidin - 290 g/L FS	metalaxyl - 7.15 g/L FS	trifloxystrobin - 7.15 g/L FS	penflufen - 10.7 g/L FS	*Prosper EverGol*	Bayer
cyantraniliprole - 600 g/L FS				*Fortenza*	Syngenta
cyantraniliprole - 625 g/L FS				*Lumiderm*	Corteva Agriscience
difenoconazole - 112 g/L SC	fludioxonil - 143 g/L SC	azoxystrobin - 143 g/L SC		*Stadium*	Syngenta
difenoconazole - 123 g/L FS	fludioxonil - 62.5 g/L FS	thiamethoxam - 250 g/L FS		*Cruiser Maxx Potato Extreme*	Syngenta
difenoconazole - 16 g/L FS	fludioxonil - 1.7 g/L FS	thiamethoxam - 269 g/L FS	metalaxyl-m+s:sedaxane-5:3.4 g/L FS	*Helix Vibrance*	Syngenta
difenoconazole - 19.4 g/L FS	fludioxonil - 19.4 g/L FS			*Maxim D*	Syngenta
difenoconazole - 3.37 % FS	metalaxyl-m+s - 0.27% FS			*Interest Forte*	Sharda Cropchem
difenoconazole - 36.3 g/L FS	metalaxyl - 12.6 g/L FS	tebuconazole - 4.6 g/L FS		*Straxan*	Corteva
difenoconazole - 36.8 g/L FS	fludioxonil - 7.6 g/L FS	metalaxyl-m+s - 9.2 g/L FS	sedaxane - 15.4 g/L FS	*Vibrance Quattro*	Syngenta
difenoconazole - 36.9 g/L FS	fludioxonil - 7.7 g/L FS	thiamethoxam - 61.5 g/L FS	metalaxyl-m+s: sedaxane-9.2: 15.4 g/L FS	*Cruiser Vibrance Quattro*	Syngenta
difenoconazole - 77.2 g/L FS	mandipropamid - 154.3 g/L FS	sedaxane - 77.2 g/L FS		*Vibrance Ultra Potato*	Syngenta
difenoconazole - 7.73 % FS	metalaxyl-m+s - 1.93% FS			*Dividend Exteme Fungicide*	Syngenta
dimethyl benzyl ammonium chloride - 10% Liquid				*General Storage Disinfectant*	Ag-Services
ethaboxam - 14.7 g/L	clothianidin - 29.5 g/L	metalaxyl - 8.82 g/L	metaconazole - 4.41 g/L	*INTEGO SUITE Cereals OF*	Valent
ethaboxam - 24.9 g/L FS	mandestrobin - 33.2 g/L FS	metalaxyl - 13.3 g/L FS		*Intego Pulse*	Valent
ethaboxam - 383 g/L FS				*INTEGO Solo Fungicide*	Valent
ethaboxam - 383 g/L FS	fludioxonil - 25 g/L FS	metalaxyl-m+s - 37.5 g/L	sedaxane - 50 g/L FS	*Vibrance Maxx with INTEGO Seed Treatment*	Syngenta
ethaboxam - 23.9 g/L FS	mandestrobin - 31.7 g/L FS	metalaxyl - 12.7 g/L FS	inpyrfluxam - 15.9 g/L FS	*Zeltera Pulse*	Nufarm
fenamidone - 500g/L SC				*Reason 500 SC*	Gowan
fludioxonil - 0.5% DS				*Maxim PSP*	Syngenta
fludioxonil - 0.5% DS	mancozeb - 5.7% DS			*Maxim MZ PSP*	Syngenta

(Component 1) Active Ingredient* - Formulation	(Component 2) Active Ingredient* - Formulation	(Component 3) Active Ingredient* - Formulation	(Component 4) Active Ingredient* - Formulation	Product	Company
fludioxonil - 0.73% FS	metalaxyl-m+s - 1.10% FS			*Apron Maxx RTA*	Syngenta
fludioxonil - 0.73% FS	metalaxyl-m+s - 1.10% FS	sedaxane - 500 g/L FS		*Vibrance Maxx RTA*	Syngenta
fludioxonil - 1.12% FS	metalaxyl-m+s - 1.7% FS	thiamethoxam - 22.6% FS		*Cruiser Maxx Beans*	Syngenta
fludioxonil - 1.7 g/L FS	metalaxyl-m+s - 5 g/L FS	thiamethoxam - 269 g/L FS	sedaxane: difenoconazole- 3.4:16 g/L FS	*Helix Vibrance*	Syngenta
fludioxonil - 143 g/L SC	difenoconazole - 112 g/L SC	azoxystrobin - 143 g/L SC		*Stadium*	Syngenta
fludioxonil - 19.4 g/L FS	difenoconazole - 19.4 g/L FS			*Maxim D*	Syngenta
fludioxonil - 24.8 g/L FS	metalaxyl-m+s - 149.3 g/L FS	picarbutrazox - 400 g/L FS	sedaxane - 24.8 g/L FS	*Vayantis IV*	Syngenta
fludioxonil - 25 g/L FS	metalaxyl-m+s - 20 g/L FS	thiabendazole - 150 g/L FS		*Apron Advance*	Syngenta
fludioxonil - 25 g/L FS	metalaxyl-m+s - 37.5 g/L FS	sedaxane - 50 g/L FS		*Vibrance Maxx RFC*	Syngenta
fludioxonil - 25 g/L FS	metalaxyl-m+s - 37.5 g/L FS	sedaxane - 50 g/L FS	ethaboxam - 383 g/L FS	*Vibrance Maxx RFC with INTEGO Seed Treatment*	Syngenta
fludioxonil - 3.32% FS	metalaxyl-m+s - 2.65% FS	thiabendazole - 26.5% FS	azoxystrobin - 1.33% FS	*Maxim Quattro*	Syngenta
fludioxonil - 3.32% FS	metalaxyl-m+s - 2.65% FS	thiamethoxam - 47.6% FS	azoxystrobin; thiabendazole- 1.33%: 26.5% FS	*Cruiser Maxx Corn*	Syngenta
fludioxonil - 62.5 g/L FS	difenoconazole - 123 g/L FS	thiamethoxam - 250 g/L FS		*Cruiser Maxx Potato Extreme*	Syngenta
fludioxonil - 7.6 g/L FS	metalaxyl-m+s - 9.2 g/L FS	sedaxane - 15.4 g/L FS	difenoconazole - 36.8 g/L FS	*Vibrance Quattro*	Syngenta
fludioxonil - 7.7 g/L FS	picarbutrazox - 7.7 g/L FS	thiabendazole - 46.2 g/L FS	metalaxyl-m+s - 11.4 g/L FS sedaxane - 15.4 g/L FS	*Vibrance Total*	Syngenta
fludioxonil - 7.7 g/L FS	metalaxyl-m+s - 9.2 g/L FS	thiamethoxam - 61.5 g/L FS	sedaxane: difenoconazole- 15.4:36.9 g/L FS	*Cruiser Vibrance Quattro*	Syngenta
flupyradifurone - 480 g/L FS				*BUTEO start 480 FS*	Bayer
fluxapyroxad - 16.7 g/L FS	metalaxyl - 13.3 g/L FS	pyraclostrobin - 16.7 g/L FS		*Insure Pulse*	BASF
fluxapyroxad - 8.35 g/L FS	pyraclostrobin - 16.7 g/L FS	triticonazole - 16.7 g/L FS	metalaxyl - 10 g/L FS	*Insure Cereal FX4*	BASF
fluxapyroxad: pyraclostrobin - 8.35 g/L: 16.7 g/L SC	broflanilide - 16.7 g/L SC	triticonazole - 16.7 g/L SC	metalaxyl - 10.0 g/L SC	*Teraxxa F4*	BASF
hydrogen peroxide - 27% LS				*StorOx*	Biosafe Systems
imidacloprid - 240 g/L FS				*Alias 240SC*	ADAMA
imidacloprid - 600 g/L FS				*Sombrero 600FS*	ADAMA
imidacloprid - 600 g/L FS				*Stress Shield 600*	Bayer
imidacloprid - 600 g/L FS	metalaxyl - 6.2 g/L FS	tebuconazole - 3.0 g/L FS	prothioconazole-15.4 g/L FS	*Raxil PRO SHIELD*	Bayer
imidacloprid - 600 g/L FS	metalaxyl - 317 g/L FS	penflufen - 154 g/L FS	trifloxystrobin - 154 g/L FS	*Trilex EverGol SHIELD*	Bayer
Inpyrfluxam - 15.9 g/L	ethaboxam - 23.9 g/L FS	mandestrobin - 31.7 g/L FS	metalaxyl - 12.7 g/L FS	*Zeltera Pulse*	Valent
ipconazole - 4.61 g/L FS	metalaxyl - 6.15 g/L FS			*Rancona Pinnacle*	UPL AgroSolutions
ipconazole - 9.38 g/L FS	carbathiin - 87.5 g/L FS			*Rancona V RS*	UPL AgroSolutions
ipconazole - 5.0 g/L FS	carbathiin - 133.33 g/L FS	metalaxyl - 13.33 g/L FS		*Rancona Trio*	UPL AgroSolutions
ipconazole - 4.61 g/L FS	metalaxyl - 6.15 g/L FS			*Cover 2*	Loveland Products
mancozeb - 5.7% DS	fludioxonil - 0.5% DS			*Maxim MZ PSP*	Syngenta
mandestrobin - 31.7 g/L FS	ethaboxam - 23.9 g/L FS	Inpyrfluxam - 15.9 g/L	metalaxyl - 12.7 g/L FS	*Zeltera Pulse*	Valent
mandestrobin - 33.2 g/L FS	ethaboxam - 24.9 g/L FS	metalaxyl - 13.3 g/L FS		*Intego Pulse*	Valent
mandipropamid - 250 g/L FS				*Revus*	Syngenta
mandipropamid - 154.3 g/L FS	difenoconazole - 77.2 g/L FS	sedaxane - 77.2 g/L FS		*Vibrance Ultra Potato*	Syngenta
metalaxyl - 8.82 g/L	clothianidin - 29.5 g/L	ethaboxam - 14.7 g/L	metaconazole - 4.41 g/L	*INTEGO SUITE Cereals OF*	Valent
metalaxyl - 10 g/L FS	pyraclostrobin - 17 g/L FS	triticonazole - 17 g/L FS		*Insure Cereal*	BASF
metalaxyl - 10 g/L FS	pyraclostrobin - 16.7 g/L FS	triticonazole - 16.7 g/L FS	fluxapyroxad - 8.35 g/L FS	*Insure Cereal FX4*	BASF
metalaxyl - 10.8 g/L FS	trifloxystrobin - 13.5 g/L FS			Obex	AgraCity Crop & Nutrition
metalaxyl - 10.8 g/L FS	trifloxystrobin - 13.5 g/L FS			VIKING Grimstad	Viking Crop Production Partners Inc.
metalaxyl - 10.0 g/L SC	fluxapyroxad: pyraclostrobin - 8.35 g/L: 16.7 g/L SC	broflanilide - 16.7 g/L SC	triticonazole - 16.7 g/L SC	*Teraxxa F4*	BASF

(Component 1) Active Ingredient* - Formulation	(Component 2) Active Ingredient* - Formulation	(Component 3) Active Ingredient* - Formulation	(Component 4) Active Ingredient* - Formulation	Product	Company
metalaxyl - 12.6 g/L FS	tebuconazole - 4.6 g/L FS	difenoconazole - 36.3 g/L FS		*Straxan*	Corteva
metalaxyl - 12.7 g/L FS	ethaboxam - 23.9 g/L FS	Inpyrfluxam - 15.9 g/L	mandestrobin - 31.7 g/L FS	*Zeltera Pulse*	Valent
metalaxyl - 13.3 g/L FS	pyraclostrobin -16.7 g/L FS	fluxapyroxad - 16.7 g/L FS		*Insure Pulse*	BASF
metalaxyl - 13.33 g/L FS	ipconazole - 5.0 g/L FS	carbathiin - 133.33 g/L FS		*Rancona Trio*	UPL AgroSolutions
metalaxyl - 13.3 g/L FS	mandestrobin - 33.2 g/L FS	ethaboxam - 24.9 g/L FS		*Intego Pulse*	Valent
metalaxyl - 317 g/L FS				*Allegiance FL*	Bayer
metalaxyl - 317 g/L FS				*Belmont 2.7FS*	UPL AgroSolutions
metalaxyl - 317 g/L FS				*Trilex Component B*	Bayer
metalaxyl - 317 g/L FS				*Telex*	Sharda Cropchem Limited
metalaxyl - 317 g/L FS	trifloxystrobin - 154 g/L FS	penflufen - 154 g/L FS		*Trilex EverGol*	Bayer
metalaxyl - 317 g/L FS	trifloxystrobin - 154 g/L FS	penflufen - 154 g/L FS	imidacloprid - 600 g/L FS	*Trilex EverGol SHIELD*	Bayer
metalaxyl - 6.15 g/L FS	ipconazole - 4.61 g/L FS			*Cover 2*	Loveland Products
metalaxyl - 61.4 g/L FS	prothioconazole - 76.8 g/L FS	penflufen - 38.4 g/L FS		*EverGol Energy*	Bayer
metalaxyl - 6.2 g/L FS	tebuconazole - 3.0 g/L FS	imidacloprid - 600 g/L FS	prothioconazole - 15.4 g/L FS	*Raxil PRO SHIELD*	Bayer
metalaxyl - 6.2 g/L FS	tebuconazole - 3.0 g/L FS	prothioconazole - 15.4 g/L FS		*Lixar PRO*	Sharda Cropchem Limited
metalaxyl - 6.2 g/L FS	tebuconazole - 3.0 g/L FS	prothioconazole - 15.4 g/L FS		*Raxil PRO*	Bayer
metalaxyl - 6.6 g/L FS	tebuconazole - 5.0 g/L FS			*Sharda METEB 11ST*	Sharda Cropchem
metalaxyl - 7.15 g/L FS	trifloxystrobin - 7.15 g/L FS	clothianidin - 290 g/L FS	penflufen - 10.7 g/L FS	*Prosper EverGol*	Bayer
metalaxyl - 9.24 g/L FS	metconazole - 4.92 g/L FS	clothianidin - 30.7 g/L FS		*NipsIt SUITE Cereals OF Seed Protectant*	Valent
metalaxyl-m+s - 11.4 g/L FS	sedaxane - 15.4 g/L FS	fludioxonil - 7.7 g/L FS	picarbutrazox - 7.7 g/L FS thiabendazole - 46.2 g/L FS	*Vibrance Total*	Syngenta
metalaxyl-m+s - 1.93% FS	difenoconazole - 7.73% FS			*Dividend Extreme Fungicide*	Syngenta
metalaxyl-m+s - 0.27% FS	difenoconazole - 3.37 % FS			*Interest Forte*	Sharda Cropchem
metalaxyl-m+s - 1.10% FS	fludioxonil - 0.73% FS			*Apron Maxx RTA*	Syngenta
metalaxyl-m+s - 1.10% FS	fludioxonil - 0.73% FS	sedaxane - 500 g/L FS		*Vibrance Maxx RTA*	Syngenta
metalaxyl-m+s - 1.7% FS	fludioxonil - 1.12% FS	thiamethoxam - 22.6% FS		*Cruiser Maxx Beans*	Syngenta
metalaxyl-m+s - 1.93% FS	difenoconazole - 7.73 % FS			*Dividend Exteme Fungicide*	Syngenta
metalaxyl-m+s - 2.65% FS	fludioxonil - 3.32% FS	thiabendazole - 26.5% FS	azoxystrobin - 1.33% FS	*Maxim Quattro*	Syngenta
metalaxyl-m+s - 2.65% FS	fludioxonil - 3.32% FS	thiamethoxam - 47.6% FS	azoxystrobin: thiabendazole - 1.33%: 26.5% FS	*Cruiser Maxx Corn*	Syngenta
metalaxyl-m+s - 20 g/L FS	fludioxonil - 25 g/L FS	thiabendazole - 150 g/L FS		*Apron Advance*	Syngenta
metalaxyl-m+s - 37.5 g/L FS	fludioxonil - 25 g/L FS	sedaxane - 50 g/L FS		*Vibrance Maxx RFC*	Syngenta
metalaxyl-m+s - 37.5 g/L FS	fludioxonil - 25 g/L FS	sedaxane - 50 g/L FS	ethaboxam - 383 g/L FS	*Vibrance Maxx RFC with INTEGO Seed Treatment*	Syngenta Valent
metalaxyl-m+s - 5 g/L FS	fludioxonil - 1.7 g/L FS	thiamethoxam - 269 g/L FS	sedaxane: difenoconazole-3.4:16 g/L FS	*Helix Vibrance*	Syngenta
metalaxyl-m+s - 9.2 g/L FS	fludioxonil - 7.6 g/L FS	sedaxane - 15.4 g/L FS	difenoconazole - 36.8 g/L FS	*Vibrance Quattro*	Syngenta
metalaxyl-m+s - 9.2 g/L FS	fludioxonil - 7.7 g/L FS	thiamethoxam - 61.5 g/L FS	sedaxane: difenoconazole-15.4:36.9 g/L FS	*Cruiser Vibrance Quattro*	Syngenta
metalaxyl-m+s - 149.3 g/L FS	fludioxonil - 24.8 g/L FS	picarbutrazox - 400 g/L FS	sedaxane - 24.8 g/L FS	*Vayantis IV*	Syngenta
metaconazole - 4.41 g/L	clothianidin - 29.5 g/L	ethaboxam - 14.7 g/L	metalaxyl - 8.82 g/L	*INTEGO SUITE Cereals OF*	Valent
metconazole - 4.92 g/L FS	metalaxyl - 9.24 g/L FS	clothianidin - 30.7 g/L FS		*NipsIt SUITE Cereals OF Seed Protectant*	Valent
mono/di-potassium salts of phosphorous acid - 53% SC				*Confine Extra*	Winfield Solutions
mono/di-potassium salts of phosphorous acid - 53% SC				*Rampart*	Loveland Products

(Component 1) Active Ingredient* - Formulation	(Component 2) Active Ingredient* - Formulation	(Component 3) Active Ingredient* - Formulation	(Component 4) Active Ingredient* - Formulation	Product	Company
oxathiapiprolin - 200g/L FS				*Lumisena*	Corteva Agriscience
penflufen - 10.7 g/L FS	metalaxyl - 7.15 g/L FS	trifloxystrobin - 7.15 g/L FS	clothianidin - 290 g/L FS	*Prosper EverGol*	Bayer
penflufen - 154 g/L FS	metalaxyl - 317 g/L FS	trifloxystrobin - 154 g/L FS		*Trilex EverGol*	Bayer
penflufen - 154 g/L FS	metalaxyl - 317 g/L FS	trifloxystrobin - 154 g/L FS	imidacloprid - 600 g/L FS	*Trilex EverGol SHIELD*	Bayer
penflufen - 100 g/L FS	prothioconazole - 18 g/L FS			*Emesto Silver*	Bayer
penflufen - 38.4 g/L FS	prothioconazole - 76.8 g/L FS	metalaxyl - 61.4 g/L FS		*EverGol Energy*	Bayer
penflufen - 154 g/L FS	trifloxystrobin - 154 g/L FS			*Trilex Component A*	Bayer
picarbutrazox - 400 g/L FS	fludioxonil - 24.8 g/L FS	metalaxyl-m+s - 149.3 g/L FS	sedaxane - 24.8 g/L FS	*Vayantis IV*	Syngenta
picarbutrazox - 7.7 g/L FS	thiabendazole - 46.2 g/L FS	metalaxyl-m+s - 11.4 g/L FS	sedaxane - 15.4 g/L FS fludioxonil - 7.7 g/L FS	*Vibrance Total*	Syngenta
prothioconazole - 76.8 g/L FS	metalaxyl - 61.4 g/L FS	penflufen - 38.4 g/L FS		*EverGol Energy*	Bayer
prothioconazole - 15.4 g/L FS	metalaxyl - 6.2 g/L FS	tebuconazole - 3.0 g/L FS		*Lixar PRO*	Sharda Cropchem Limited
prothioconazole - 15.4 g/L FS	metalaxyl - 6.2 g/L FS	tebuconazole - 3.0 g/L FS		*Raxil PRO*	Bayer
prothioconazole - 15.4 g/L FS	metalaxyl - 6.2 g/L FS	tebuconazole - 3.0 g/L FS	imidacloprid - 600 g/L FS	*Raxil PRO SHIELD*	Bayer
prothioconazole - 18 g/L FS	penflufen - 100 g/L FS			*Emesto Silver*	Bayer
pydiflumetofen 500 g/L FS				*Saltro*	Syngenta
pyraclostrobin - 17 g/L FS	metalaxyl - 10 g/L FS	triticonazole - 17 g/L FS		*Insure Cereal*	BASF
pyraclostrobin - 16.7 g/L FS	metalaxyl - 13.3 g/L FS	fluxapyroxad - 16.7 g/L FS		*Insure Pulse*	BASF
pyraclostrobin - 16.7 g/L FS	fluxapyroxad 8.35g/L FS	metalaxyl - 10 g/L FS	triticonazole - 16.7 g/L FS	*Insure Cereal FX4*	BASF
pyraclostrobin: fluxapyroxad - 16.7 g/L SC: 8.35 g/L SC	broflanilide - 16.7 g/L SC	triticonazole - 16.7 g/L SC	metalaxyl - 10.0 g/L SC	*Teraxxa F4*	BASF
saponins of *Chenopodium quinoa* - 63.02% WS				*Heads Up Plant Protectant*	Heads Up Plant Protectants
sedaxane - 15.4 g/L FS	metalaxyl-m+s - 9.2 g/L FS	difenoconazole - 36.8 g/L FS	fludioxonil - 7.6 g/L FS	*Vibrance Quattro*	Syngenta
sedaxane - 15.4 g/L FS	metalaxyl-m+s - 9.2 g/L FS	difenoconazole - 36.9 g/L FS	fludioxonil: thiamethoxam - 7.7:61.5 g/L FS	*Cruiser Vibrance Quattro*	Syngenta
sedaxane - 24.8 g/L FS	fludioxonil - 24.8 g/L FS	metalaxyl-m+s - 149.3 g/L FS	picarbutrazox - 400 g/L FS	*Vayantis IV*	Syngenta
sedaxane - 3.4 g/L FS	metalaxyl-m+s - 5 g/L FS	difenoconazole - 16 g/L FS	fludioxonil: thiamethoxam- 1.7:269 g/L FS	*Helix Vibrance*	Syngenta
sedaxane - 50 g/L FS	metalaxyl-m+s - 37.5 g/L FS	fludioxonil - 25 g/L FS		*Vibrance Maxx RFC*	Syngenta
sedaxane - 50 g/L FS	metalaxyl-m+s - 37.5 g/L FS	fludioxonil - 25 g/L FS	ethaboxam - 383 g/L FS	*Vibrance Maxx RFC with INTEGO Seed Treatment*	Syngenta
sedaxane - 500 g/L FS				*Vibrance 500FS*	Syngenta
sedaxane - 500 g/L FS	metalaxyl-m+s - 1.10% FS	fludioxonil - 0.73% FS		*Vibrance Maxx RTA*	Syngenta
sedaxane - 500 g/L FS	metalaxyl-m+s - 1.7% FS	fludioxonil - 1.12% FS	thiamethoxam - 22.6% FS	*Cruiser Maxx Vibrance Beans*	Syngenta
sulfoxaflor - 500 g/L FS				*Rascendo*	Syngenta
sedaxane - 15.4 g/L FS	fludioxonil - 7.7 g/L FS	picarbutrazox - 7.7 g/L FS	thiabendazole - 46.2 g/L FS metalaxyl-m+s - 11.4 g/L FS	*Vibrance Total*	Syngenta
sedaxane - 77.2 g/L FS	mandipropamid - 154.3 g/L FS	difenoconazole - 77.2 g/L FS		*Vibrance Ultra Potato*	Syngenta
thiabendazole - 150 g/L FS	metalaxyl-m+s - 20 g/L FS	fludioxonil - 25 g/L FS		*Apron Advance*	Syngenta
thiamethoxam - 22.6% FS	fludioxonil - 1.12% FS	metalaxyl-m+s - 1.7% FS		*Cruiser Maxx Beans*	Syngenta
thiamethoxam - 240 g/L FS				*Actara 240SC*	Syngenta
thiabendazole - 26.5% FS	metalaxyl-m+s - 2.65% FS	fludioxonil - 3.32% FS	azoxystrobin - 1.33% FS	*Maxim Quattro*	Syngenta
thiabendazole - 26.5% FS	metalaxyl-m+s - 2.65% FS	fludioxonil - 3.32% FS	azoxystrobin: thiamethoxam - 1.33%: 47.6% FS	*Cruiser Maxx Corn*	Syngenta
tebuconazole - 4.6 g/L FS	difenoconazole - 36.3 g/L FS	metalaxyl - 12.6 g/L FS		*Straxan*	Corteva
tebuconazole - 3.0 g/L FS	metalaxyl - 6.2 g/L FS	imidacloprid - 600 g/L FS	prothioconazole - 15.4 g/L FS	*Raxil PRO SHIELD*	Bayer
tebuconazole - 3.0 g/L FS	metalaxyl - 6.2 g/L FS	prothioconazole - 15.4 g/L FS		*Raxil PRO*	Bayer

(Component 1) Active Ingredient* - Formulation	(Component 2) Active Ingredient* - Formulation	(Component 3) Active Ingredient* - Formulation	(Component 4) Active Ingredient* - Formulation	Product	Company
tebuconazole - 3.0 g/L FS	metalaxyl - 6.2 g/L FS	prothioconazole - 15.4 g/L FS		*Lixar PRO*	Sharda Cropchem Limited
tebuconazole - 5.0 g/L FS	metalaxyl - 6.6 g/L FS			*Sharda METEB 11ST*	Sharda Cropchem
thiabendazole - 46.2 g/L FS	metalaxyl-m+s - 11.4 g/L FS	sedaxane - 15.4 g/L FS	fludioxonil - 7.7 g/L FS picarbutrazox - 7.7 g/L FS	*Vibrance Total*	Syngenta
thiabendazole - 500 g/L SC				*Tibet*	Sharda Cropchem Limited
thiabendazole - 500 g/L SC				*Mertect SC*	Syngenta
thiamethoxam - 250 g/L FS	fludioxonil - 62.5 g/L FS	difenoconazole - 123 g/L FS		*Cruiser Maxx Potato Extreme*	Syngenta
thiamethoxam - 269 g/L FS	fludioxonil - 1.7 g/L FS	metalaxyl-m+s - 5 g/L FS	sedaxane: difenoconazole - 3.4:16 g/L FS	*Helix Vibrance*	Syngenta
thiamethoxam - 47.6% FS				*Cruiser 5FS*	Syngenta
thiamethoxam - 47.6% FS	fludioxonil - 3.32% FS	metalaxyl-m+s - 2.65% FS	azoxystrobin: thiabendazole - 1.33:26.5% FS	*Cruiser Maxx Corn*	Syngenta
thiamethoxam - 61.5 g/L FS	fludioxonil - 7.7 g/L FS	metalaxyl-m+s - 9.2 g/L FS	sedaxane: difenoconazole - 15.4:36.9 g/L FS	*Cruiser Vibrance Quattro*	Syngenta
thiophanate-methyl - 10% DS				*Senator PSPT*	Belchim Crop Protection
thiram - 13.25% FS	carbathiin - 15.59% FS			*Vitaflo 280*	UPL AgroSolutions
thiram - 13.25% FS	carbathiin - 15.59% FS			*Vitaflo SP Fungicide*	IPCO
thiram - 13.25% FS	carbathiin - 15.59% FS			*Vitaflo Fungicide*	IPCO
trifloxystrobin - 13.5 g/L FS	metalaxyl - 10.8 g/L FS			*Obex*	AgraCity Crop & Nutrition
trifloxystrobin - 13.5 g/L FS	metalaxyl - 10.8 g/L FS			*VIKING Grimstad*	Viking Crop Production Partners Inc.
trifloxystrobin - 7.15 g/L FS	metalaxyl - 7.15 g/L FS	clothianidin - 290 g/L FS	penflufen - 10.7 g/L FS	*Prosper EverGol*	Bayer
trifloxystrobin - 154 g/L FS	metalaxyl - 317 g/L FS	penflufen - 154 g/L FS		*Trilex EverGol*	Bayer
trifloxystrobin - 154 g/L FS	penflufen - 154 g/L FS			*Trilex Component A*	Bayer
triticonazole - 17 g/L FS	pyraclostrobin - 17 g/L FS	metalaxyl - 10 g/L FS		*Insure Cereal*	BASF
triticonazole - 16.7 g/L FS	fluxapyroxad - 8.35g/L FS	metalaxyl - 10 g/L FS	pyraclostrobin - 16.7 g/L FS	*Insure Cereal FX4*	BASF
triticonazole - 16.7 g/L SC	metalaxyl - 10.0 g/L SC	fluxapyroxad: pyraclostrobin - 8.35 g/L: 16.7 g/L SC	broflanilide - 16.7 g/L SC	*Teraxxa F4*	BASF

Insecticides

(Component 1) Active Ingredient* - Formulation	(Component 2) Active Ingredient* - Formulation	(Component 3) Active Ingredient* - Formulation	(Component 4) Active Ingredient* - Formulation	Product	Company
abamectin - 28.5 g/L	cyantraniliprole -135 g/L SC			*Minecto Pro*	Syngenta
abamectin - 84 g/L SC				*Agri-Mek SC*	Syngenta
acetamiprid - 70% WP				*Aceta 70 WP*	Sharda CropChem
acetamiprid - 70% WP				*Assail*	Belchim Crop Protection
acetamiprid - 80 g/L	novaluron - 100 g/L EC			*Cormoran*	ADAMA
afidopyropen - 50 g/L				*Sefina*	BASF
aluminum phosphide - 55% tablets				*Fumitoxin*	Degesch America
aluminum phosphide - 55% tablets				*Phostoxin*	Degesch America
bacillus thuringiensis - 12.7 billion CLU/L				Bioprotec CAF	AEF Global
bacillus thuringiensis - 20 billion CLU/L				Bioprotec PLUS	AEF Global
bacillus thuringiensis - 32 billion CLU/kg WG				*Dipel 2X DF*	Valent BioSciences
Beauveria bassiana strain ANT-03 - at least 1 X 10^{10} spores (conidia)/g				BioTitan WP	Tessenderlo Kerley
broflanilide - 100 g/L SC				*Cimegra*	BASF
carbaryl - 2% spreadable bran bait				*Eco Bran*	Peacock Industries
carbaryl - 466 g/L				*Sevin XLR*	Univar Solutions
chlorantraniliprole - 200 g/L SC				*Coragen*	FMC
chlorantraniliprole - 400 g/L SC				*Shenzi*	UPL AgroSolutions
chlorantraniliprole - 600 g/L SC				*Coragen MaX*	FMC
cyantraniliprole - 100 g/L				*Exirel*	FMC
cyantraniliprole - 135 g/L SC	abamectin - 28.5 g/L			*Minecto Pro*	Syngenta
cyantraniliprole - 20% WG	thiamethoxam - 20%			*Minecto Duo*	Syngenta
cyantraniliprole - 200 g/L SC				*Verimark*	FMC
cyclaniliprole - 50 g/L				*Harvanta 50 SL*	Belchim Crop Protection
cypermethrin - 250 g/L				*Ship 250 EC*	Sharda CropChem
cypermethrin - 250 g/L EC				*UP-Cyde*	UPL AgroSolutions
deltamethrin - 10 g/L SC	imidacloprid - 75 g/L SC			*Concept*	Bayer
deltamethrin - 100 g/L EC				*Decis 100 EC*	Bayer
deltamethrin - 50 g/L EC				*Advantage Deltamethrin 5 EC*	Advantage Crop Protection
deltamethrin - 50 g/L				*Decimate*	AgraCity
deltamethrin - 50 g/L				*Rauma*	Viking
delthamethrin - 25 g/L EC				*Poleci 2.5 EC Western*	Sharda CropChem
diatomaceous earth - 0.9				*Protect-It*	Hedley Technologies
dimethoate - 400 g/L				*Cygon 400EC*	FMC
dimethoate - 480 g/L EC				*Cygon 480-Ag*	FMC
dimethoate - 480 g/L EC				Diamante 4	Sharda CropChem
dimethoate - 480 g/L EC				*Lagon 480E*	Loveland Products
ferric phosphate - 0.76 % granules				*Sluggo Professional*	Belchim Crop Protection
flonicamid - 50% WP				*Beleaf*	FMC
flonicamid - 50% WG				*Carbine*	FMC
flupyradifurone - 200 g/L				*Sivanto Prime*	Bayer
imidacloprid - 240 g/L SC				*Admire 240*	Bayer
imidacloprid - 75 g/L SC	deltamethrin - 10 g/L SC			*Concept*	Bayer
lambda-cyhalothrin - 120 g/L EC				*Labamba*	Sharda CropChem
lambda-cyhalothrin - 120 g/L EC				*Matador*	Syngenta
lambda-cyhalothrin - 120 g/L EC				*Silencer 120 EC*	ADAMA
lambda-cyhalothrin 120 g/L EC				*Zivata*	ADAMA

(Component 1) Active Ingredient* - Formulation	(Component 2) Active Ingredient* - Formulation	(Component 3) Active Ingredient* - Formulation	(Component 4) Active Ingredient* - Formulation	Product	Company
lambda-cyhalothrin - 50 g/L	chlorantraniliprole - 100 g/L			Voliam Xpress	Syngenta
malathion - 85%				*Malathion 85E*	Loveland Products
methoxyfenozide - 240 g/L				*Intrepid*	Corteva Agriscience
mineral oil - 99%				*Superior 70 oil*	Loveland Products, N.M. Bartlett
novaluron - 10% EC				*Rimon 10 EC*	UPL AgroSolutions
novaluron - 100 g/L EC	acetamiprid - 80 g/L			*Cormoran*	ADAMA
permethrin - 384 g/L EC				*IPCO Synchro*	IPCO
permethrin - 384 g/L EC				*Perm-UP*	UPL AgroSolutions
permethrin - 384 g/L EC				*Pounce*	FMC
permethrin - 500 g/L EC				*Ambush*	Amvac Chemical
phorate - 20% G				*Thimet 20G*	Amvac Chemical
phosmet - 70% WP				*Imidan*	Gowan
Plutella xylostella granulovirus isolate GV-0020 - minimum of 2.5 X 10^{13} occlusion bodies/L				Plutex	Andermatt Canada
spinetoram - 25% SG				*Delegate*	Corteva Agriscience
spinosad - 0.07% EC				*Scorpio Ant and Insect Bait*	Belchim Crop Protection
spinosad - 480 g/L SC				*Success 480 SC*	Corteva Agriscience
spinosad - 80% WP				*Entrust*	Corteva Agriscience
spiromesifen - 240 g/L SC				*Oberon*	Bayer
spirotetramat - 240 g/L SC				*Movento 240 SC*	Bayer
spores of N*osema* (*Paranosema*) *locustae canning* - minimum of 2.2 x 106 on coated wheat bran				*Nolo Bait*	M&R Durango
sulfoxaflor - 240 g/L				*Closer*	Corteva Agriscience
tetraniliprole - 200 g/L				*Vayego 200 SC*	Bayer
thiamethoxam - 20%	cyantraniliprole - 20% WG			*Minecto Duo*	Syngenta
thiamethoxam - 240 g/L SC				*Actara 240 SC*	Syngenta
thiamethoxam - 25% WG				*Actara 25 WG*	Syngenta

Key to Product Pages

Pesticide Product Name

This field lists the pesticide product name. Where there is only one product the commercial "trade" name is given. Where more than one company sells pesticides with the same combination of active ingredients the "generic" (active ingredient) name is given.

If the active ingredients are all in a common formulation (liquid, granule, etc.) the generic name will appear as 'Ingredient A/ Ingredient B' and if the active ingredients are in separate containers to be mixed in the sprayer the names are given as 'Ingredient A + Ingredient B'.

Pesticide Resistance Group

This area will the pesticide active ingredient(s) to the mode of action that ingredient uses.

Company:

This section identifies the company (or companies) that manufacture or market this crop protection product (or generic equivalents) in Canada as well as the PCP# for that (those) product(s). See page 10 for more information on PCP numbers. PCP#s are given as *'(PCP#XXXXX)'* where XXXXX is a four or five digit number unique to that product. In some cases, where there are multiple components with separate PCP numbers, the PCP number will be provided below under 'Formulation:'

Formulation:

This section gives information on the active ingredient and its concentration in the product as well as information on formulation type and packaging types and configurations. Formulation strength (or concentrations) are given in % by weight for dry formulations and g/L for liquid formulations. PCP numbers may also be give for some products (see above).

Crops and Staging:*

This section indicates on which crops the product may be used and what stage of crop development it should be applied at. Rates may also be included in this section if they vary between crop types or crop stage.

***This section will also indicate which crops are registered under the User Requested Minor Use Label Expansion (URMULE) program. Some companies, as a condition of placing these minor crops on their labels request, that users of their product on these crops do so at their own risk because the registration was approved with information the company did not produce.*

These crops will be flagged separately from the main crops.

Pest (Diseases, Insects, Weeds) and Staging:

This section indicates the pests (Diseases, Insects, or Weeds) that are indicated on the product label as controlled or suppressed, as well as any specifics on the timing of application relative to the pest stage if required. Rates may also be included in this section if they differ for different pests or stage of pest.

Rates:

The rates provided in this section are given in the amount of product required per acre and the number of acres treated per package unit where possible. This section will also indicate any adjuvants that are to be used in conjunction with the product and the rate of that adjuvant.

This section will not be present if rates have been integrated into either of the previous **Crops** or **Pest** sections.

Application Information:

- **Water Volume:** This section indicates the minimum carrier water volume to be used to apply the product. Using less than the recommended minimum carrier application volume can negatively affect pesticide performance, particularly with contact pesticides and when using low drift nozzles.
- **Nozzles and Pressure:** This section indicates if there are any particular nozzles that should or should not be used to apply the product. Pressures indicated reflect those for conventional nozzles. Low drift nozzles may require higher pressures for proper performance. A general statement of "Use nozzles and pressures designed to deliver proper coverage with ***ASABE*** ___ droplets" indicating the ideal droplet sizes to allow for the combination of lowest drift potential and best performance from the pesticide. ASABE refers to the American Society of Agricultural Engineers who have set standards a series of droplet measurements (in microns or micrometres) that classify droplet sizes from *'fine'* to *'very coarse'*.

How it Works:

This section typically refers to the page where a general description of the various modes of action of either herbicide, fungicides or insecticides.

Effects of Growing Conditions:

This section summarizes any adverse conditions that will affect the biological function of the crop or the target pest and therefore possibly impact the product's performance. In most cases both crop and target pest must be growing or functioning normally for pesticides to provide expected performance and/or crop tolerance. Adverse weather conditions such as extreme heat, cold, drought or flooding can slow or stop the biological processes in the crop or pest. These biological processes in the crop allow the pesticide to be degraded quickly. If biological processes that are attacked by the pesticide, and under normal conditions would kill the pest, are not functioning normally the pest may be able to rid itself of the pesticide before dying and recover from the application.

Tank Mixes:

This section indicates which other pesticides the pesticide label indicates are registered for use as tank mix combinations with this pesticide.

Common mixes may include:

Herbicides:
- (Subtitles may indicate specific crops or condition restrictions:)

Insecticides:
Fungicides:
Fertilizers:

There may be additional pesticides that are registered but not listed on this product's label. Other pesticides may have this product listed as a mix option on their labels. The note below **(in bold)** directs users to a chart inside the back cover that show all available mixes for this pesticide. The product listed on the left column of the chart is the product that supports the mix. Mixes supported by both products are marked with an 'X'. Mixes supported by only one of the products is indicated by an arrow pointing to the left column.

Included in the tank mix section in non-bolded italics may be any precautions against the mixing of pesticides which will have adverse reactions such as crop injury, reduced pest control or unusual increased danger in the use of the product.

Note: The above mixes are those listed on the pesticide label only. To check for other possible mixes see the blue fold out chart inside the back cover.

Restrictions:

Since most pesticides have a capacity to injure neighboring plants, wildlife or people, they will come with restrictions on their use in order to prevent this unintentional damage. Misuse of pesticides may result in as little as temporary or superficial damage to plants or a slight irritation to the eyes or nose, or could also result in poor performance of the pesticide, severe injury and/or yield loss to very sensitive plants and/or unacceptable residues in agricultural commodities, and/or serious illness or death of non-target organism or people. It is important to comply with product restrictions in order to minimize the impact of the pesticide used on non-target organisms and people. A selection of common restrictions and precautions found on product labels are provided in this section, ***but it is important to read the label carefully in order to understand how to use the product properly.***

- **Rainfall:** This section indicates the required delay between application and rainfall to avoid reductions in the performance of the product or the unintentional movement of the product.
- **Restricted Entry Interval:** This section indicates when it is safe for a person to re-enter treated field following an application of a particular pesticide without the same personal protection used to apply the product.
- **Resistance Management:** This section highlights products where an increased risk of the target pests developing resistance to the group of products (typically fungicides)has been identified. If no specific risk has been identified the reader is referred to a general resistance section. All pesticides have some risk of the target pest developing resistance. Rotating pesticide groups using as many different resistance groups as possible in the rotation is one way to avoid or delay resistance development.
- **Grazing:** This section indicates whether and how soon treated crops may be grazed by livestock or otherwise fed to livestock. This restriction is in place to avoid residues of the pesticide from being detected in milk or meat from animals consuming forage, greenfeed or straw from treated crops or forage.
- **Pre-harvest interval:** Is the time that must be left between application of a pesticide and the harvest of a crop in order to prevent greater than allowable residues of the pesticide in the harvested material. Harvest is the cutting of the crop (i.e. combining or hay cut) or removal of the harvestable material from the plant (i.e. picking fruit or striper header). Maximum Residue Limits (MRLs) are set for commodities based on registered rates and staging of pesticides used in the production of those commodities. Disregarding these intervals can result in residues over the MRLs, which can lead to market disruptions.
- **Re-cropping:** This section indicates how soon specific crops may be seeded into treated fields. Failure to adhere to these delays could result in injury to the following crop.

- **Aerial Application:** This section indicates whether the product may be applied by aircraft and any special conditions that may be necessary.
- **Labelling:** In addition to other precautions and warnings, seed treatment products will also have statements about how seed treated with the product should be labeled.
- **Storage:** This section indicates how the product must be stored. As a general rule, unused pesticides should always be stored in their original containers in a secure, dry area, away from other pesticides, food or feed.
- **Buffer Zones:** This section will indicate any setback distances that are required from sensitive aquatic or upland habitats. Newer labels may indicate that these distances are from the downwind edge of the boom but older labels may not. Examples of aquatic habitats are lakes, rivers, sloughs, ponds, prairie potholes, creeks, marshes, streams, reservoirs and wetlands. Examples of terrestrial habitats are grasslands, forested areas, shelter belts, woodlots, hedgerows, riparian areas and shrublands.

In addition to the set back or 'buffer' distances indicated on product labels, provincial environment departments may also have additional restrictions or requirements for permits to apply pesticides to or near water. Check with the provincial environment department/ministry for more information.

Tank Cleaning:

This section describes the measures that are required to properly clean out spray tanks. A general overview of sprayer cleaning is given on page 15, but products where there is a high risk of crop damage as a result of very low level contamination of the spray solution, will have specific measures indicated.

Hazard Rating:

This section indicates the relative toxicity of the pesticide, formulations or components. For an explanation of the symbols used here see pages 10 and 11. An additional symbol that is used that is not a standard symbol is the (!) exclamation mark which indicates an otherwise undefined risk factor (i.e. irritation).

Example:

Caution – Eye Irritant

Some older products have not had hazard ratings developed, while other products have very low toxicity and do not have hazard warnings. Even in the absence of a hazard rating users should wear a minimum of nitrile gloves and an apron as well as long sleeved apparel during mixing and avoid unnecessary exposure.

Weed Control

The use of herbicides to control weeds is often important in determining the success or failure of a crop. However, many other practices can be implemented before and after a herbicide application to help reduce weed competition. The use of these practices is termed Integrated Weed Management.

Integrated Weed Management

A farming system that uses an array of inter-dependent cultural, biological, mechanical and herbicidal weed control practices is implementing Integrated Weed Management (IWM). It is essential that IWM involve a variety of tools including the rotation and/or mixes of available herbicide groups, ensuring that weeds are exposed to a diverse range of control mechanisms. The goal of IWM is to improve the health and vigour of crops so that they may out-compete weeds emerging in the stand. This helps to reduce selection for resistance to any single control agent and to delay or prevent the development of herbicide resistant weeds.

Practicing IWM does not mean abandoning chemical weed control, just relying on it less exclusively. For example:

- You may decide to choose a taller wheat variety or a tall, viny pea variety for a certain field. These crop selections will compete strongly with weeds, possibly allowing you to skip a spray operation in more competitive crops.
- You could insert a short-term forage crop into your crop rotation. Studies show that short-term (3 year) alfalfa stands can reduce wild oat and green foxtail populations by up to 80 percent the year after terminating the forage crop.
- Early sown barley may give you enough of a "jump" on the weeds that you can avoid herbicide applications.
- Use of vigorous, high-quality seed, sown shallow, can give you better crop competition than poor-quality or deeply sown crop seed.
- Banding nitrogen near the seed-row can give your crop an advantage over weeds, whereas broadcasting fertilizer benefits both crop and weed equally.

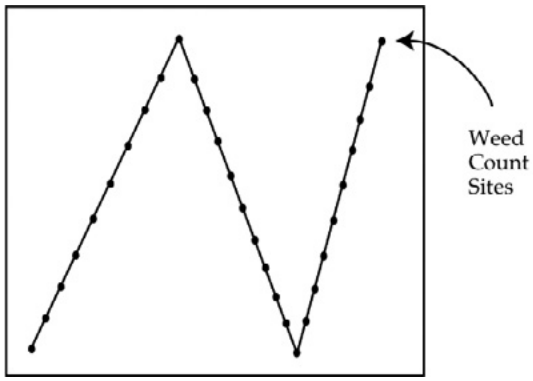
For more information, refer to "Integrated Weed Management: Making it Work on Your Farm" factsheet, available from Manitoba Agriculture.

Making Spray Decisions

Field Scouting

Field scouting is an important tool for making informed spray decisions. Accurately assessing the type and number of weeds in the field will help you determine if a spray operation is necessary. The scouting pattern diagram on this page provides a guideline for scouting a field. The entire field should be walked to get a feel for the distribution and species of the weeds present. A minimum of 20 weed counts should be taken across the field. A smaller number may be used, but be aware that accuracy decreases as the number of counts gets smaller. Count the number of weeds in a 1 square metre or a 0.25 square metre area and divide the total number of weeds by the number of counts taken to obtain an average for the field. If using 0.25 square metre samples, make sure to multiply by four so your average is for a 1 square metre area.

Some weeds are not distributed uniformly and may be found in patches (for example, Canada thistle) or in low spots. As well, the type and number of weeds found along the field edges may be very different from those found inside the field. These areas should be considered separate from the rest of the field. If possible, patches, low spots, and field borders should be treated separately, as field-wide spraying may not be required. Look out for new invading weeds and patches of herbicide-resistant weeds. Herbicide-resistant weeds and new invaders should be removed (manually if necessary), regardless of their number, to prevent them from spreading and becoming a serious control problem. Mapping your field's weed problems will allow you to monitor the spread of weed patches over time and help you assess the effectiveness of your control program.



Yield Losses Caused by Weeds

Knowing the amount of crop yield loss caused by a given weed density will help you decide if a spray operation is required. The tables on the following pages give an indication of the yield loss caused by some of the important grassy weeds.

THE FOLLOWING TABLES SHOULD BE USED ONLY AS A GUIDE.

The figures are based on Western Canadian research trials and will not be accurate all of the time. The yield loss values apply only to healthy, well fertilized crops with good stand establishment. Crops that are diseased or emerged unevenly will not compete well with weeds and will suffer larger yield losses than indicated in these tables. The yield loss figures are based on competition from a single weed species only. Other weeds, such as wild mustard or Canada thistle, must be controlled if the figures are to be accurate. As well, the tables are based on competition from normal height crops. Semi-dwarf or hybrid varieties may not compete as well with weeds and the figures may not be accurate in these cases.

Table 1. Yield Losses (Percent) in Wheat Caused by Wild Oats.

	Wild Oats Density (number/m^2)																
	1	2	4	6	8	10	12	14	16	18	20	25	30	35	40	45	50
Wild oats are 1 leaf stage ahead of the crop	1	2	4	6	8	10	12	14	15	17	19	22	26	29	32	34	37
Wild oats are the same leaf stage as the crop	1	1	2	4	5	6	7	8	9	10	11	14	16	18	20	22	24
Wild oats are 1 leaf stage behind the crop	0	1	1	2	3	3	4	5	5	6	7	8	10	11	13	14	15

Source: O'Donovan, Alberta Environmental Centre (Vegreville, Alberta)

Figure 1. Spray Decision Guideline for Wild Oats in Wheat.

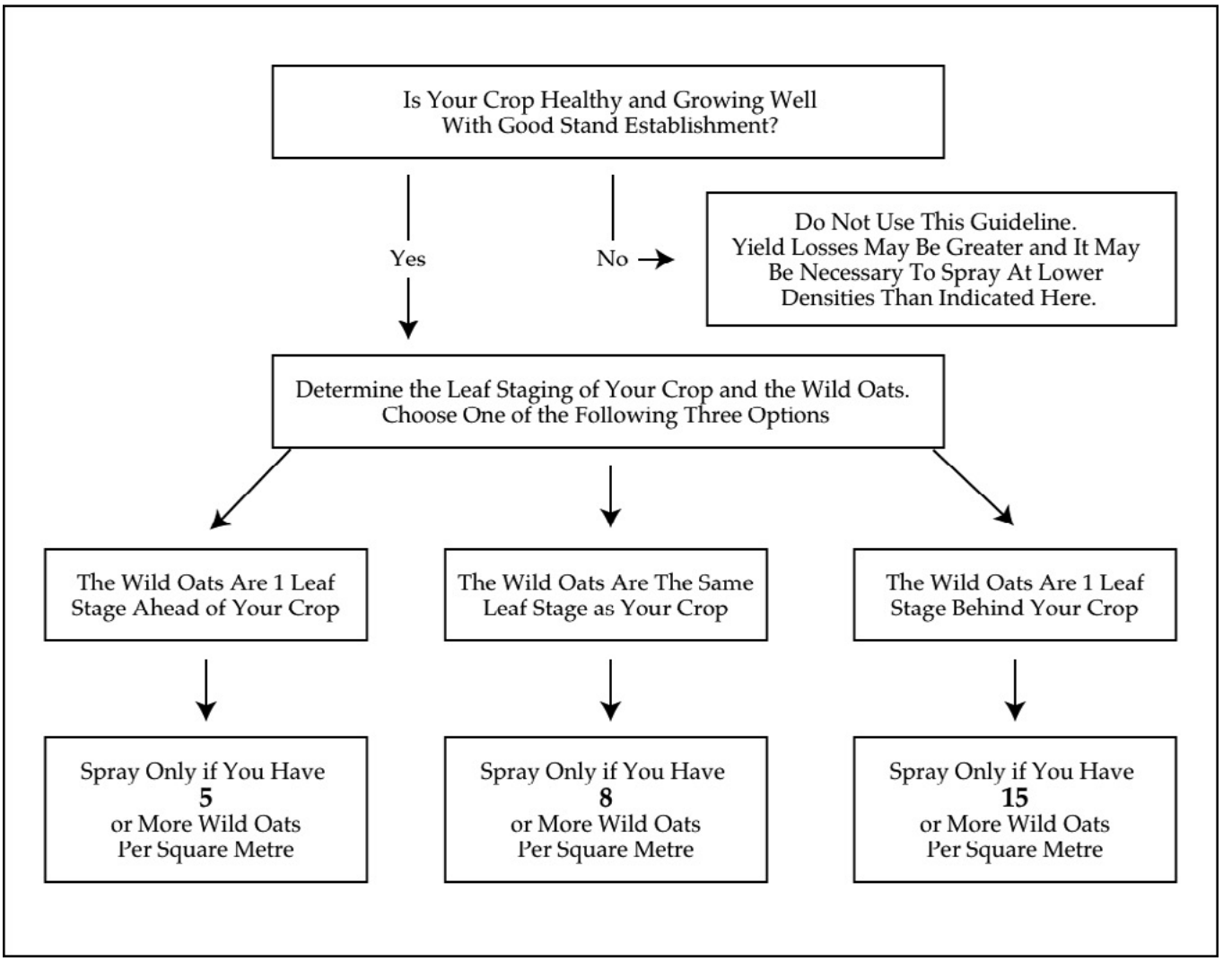
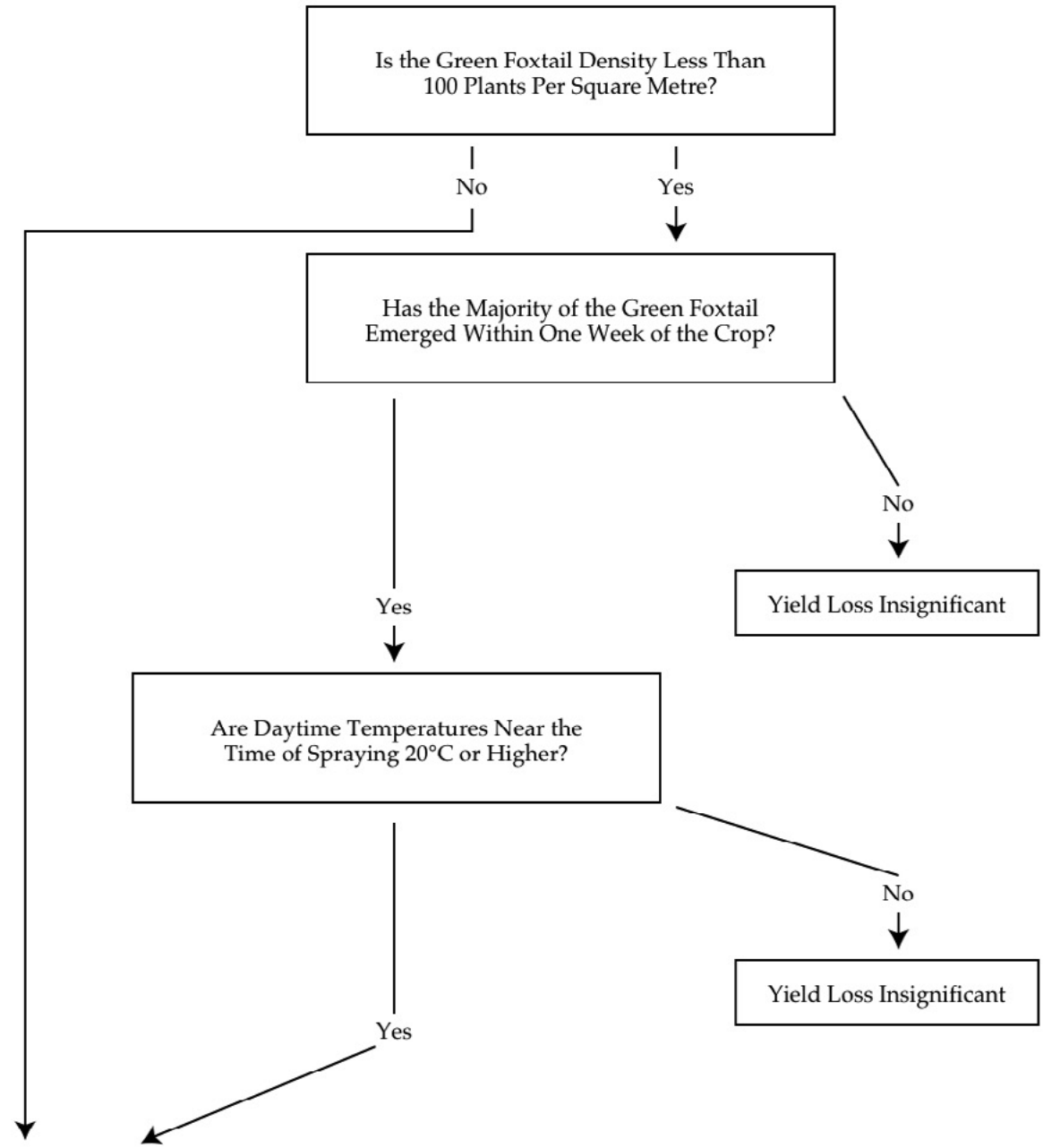


Table 2. Yield Losses (Percent) in Wheat Caused by Green Foxtail (Wild Millet).



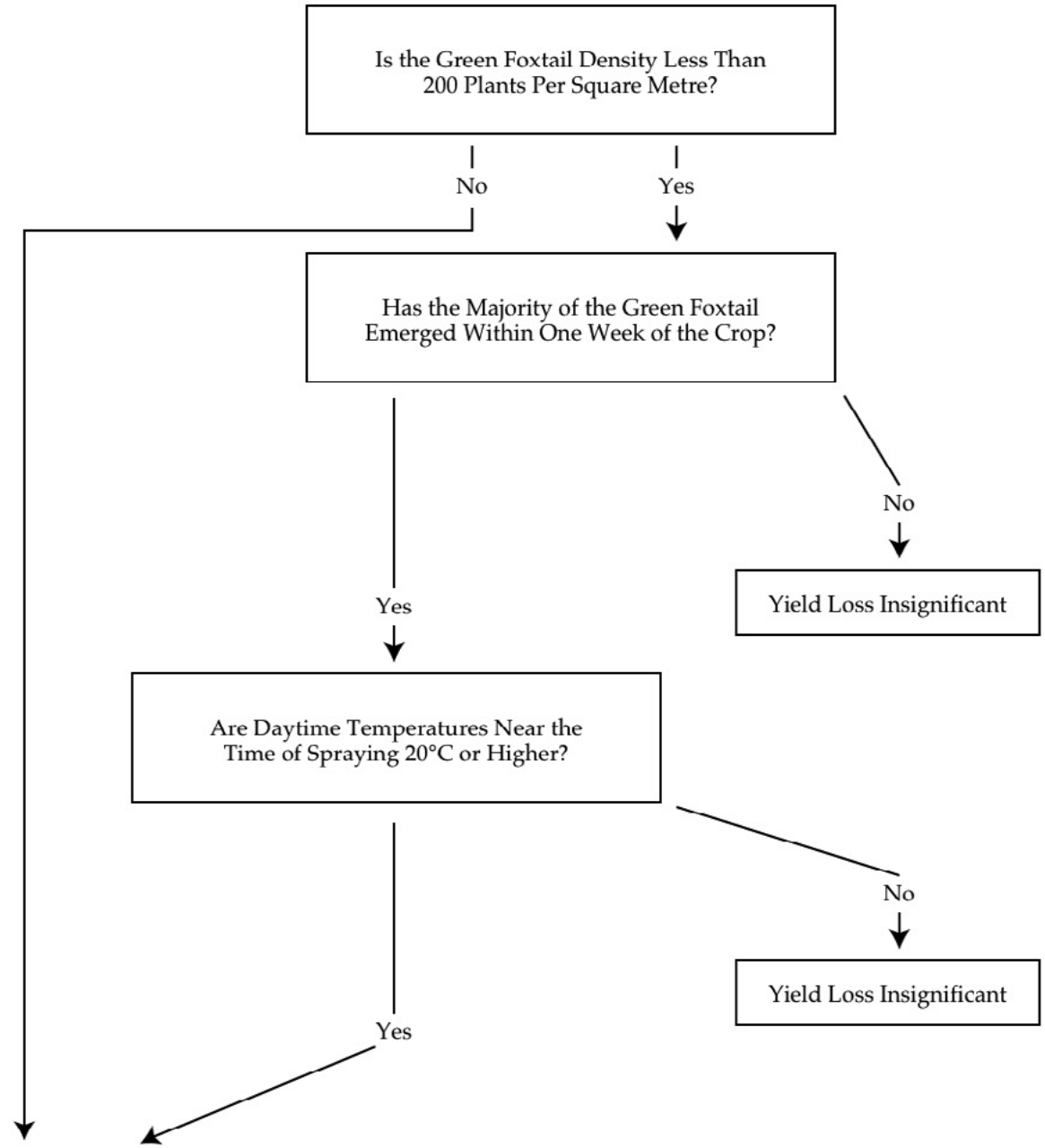
Green Foxtail Density (no. per square metre)	50	75	100	125	150	175	200	250	300	350	400	450	500
Yield Loss (percent)	2	3	5	6	7	8	9	11	14	16	18	20	23

Source: O'Donovan, Alberta Environmental Centre (Vegreville, Alberta)

Table 3. Yield Losses (Percent) in Barley Caused by Wild Oats.

Crop Density (plants/m^2)	Relative Emergence	Wild Oat Density (plants/m^2)											
		1	5	10	15	20	25	30	40	50	70	100	150
300	Wild oats are 1 leaf stage ahead of the crop	0.3	1.4	2.8	4.1	5.4	6.7	8.0	10.3	12.6	16.8	22.4	30.2
	Wild oats are the same leaf stage as the crop	0.3	1.3	2.5	3.7	4.8	6.0	7.1	9.2	11.3	15.1	20.3	27.6
	Wild oats are 1 leaf stage behind the crop	0.2	0.9	1.7	2.6	3.4	4.2	5.0	6.6	8.1	11.0	15.0	20.9
225	Wild oats are 1 leaf stage ahead of the crop	0.4	1.9	3.6	5.4	7.0	8.6	10.2	13.1	15.9	20.9	27.4	36.2
	Wild oats are the same leaf stage as the crop	0.3	1.6	3.1	4.6	6.1	7.5	8.8	11.4	13.9	18.4	24.4	32.6
	Wild oats are 1 leaf stage behind the crop	0.2	1.0	2.0	3.0	4.0	4.9	5.8	7.6	9.3	12.6	17.1	23.6
175	Wild oats are 1 leaf stage ahead of the crop	0.5	2.3	4.6	6.7	8.7	10.7	12.5	16.1	19.3	25.1	32.3	41.8
	Wild oats are the same leaf stage as the crop	0.4	1.9	3.8	5.6	7.3	8.9	10.5	13.6	16.4	21.6	28.2	37.1
	Wild oats are 1 leaf stage behind the crop	0.2	1.1	2.3	3.4	4.4	5.5	6.5	8.5	10.4	14.0	18.9	25.9

Table 4. Yield Losses (Percent) in Barley Caused by Green Foxtail (Wild Millet).



Green Foxtail Density (no. per square metre)	50	75	100	125	150	175	200	250	300	350	400	450	500
Yield Loss (percent)	1	2	3	3	4	5	6	7	8	10	11	13	14

Source: O'Donovan, Alberta Environmental Centre (Vegreville, Alberta)

Table 5. Yield Losses (Percent) in Canola Caused by Wild Oats and Volunteer Cereals.

	Weed Density (number/m^2)												
	1	2	4	6	8	10	12	14	16	18	20	25	30
Wild oats	3	5	6	8	9	10	11	12	13	14	15	16	18
Volunteer wheat	1	3	6	8	10	11	12	14	15	16	17	19	21
Volunteer barley	3	5	8	10	12	14	15	17	18	19	20	23	25

Sources: Dew and Keys, Agriculture Canada (Lacombe, Alberta); and O'Donovan, Alberta Environmental Centre (Vegreville, Alberta)

Figure 2. Spray Decision Guideline for Wild Oats and Volunteer Cereals in Canola.

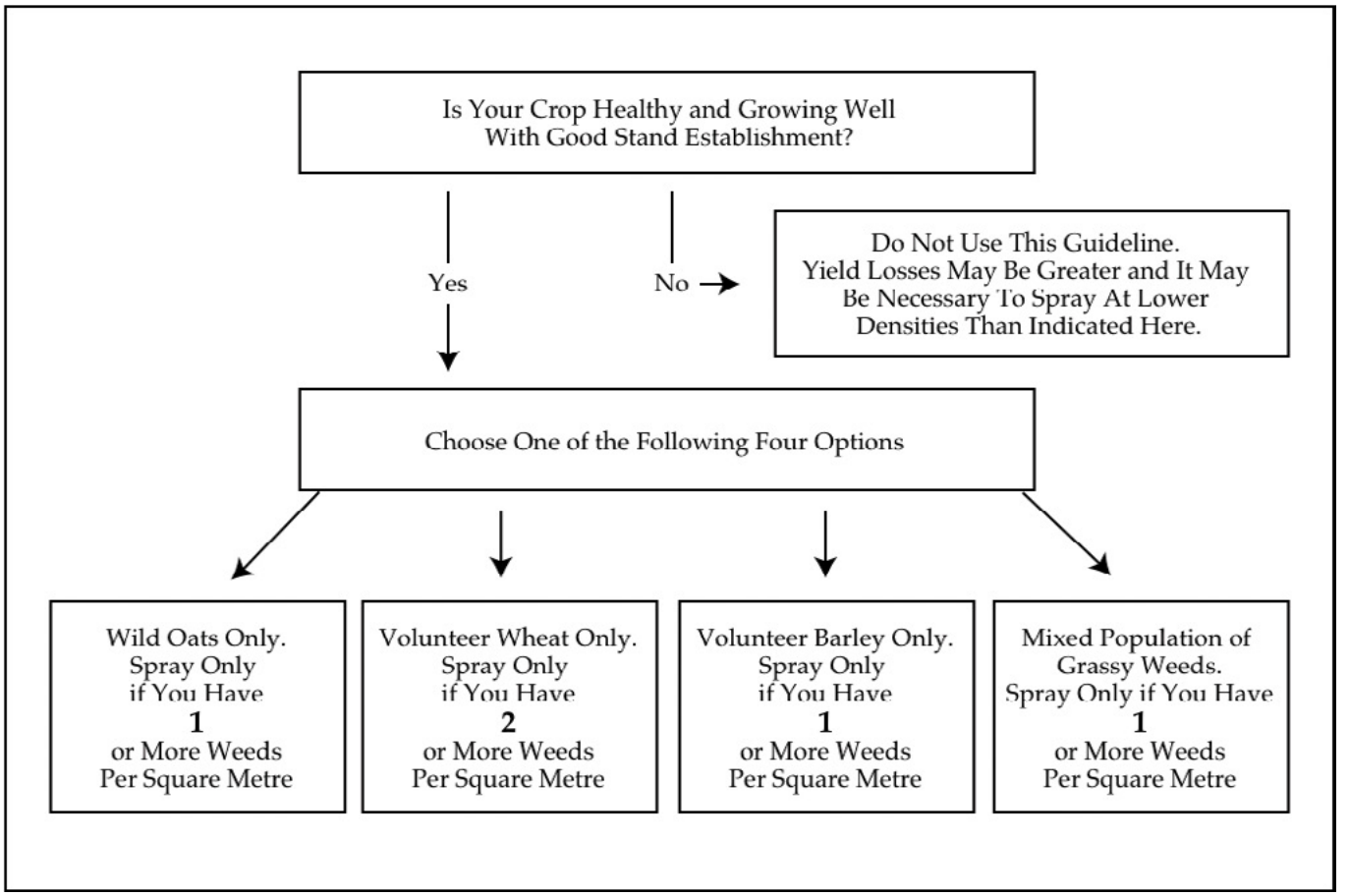
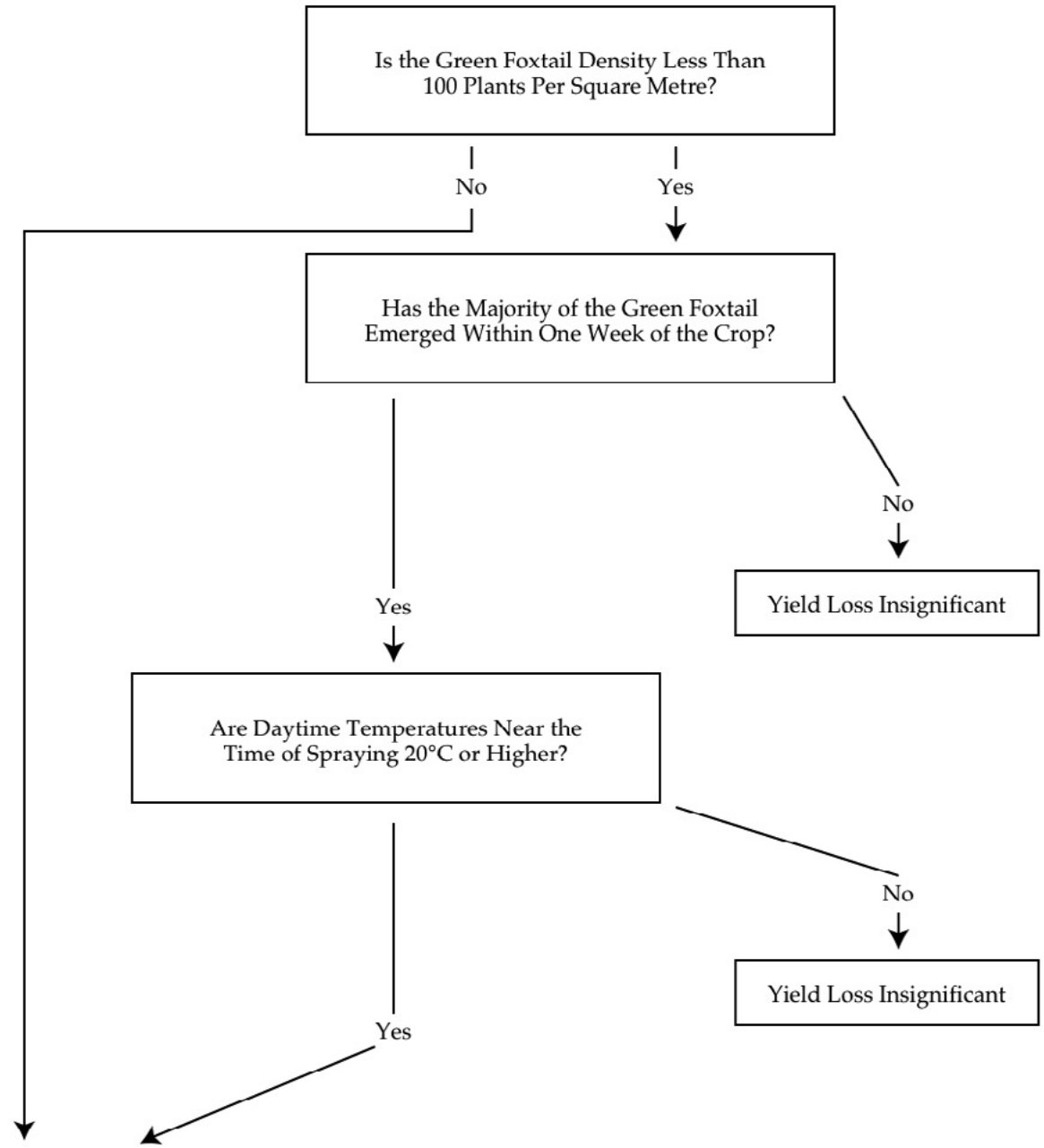


Table 6. Yield Losses (Percent) in Canola Caused by Green Foxtail (Wild Millet)



Green Foxtail Density (no. per square metre)	50	75	100	125	150	175	200	250	300	350	400	450	500
Yield Loss (percent)	3	4	5	6	8	9	10	13	15	18	20	23	25

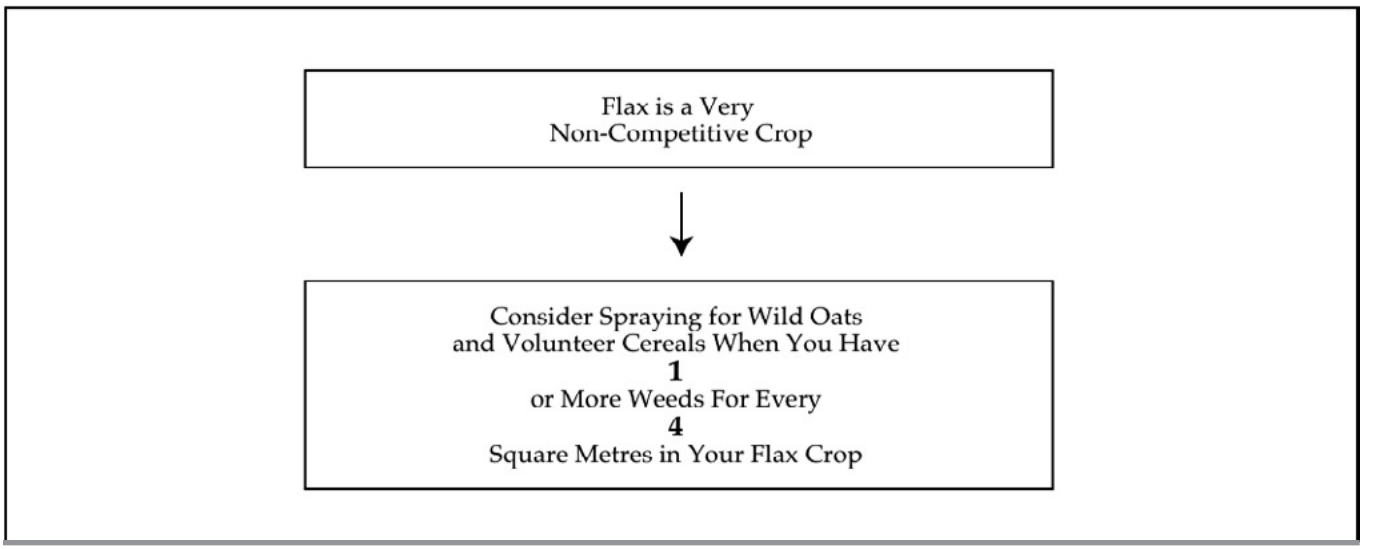
Source: O'Donovan, Alberta Environmental Centre (Vegreville, Alberta)

Table 7. Yield Losses (Percent) in Flax Caused by Wild Oats and Volunteer Cereals.

	Weed Density (number/m^2)									
	1	2	3	4	5	6	7	8	9	10
Wild oats	6	8	10	12	13	15	16	17	18	19
Volunteer wheat	6	11	15	18	22	24	27	29	31	33
Volunteer barley	6	12	16	21	24	28	31	34	36	39

Sources: Dew and Keys, Agriculture Canada (Lacombe, Alberta); and Friesen et al., University of Manitoba (Winnipeg, Manitoba)

Figure 3. Spray Decision Guideline for Wild Oats and Volunteer Cereals in Flax.



Deciding to Spray – Economic Thresholds and Herbicide Resistance

An economic threshold is the level of infestation at which lost yield exceeds the cost of the chemical and its application. Determining the economic threshold will help you decide if a spray operation is necessary.

The following example outlines how to determine an economic threshold:

You have a wild oat problem in your wheat. After a thorough field scouting, you have determined that your field has an average density of 35 wild oats per square metre. You know that the crop and weeds are at the same leaf stage. Using Table 1, choose the "Same Leaf Stage" row and read across to 35 wild oats per square metre. You will find that your yield loss will be about 18 percent.

You think it could be a 60 bushel per acre wheat crop, and expect to get $6 per bushel for it. Therefore:

- 60 bushels x 0.18 (percent of expected yield loss) = 10.8 bushels per acre of lost yield
- 10.8 bushels x $6 per bushel = $64.80 per acre of lost income

Now find out the price of your herbicide. Most wild oat herbicides for wheat cost between $10 to $25 per acre. In this case, lost income exceeds the cost of the herbicide and application, so spraying would be justified.

Alternatively, you may want to use the figures provided with some of the yield loss tables. These figures provide flowcharts to assist you in making spray decisions. In some cases the flowcharts may indicate to spray when you do not have an economic threshold weed density, but most times they will prevent you from spraying unnecessarily.

Another factor to consider when deciding whether to spray is your herbicide rotation. A minimum one-in-three rotation of herbicide groups is currently recommended to delay the development of herbicide resistance for weeds such as wild oats and green foxtail. Skipping a spray operation will give you an extra year of flexibility in your herbicide rotation. This means that you have one extra herbicide group to choose from the year after you skipped the spray operation. When making spray decisions, the ability to rotate herbicides should be considered in addition to the economics of spraying.

Making the Spray Decision

Remember that economic thresholds should be used only as guides when making a spray decision. Lost income caused by dockage or downgrading must also be considered. FIELDS THAT ARE NOT SPRAYED THIS YEAR HAVE A HIGHER POTENTIAL FOR PROBLEMS THE FOLLOWING YEAR BECAUSE OF WEED SEED RETURN. A farmer's experience and common sense play an important role when deciding to spray. Used properly, however, the economic threshold can be an important tool in making spray decisions.

Brush Control

Woody species can have both positive and negative characteristics. Many woody plants are useful for fruit, their ornamental qualities or wood for fuel or for building materials. However, when useful species dominate landscapes where they are not desired, they require controlling. Other woody species, and there may be some overlap with the species above, can be toxic to people and animals, or become invasive on the landscape, reducing utilization of the land for other purposes like grazing, recreation, sightlines for transportation corridors or protecting against the destruction of infrastructure.

Control of woody species can be challenging and require a different approach from the control of herbaceous plants whose tops die down to the ground each year.

Woody species also provide an opportunity for management through physical cutting or plowing/dozing the tops to severely compromise the woody plant's ability to survive. While these methods can be quite effective, they can also encourage regrowth from the cut surface or from underground roots. The use of herbicides in conjunction with these operations can result in better overall results, by suppressing or preventing the return of secondary growth of that plant. Similarly, fire can sometimes be used to reduce woody growth on a wider landscape basis, but may not be targeted enough for all situations, and comes with some risk of escape and resulting liability from unintended destruction of property.

While herbicides can be an effective tool for managing woody species, timing can be different than with the management of herbaceous plants. Approaching control of perennial plants with herbicides is often more successful when the perennial plant is treated when stored energy levels are low. The energy reserve in herbaceous perennial plants typically declines through the season until the point when energy begins to flow to the root again after flowering. This results in a low ebb of energy reserves typically just as flowers emerge. However, woody species have their low energy ebb just after they leaf out in the spring, and the rest of the entire season is spent rebuilding those reserves and setting new buds for the following year. As a result, the susceptibility to the timing of systemic herbicide application differs between herbaceous and woody plants. In perennial herbaceous plants, this vulnerability occurs in late summer and fall as plants shift from fueling aerial growth to fueling the building of root reserves for winter. In woody plants, however, plants are particularly vulnerable just after leafing out and then that vulnerability gradually declines as the growing season progresses.

As the control of woody species often occurs in congested sites, where control needs to be very localized and targeted to a single individual or interspersed undesirable individuals within a collection of desirable individuals, there are additional application methods that differ from broadcast applications that are utilized in open habitats. The height of woody vegetation may also restrict broadcast applications to delivery with aircraft, ground applications need to be more specialised. Below are a series of approaches that can be used to apply herbicide to control woody species.

Foliar

Foliar applications, as mentioned before are somewhat limited by the height of the canopy, unless executed by aircraft. But foliar treatment can also take place from the ground using vehicle-based methods or hand wand applications. Vehicle based sprayers can include those with solid booms with relatively conventional nozzles, or those with 'boomless nozzles' that deliver a fan of spray horizontally from the delivery vehicle over the target. The advantage to boomless nozzles is that they allow the vehicle to navigate tight pathways and spray past obstacles without having to physically retract a rigid boom. Delivery vehicles for boomless nozzles can range from all-terrain vehicles to tractors to road based vehicles such as trucks.

Foliar applications can also be made from the ground using single nozzle handheld systems. Low volume systems that are most common in vehicle delivery systems may also be useful for low growing and/or young woody plants (below waist height) like those used for applying to herbaceous plants. High volume applications are useful for larger woody plants and higher pressure, higher volume wands can reach the upper reaches of woody plants of moderate height that are taller than the applicator but not greatly so. The higher volumes delivering larger droplets help to reduce the risk of off target drift to some degree, but caution should still be taken when treating taller vegetation using this approach that applications take place under conditions that minimize the risk of drift and takes place in areas where drift is less problematic.

Wipers or rollers may also be used to apply herbicide solutions to short brush species. This method has minimal off target drift since the herbicide solution is applied to the absorptive material of the roller drum or wiper using low pressure and the roller/wiper makes direct contact with the target to deliver the herbicide solution to the plant.

Basal and Single Stem Treatments

Cut stump

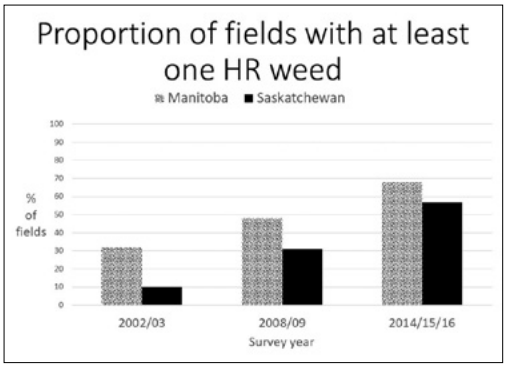
The principal behind cut stump treatments is straight forward. The tree is cut down. Then shortly after the tree is felled, a treatment is applied to the area of the cut surface where the wood and the bark meet called the cambium. The cambium is the living part of the stem of woody plants and any material inside of that thin layer (wood) or outside of that layer (bark) is inert. The cut stump application is designed to allow the treatment to move into that live layer and circulate to the buds on the roots or just below the cut region that may produce regrowth or 'suckers'.

Basal bark treatments

Basal treatments are usually used on smaller diameter woody plants of 6 inches (15 cm) or less with relatively thin bark. The thinner bark of these young saplings allows the penetration of the herbicides through to the cambium where they either kill a band of the cambium around the tree effectively girdling it and thereby killing the tree, or to allow the treatment to circulate to growing points. Herbicide carriers are often waterless, using mineral or vegetable oil carriers, allowing these applications to take place year-round.

- ***Low Volume*** applications that treat on side of the stem thoroughly with spray solution from the base of the stem upwards for at least one foot (30 cm).
- ***Streamline*** applications use a thins stream of solution to an area of the stem that is about 1 to 1.5 feet (30 to 50 cm) above the base of the stem. The stream of solution is applied around the entire circumference of the stem in a roughly 2 inch (5 cm) band.
- ***Frilling*** applications, sometimes referred to as 'hack and squirt', are used on larger trees that have developed a thicker bark layer that makes direct treatment less effective. An axe, hatchet or machete is used to cut through the bark and penetrate past the cambium layer slightly. The resulting frill that is produced acts as a cup to hold the herbicide solution. Concentrated herbicide solution is applied to the frill so that it contacts the cambium layer. This can be done through spraying, dribbling, or squirting the herbicide solution into the frill. Frills should be made at relatively close regular intervals around the girth of the tree to girdle it.
- ***Injection*** applications use either heavy duty needles, spikes, hand drills or capsules to penetrate the bark layer of woody plants to facilitate the entry of the herbicide solution into the tree. Similar to the frills, the injection sites should be made a regular intervals to ensure treatment of the entire stem.

Weed Resistance to Herbicides



In recent years, the number of herbicide-resistant weeds and the areas they infest have increased.

Most herbicide-resistant weed infestations have developed following repeated use of the same herbicide (or herbicide group) for a number of years on the same field. Growers who have developed weed resistance on their farms will typically see a weed, which is normally controlled by a herbicide, escape uncontrolled after a number of years of use of the same product or product group. Individual plants may be resistant to 1.5 up to 10 or more times the normal field rate.

Herbicide Groups

To help you plan your herbicide program, the following table lists "herbicide groups." To slow down the process of developing weed resistance, tank mix products from different groups to control the same key weeds and/or use products from different groups from year to year on your fields. 'Herbicide Layering' is another way to use multiple herbicide groups that control of the same weed for managing herbicide resistance. Layering involves application of a soil active herbicide followed by in-crop foliar sprays. The soil applied herbicide provides a base for control and the foliar herbicide picks up any stragglers. Soil applied herbicides also help to control certain difficult to control weeds as well as improving crop yields by removal of weeds in the crop's sensitive early growth stage.

Table 8. Herbicide Site of Action and Chemical Family for Resistant Weed Management

Mode of Action (Group)	Active Ingredient	Herbicide Tradename	Premix or Co-pack† Tradenames*
Unknown (0)	pelargonic acid	*Beloukha*	-
	ammonium salts of fatty acid	*Axxe*	-
ACCase Inhibitor (1) Aryloxyphenoxy proprionate "Fop"	clodinafop	*Horizon NG=Foothills NG, Cadillac One=Ladder All In, Aurora=Cadillac= Foax=Ladder 240 EC= Signal=Slam'-R = Viking Clodinafop= Winner*	*Signal FSU*†, Traxos, TraxosTwo*†*
	fenoxaprop	*Puma Advance, HellCat=Vigil WB =Viking Fenoxaprop*	*Cirray, Tundra*
	quizalofop	*Assure II=Yuma GL=COOP/IPCO Contender II=Quiz=Idol= Leopard= ADAMA Quizalofop Elegant 10EC=Marshall =Caziva Ultra Q =Viking Quizalofop*	*Boa IQ*†, Anaconda*†, Odyssey Ultra Q*†, Solo Ultra Q*†, Davai Q Plus*†, Select Plus*

Table 8. Herbicide Site of Action and Chemical Family for Resistant Weed Management, *continued*

Mode of Action (Group)	Active Ingredient	Herbicide Tradename	Premix or Co-pack† Tradenames*
Cyclohexanedione "Dim"	clethodim	*Select=Centurion ADV= Advantage Clethodim 240= Antler 240 EC =Arrow=Clethodim 240= IPCO GraminX=Independence=Shadow RTM= CO-OP Patron II=Statue =Deputy=Viking Clethodim, Arrow-All-In =Shadow XL=IPCO GraminX Complete=CO-OP Patron Complete, Antler Unpacked*	*Ninja Master*†, Samurai Master†*, Select Plus, Viking Floro*†*
	sethoxydim	*Poast Ultra*	-
	tralkoxydim	*Achieve=Bison=Marengo=Nufarm Tralkoxydim*	-
Phenylpyrazoline "Den"	pinoxaden	*Axial = Brazen All In= Pina =Ace 50 =Viking Pinoxaden, Epic=Trondus =CO-OP/IPCO Avant =EPCI II=Advantage Pinoxaden*	*Avenza*†, Axial Xtreme* =Kingpin*, Axial Xtreme iPak*†, Axial Maxx*†, BroadBand*, Cirray, Rezuvant†*, Traxos, TraxosTwo*†*
ALS Inhibitor (2) Imidazolinone "Imi"	imazamox	*Solo ADV, Davai 80SL= Amity WDG=Samuari=Next =Dakota =Viking Imazamox=Canvista, Venim, Image*	*Altitude FX3*†, Ares SN, Duet=Judo=Ninja=Quasar† =Viking Skien, Ransack*=Nelatic*, Anaconda*†, Boa Pro*†, Ninja Master*†, Samurai Master†*, Odyssey NXT, Odyssey Ultra Q*†, Python*†, Solo Ultra Q*†, Viper ADV*=Benz* , Davai Q Plus*†, Viking Floro*†*
	imazapyr	*Arsenal Powerline*	*Ares SN*
	imazethapyr	*Pursuit 240=Kamikaze=Phantom =Viking Imazethapyr*	*Ninja Master*†, Duet=Judo=Ninja, Odyssey NXT, Odyssey Ultra Q*†, Viking Floro*†*
Sulfonylurea "SU"	ethametsulfuron	*Muster*	-
	foramsulfuron	*Option 2.25 OD*	-
	halosulfuron	*Permit WG*	-
	metsulfuron	*Ally =Plotter =Ally Toss-N-Go=MPower Pro, Escort*	*Clearview*, Express Pro, Navius Flex*=TruRange*, Reclaim II*†, Sightline*†, Smoulder*, Travallas**
	nicosulfuron	*Accent=Nicosh= Primero, Accent IS*	*Steadfast IS*
	rimsulfuron	*Prism=Sharda Rimsulfuron=Hinge, Sortan IS*	*Steadfast IS*
	thifensulfuron	*Pinnacle=Volta*	*Ammo DR†*, Audible*†, Barricade II*†=Foxxy R*†, Broadside*†=Refine M*†, Foxxy CRX*†, Predicade*†, Refine SG=Deploy=MPOWER RX =Viking Avesta, Retain SG*†=Foxxy Pro RX*† =Viking Navik*†, Sentrallas*, Signal FSU*†, Travallas* , Barricade M*† , Viking Larvik*†*
	tribenuron	*Express SG=MPOWER Extra= Inferno WDG=Involve 50WDG=Cleat =Tribe 75WDG =Viking Tribenuron*	*Ammo DR†*, Audible*†, Barricade II*† =Foxxy R*†, Broadside*†=Refine M*†, Express Pro, Foxxy CRX*†, Inferno Duo=Himalaya Extra† =Viking Visby†, Intruvix*†, Intruvix II*†, Predicade*†, Refine SG=Deploy= MPOWER RX=Boost=Draft, Retain SG*†=Foxxy Pro RX*† =Viking Navik*†, Signal FSU*†, Travallas, Viking Larvik*† , Barricade M*†*
Triazolopyrimidine "TPS"	florasulam	*PrePass Flex, Priority=Battlefront=Blitz= Flora =Advantage Florasulam 50 SC=Clorvante=Bombard 50 SC=Start 25 WDG =Viking Florasulam*	*Alloy*†, Akito*, Avenza*†, Broadband*, Cirpreme/ Cirpreme XC*†, Exhilarate†*, Inferno Trio*, Topline*†, Korrex II*†, Deathstar*†, Paradigm PRE†, PrePass XC*†, Steel* =Battlestar*= Viking Bodo*, Outshine*†, Sabatis*= Stellar Unpacked*†, Stellar XL*, Thunderhawk†*, Tridem*† , Extinguish XL*† , Viking Askim*†*
	pyroxsulam	*Simplicity*	*Erebus Xtreme*, Rexade*†, Tandem*†, Tridem*†*
Triazolinone	flucarbazone	*Everest/Sierra 3.0 AG , Himalaya=Viking Flucarbazone*	*Inferno Duo=Himalaya Extra†=Viking Visby†, Inferno Trio*, Batalium**
	propoxycarbazone-sodium	*Olympus*	-
	thiencarbazone	*Varro*	*Predicade*, Varro FX*, Velocity m3**

Table 8. Herbicide Site of Action and Chemical Family for Resistant Weed Management, *continued*

Mode of Action (Group)	Active Ingredient	Herbicide Tradename	Premix or Co-pack[‡] Tradenames*
Microtubule Assembly Inhibitor (3) Dinitroaniline (DNA)	ethalfluralin	*Edge MicroActiv = YieldShield Resflura Soilsorb*	-
	trifluralin	*Treflan = Bonanza = Rival = Yieldshield Respectra Soilsorb = RHI Trifluralin 480 EC Liquid = Thrill = Bonita*	*Fortress MicroActiv*= YieldShield Resiliant XP Soilsorb**
Benzamide	propyzamide	*Kerb SC*	-
Auxin Mimics (4) Phenoxy-carboxylate	2,4-D amine	*2,4-D, USHA6, others*	*Restore II*
	2,4-D ester	*2,4-D Ester, Salvo, Lima 660EC , Viking 2,4-D Ester*	*Ammo DR[†]*, Leader*= Swipe*= Thrasher*=Thumper*, Blackhawk* , Blackhawk EVO*, Estaprop XT=Dichlorprop DX, Enforcer D*, Flurox- 24[†]=Rush 24[†]= Foxxy Pro[†] =Viking Kalmar[†] =Foxxy Extreme[†] =Attain XC[†], Octtain XL =OSIM Plus=Rush 24 All In=CO-OP OcTTain XL-IPCO OcTTain XL, Reclaim*[†], Reclaim II*[†], IPCO/CO-OP Convex*[†] =Revenge Pro*[†], Rexade*[†], Retain SG*= Foxxy Pro RX*[†], TraxosTwo*[†], Extinguish XL*[†], Viking Solna*[†]*
	2,4-D choline	-	*Enlist 1, Enlist Duo*, Grazon XC/Aspect*
	2,4-DB	*Embutox, Cobutox, Caliber*	-
	Dichorprop (2,4-DP)	-	*Estaprop XT=Dichlorprop DX, Optica Trio, Oxbow*, Blackhawk EVO**
	MCPA amine	*MCPA Amine*	*Optica Trio, Sword, Tracker XP*
	MCPA ester	*MCPA LV ester, CheckMate, Media Brands*	*Alloy*†= Batalium*, Buctril M*=Badge II*= Brilliant*= Logic M*=Mextrol 450*=Canuck*, Curtail M, Enforcer M*= ForceFighter All In*[†]=Foxxy Canuck*[†]=CO-OP Emit*=IPCO Emit*=Pierce*, Exhilarate*[†]=CO-OP Exhilarate*[†]=IPCO Exhilarate*[†], Goldwing*, Deathstar*[†], Prestige XC[†] = Foxxy CM[†] =Esteem All In[†], Pixarro[†], Predicade*[†], Prestige XL*=Repute* = Outshine*[†], Sabatis*= Stellar Unpacked*[†]= Stellar XL*, Thunderhawk*[†], Topline*[†], Trophy[†]=Foxxy M[†] , Truslate Pro=CO-OP/IPCO State, Viking Hamar*[†], Viking Stavanger*[†], Viking Trycka*[†], Viking Lidingo*[†] , Barricade M*[†]*
	MCPA K+	*Various*	*Clovitox Plus, Topside, Tropotox Plus*
	MCPA Na (sodium)	-	-
	MCPB	-	*Clovitox Plus, Topside, Tropotox Plus*
	Mecoprop–p (MCBP)	*Mecoprop-P*	*Optica Trio, Sword, Tracker XP*
Benzoate	dicamba		
	• bapma salt	*Engenia*	-
	• Dimethylamine salt	*Ammo=Disha 480=Oracle =Viking Dicamba*	*Ammo DR*[†], Intruvix*[†], Korrex II*[†], Sword, Tracker XP, Intruvix II**
	• Digycolamine salt	*Banvel VM, XtendiMax , XtendiMax 2, Vanquish*	*Pulsar=DiFlux, Roundup Xtend*
	• Sodium (Na) salt	-	*Distinct=Overdrive*
	• Isopropylamine	-	*Glykamba**
6-Chloropicolinate	aminopyralid	-	*Clearview*[†], Milestone, Restore II, Reclaim II*[†], Restore NXT*, Sightline*[†]*
	aminocyclopyrachlor	-	*Navius Flex*=TruRange**
	clopyralid	*Lontrel=Pyralid=Clobber= Advantage Clopyralid 360 =Spur 360 =Viking Clopyralid*	*Akito*, Cirpreme/Cirpreme XC*[†], Curtail M=Clobber M, =Certain=Spur-M =Viking Drammen, Eclipse*[†], Foxxy CRX*[†], Momentum, Inertia, Foxxy CM[†]=Prestige XC[†] =Esteem All In[†], Prestige XL*=Repute*, Prominex*, Truslate Pro=CO-OP/IPCO State, Viking Stavanger*[†], Viking Hamar*[†], Viking Larvik*[†]*

Table 8. Herbicide Site of Action and Chemical Family for Resistant Weed Management, *continued*

Mode of Action (Group)	Active Ingredient	Herbicide Tradename	Premix or Co-pack[‡] Tradenames*
Pyridyloxy-carboxylate	fluroxypyr	*Ikwin=Fluro Star =Cavalier 180 =Viking Fluroxypyr,, Perimeter II =Cavalier 333 = Fluro Star Max= Advantage Fluroxypyr 333 EC*	*Akito*, Altitude FX3*†, Attain XC†=Flurox-24†= Foxxy Pro†=Rush 24 All In† =Viking Kalmar†, Audible*†, Avenza*†, Axial Xtreme* = Kingpin*, Axial Xtreme iPak*†, Barricade II*†=Viking Brevik*†, Foxxy R*†, Batalium*, Cirpreme XC*†, EnforcerD*, Enforcer M*= ForceFighter All In*†=Foxxy Canuck*†=CO-OP Emit*=IPCO Emit*=Pierce*, Erebus Xtreme*, Erebus Xtreme*, Foxxy CRX*†, Foxxy RCK*†, Foxxy MR*†, Infinity FX*†, Momentum, Inertia, Deathstar*†, OcTTain XL =OSIM Plus=Rush 24 All In=CO-OP OcTTain XL= IPCO OcTTain XL, Pixarro†, Predicade*†, Prestige XC†= Foxxy CM†=Esteem All In†, Prestige XL*=Repute*, Prominex*, Pulsar=DiFlux, Retain SG*† =Viking Navik*†, = Foxxy CRX*†, Rezuvant†*, Sentrallas*, Sightline*†, Signal FSU*†, Steel* =Battlestar* =Viking Bodo* =Alloy* =Outshine*†, Stellar Unpacked*†, Sabatis*= Stellar XL*, Tandem*†, Travallas*, TraxosTwo*†, Tridem*†, Trophy†=Foxxy M† , Truslate Pro=CO-OP/IPCO State, Varro FX*, Axial Maxx*†, Barricade M*† Viking Stavanger*†, Viking Trycka*†, Viking Lidingo*†, Viking Askim*†, Viking Larvik*†, Viking Kalmar*†*
6-Arylpicolinate	florpyrauxifen	-	*Restore NXT*
	halauxifen		*Cirpreme/Cirpreme XC*†, Exhilarate*†= Co-op Exhilarate*†=IPCO Exhilarate*†, Paradigm PRE*†, Pixarro*†, Prominex*, Prospect*, Rexade*†, Rezuvant*†, Extinguish XL*†*
	picloram	*Tordon 22K*	*Grazon XC/Aspect*
Quinoline carboxylate	quinclorac (dicots)	*Clever=Ingenious = Advantage Quinclorac, Facet L*	*Advantage Glufosinate Plus*†*
Photosystem II Inhibitor (5) Triazine	atrazine	*Aatrex*	*Primextra II Magnum**
	simazine	*Princep Nine-T=Simazine 480*	-
Triazinone	hexazinone	*Velpar DF CU*	-
	metribuzin	*Sencor=TriCor=Squadron=Buzzin=Meter 75 DF =Viking Metribuzin, Metrix SC=Tricor LQ =Meteor*	*Strim MTZ* , IPCO Bifecta EZ**
Photosystem II Inhibitor (6) Benzothiadiazinone	bentazon	*Basagran=Benta Super=Beserk=Broadloom= Boa =Viking Bentazon, Basagran Forté*	*Hurricane*, Anaconda*†, Boa Pro*†, Python*†, Viper ADV*, Ransack*† =Benz*, Taipan*†*
Benzonitrile	bromoxynil	*Pardner, Brotex 240=Bromotril= Brox 240 EC= Starbuck, Brotex 480= Brotex 4AT*	*Batalium*, Leader*= Swipe*= Thrasher*=Thumper*, Axial Xtreme iPak*†, Buctril M*=Badge*= Brilliant*= Canuck*=Logic M*=Mextrol 450*, Certitude*†, Conquer*†=Revenge B*†, Emphasis Max*†=IPCO Octagon*†, Conquer II*, Enforcer D*, Enforcer M* =CO-OP/IPCO Emit*=Pierce*, ForceFighter All In*†=Foxxy Canuck*†, Infinity*, Infinity FX*†, OnDeck*, Tundra*, Velocity m 3* , Oxbow*, Talinor*, Axial Maxx*†, Viking Trycka*†, Viking Vardo*†, Huskie PRE**
Phenyl-pyridazine	pyridate	*Tough EC*	-
Photosystem II Inhibitor (7)	linuron	*Lorox*	-
EPSP Synthase Inhibitor (9)	glyphosate-IPA, K, DMA	*several - see page 281*	*CleanStart*†, Eclipse XC*†, Enlist Duo*, Flexstar GT*, PrePass XC*†, Roundup Xtend*

Table 8. Herbicide Site of Action and Chemical Family for Resistant Weed Management, *continued*

Mode of Action (Group)	Active Ingredient	Herbicide Tradename	Premix or Co-pack† Tradenames*
Glutamine Synthetase Inhibitor (10)	glufosinate	*Liberty 150=Vigor= RHI Glufosinate-ammonium 150SN= Justice =Opportunity 15SL =Granata=ADAMA Glufosinate 150 SL =Innovis Glufosinate-ammonium 150 SN= Viking Glufosinate 150 =IPCO Glufosinate 150, Innovis Glufosinate 200, Liberty 200, RHI Glufosinate 280*	-
Bleaching: DOXP Synthase Inhib. (13)	clomazone	*Command 360 ME=IPCO Clomazone=Czar*	*Command Charge*†, IPCO Trigon*†*
PPO (Protox) Inhibitor (14) Diphenyl ether	acifluorfen	*Ultra Blazer*	*Hurricane**
	fomesafen	*Reflex*	*Flexstar GT**
N-Phenyl-imide	flumioxazin	*Chateau=Valtera*	*Fierce*=Torpedo* (IVM only)* , *IPCO Bifecta EZ**
	trifludimoxazin	-	*Voraxor, Voraxor Complete*†*
	saflufenacil	*Heat=Detail* (IVM only)	*Heat Complete*†, Smoulder*, Voraxor, Voraxor Complete*†*
	tiafenacil	*Insight Liquid SC*	-
Phenylpyrazole	pyraflufen	-	*BlackHawk*, Blackhawk EVO*, Conquer II*, Goldwing*, Thunderhawk*†*
N-Phenyl-triazolinone	carfentrazone	*Aim EC=InStep=Revenge=IPCO C-Zone=Foremost =Viking Carfentrazone*	*Authority Strike†, Command Charge*†, Conquer*†=Revenge B*†, Revenge B Extreme*† Emphasis Max*†=IPCO Octagon*†, Conquer II*, Focus*, Inferno Trio*, Intruvix*†, IPCO Trigon*†, Prospect*, Revenge Pro*†= IPCO/CO-OP Convex*†, Intruvix II*, Viking Solna*†, Viking Vardo*†*
	sulfentrazone	*Authority 480, Sulfentra, Intensa, IPCO Tactic, CO-OP Governor*	*Authority Strike† = Throne II Revenge*†, Authority Supreme*†*
Very Long Chain Fatty Acid Inhibitor (15) Acetamide	dimethanamid-P	*Frontier Max*	-
Chloroacetamide	S-metolachlor+ safener	*Dual II Magnum=Komodo=Metallica =Stallion*	*Primextra II Magnum*, Strim MTZ**
	pyroxasulfone	*Zidua SC*	*Authority Supreme*†, Fierce*=Torpedo* (IVM only)*, Focus*, Heat Complete*†, Voraxor Complete*†*
Thiocarbamate	EPTC	*Eptam*	-
	triallate	*Avadex Brands =YieldShield Resiliant Soilsorb = RHI Triallate 480 EC*	*Fortress MicroActive* = YieldShield Resiliant XP Soilsorb**
Auxin Inhibitor (19)	diflufenzopyr	-	*Distinct*=Overdrive**
Photosystem I Inhibitor (22)	diquat	*Reglone= Advantage Diquat 240= Bolster=Craven=Desica=Dessicash Desiccant= Diquat 240=Drifast=Clone=Stage =Viking Diquat =Innovis Diquat 240 Harvest Aide, Reglone Ion =Armory All In, Reward*	-
Unknown (26)	quinclorac (grass)	*Clever=Ingenious, Facet L*	-
Bleaching: HPPD Inhibition (27) Pyrazole	pyrasulfotole	-	*Axial Xtreme iPak*†, Infinity*, Infinity FX*†, Tundra*, Velocity m3* , Huskie PRE**
	tolpyralate	*Shieldex*	*OnDeck**
	topramezone	*Armezon=Impact=Topple*	*Certitude*†*

Table 8. Herbicide Site of Action and Chemical Family for Resistant Weed Management, *continued*

Mode of Action (Group)	Active Ingredient	Herbicide Tradename	Premix or Co-pack† Tradenames*
Triketone	bicyclopyrone	-	*Talinor*, Axial Maxx*†*
	mesotrione	*Callisto 480 SC*	-
	tembotrione	*Laudis*	-
Cellulose Synthesis Inhibitor (29) Alkylazines	indazaflam	*Esplanade*	-

Adapted from WSSA Herbicide Classification System For Resistant Weed Management. Weed Technol. 17:606-608 and the NDSU Weed Control Guide.
Contact herbicides = Groups 5, 6, 7, 10, 14, and 22.

*** Products contain more than one active ingredient and appear in more than one group. In some instances, both active ingredients act to kill the same weed using different sites of action. Using these products or tank mixes of products from different groups that control the same high risk weed (see the Herbicide Resistant Weeds in Western Canada chart in the Weed Control Introduction) will slow down the process of developing weed resistance.**
New herbicides do not necessarily have a unique site of action and may fall within the groups listed in the charts.
Herbicides that have the same site of action may not control the same weed spectrum or have the same crop safety. For example, *Assert* and *Ally* have the same site of action; however, *Assert* controls wild oats while *Ally* does not.
† Products are packaged with multiple components in one package. Each component may also have multiple active ingredients.

How Do Herbicides Work?

There are several ways to define how herbicide work:

- **Timing (may apply to crop and/or weed and may be one timing for the crop and another for the weed):**
  - **PPI (Pre-Plant Incorporated):** the product is applied to the soil and worked in with a tillage implement prior to seeding. The product remains effective in the soil for one to several weeks, preventing weeds from emerging within the crop.
  - **PRE (Pre-Emergent Surface):** the product is applied to the soil surface and relies on rainfall to move it into the emergence zone of target weeds in the soil. The product remains effective in the soil for one to several weeks, preventing weeds from emerging within the crop. Products may allow application in the fall or in the spring prior to seeding or following seeding up until the emergence of the crop and target weeds.
  - **POST (post-emergent foliar):** the product is applied at the seedling stage of the weed and/or the crop. Early applications are usually the most beneficial to crop yield because of the removal of competition by the target weed at the crop's most vulnerable stage.
  - **Pre-harvest:** applied prior to the harvest of the crop to address weeds growing in mature.
- **Target:**
  - **Cell membrane disruptor:** causes the plant cells to produce compounds that attack the intregrity of the cell membrane. Result is the spilling of cell contents into the environment and rapid drying of affected tissues.
  - **Inhibitor of essential growth component (amino acids, lipids):** blocks the production of essential building blocks for plant growth and maintenance. Target weeds stop growing and display a loss of green colour, typically in new growth first and then in older tissues as plants need to repair their tissues after environmental damage.
  - **Pigment inhibitor:** new tissues produced after exposure to the herbicide develop without colour (white). Some tissues may display red or purple tinges as a result of the presence of stress compounds called anthocyanins.
  - **Plant hormone mimic/Hormone transport inhibitor:** the herbicide produces the same response in plants as the natural hormone but susceptible plants are unable to break down these compounds as they would natural hormones. Results in unregulated growth of the plant cells causing distorted growth and a proliferation of non-functional tissue in the stem/root, blocking water flow to plant shoots. Transport inhibitors concentrate both natural and synthetic hormones in the tissues where they were produced, causing distorted growth.
  - **Seedling Root inhibitor:** stops roots growth of susceptible weeds. Susceptible weeds fail to emerge from treated soil.
  - **Seedling Shoot inhibitor:** stops shoot growth in susceptible weeds. Susceptible weeds fail to emerge from treated soil.
  - **Unknown:** the target of the herbicide is not known.
  - **Movement:**
  - **Little to no plant movement:** typically soil active products. Does not move from the point where it enters the plant, or only by diffusion.
  - **Apoplastic Movement:** xylem-mobile; moves passively within free space and cell walls, upward through the transpiration stream (with water). Foliar applied products are relatively immobile. Soil active products are taken up by the root and transported to the upper portions of the plant.
  - **Symplastic Movement:** phloem-mobile – enters the cell where it is actively moved within the plant to areas of rapid growth along with other nutrients and sugars.
- **Spectrum:**
  - **Non-selective:** controls or injures most plants, except for those crops that have been bred to tolerate the herbicide.
  - **Selective:** controls weeds within a crop. Specific herbicides may be specific to control of the following weed types
    - Broadleaf
    - Grass

- **Biochemistry:**
  - The "Group" numbering system, developed by Weed Science Society of America (WSSA), and was adopted by the Pest Management Regulatory Agency of Health Canada for use on Canadian labels.
  - This system uses the herbicide's chemistry to summarize their general Mode of Action on weeds. There are also sub-divisions with in these Groups (see Table 8 Herbicide Site of Action and Chemical Family for Resistant Weed Management in the Weed Control Introduction) that may have differing resistance patterns.
  - All herbicides within a Group share a common mode of action and resistance mechanism.
  - Herbicides within a Group may have different basic chemical structures. The difference in these basic structures are captured by the family.
  - In general, weeds resistant to one herbicide within a Group (or family where they are available) will be resistant to all herbicides within the Group/sub-group. There are exceptions to this rule. Cross resistant between families within a Group is common.
  - Resistance management strategies are required wherever resistance is known or there is a risk of resistance development.
  - Heavy reliance on herbicides without the integration of other non-herbicide management practices raises the risk of resistance evolution greatly.

After applying a herbicide, fields can be scouted to determine the effectiveness of the treatment. The symptoms of different herbicide groups, and the approximate time it takes to develop these symptoms, are listed in the following table. Weed patches that are not affected should be noted and checked, as they may be herbicide resistant. Note that symptoms may take longer to develop when conditions are not conducive to rapid plant growth.

The following table gives a brief description of symptoms that may be exhibited if plants are injured by a herbicide. The symptoms of each group are addressed for both foliar and soil exposures.

Table 9. The Mode of Action, Site of Uptake and Symptoms of Different Herbicide Groups

Herbicide Group	Mode of Action	Site of Uptake	Weed symptoms/timing	
			Grass weeds	Broadleaf weeds
1	Systemic	Foliar	Reduced growth, yellowing of growing point in 1 to 3 weeks. Newest leaf of affected plant pulls out easily in 3 to 5 days.	Tolerant
2	Systemic	Foliar/Soil	Newest leaves yellowed in 3 to 10 days, dead in 1 to 3 weeks.	Newest growth discolored (red/yellow/purple) and/or miniaturized; the whole plant is involved in 1 to 3 weeks.
3	Systemic	Soil	Reduced emergence, poor root development of emerged plants. Roots often swollen/stunted and root tips darkened.	Reduced emergence, poor root development of emerged plants.
4	Systemic	Foliar	Tolerant to moderate rates. High rates cause symptoms similar to drought. Improper timing may cause kernel abortion in cereal crops.	Abnormal growth (twisted stems, cupped leaves) in 2 to 10 days.
5	Systemic	Soil	Wilted and yellowed oldest leaves beginning at leaf margins, death in 7 to 10 days.	
	Contact	Foliar	Yellowed oldest leaves, death within days.	Yellowed/bleached oldest leaves where spray contacts, death within days.
6	Contact	Foliar	Some leaf tip burn or white tissues possible.	Yellowed leaves in 2 to 4 days, death in 1 to 2 weeks.
9	Systemic	Foliar	Wilted, yellowed leaves in 7 to 10 days. Newest growth is impacted first followed by the rest of the plant.	
10	Contact	Foliar	Wilted, bleached leaves in 3 to 5 days, death in 1 to 2 weeks.	
13	Systemic	Soil	Bleached leaves, susceptible seedlings die shortly after emergence.	
14	Contact	Foliar	Some leaf burn at contact points or leaf edges.	Leaves yellowed and desiccated in 1 to 3 days. (Post-emergence applications)
	Systemic	Soil	Bleaching and yellowing, death prior to or shortly following emergence	
15	Systemic	Soil	Reduced emergence, emerged plants stunted. Leaf rolling (grasses). Leaf tips compressed and crinkled (broadleaves). Buggy-whipping. Plants deep blue-green.	
19	Systemic	Foliar	Twisting of older leaves, new leaves fail to expand, plant death in 2 to 4 weeks.	

Table 9. The Mode of Action, Site of Uptake and Symptoms of Different Herbicide Groups, *continued*

Herbicide Group	Mode of Action	Site of Uptake	Weed symptoms/timing	
			Grass weeds	Broadleaf weeds
22	Contact	Foliar	Leaves wilted within hours, desiccated in 1 to 3 days.	Leaves wilted in 1 to 3 days, desiccated and dead in 3 to 7 days.
26 (grass weeds only)	Systemic	Foliar	Immediate cessation of growth, rapid desiccation of new leaves and purpling and yellowing of older tissues.	See Group 4.
27	Systemic	Foliar	Some bleaching and whitening of leaves.	Leaves bleached and whitened in 2 to 10 days and death in 7 to 10 days.
29	Systemic	Soil	Seedlings fail to emerge.	Seedlings fail to emerge.

How to Identify Weed Resistance

It is important to avoid confusing herbicide failure caused by resistance with herbicide failure caused by various other factors (such as weather or application errors). When a herbicide fails to control weeds because of weather or application factors, that herbicide may work in the field the next season. But when herbicides fail because of the development of resistance, they will fail in subsequent years, regardless of weather or application procedures.

Herbicide resistance should be suspected under the following conditions:

- A weed species that the herbicide controlled in previous seasons now escapes the treatment, while other weeds that appear on the label continue to be controlled in the field.
- The escapes cannot be attributed to adverse weather or emergence after application (if a post-emergence product is in question).
- Irregular-shaped patches of a weed develop where the herbicide gives little or no control.
- Records of the past history of the field show repeated use of the same herbicide, or combinations of herbicides, that kill the weed in question in the same way.

Table 10. Herbicide-Resistant Weeds in Western Canada

Weed	Herbicide Group	Locations Confirmed
Barnyard grass	Group 2	MB
Canada fleabane	Group 9	Occurs in several US states
	Multiple Resistant: Groups 2 & 9	Occurs in Ontario
Cleavers	Group 2	AB, MB, SK
	Group 4	AB
	Multiple combinations of: Groups 2 & 4	AB
Chickweed	Group 2	AB, MB, SK
Cow cockle	Group 2	AB
Downy brome	Group 2	Occurs in Montana
	Group 9	AB
Foxtail, green	Group 1	AB, MB, SK
	Group 2	MB, SK
	Group 3	AB, MB, SK
	Multiple combinations of: Groups 1 & 3	MB, SK
Foxtail, yellow	Group 1 + 2	MB , SK
Hemp-nettle	Group 2	AB, MB , SK
	Group 4	AB
	Multiple combinations of: Groups 2 & 4	AB

Table 10. Herbicide-Resistant Weeds in Western Canada, *continued*

Weed	Herbicide Group	Locations Confirmed
Kochia	Group 2	AB, MB, SK (overwhelming majority)
	Group 4 (dicamba and /or fluroxypyr)	AB, SK , MB
	Group 5	Occurs in North Dakota and Montana
	Group 9 (glyphosate)	AB, MB, SK
	Group 14	SK, also occurs in North Dakota
	Multiple Resistant: Groups 2 & 9	AB, MB, SK
	Multiple Resistant: Groups 2 & 4	AB, SK , MB
	Multiple Resistant: Groups 2, 4 (dicamba) & 9	AB, SK, MB
	Multiple Resistant: Groups 2, 4 & 9	AB
Lamb's-quarters	Group 2	SK
	Group 5	Occurs in Ontario
Marshelder (false ragweed)	Group 2	Occurs in North Dakota
Mustard, ball	Group 2	AB
Mustard, wild	Group 2	AB, MB, SK
	Group 4	MB
	Group 5	MB
Narrow-leaved hawk's-beard	Group 2	AB
Persian darnel	Group 1	AB, SK
Ragweed, giant	Group 2 & 9	Occurs in Ontario, Minnesota
Redroot pigweed	Group 2	MB, SK
	Group 5	Occurs in Ontario
Russian thistle	Group 2	AB, SK
	Group 9	Occurs in Montana
Shepherd's-purse	Group 2	AB, MB, SK
Smartweed, pale	Group 2	MB, SK
Spiny annual sow-thistle	Group 2	AB, MB, SK
Stinkweed	Group 2	AB, MB, SK
Waterhemp	Group 2 & 9	Occurs in North Dakota, MB
	Group 9 & 14	MB, North Dakota, Ontario, multiple US states
	Group 2, 5, 9 & 14 , 27	
Wild buckwheat	Group 2	AB
Wild oats	Group 1	AB, MB, SK
	Group 2	AB, MB, SK
	Group 15 (triallate)	AB, MB, SK
	Multiple combinations of: Groups 1 & 2, Groups 1,8 & 15 (triallate) Groups 2, 8 & 15 (triallate) Groups 1, 2, 8 & 15 (triallate) Groups 1, 2, 8, 15 (triallate) & 25 Groups 1, 2, 14, 15 (triallate and pyroxasulfone) (MB)	AB, MB, SK

See Table 8 Herbicide Site of Action and Chemical Family for Resistant Weed Management in the Weed Control Introduction for a complete list of products in each Herbicide Resistance Group.

If Weed Resistance Develops on Your Farm

It is important to identify weed resistance before it spreads across your farm. Plan on conducting a "patch watch" scouting program this summer to identify suspicious patches before they become difficult to manage. Resistant weed patches have been identified on fields where producers were unaware of their existence.

Your patch watch program should begin shortly after spraying and continue through July after the crop has headed out and most weeds are visible from a distance. If you find suspicious looking patches, contact your local agricultural office or crop protection company representative to assist you in confirming weed resistance. If resistance is suspected:

1. Map the location of the patches and mark them with stakes so you will remember their location.
2. Mow, cultivate or spot spray the patches. Resistant patches should not be allowed to produce seed.
3. Patchy areas should NOT be harvested with the rest of the field. Harvest these areas separately, and make sure to clean all harvesting equipment before leaving the area to prevent the spread of seeds across the field or a neighbouring field.
4. Check patches each year to monitor their spread. Keeping your resistant weeds isolated to a manageable patch is easier than dealing with an entire field of resistant weeds.

Adjuvants and Your Herbicide

Adjuvants are important ingredients in chemical weed control. Many herbicides must be applied with an adjuvant. If it is forgotten, the level of weed control can vary widely, and re-spraying may be necessary.

Many products have adjuvants built into the formulation. Others require adjuvant addition (e.g. *Refine SG*). Some adjuvants were developed specifically for one herbicide, and these are either pre-packaged with the herbicide, or are identified by name on the label (e.g. *Turbocharge* for *Marengo, Amigo* for *Select/Centurion*).

Consult a company representative to determine the support for pesticide adjuvant combinations not listed on the product label.

With some products, adjuvants need to be added only under certain conditions. For example, glyphosate products have built-in adjuvants, but require additional adjuvant when low rates (pre-seeding or chem-fallow), high water volumes, or certain tank mixes are used.

Adjuvants should be added only when required. If one is not required, addition can reduce weed control or injure crops. Product labels will describe when an adjuvant is required, and what type should be used.

There are two main classes of adjuvants: "activators or spray modifiers" (including surfactants and crop oils), and "utility modifiers" (including pH adjusters, water conditioners, low-drift adjuvants, and anti-foaming agents). The most important class of adjuvants is the activators. Surfactants, the main group within the activators, are "surface active agents." These chemicals produce effects at points where two substances touch, such as between two liquids (herbicide and water) or between a solid and a liquid (herbicide and leaf surface). Some surfactants act as dispersing agents, helping to keep a pesticide suspended in water. Others work on the plant, improving the wetting, sticking and penetrating characteristics of the herbicide droplets. Oil-based adjuvants contain petroleum or vegetable oil and an emulsifier that suspends the oil in tiny droplets within the spray solution. Oil-based adjuvants typically assist in herbicide penetration into the leaf.

There are two basic types of surfactants (ionic and non-ionic), of which the non-ionic are most common. The following table lists the surfactants registered for use with herbicides in Western Canada.

Adjuvants and Registered Pesticides:

Note – some products are specific about the concentration of active ingredient in the surfactant for product performance. Check with the product page in this guide or the product label.

Trade Name	Composition	Adjuvant Type	Registered Pesticides (Adjuvant label only)
Addit Adjuvant (PCP#29263)	37% surfactant blend	Oil-surfactant blend	*Bison*
Adigor Adjuvant (PCP#28151), *Cohere Adjuvant* (PCP#33552)	48.8% methylated rape seed oil 28.2% ethoxylated alcohols	MSO-surfactant blend	*Broadband, Brazen II (Cohere Adjuvant), Trondus*
Agral 90 (PCP#24725)	90% nonylphenoxy polyethoxy ethanol	Non-ionic surfactant	*Accent, Altitude FX, Battalion*, diquat, *Escort*, flucarbazone, glyphosate, *Muster, Pinnacle, Prism*, imazethpyr, metsulfuron, thifensulfuron/tribenuron, *Reflex, Reward, Triton K* (Not all adjuvants may be used with all herbicides listed)
Agral 90 (PCP#11809), *IPCO Agsurf Original* (PCP#15881), *MPOWER Icon* (PCP#28342)	92% nonylphenoxy polyethoxy ethanol		
Agsurf II (PCP#30071)	92% alcohol ethoxylate		
Albaugh Surfactant (PCP#32599)	100% surfactant blend		Clodinafop
Amigo Adjuvant (PCP#22644), *X-Act* (PCP#28225), *CO-OP Patron Adjuvant* (PCP#33662), *IPCO X-Surf Adjuvant* (PCP#33660), *MPOWER Empire* (PCP#33380), *Surf-Act* (PCP#32313)	30% phosphate ester surfactant	Anionic surfactant and acidifier/water conditioner	clethodim†*

Trade Name	Composition	Adjuvant Type	Registered Pesticides (Adjuvant label only)
Assist Oil Concentrate (PCP#16937), *CropOil 83/17 Adjuvant* (PCP#30978), *XA Oil Concentrate* (PCP#11769), *Score Adjuvant Liquid* (PCP#12200), *Chem Spray* (PCP#29712)	83% paraffin based mineral oil 17% surfactant blend	Oil-surfactant blend	*AAtrex, Basagran* (all crops), *Ultra Blazer*, clodinafop†*, *Impact*, quizalofop *(Contender, Yuma GL), Simplicity* (Not all adjuvants may be used with all herbicides listed)
Citowett Plus Adjuvant (PCP#12766), *Super Spreader* (PCP#17402)	50% octylphenoxypolyethoxy ethanol	Non-ionic surfactant	*Accent, AAtrex, Basagran* (peas), *Escort*, flucarbazone, metsulfuron, *Muster, Pinnacle, Prism*, thifensulfuron/ tribenuron, *Triton K*
Companion Adjuvant (PCP#15882)	70% octylphenoxypolyethoxy-(9)-ethanol	Non-ionic surfactant	Glyphosate, metsulfuron, *Muster*
Enhance (PCP#29270), *Nufarm Enhance* (PCP#29952), *ADAMA Adjuvant 80* (PCP#30419)	80% triglyceride ethoxylate 10 POE	Non-ionic surfactant	*Accent,* diquat, *Escort, Folicur 432 Fungicide*, glyphosate, *Lontrel, Muster, Pinnacle, Prism*, imazethapyr, metsulfuron, thifensulfuron/tribenuron, *Signal, Signal FSU, Reflex, Reward, Valtera*
Gateway (PCP# 31470)	59% paraffinic oil, 24% alkylated alcohol non-ionic surfactants	Oil-surfactant blend	*Clearview, Reclaim II, Sightline A, Escort, glyphosate*
Hasten Spray Adjuvant (PCP#27420)	73.3% methyl and ethyl oleate (esterified vegetable oil)	Methylated Seed Oil	*Impact*
HiActivate Non-Ionic Liquid Spreader Activator (PCP#31817)	900 g/L alkylarylpolyoxyethylene glycols, free fatty acids & isopropyl alcohol	Non-ionic surfactant	*Accent, Assure, Ally, Pursuit*
IPCO MSO Adjuvant (PCP#33757)	100% surfactant blend	Methylated Seed Oil	tralkoxydim, quizalofop, imazamox, imazamox+imazethapyr, *Arsenal Powerline*, glyphosate, *Shieldex*, topramezone, thifensulfuron:tribenuron (2:1), *Valtera, Heat* ***Insecticides:*** *Coragen/Acelepryn, Benevia*
IPCO Surfactant NI (PCP#33759)	100% surfactant blend	Non-ionic surfactant, Water Modifier, Drift Retardant	glyphosate, flucarbazone, quizalofop, imazethapyr, diquat, *Aim, Fulfill Insecticide*
Journey HSOC (PCP#33800)	50% methylated seed oil of soybean	Methylated Seed Oil	clethodim, quizalofop, clodinafop
LI 700 (PCP#23026)	80% surfactant blend	Non-ionic surfactant, Water Modifier, Drift Retardant	Diquat, flucarbazone, glyphosate, *Fulfill* insecticide, quizalofop *(Assure II)*
Liberate Adjuvant (PCP#29491)	100% lecithin, methyl esters of fatty acids and alcohol ethoxylate	Methylated Seed Oil, Water Modifier, Drift Retardant, Sticker	Flucarbazone, *Pursuit, Reflex, Odyssey*, quizalofop *(Assure II)*, thifensulfuron/ tribenuron, tribenuron, metsulfuron *(Accurate)*
Masterlock (PCP# 34451)	100% surfactant blend	Non-ionic surfactant	*Cadillac 240 Unpacked, Nufarm Signal Herbicide, Marshall, Yuma GL Liquid EC, Assure II, Leopard*

Trade Name	Composition	Adjuvant Type	Registered Pesticides (Adjuvant label only)
Merge Adjuvant (PCP#24702), *MPOWER Assassin* (PCP#33444), *Surjet* (PCP#33339)	50% surfactant blend 50% solvent (petroleum hydrocarbons)	Oil-surfactant blend	*Ares*, Heat WG, Heat LQ**, quinclorac, *Odyssey, Odyssey Ultra*, Poast Ultra*, quizalofop, *Solo*
MSO Concentrate with Leci-Tech (PCP#28385), IPCO *Contender MSO Adjuvant with Leci-Tech* (PCP#32198)	70% methylated seed oil of soybean	Methylated Seed Oil, Drift Retardant	imazethapyr, *Odyssey, Poast Ultra*, quizalofop *(Contender)*
StrikeLock (PCP#34946)	100% surfactant blend	Methylated Seed Oil	Arrow 240 EC, Marshall, Yuma GL Liquid EC, Assure II, Leopard, Cadillac 240 Unpacked, Nufarm Signal Herbicide
Sure-Mix Surfactant (PCP#25467)	60% praraffinic petroleum oil 40% surfactant blend	Oil-surfactant blend	quizalofop
Turbocharge Adjuvant (PCP#23135), *Adjuvant for Nufarm Tralkoxydim* (PCP#30828), *Carrier* (PCP#30639)	50% mineral oil 39.5% surfactant blend	Oil-surfactant blend	*Paradigm PRE*, tralkoxydim†*, clethodim (*Statue* only)*

*** The adjuvant is packaged with the product.**
† Note: All products may not be registered with all adjuvants. See product page in the following sections to determine which adjuvants are registered for each herbicide.

Crop and Herbicide Recommendation Tables

The following charts give general weed control comparisons based on rates, timing and other application instructions and precautions as outlined in this Guide.

A dot (•) will indicate if the weed is listed on a product label. Where rate ranges are listed for controlling a given weed, ratings are based on results achieved with the higher rate unless noted otherwise. 'S' indicates weed suppression.

Weed Control Tables

Table 1. Weed Control in Barley

PRE-emergent herbicides (with residual control)	Page	Herbicide Mode of Action Group	Barnyard Grass	Foxtail, Green and Yellow	Wild Oats	Buckwheat, Wild	Chickweed	Cleavers	Cocklebur	Dandelion	Flixweed	Hemp-nettle	Kochia	Lamb's-quarters	Mallow, Round-leaved	Mustard, Wild	Night-flowering Catchfl	Pigweed, Redroot	Russian Thistle	Shepherd's-purse	Smartweed, Annual Species	Sow-thistle (Perennial)	Stinkweed	Thistle, Canada	Volunteer Flax	Volunteer Mustard, Canola	Volunteer Sunflowers
Triallate[9,10]	484	15			•																						
Triallate/Trifluralin[9]	487	3,15		•	•	S							S	S				S	S								
Trifluralin (green foxtail control)[9]	495	3		•																							
Trifluralin (grassy and broadleaf)[9]	495	3	•	•	•	•	•							•				•									
POST-emergent herbicides																											
2,4-D	105	4					•		•	•[5]	•		•	•		•		•	•	•	•	TG	•	TG		•	S
Akito	115	2,4				•	•	•		•			•							•		•		•	•	•	
Ammo DR	119	2,4				•	•	•	•	•[5]	•	•	•	•		•		•	•	•	•	TG	•	TG		•	•
Audible	125	2,4				•	•	•			•	•	•	•	S	•		•	•	•	•	S	•	S	•	•[2]	•
Avenza	131	1,2,4	•	•	•	•	•	•		•		•	•	•	•		•	•	•	•	•	•	•	•	•	•	•
Axial Maxx	383	1,4,6, 27	•	•	•	•	•	•		S	•	•	•	•	•	•		•		•			•	S		•	
Axial Xtreme iPak	134	1,2,6 ,27	•	•	•	•	•	•		•[4]	•	•	•	•	S	•		•	•	•	•	S	•	S		•	
Axial Xtreme	383	1,4	•	•	•	S		•					•														
Broadband	150	1,2	•	•	•	•	•	•				S				•		S		•		S	•			•	
Bromoxynil	152	6				•			•				•	•		•[7]		•[7]	•		•		•[7]				
Bromoxynil/2,4-D	155	4,6				•			•		•		•	•		•	•	•	•	•	•		•			•	•
Bromoxynil/MCPA	159	4,6				•			•		•		•	•		•	•	•	•	•	•	TG	•	TG		•	•
Bromoxynil+MCPA+fluroxypyr	163	4,6				•[7]	•[7]	•[7]	•[7]		•[7]	•[7]	•	•		•	•	S	•[7]	•[7]	•[7]		•[7]	TG	•[7]	•	•[7]
Cirpreme + MCPA	174	2,4				•	•	•	•	•	•	•	S	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Cirray	176	1	•	•	•																						
Clopyralid	188	4				•																TG		•			
Clopyralid + fluroxypyr	191	4				•		•					•											•	•		
Clopyralid/MCPA	193	4				•			•	•[3]	•		S	•		•		•[7]		•[7]	•[7]	TG	•	•		•[7]	•
Clopyralid/MCPA+fluroxypyr	195	4				•	S	•		•[3]	•	S	•	•	•	•		•		•	•	•	•	•	•	•	•
Deathstar	251	2,4				•	•	•	•	S	•	•	•	•	•	•		•		•	•		•	S	•	•	
Dicamba/fluroxypyr	205	4				•		•					•	S				S	•						•		
Dicamba+MCPA/2,4-D	201	4				•		•	•		•	•[1]	•	•		•		•	•	•	•	TG	•	TG		•	
Dicamba/Mecoprop/MCPA	207	4				•		•			•	•	•	•		•	•	•	•	•	•		•	TG		•	•
Dichlorprop/2,4-D	209	4				•			•	S	•		•	•	•	•	•[3]	•	•	•	•	•	•	TG		•	•
EnforcerD	217	4,6				•[7]		•		TG		•	•	•	•[7]	•	•	•[7]	•[7]	•			•	S	•[7]	•	
Exhilarate	233	2,4	•			•	•	•		•	•	•	S	•	•	•	•	•		•	•	S	•	S	•	•	
Fenoxaprop	241	1	•	•	•																						
Florasulam	248	2				•	•	•				S				•		S		•	•	S	•			•	
Florasulam/fluroxypyr+MCPA	254	2,4				•	•	•	•		•	•	•	•		•		•		•	•		•		•	•	
Fluroxypyr	262	2,4				S	•	•				S	•		•										•		
Fluroxypyr+2,4-D, *OcTTain XL*	361	4				•	S	•	•	•[3]	•	S	•	•	•	•		•	•	•	•	S	•	S	•	•	•
Fluroxypyr+MCPA	267	4				S		•	•		•	•[3]	•	•		•		•		•	S		•		•	•	•
Foxxy MR	272	2,4				•	•	•	•	•[5]	•	•	•	•		•		•	•	•	•	TG	•	TG	•	•	•
Infinity	321	6,27				•	•	•		•[4]	•	•	•	•	S	•		•	•	•	•	S	•	S		•	
MCPA	340	4							•	•[8]	•	S	•	•		•		•		•	•		•				
Mecoprop-p	346	4					•	•						•		•								TG			
Metribuzin	349	5					•					•[7]		•		•	•	•	•		•		•			•	
Metsulfuron	353	2					•				•	•		•		•		•	•	•	•	•[3]	•			•	
OnDeck	367	6,27		•		•	•	•				•	•	•				•			•					•	
Optica Trio	369	4				•	•	•					•	•		•		•					•	TG		•	
Oxbow	374	4,6				•	•	•	•				•	•	•	•		S	•		•		•			•	
Pinoxaden	381	1	•	•	•																						
Pixxaro	385	4	•			•	•	•	•	•	•	•	•	•	•	•		•		•	S		•	S	•	•	
Prominex	394	4	•			•	•	•			•	•	•	•	•	S		•		•				•	•		
Quinclorac	398	4,26	•	•				•														S			•		
Rezuvant/Rezuvant XL	419	1,4	•	•	•	•	•	•			•	•	•	•	•	•		•		•					•		

Table 1. Weed Control in Barley *continued*

POST-emergent herbicides	Page	Herbicide Mode of Action Group	Barnyard Grass	Foxtail, Green and Yellow	Wild Oats	Buckwheat, Wild	Chickweed	Cleavers	Cocklebur	Dandelion	Flixweed	Hemp-nettle	Kochia	Lamb's-quarters	Mallow, Round-leaved	Mustard, Wild	Night-flowering Catchfl	Pigweed, Redroot	Russian Thistle	Shepherd's-purse	Smartweed, Annual Species	Sow-thistle (Perennial)	Stinkweed	Thistle, Canada	Volunteer Flax	Volunteer Mustard, Canola	Volunteer Sunflowers
Sentrallas	429	2,4				•	•	•				•	•	•		•		•	•		•		•				
Talinor	451	6,27				•	•	•		S	•	•	•	•	•	•		•		•			•	S		•	
Thifen:Triben (2:1) + Fluroxypyr	461	2,4				•	•	•			•	•		•		•		•	•	•	•		•			•[2]	•
Thifen:triben (25:25) + Fluroxypyr	461	2,4				•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
Thifensulfuron/tribenuron (2:1)	464	2				•	•	S			•	•		•	S	•		•	•	•	•	S	•	S		•[2]	•
Thifensulfuron/tribenuron (2:1) + MCPA	467	2,4				•	•	S		•[6]	•	•	•	•	S	•		•	•	•	•	S	•	S		•	•
Topline	469	2,4				•	•	•		•[5]	•	•		•		•		•		•	•	TG	•	TG		•	•
Tralkoxydim	476	1	•	•	•																						
Travallas	479	2,4				•	•	•		•[4]	•	•	•	•		•	•	•	•	•	•	•	•	TG	•	•[2]	
Tundra	500	1,6,27	•	•	•	•	•	•		•[4]	•	•	•	•	S	•		•	•	•	•	S	•	S		•	

• Control. S – Suppression. TG – Top growth control.
[1] MCPA K mixes only. [2] Will not control CLEARFIELD canola varieties. [3] Spring seedlings only. [4] Up to 25 cm diameter. [5] Seedlings and overwintered rosettes.
[6] Less than 15 cm diameter. [7] Controlled at higher rates. [8] Fall application. [9] Only controlled when weeds are emerging from seed (not controlled if emerged at application). [10] Crop and use may vary between different brands. Consult product page for crop and use.

Table 2. Weed Control in Oats

POST-emergent herbicides	Page	Herbicide Mode of Action Group	Foxtail, Green and Yellow	Buckwheat, Wild	Chickweed	Cleavers	Cocklebur	Dandelion	Flixweed	Hemp-nettle	Kochia	Lamb's-quarters	Mallow, Round-leaved	Mustard, Wild	Night-flowering Catchfly	Pigweed, Redroot	Russian Thistle	Shepherd's-purse	Smartweed, Annual Species	Sow-thistle (Perennial)	Stinkweed	Thistle, Canada	Volunteer Flax	Volunteer Mustard, Canola	Volunteer Sunflowers
2,4-DB	109	4		•[5]				TG				•		•		•		•	S[5]	TG[5]	•	TG[5]			
Akito	115	2,4		•	•	•		•			•							•		•		•	•	•	
Audible	125	2,4		•	•	•			•	•	•	•	S	•		•	•	•	•	S	•	S	•	•[2]	•
Barricade II	461	2,4		•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	**S**	•	•	
Bromoxynil	152	6		•			•				•	•		•[5]		•[5]	•[3]		•		•[5]				
Bromoxynil/MCPA	159	4		•			•		•		•	•		•	•	•	•	•	•	TG	•	TG		•	•
Clopyralid	188	4		•[5]																TG		•			
Clopyralid/MCPA	193	4		•			•	•[3]	•		S	•		•		•[5]		•	•[5]	TG	•	•		•[5]	•
Clopyralid/MCPA+Fluroxypyr[6]	195	4		•	S	•		•[3]	•	S	•	•	•	•		•		•	•	•	•	•	•	•	•
Dicamba + MCPA	201	4		•		•	•		•	S	•	•		•		•	•	•	•	TG	•	TG		•	
Dicamba/Mecoprop/MCPA	207	4		•		•			•	•	•	•		•	•	•	•	•	•	•	•	TG		•	•
MCPA	340	4					•		•	S	•	•		•		•		•	•		•				
MCPB/MCPA	344	4								S		•		•		•		•		TG	•	•		•	
Mecoprop-p	346	4			•	•						•		•								TG			
Optica Trio	369	4		•	•	•					•	•		•		•					•	TG		•	
Sentrallas	429	2,4		•	•	•				•	•	•		•		•	•		•		•				
Stellar Unpacked/Stellar XL (see Florasulam/ fluroxypyr + MCPA)	254	2,4		•	•	•	•		•	•	•	•		•		•		•	•		•		•	•	
Thifensulfuron/tribenuron (2:1)	464	2		•	•	S			•	•		•	S	•		•	•	•	•	S	•	S		•[2]	•
Thifensulfuron/tribenuron (2:1) + MCPA	467	2,4		•	•	S		•	•	•		•	S	•		•	•	•	•	S	•	S		•	•
Topline	469	2,4		•	•	•		•[5]	•	•		•		•		•		•	•	TG	•	TG		•	•

• Control. S – Suppression. TG – Top growth control.
[2] Will not control CLEARFIELD canola varieties. [3] Spring seedlings only. [4] Seedlings and overwintered rosettes. [5] Controlled at higher rates. [6] *Prestige Brands, CO-OP/IPCO State* and *Truslate Pro* only.

Table 3. Weed Control in Rye or Triticale

POST-emergent herbicides	Page	Herbicide Mode of Action Group	CROP F - Fall Rye, R - Spring Rye, T - Triticale	Barnyard Grass	Foxtail, Green and Yellow	Wild Oats	Buckwheat, Wild	Chickweed	Cleavers	Cocklebur	Dandelion	Flixweed	Hemp-nettle	Kochia	Lamb's-quarters	Mallow, Round-leaved	Mustard, Wild	Night-flowering Catchfly	Pigweed, Redroot	Russian Thistle	Shepherd's-purse	Smartweed, Annual Species	Sow-thistle (Perennial)	Stinkweed	Thistle, Canada	Volunteer Mustard, Canola	Volunteer Sunflowers
2,4-D[3]	105	4	F/R							•	•[2]	•		•	•		•		•	•	•	•	TG	•	TG	•	S
Bromoxynil	152	6	F				•			•				•	•		•[3]		•[3]	•		•		•[3]			
Bromoxynil/MCPA	159	4,6	F				•			•		•		•	•		•	•	•	•	•	•	TG	•	TG	•	•
Dicamba + 2,4-D	201	4	R				•		•	•		•		•	•		•		•	•	•	•	TG	•	TG	•	
Infinity	321	6,27	T				•	•	•		•[1]	•	•	•	•	S	•		•	•	•	•	S	•	S	•	
Infinity FX	323	4,6,27	T				•	•	•		S[1]	•	•	•	•	•	•		•	•	•	•	S	•	S	•	
MCPA	340	4	F/R							•		•	S	•	•		•		•		•	•		•			
Simplicity	438	2	F/R/T	•	S	•	S	•	•		S	•	•						•	S	•	•		•	S	•[4]	
Tralkoxydim	476	1	F/R/T	•	•	•																					

• Control. S – Suppression. TG – Top growth control.
[1] Up to 25 cm diameter. [2] Seedling stage only. [3] Controlled at higher rates. [4] Not CLEARFIELD varieties.

Table 4. Weed Control in Wheat (Spring, Durum and Winter)

PRE-emergent herbicides (with residual control)	Page	Herbicide Mode of Action Group	CROP: W - Winter, S - Spring, D - Durum	Barnyard Grass	Foxtail, Green	Foxtail, Yellow	Annual bromes	Wild Oats	Buckwheat, Wild	Chickweed	Cleavers	Cocklebur	Dandelion	Flixweed	Hemp-nettle	Kochia	Lamb's-quarters	Mallow, Round-leaved	Mustard, Wild	Night-flowering Catchfly	Pigweed, Redroot	Russian Thistle	Shepherd's-purse	Smartweed, Annual Species	Sow-thistle (Perennial)	Stinkweed	Thistle, Canada	Volunteer Flax	Volunteer Mustard, Canola	Volunteer Sunflowers
Sulfentrazone/*Authority Strike*[10]	449	14	S/D						•		S					•	•				•	S								
Fierce[10]	243	14,15	W/S	•	•		•[J]	S	•	•			•[1]			•	•		•		•	S		•					S	
Focus (residual component)[10]	269	14,15	W/S	•	•	•	•[JD]	S	S		•					S	S		S		•					•				
IPCO Bifecta EZ[14]	328	5,14	S	•	•	•	•[D]		•	•	•		•			•	•		•		•	•	•	•					S	
Olympus	365	2	W/S/D				•[JD]	S																						
Triallate[10,13]	484	15	S/D					•																						
Triallate/Trifluralin[10]	487	3,15	S/D		•			•								S	S				S	S								
Trifluralin (foxtail control)[10]	495	3	S/D		•	•																								
Valtera[10]	504	14	S		S					•			•			•	•				•								S	
POST-emergent herbicides																														
2,4-D	105	4	W/S/D							•		•	•[1]	•		•	•		•		•	•	•	•	TG	•	TG		•	S
Akito	115	2,4	W/S/D						•	•	•		•			•							•		•		•	•	•	
Altitude FX3[6]	117	2,4	S[6]	•	•	•	S[JD]	•	•		•					•	•	S	•		•	S	•	•		•		•	•	
Ammo DR	119	2,4	S						•	•	•	•	•[1]	•	•	•	•	S	•		•	•	•	•	TG	•	TG		•	•
Audible	125	2,4	W/S/D						•	•	•	•	•[1]	•	•	•	•	S	•		•	•	•	•	TG	•	TG	•	•	•
Avenza	131	1,2,4	W/S	•	•	•		•	•	•	•	•	•		•	•	•	•			•	•	•	•	•	•	•	•	•	•
Axial Maxx	133	1,4,6, 27	S/D	•	•	•		•	•	•	•		S	•	•	•	•	•	•		•		•			•	S		•	
Axial Xtreme	383	1,4	S	•	•	•		•	S		•					•			S											
Axial Xtreme iPak	134	1,4,6 ,27	S	•	•	•		•	•	•	•		S	•	•	•	•	S	•		•	•	•	•	S	•	S		•	
Batalium	137	2,4,6	W/S/D	S	•	S			•		•	•		•		•	•		•	•	•	•	•	•	S	•	S	•		•
Bentazon + 2,4-D[12]	141	4,6	S									•					•		•		S	•	•	•		•			•	
Broadband	150	1,2	S	•	•	•		•	•	•	•				S				•		S		•		S	•			•	
Bromoxynil	152	6	W/S/D						•			•				•	•		•[5]		•[5]	•		•		•[1]				
Bromoxynil/2,4-D	155	4,6	S/D						•			•		•		•	•		•	•	•	•	•	•		•			•	•
Bromoxynil/MCPA	159	4,6	W/S/D						•			•		•		•	•		•	•	•	•	•	•	TG	•	TG		•	•

Table 4. Weed Control in Wheat (Spring, Durum and Winter) *continued*

POST-emergent herbicides	Page	Herbicide Mode of Action Group	CROP: W - Winter, S - Spring, D - Durum	Barnyard Grass	Foxtail, Green	Foxtail, Yellow	Annual bromes	Wild Oats	Buckwheat, Wild	Chickweed	Cleavers	Cocklebur	Dandelion	Flixweed	Hemp-nettle	Kochia	Lamb's-quarters	Mallow, Round-leaved	Mustard, Wild	Night-flowering Catchfly	Pigweed, Redroot	Russian Thistle	Shepherd's-purse	Smartweed, Annual Species	Sow-thistle (Perennial)	Stinkweed	Thistle, Canada	Volunteer Flax	Volunteer Mustard, Canola	Volunteer Sunflowers
Bromoxynil + MCPA + Fluroxypyr	163	4,6	W/S/D						•[5]	•[5]	•[5]	•[5]			•[5]	•	•		•	•[5]	S	•[5]	•[5]	•[5]		•[5]	TG	•[5]	•[5]	•[5]
Cirpreme/MCPA	174	2,4	W/S/D						•	•	•	•	•	•	•	S	•	•	•		•		•	•	•	•	•	•	•	•
Cirray	176	1	S	•	•	•		•																						
Clodinafop	182	1	S/D	•	•	•		•																						
Clopyralid	188	4	S						•																TG		•			
Clopyralid + fluroxypyr	191	4	S/D						•		•					•											•	•		
Clopyralid/MCPA	193	4	S/D						•			•	•[1]	•		S	•		•		•[5]		•	•[5]	•	•	•		•[5]	•
Clopyralid/ MCPA+Fluroxypyr	195	4	W/S/D						•	S	•		•[1]	•	S	•	•	•	•		•		•	•	•	•	•	•	•	•
Deathstar	251	2,4	S/D						•	•	•	•	S	•	•	•[13]	•		•		•		•	•		•	S	•[13]	•	
Dicamba/fluroxypyr	205	4	S						•		•					•	S				S	•						•		
Dicamba + MCPA/2,4-D	201	4	W/S/D						•		•	•		•	•[3]	•	•		•		•	•	•	•	TG	•	TG		•	S
Dicamba/Mecoprop/MCPA	207	4	W/S/D						•		•			•	•	•	•		•	•	•	•	•	•	TG	•	TG		•	•
Dichlorprop/2,4-D	209	4	W/S/D						•			•		•		•	•	•	•	•[5]	•	•	•	•	•	•	TG		•	•
Enforcer D	217	4,6	S/D						•[5]		•		•[5]		•	•	•	•[5]	•	•	•[5]	•[5]	•	•		•	S	•[5]	•	
Erebus Xtreme	231	2,4	W/S/D	•	•	•	•[J], S[D]	•	•	•	•		s	•	•	•		•			•	S	•	•		•	S	•	•[4]	
Exhilarate	233	2,4	W/S/D	•					•	•	•		•[7]	•	•	S	•	•	•	•	•		•	•	S	•	S[7]	•	•	
Fenoxaprop	241	1	S/D	•	•	•		•																						
Florasulam	248	2	S/D						•	•	•				S				•		S		•	•	S	•			•[4]	
Florasulam/fluroxypyr + MCPA	254	2,4	S						•	•	•	•		•	•	•	•		•		•		•	•		•		•	•	
Flucarbazone	257	2	W/S/D	S	•	S		•	S[5,12]										•		•		•	•					•[4]	
Fluroxypyr	262	4	W/S/D						S	S	•				S	•		•							S			•		
Fluroxypyr + 2,4-D, *OcTTain XL*	361	4	W/S/D						•	S	•	•	•[1]	•	S	•	•	•	•		•	•	•	•	S	•	S	•	•	•
Fluroxypyr + MCPA	267	4	S/D						S		•	•		•	•	•	•		•		•		•	S		•		•	•	•
Foxxy MR	272	2,4	S/D						•	•	•	•		•	•	•	•	S	•		•	•	•	•	TG	•	TG	•	•	•
Infinity	321	6,27	W/S/D						•	•	•		S	•	•	•	•	S	•		•	•	•	•	S	•	S		•	
Infinity FX	323	4,6,27	W/D						•	•	•		S	•	•	•	•	•	•		•	•	•	•	S	•	S	•	•	
MCPA	340	4	W/S/D									•		•	S	•	•		•		•		•	•		•				
Mecoprop-p	346	4	S/D							•	•						•		•								TG			
Metribuzin	349	5	S/D							•					•		•		•	•	•	•		•		•			•	
Metsulfuron	353	2	S/D							•				•	•	•	•		•		•	•	•	•	•[8]	•	•[8]		•	
OnDeck	367	6,27	W/S/D		•	•			•	•	•					•	•				•			•					•	
Optica Trio	369	4	W/S/D						•	•	•					•	•		•		•					•	TG		•	
Oxbow	374	4,6	W/S/D						•	•	•	•				•	•	•	•		S	•		•		•			•	
Pinoxaden	381	1	W/S	•	•	•		•																						
Pixxaro	385	4	W/S/D	•					•	•	•	•	S[7]	•	•	•	•	•	•		•		•	S		•	S[7]	•	•	
Predicade	380	2,4	S/D	•	•	•		•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
Prominex	394	4	W/S/D	•					•	•	•			•	•	•	•	•	S		•	•	•				•	•		
Quinclorac	398	4,26	S/D	•	•						•														S			•		
Rexade	417	2,4	W/S/D	•	S	•	•[J],S[D]	•	•	•	•	•	•	•	•	S	•	•	•	S	•	•	•	•		•	S	•	•	
Rezuvant/Rezuvant XL	419	1,4	S	•	•	•		•	•		•	•			•	•	•	•	•	•	•	•		•	S		•	S	•	•
Sentrallas	429	2,4	W/S/D						•	•	•				•	•	•		•		•	•		•		•				
Signal SFU	434	1,2,4	S/D	•	•	•		•	•	•	•			•	•	•	•	S	•		•	•	•		S	•	S	•	•	•
Simplicity OD/Simplicity GoDRI	438	2	W/S/D	•	S	•	•	•	S	•	•		S		•			•			•	S	•	•		•	S		•[4]	
Talinor	451	6,27	S/D						•	•	•		S	•	•	•	•	•	•		•		•			•	S		•	
Tandem	453	2,4	W/S	•	S	•	•	•	S	•	•		S	•	•	•		•			•	S	•	•		•	S	•	•[4]	
Thifen:Triben (2:1) + Fluroxypyr	461	2,4	S						•	•	•			•	•		•		•		•	•	•	•		•			•	•
Thifen/Triben (25:25) + Fluroxypyr	461	2,4	W/S/D						•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
Thifensulfuron/tribenuron (2:1)	464	2	W/S						•	•	S			•	•		•	S	•		•	•	•	•	S	•	S		•[4]	•

Table 4. Weed Control in Wheat (Spring, Durum and Winter) *continued*

POST-emergent herbicides	Page	Herbicide Mode of Action Group	CROP: W - Winter, S - Spring, D - Durum	Barnyard Grass	Foxtail, Green	Foxtail, Yellow	Annual bromes	Wild Oats	Buckwheat, Wild	Chickweed	Cleavers	Cocklebur	Dandelion	Flixweed	Hemp-nettle	Kochia	Lamb's-quarters	Mallow, Round-leaved	Mustard, Wild	Night-flowering Catchfly	Pigweed, Redroot	Russian Thistle	Shepherd's-purse	Smartweed, Annual Species	Sow-thistle (Perennial)	Stinkweed	Thistle, Canada	Volunteer Flax	Volunteer Mustard, Canola	Volunteer Sunflowers
Thifensulfuron/tribenuron (2:1) + MCPA	467	2,4	W/S					•	•		S	•[8]	•	•	•	•	•	S	•	•	•	•	•	•	S	•	S	•	•	•
Topline	469	2,4	S/D						•	•	•		•[2]	•	•		•		•		•		•	•	TG	•	TG		•	•
Tralkoxydim	476	1	W/S	•	•	•		•																						
Travallas	479	2,4	W/S/D						•	•	•	•	•[4]	•	•	•	•		•	•	•	•	•	•	•	•	S	•	•[4]	
Traxos	481	1	S/D	•	•	•		•																						
TraxosTwo	483	1,4	S/D	•	•	•		•	•	S	•	•	•[1]	•	S	•	•	•	•		•	•	•	•	S	•	S	•	•	•
Tridem + 2,4-D	493	2,4	W/S/D				•[J]	•	•	•	•	•		•	S	•	•		•		•	•	•	•	•	•	•	•	•	
Tundra	500	1,6,27	S	•	•	•		•	•	•	•		S	•	•	•	•	S	•		•	•	•	•	S	•	S		•	
Varro	510	2	W/S/D	•	•	S	S[JD]	•	•		•				•		S	S	•		•	S	•			•			S	
Varro FX	512	2,4	W/S						•	•	•				•	•	•	•			•	•	•	•				•	•	
Velocity m3	514	2,6,27	W/S/D	•	•	S	S[JD]	•	•	•	•		S	•	•	•	•	S	•		•	•	•	•	S	•	S		•	

• Control, S – Suppression, TG – Top growth control, [JD] J – Japanese brome, D – Downy brome
[1] Spring seedlings only. [2] Spring seedlings and overwintered rosettes. [3] MCPA K mixes only. [4] Will not control CLEARFIELD canola varieties.
[5] Controlled at the higher rates. [6] For use on CLEARFIELD wheat varieties only. [7] Up to 30 cm tall or across. [8] Less than 15 cm diameter. [9] *Authority 480*, *Authority Strike* and *Sulfentra* only. [10] Weeds controlled when emerging from seed only (not controlled if emerged at application). [12] Not registered for all products. See product page. [13] Crop and use may vary between different brands. Consult product page for crop and use. [14] Apply before planting, during planting or winthin 3 days after planting but before crop emerges.

Table 5. Weed Control in Corn

PRE-emergent herbicides (with residual control)	Page	Herbicide Mode of Action Group	Barnyard Grass	Volunteer Cereals	Foxtail, Green	Foxtail, Yellow	Wild Oats	Quackgrass	Buckwheat, Wild	Chickweed	Cleavers	Cocklebur	Dandelion	Flixweed	Kochia	Lamb's-quarters	Mustard, Wild	Night-flowering Catchfly	Pigweed, Redroot	Russian Thistle	Shepherd's-purse	Smartweed Annual Species	Sow-thistle (Perennial)	Stinkweed	Sunflower, Volunteer	Thistle, Canada	Volunteer Canola
Aatrex	111	5					•		•							•	•		•			•					
Fierce[9]	243	14,15	•		•		S		•	•	•		•[1]		•	•	•			S		•					S
Focus (residual component)[8,9]	269	14,15	•		•	•	S		S		•				S	S	S		•					•			
Frontier Max[9]	273	15			•																						
Heat Complete (residual component)[9]	298	14,15			S	S	S		•		•				•	•	•		•					•			•
Metolachlor[8,9]	347	15	•		•	•													S								
Primextra II Magnum[8,9]	392	5,15	•		•	•			•							•	•		•			•					
Roundup Xtend2[1]	423	4,9	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		•	•[7]
Simazine	436	5	•			•	•		•							•						•					
Sortan IS	443	2	•		•	S		•	•							S			•								•
*Voraxor Complete (*residual component)[9]	520	14,15	•		•	•	S		S		S				S	S	S		•					S			S
Zidua SC[9]	521	15	•		•	•	S								S	S			•								
POST-emergent herbicides (some products may be used PRE or POST)																											
2,4-D	105	4								•		•	•	•	•	•	•		•	•	•	•	TG	•	•	S	•
2,4-DB	109	4							•				TG			•	•		•		•	S	TG	•		TG	
Aatrex	111	5					•		•							•	•		•			•					
Bentazon	141	6								•	•	•				•	•		S	S	•	•		•		S	•
Bromoxynil	152	6							•			•			•	•	•		•	•		•		•			•
Bromoxynil/MCPA	159	4,6							•			•		•	•	•	•	•	•	•	•	•	S	•	•	S	•
Callisto[6]	166	27																									•
Dicamba	201	4							•		•				•	•	•		•			•	S			S	
Dicamba + 2,4-D amine	201	4							•		•	•	S	•	•	•	•		•	•	•	•	S	•	•	S	•
Distinct	214	4,19							•			•			•	•			•			•	S			TG	•

Table 5. Weed Control in Corn *continued*

POST-emergent herbicides (some products may be used PRE or POST)	Page	Herbicide Mode of Action Group	Barnyard Grass	Volunteer Cereals	Foxtail, Green	Foxtail, Yellow	Wild Oats	Quackgrass	Buckwheat, Wild	Chickweed	Cleavers	Cocklebur	Dandelion	Flixweed	Kochia	Lamb's-quarters	Mustard, Wild	Night-flowering Catchfly	Pigweed, Redroot	Russian Thistle	Shepherd's-purse	Smartweed Annual Species	Sow-thistle (Perennial)	Stinkweed	Sunflower, Volunteer	Thistle, Canada	Volunteer Canola
Eclipse XC[1]	216	4,9	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		•	•
Enlist Duo[13]	221	4,9	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Glufosinate 200SN[3]	279	10	•		•	•	•	S	•	•		•				•	•		•		•	•	•	•		S	
Glyphosate[1, 4]	281	9	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•[7]
Laudis	336	27			•				S						•	•			•								
Lontrel XC (clopyralid)	188	4							•				•										•			•	
MCPA	340	4										•		•		•	•				•	•		•			
MCPB/MCPA	344	4														•	•		•		•		S	•		S	•
Nicosulfuron	359	2	•		•	S	•	•																			
Option 2.25 OD[6]	371	2	•		•	•				•						•	•		•								
Permit WG	378	2								•		•				•	•		•		•	•					•[12]
Roundup Xtend2[1]	423	4,9	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		•	•[7]
Shieldex	431	27	S		•	S						•				•			•		•	•					
Sortan IS	443	2	•		•	S		•	•							S			•								•
Steadfast IS	445	2		•	•		•																				•[12]
Topramezone[10]	470	27	S		S	S				S					•	S	•		•			S					•
Topramezone + Atrazine	470	5,27	S		S	S				S						•	•		•			•					•
Tough EC	474	6									•				•	•	•		•								
Zidua SC[9]	521	15	•		•	•	S								S	S			•								

• Control. S – Suppression. TG – Top growth control.

[1] For use on glyphosate tolerant varieties only. [2] See product page for registered corn varieties. [3] For use on *Liberty 200 SN* tolerant corn varieties only. [4] Not all glyphosate products are registered for use on glyphosate tolerant corn. [6] For use in Manitoba only. [7] Will not control glyphosate tolerant varieties. [8] Apply pre-seed or pre-emergent. [9] Selective activity only when weeds are emerging from seed. [10] Must be applied with a tank mix partner. [12] Except CLEARFIELD tolerant varieties. [13] *Enlist* corn varieties only.

Table 6. Weed Control in Soybean

PRE-emergent herbicides (with residual control)	Page	Herbicide Mode of Action Group	Barnyard Grass	Foxtail, Green	Foxtail, Yellow	Volunteer Barley	Volunteer Wheat	Wild Oat	Buckwheat, Wild	Chickweed	Cleavers	Cocklebur	Hemp-nettle	Kochia	Lamb's-quarters	Mustard, Wild	Nightshade, Hairy	Pigweed, Redroot	Russian Thistle	Shepherd's-purse	Smartweed, Annual Species	Stinkweed	Volunteer Canola	Canada Thistle	Dandelion	Perennial Sow-thistle	Quackgrass
Authority 480/Authority Strike[6,7]	449	14							•		S			•	•			•	S	•		•	•				
Authority Supreme[6]	128	14,15	•	•	•			S	•		•			•	•			•				•					
Dicamba[10,11]	201	4							•		•				•	•		•			•			TG		TG	
Ethalfluralin[6,15]	229	3	•	•	•	S	S	S	•	•	S		S	•	•		S	•	S		S						
Fierce[6]	243	14,15		•					•	•				•	•	•	•	•			•		S		•		
Focus (residual component)[6,7]	269	14,15	•	•	•			S	S		•			S	S	S		•				S	•				
Heat Complete (residual component)[6,7]	298	14,15		S	S			S	•		•			•	•	•		•				•	•				
IPCO Bifecta EZ[16]	328	5,14	•	•	•				•	•	•	•		•	•	•	•	•	•	•	•		[5]		•		
Metolachlor[6]	347	15	•	•	•													S									
Metribuzin + *Treflan EC* (PPI)	349	5	•	•	•			•	•	•			•		•	•		•	•		•	•	•				
Roundup Xtend[10]	423	4,9	•	•	•	•	•	•	•	•	•	•	•	•[12]	•	•		•	•	•	•	•	•[9]	•	•	•	•
Trifluralin (broadleaf & grassy weeds)[6]	496	3	•	•	•			•	•	•					•			•	•								
Valtera[5,6]	504	14		S						•				•	•		•	•					•		•		
Voraxor Complete (residual component)[6,7]	520	14,15	•	•	•			S					S	•	•		•	S		S			S				
Zidua SC[6]	521	15	•	•	•			S					S	S			•	•									
POST-emergent herbicides (some products may be used PRE or POST)																											
Bentazon	141	6								•	•	•			•	•	•	S	S	•	•	•	•	•			
Clethodim	178	1	•	•	•	•	•	•																			
Dicamba[10,11]	201	4							•		•				•	•		•			•			TG		TG	
Enlist Duo[14]	221	4,9	•	•	•	•	•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•
Flexstar GT[1,2]	246	9,14	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Glufosinate 200SN[8]	279	10	•	•	•			•	•	•		•			•	•		•		•	•	•		S		•	S
Glyphosate[2,3]	281	9	•	•	•	•	•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•[9]	•	•	•	•
Hurricane	300	6,14													S			•									
Imazamox *(Solo ADV & Davai 80 SL* only)	306	2	•	•	•	•	•	•	S		S			S	•	•		•		•	•	•	•[4]				
Imazamox + bentazon	309	2,6		•	•	•	•	•			•				•	•		S	•	•		•	•				
Imazamox/Imazethapyr	312	2	•	•		•	•[4]	•	•	•	•		•		S	•		•	•	•	•	•	•[4]				
Imazethapyr	317	2															•						•[4]				
Odyssey Ultra Q	364	1,2	•	•	•	•	•	•	S	•	•		S		S	•		•	•	•	•	•	•[4]				S
Pinnacle	457	2													•	•		•			•						
Poast Ultra	388	1	•	•	•	•	•	•																			•
Quizalofop	401	1	•	•	•	•	•	•																			•
Reflex + Basagran[1]	408	6,14										•			•	•		S		•	•	•	•				
Roundup Xtend[10]	423	4,9	•	•	•	•	•	•	•	•	•	•	•	•[12]	•	•		•	•	•	•	•	•[9]	•	•	•	•
Select Plus	427	1	•	•	•	•	•	•																			
Ultra Blazer	502	14										•			•	•		•			•			S			

• Control. S – Suppression. TG – Top growth control.

[1] For use in the Red River Valley of Manitoba only. [2] For use on glyphosate tolerant varieties only. [3] Not all glyphosate products are registered for use on glyphosate tolerant soybeans. [4] Will not control CLEARFIELD varieties. [5] Apply in fall or spring prior to seeding of or up to 3 days after seeding. [6] Control of the following weeds emerging from seed (not controlled if emerged at application). [7] For in season activity only. For initial burn down of other weeds see Table 16b. [8] For use in *Liberty* tolerant soybeans only. [9] Will not control glyphosate tolerant varieties. [10] For use on RR Xtend soybean varieties only. [11] Not all dicamba products are registered for use on RR Xtend soybeans. [12] Including glyphosate resistant biotypes. [13] Seedlings only. [14] For *Enlist E3* soybean varieties only. [15] Crop and use may vary between different brands. Consult product page for crop and use. [16] Apply before planting, during planting or within 3 days after planting but before crop emerges.

Table 7. Weed Control in Field Pea

PRE-emergent herbicides (with residual control)	Page	Herbicide Mode of Action Group	Barnyard Grass	Foxtail, Green and Yellow	Quackgrass	Volunteer Barley	Volunteer Wheat	Wild Oats	Buckwheat, Wild	Chickweed	Cleavers	Cocklebur	Dandelion	Flixweed	Hemp-nettle	Kochia	Lamb's-quarters	Mustard, Wild	Night-flowering Catchfly	Pigweed, Redroot	Russian Thistle	Shepherd's -purse	Smartweed, Annual Species	Sow-thistle (Perennial)	Stinkweed	Thistle, Canada	Volunteer canola
Authority 480/Authority Strike[3,4]	449	14							•		S					•	•			•	S						
Authority Supreme[4]	128	14,15	•	•				S	•		•					•	•	S		•		•			•		
Ethalfluralin[4, 5]	229	3	•	•		S	S	S	•	•	S				S	•	•			•	S		S				
Fierce	243	14,15	•	•				S	•	•	•		•[5]			•	•			•	S		•				S
Focus (residual component)[3,4]	269	14,15	•	•				S	S		•					S	S	S		•					S		
Heat Complete (residual component)[3,4]	298	14,15		S				S	S		S					S	S	S		S					S		S
IPCO Bifecta EZ	328	5,14	•	•					•	•	•	•	•			•	•	•		•	•	•	•				S
Metribuzin + *Treflan* (PPI)[4]	349	3,5	•	•				•	•	•					•		•	•		•	•	•	•		•		•
Metribuzin + *Rival* (PPI)[4]	349	3,5	•	•				•	•	•					•	•	•	•		•		•	•		•		•
Triallate[4]	484	15						•																			
Trifluralin (broadleaf & grassy weeds)[4]	495	3	•	•				•	•	•							•			•	S						
Valtera[4]	504	14		S[1]						•			•			•	•			•							•
Voraxor Complete (residual component)[3,4]	520	14,15		[s]				S								•	•			S		S					S
Zidua SC[4]	521	15		S				S								S	S			S							
POST-emergent herbicides																											
Anaconda	120	1,2,6	•	•	•	•	•	•	S		S					S	•	•		•	•	•	•		•		•
Bentazon	141	6								•	•	•					•	•		S	S	•	•		•	•	•
Clethodim	178	1	•	•	•	•	•	•																			
Imazamox	306	2	•	•		•	•[2]	•	S		S						•	•		•		•	•		•		•
Imazamox+Bentazon	309	2,6	•	•		•	•[2]	•	S		S					S	•	•		•	•	•	•		•		•
Imazamox+Imazethapyr	312	2	•	•[1]		•	•[2]	•	S	•	•			•	S		S	•		•	•	•	•		•		•[2]
Imazamox+Quizalofop	316	1,2	•	•	S	•	•	•	S		S			•			•	•		•		•	•		•		•[2]
Imazethapyr	317	2		•[1]				S	S	•	•				•			•		•		•	•		•		•[2]
MCPA Sodium Salt/Amine	340	4												•			•	•				•			•		
MCPB+MCPA	344	4													S		•	•		•		•		TG	•	•	•
Metribuzin (post-emergence)	349	5								•					•		•	•					•		•		•
Odyssey Ultra Q	364	1,2	•	•	S	•	•	•	S	•	•			•	S		S	•		•	•	•	•		•		•[2]
Poast Ultra	388	1	•	•	•	•	•	•																			
Quizalofop	401	1	•	•	•	•	•	•																			
Samurai Master	426	1,2	•	•		•	•	•	S		S						•	•		•		•	•		•		•
Select Plus	427	1	•	•			••	•																			

• Control. S – Suppression. TG – Top growth control.

[1] Green foxtail only. [2] Will not control CLEARFIELD varieties. [3] For in season activity only. For initial burn down of other weeds see Table 16b. [4] For control of the marked weeds when emerging from seed (not controlled if emerged at application). [5]seedlings only

Table 8. Weed Control in Other Pulses

			CROP				ANNUAL WEEDS																					PERENNIALS		
PRE-emergent herbicides (with residual control)	Page	Herbicide Mode of Action Group	Fababean	Fenugreek	Chickpea	Sweet White Lupin	Barnyard Grass	Foxtail, Green	Foxtail, Yellow	Volunteer Barley	Volunteer Wheat	Wild Oat	Buckwheat, Wild	Chickweed	Cleavers	Cocklebur	Hemp-nettle	Kochia	Lamb's-quarters	Mustard, Wild	Nightshade, Hairy	Pigweed, Redroot	Russian Thistle	Dandelion	Shepherd's-purse	Smartweed, Annual Species	Stinkweed	Volunteer Canola	Canada Thistle	Dandelion	Quackgrass
Sulfentrazone/*Authority Strike*[1,2]	449	14	X		X								•		S			•	•			•	S		•		•	•			
Authority Supreme[1]	128	14,15			X		•	•	•			S	•		•			•	•	S		•					•				
Avadex MA	484	15			X							•																			
Ethalfluralin[1]	229	3	X		X		•	•	•	S	S	S	•	•	S		S	•	•			•	S			S					
Metolachlor[1]	347	15				X	•	•	•													S									
Metribuzin + *Treflan* (PPI)[1]	349	3,5	X				•	•	•			•	•	•			•		•	•		•	•			•	•				
Trifluralin (broadleaf & grassy weeds)[1]	495	3	X				•	•	•			S	S	•					•			•									
Valtera[1]	504	14			X			S						•				•	•		•	•						S		•	
POST-emergent herbicides																															
Bentazon	141	6	X											•	•	•			•	•	•	S	S		•	•	•	•	TG		
Clethodim	178	1	X	X	X		•	•	•	•	•	•																			
Imazamox/Imazethapyr	312	2	X	X			•	•		•	•[3]	•	•	•	•		•		S	•		•	•		•	•	•	•[3]			
Metribuzin (post-emergence)	349	5			X									S			S		S	S						S	S				
Odyssey Ultra Q	364	1,2	X				•	•	•	•	•	•	S	•	•		S		S	•		•	•		•	•	•	•[3]			S
Poast Ultra	388	1	X	X	X	X	•	•	•	•	•	•																			•
Quizalofop	401	1	X		X		•	•	•	•	•	•																			•
Select Plus	427	1	X		X		•	•	•	•	•	•																			
Tough EC	474	6			X										•			•	•	•		•									

• Control. S – Suppression. TG – Top growth control.
[1] For control of the marked weeds when emerging from seed (not controlled if emerged at application). [2] For in season activity only. For initial burn down of other weeds see Table 16b.
[3] Not including CLEARFIELD varieties.

Table 9. Weed Control in Dry Bean

			ANNUAL WEEDS																					PERENNIALS	
PRE-emergent herbicides (with residual control)	Page	Herbicide Mode of Action Group	Barnyard Grass	Foxtail, Green	Foxtail, Yellow	Volunteer Barley	Volunteer Wheat	Wild Oat	Buckwheat, Wild	Chickweed	Cleavers	Cocklebur	Hemp-nettle	Kochia	Lamb's-quarters	Mustard, Wild	Nightshade, Hairy	Pigweed, Redroot	Russian Thistle	Shepherd's-purse	Smartweed, Annual Species	Stinkweed	Volunteer Canola	Canada Thistle	Quackgrass
Command 360 ME	186	13								S	•														
Eptam Liquid EC[7]	223	15	•	•	•	•	•	•		•					•		•	•							S
Ethalfluralin[2, 7, 8]	229	3	•	•	•	S	S	S	•	•	S		S	•	•			•[5]	S		S				
Frontier Max[2, 7]	273	15		•																					
Metolachlor[1, 7]	347	15	•	•	•													S							
Permit WG[5]	378	15								•		•			•	•		•		•	•		•[6]		
Trifluralin (broadleaf & grassy weeds)[7]	495	3	•	•	•			S	S	•					•			•							
POST-emergent herbicides (some products may be used PRE or POST)																									
Bentazon[5]	141	6								•	•	•			•	•	•	S	S	•	•	•	•	TG	
Clethodim	178	1	•	•	•	•	•	•																	S
Imazamox+Bentazon	309	2,6	•	•	•	•	•[6]	•	S		S			S	•	•		•	•	•	•	•	•		
Imazamox+Quizalofop	316	1,2	•	•	•	•	•	•	S		S				•	•		•		•	•	•	•[2]		S
Imazethapyr[3]	317	2															•								
Poast Ultra	388	1	•	•	•	•	•	•																	•
Permit WG[5]	378	2								•		•			•	•		•		•	•		•[6]		
Quizalofop[5]	401	1	•	•	•	•	•	•																	•
Select Plus	427	1	•	•	•	•	•	•																	
Reflex + Basagran[4]	408	6,14										•			S	•		S		•	•	•	•	TG	

• Control. S – Suppression. TG – Top growth control.
[1] Navy, kidney and pinto beans only. [2] Navy and kidney beans only. [3] Pinto, pink and red beans only. [4] For use on navy beans in the Red River Valley of Manitoba. Does not include weeds controlled by Basagran Forté. [5] Not all dry bean types have been tested for tolerance to this herbicide. [6] Not including CLEARFIELD varieties. [7] For control of the marked weeds when emerging from seed (not controlled if emerged at application).

Table 10. Weed Control in Lentil

			ANNUAL WEEDS																					PERENNIALS		
PRE-emergent herbicides (with residual control)	Page	Herbicide Mode of Action Group	Barnyard Grass	Foxtail, Green	Foxtail, Yellow	Volunteer Barley	Volunteer Wheat	Wild Oat	Buckwheat, Wild	Chickweed	Cleavers	Cocklebur	Hemp-nettle	Kochia	Lamb's-quarters	Mustard, Wild	Nightshade, Hairy	Pigweed, Redroot	Russian Thistle	Shepherd's-purse	Smartweed, Annual Species	Stinkweed	Volunteer Canola	Canada Thistle	Dandelion	Quackgrass
Avadex MA	484	15						•																		
Ethalfluralin[1, 4, 5]	229	3	•	•	•	S	S	S	•	•	S		S	•	•			•	S		S					
Focus (residual component)[4]	269	14,15	•	•	•			S	S		•			S	S	S		•				S	•			
Heat Complete (residual component)[4]	298	14,15		S	S			S	S		S			S	S	S		S				S				
IPCO Bifecta EZ	328	5,14	•	•	•				•	•	•	•		•	•	•	•	•	•	•	•		S		•	
Trifluralin (broadleaf & grassy weeds)[4]	495	3	•	•	•			S	S	•					•			•								
Valtera[4]	504	14		S						•				•	•		•	•					•		•	
Voraxor Complete (residual component)[4]	520	14,15		S	S			S					S	•	•		S	S		S			S			
Zidua SC[4]	521	15		S	S			S					S	S			S									
POST-emergent herbicides																										
Clethodim	178	1	•	•	•	•	•	•																		•
Imazamox[2]	306	2	•	•	•	•	•[3]	•	S		S				•	•		•		•	•	•	•[3]			
Imazamox/Imazethapyr[2]	312	2	•	•		•	•[3]	•	S	•	•		S		S	•		•	S	•	•	•	•[3]			
Imazamox+Quizalofop[2]	316	1,2	•	•	•	•	•	•	S		S				•	•		•		•	•	•	•[2]			S
Metribuzin	349	5								S			S		S	S					S	S	S			
Odyssey Ultra Q[2]	364	1,2	•	•	•	•	•	•	S	•	•		S		S	•		•	S	•	•	•	•[3]			S
Poast Ultra	388	1	•	•	•	•	•	•																		•
Quizalofop	401	1	•	•	•	•	•	•																		•
Select Plus	427	1	•	•	•	•	•	•																		

• Control. S – Suppression. TG – Top growth control.
[1] Fall applications only. [2] For use ONLY on CLEARFIELD lentil varieties. [3] Not including CLEARFIELD varieties. [4] For control of the marked weeds when emerging from seed (not controlled if emerged at application).

Table 11. Weed Control in Flax

PRE-emergent herbicides (with residual control)	Page	Herbicide Mode of Action Group	Barnyard Grass	Foxtail, Green	Foxtail, Yellow	Quackgrass	Volunteer Cereals	Wild Oats	Buckwheat, Wild	Chickweed	Cleavers	Cocklebur	Dandelion	Flixweed	Kochia	Lamb's-quarters	Mallow, Round-leaved	Mustard, Wild	Night-flowering Catchfly	Pigweed, Redroot	Russian Thistle	Shepherd's-purse	Smartweed, Annual Species	Sow-thistle (Perennial)	Stinkweed	Thistle, Canada
Authority 480/Authority Strike[6,7]	449	14							•		S				•	•				•	S					
Eptam Liquid EC[3,6]	223	15	•	•	•	S	•	•		•						•				•						
Triallate[7]	484	15						•																		
Triallate/Trifluralin[7]	487	3,15		•	•			•	S						S	S				S	S					
Trifluralin (broadleaf and grassy weeds)[4]	495	3	•	•	•			S	S	•						•				•						
POST-emergent herbicides																										
Bentazon	141	6								•	•	•				•		•		S	S	•	•		•	•
Bromoxynil[1]	152	6							•			•			•	•		•		•	•		•		•	
Bromoxynil/MCPA[1]	159	4,6							•			•		•	•	•		•	•	S	•	•	•	TG	•	TG
Clethodim[1]	178	1	•	•	•	•	•	•																		
Clopyralid[1]	188	4							•															TG		•
Clopyralid/MCPA[1]	193	4							•			•	•[2]	•	S	•		•		•		•	•	TG	•	•
MCPA	340	4										•	TG	•	•	•		•		•	TG	•	•	TG	•	TG
Poast Ultra[1]	388	1	•	•	•	•	•	•																		
Quizalofop[1]	401	1	•	•	•	•	•	•																		
Select Plus	427	1	•	•	•			•																		

• Control. S – Suppression. TG – Top growth control.
[1] Registered for use on both flax and solin (low linolenic acid flax). [2] Spring seedlings only. [3] Not recommended for use on flax in Saskatchewan. [4] Fall application only. [5] For in season activity only. [6] For initial burn down of other weeds see Table 16b. [7] For the control of marked weeds when emerging from seed (not controlled if emerged at application)

Table 12. Weed Control in Canola

PRE-emergent herbicides (with residual control)	Page	Herbicide Mode of Action Group	Barnyard Grass	Foxtail, Green	Foxtail, Yellow	Quackgrass	Volunteer Barley	Volunteer Wheat	Wild Oats	Buckwheat, Wild	Chickweed	Cleavers	Cocklebur	Dandelion	Flixweed	Hemp-nettle	Kochia	Lamb's-quarters	Mallow, Round-leaved	Mustard, Wild	Night-flowering Catchfly	Pigweed, Redroot	Russian Thistle	Shepherd's-purse	Smartweed, Annual Species	Sow-thistle (Perennial)	Stinkweed	Thistle, Canada
Command 360ME, Command Charge (residual component)	186	13,14									S	•[8]																
Ethalfluralin[8]	229	3	•	•	•		S	S	S	•	•	S				S	•	•				•	S		S			
IPCO Trigon (residual component)	331	6,13, 14										•[8]																
Triallate[8]	484	15							•																			
Triallate/Trifluralin[8]	487	3,15		•	•				•	S							S	S				S	S					
Trifluralin (broadleaf & grassy weeds)[8]	495	3	•	•	•				S	S	•							•				•						
POST-emergent herbicides																												
Advantage Glufosinate Plus[1]	113	4,10	•	•		•	S	•	•[3]	•	•	•[3]		•[3]	•[3]	•	•	•	•	•		•	•	•	•	•	•	•
Ares SN[2]	121	2	•	•	•		•	•[6]	•	•	•	•				•		•	•	•		•	•	•	•		•	
Clethodim	178	1	•	•	•	•	•	•	•																			
Clopyralid	188	4								•																TG		•
Eclipse XC[4]	216	4,9	•	•		•[7]	•	•	•	•	•	•		•[7]	•	•	•	•		•	•	•	•	•	•	•[7]	•	•[7]
Glufosinate 150[1]	275	10	•	•		•	•[3]	•[3]	•[3]	•	•	•[3]		•[3]	•[3]	•[3]	•	•	•	•		•	•	•	•	•	•	•
Glufosinate 280	275	10	•	•		•	•[10]	•[10]	•[10]	•	•	•[10]		•[10]	•[10]	•[10]	•	•	•	•		•	•	•	•	•	•	•
Glyphosate[4,5]	281	9	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Imazamox[2]	306	2	•	•	•		•	•[6]	•	S		S						•	S	•		•	•	•	•		•	
Imazamox/imazethapyr[2]	312	2	•	•			•	•[6]	•	•	•	•			•	•		S		•		•	•	•	•		•	
Muster	355	2													•	•				•		S			•		•	
Odyssey Ultra Q[2]	364	1,2	•	•	•	S	•	•	•	•	•	•			•	•		S		•		•	•	•	•		•	
Poast Ultra	388	1	•	•	•	•	•	•	•																			
Quinclorac	398	4,26	•	•								•														S		
Quizalofop	401	1	•	•	•	•	•	•	•																			
Select Plus	427	1	•	•	•		•	•	•																			
Solo Ultra Q[2]	306	1,2	•	•	•	S	•	•	•	S		S						•	S	•		•		•	•		•	
Thifensulfuron/tribenuron (2:1 ratio) (*Draft* only)[9]	464	2									•	S			•	•		•	S	•		•	•	•	•		•	S

• Control. S – Suppression. TG – Top growth control.

[1] For use only on Liberty Link canola varieties. [2] For use only on CLEARFIELD canola varieties. [3] 1.35 L per acre rate of *Glufosinate 150SN*. Control may be reduced at lower rates. [4] For use only on glyphosate tolerant canola varieties. [5] Not all glyphosate products are registered for use on glyphosate tolerant canola. [6] Will not control CLEARFIELD wheat volunteers. [7] Season long control. [8] For control of weeds when emerging from seed (not controlled if emerged at application). [9] For use in SU tolerant canola only. [10] 0.72 L per acre rate of *Glufosinate 280*. Control may be reduced at lower rates.

Table 13. Weed Control in Potatoes

PRE-emergent herbicides (with residual control)	Page	Herbicide Mode of Action Group	Barnyard Grass	Foxtail, Green and Yellow	Volunteer Canola	Volunteer Corn	Volunteer Barley	Volunteer Wheat	Wild Oats	Quackgrass	Chickweed	Hemp-nettle	Lamb's-quarters	Mustard, Wild	Nightshade	Pigweed, Redroot	Pigweed, Prostrate	Purslane	Smartweed (Annual)	Shepherd's-purse	Stinkweed
Chateau (see *Valtera*)	504	14											•		•	•	•				
Eptam Liquid EC	223	15	•	•			•	•	•	S	•		•		•[2]	•	•	•			
Frontier Max	273	15	•	•											•	•					
Lorox L	338	5	S	S							•		•			•		•	•	•	•
Metolachlor	347	15	•	•											•[1]	S					
Metribuzin[3]	349	5			•						•	•	•	•		•			•	•	•
Strim MTZ[3]	447	5,15	•	•	•						•	•	•	•	•[1]	•			•	•	•
Zidua SC	521	15	•	S					S				S			S					
POST-emergent herbicides(some products may be used PRE or POST)																					
Clethodim	178	1	•	•		•	•	•	•	•											
Metribuzin[3]	349	5			•						•	•	•	•		•			•	•	•
Poast Ultra	388	1	•	•		•	•	•	•	•											
Prism SG	421	2	•	•						•			S			•					

• Control. S – Suppression. TG – Top growth control.
[1] American and Eastern black nightshades. [2] Hairy nightshade. [3] Consult manufacturer or seed provider for varietal tolerance to Metribuzin.

Table 14. Weed Control in Sunflowers

PRE-emergent herbicides (with residual control)	Page	Herbicide Mode of Action Group	Barnyard Grass	Foxtail, Green and Yellow	Quackgrass	Volunteer Barley	Volunteer Wheat	Wild Oats	Buckwheat, Wild	Chickweed	Cleavers	Cocklebur	Dandelion	Flixweed	Hemp-nettle	Kochia	Lamb's-quarters	Mallow, Round-leaved	Mustard, Wild	Night-flowering Catchfly	Pigweed, Redroot	Russian Thistle	Smartweed, Annual Species	Sow-thistle (Perennial)	Stinkweed	Thistle, Canada	Volunteer Canola
Authority 480/Authority Strike[4, 7]	449	14							•		S					•	•				•	S			•[6]		
Authority Supreme[7]	128	14,15	•	•				•	•		•					•	•		•		•				•		
Eptam Liquid EC[7]	223	15	•	•	S	•	•	•		•							•				•						
Ethalfluralin[7]	229	3	•	•		S	S	S	•	•	S				S	•	•				•	S	S				
Focus (residual component)[4, 7]	269	14,15	•	•				S	S		•					S	S		S		•				S		
Trifluralin[7]	495	3	•	•				S	S	•							•				•						
Zidua SC[7]	521	15		S				S								S	S				S						
POST-emergent herbicides																											
Clethodim	178	1	•	•	•[2]	•	•	•																			
Express SG (see Tribenuron)[5]	490	2							S								•										•
Imazamox[3]	306	2	•	•		•	•[1]	•	S		S						•		•		•		•		•		•[1]
Imazamox/imazethapyr[3]	312	2	•	•		•	•[1]	•	S	•	•			•	S		S		•		•		•		•		•[1]
Muster	355	2												•	•				•				•		•		
Poast Ultra	388	1	•	•	S	•	•	•																			
Quizalofop	401	1	•	•	•[2]	•	•	•																			
Solo Ultra Q[3]	306	1,2	•	•	S	•	•	•	S		S						•		•		•		•		•		•[1]

• Control. S – Suppression. TG – Top growth control.
[1] Will not control CLEARFIELD volunteers. [2] Season-long control. [3] Apply only on CLEARFIELD sunflower varieties. [4] For in season soil activity only. For initial burn down of other weeds see Table 16b. [5] *ExpressSun* (tribenuron tolerant) sunflower varieties only. [6]Authority Strike only. [7]For control of the marked weeds when emerging from seed (not controlled if emerged at application)

Table 15. Weed Control in Special Crops

			CROP							ANNUAL WEEDS																						PERENNIALS			
PRE-emergent herbicides (with residual control)	Page	Herbicide Mode of Action Group	Canaryseed	Safflower	Caraway	Coriander	Buckwheat	Mustard	Oilseed mustard (Brassica juncea)	Barnyard Grass	Foxtail, Green	Foxtail, Yellow	Volunteer Barley	Volunteer Wheat	Wild Oat	Buckwheat, Wild	Chickweed	Cleavers	Cocklebur	Flixweed	Hemp-nettle	Kochia	Lamb's-quarters	Mustard, Wild	Night-flowering Catchfly	Pigweed, Redroot	Russian Thistle	Shepherd's-purse	Smartweed, Annual Species	Stinkweed	Volunteer Flax	Volunteer Mustard, Canola	Canada Thistle	Dandelion	Perennial Sow-thistle	Quackgrass
Sulfentrazone/ *Authority Strike*[12]	449	14						✓								•		S				•	•			•[5]	S	•[11]		•[11]		•[11]				
Avadex EC	484	15					✓								•																					
Ethalfluralin[12]	229	3		✓	✓	✓		✓[2]		•	•	•	S	S	S	•	•	S			S	•	•			•	S		S							
Triallate[12]	484	15	✓[1]					✓							•																					
Triallate/ Trifluralin[12]	487	3,15						✓			•	•			•	•						•	•			•	•									
Trifluralin[12]	495	3		✓				✓		•	•	•			•	•	•						•			•	•									
POST-emergent herbicides																																				
Bromoxynil	152	6	✓													•			•			•	•	•		•	•		•	•						
Bromoxynil/MCPA	159	4,6	✓													•			•	•		•	•	•	•	•	•	•	•	•		•	•		•	
Bromoxynil + MCPA + fluroxypyr	163	4,6	✓													•[10]	•[10]		•[10]	•[10]	•[10]	•	•	•	•[10]	S	•[10]	•[10]		•[10]	•[10]					
Clethodim	178	1		✓	✓	✓	✓	✓	✓	•	•	•	•	•	•	✓[13]																				•
Clopyralid/MCPA+ Fluroxypyr	195	4	✓													•	S	•		•	S	•	•	•		•		•	•	•	•	•	•	•[4]	•	
Curtail M	193	4	✓													•			•	•		S	•	•		•		•	•	•		•	•	•[4]	•	
Dicamba + MCPA	201	4	✓													•		•	•	•	•		•	•		•	•	•	•	•	•	•	•	•	•	
Dicamba/ Mecoprop/MCPA	207	4	✓													•		•		•	•	•	•	•	•	•	•	•	•	•		•	•		•	
Fluroxypyr + MCPA	267	4	✓													S		•	•	•	•	•	•	•				•	S	•	•	•				
Imazamox	306	2							✓[6]	•	•	•	•	•[8]	•	S		S					•	•		•		•	•	•		•[8]				
Imazamox/ Imazethapyr	312	2							✓[6]	•	•		•	•[8]	•	•	•	•		•	•		•	•		•	•	•	•	•		•[8]				
Lontrel XC	188		✓																														✓			
Muster	355	2						✓[3,9]	✓											•	•			•					•	S						
Poast Ultra	388	1		✓	✓	✓	✓	✓		•	•	•	•	•	•																					•
Quinclorac	398	4,26						✓[3]		•	•							•																	S	
Quizalofop	401	1						✓[9]	✓	•	•	•		•	•																•					
Select Plus	427	1						✓		•	•	•	•	•	•																					

• Control. S – Suppression. TG – Top growth control.

[1] Granular formulation only. [2] Yellow mustard only. [3] Brown and oriental mustards only. [4] Spring seedlings only. [5] *Authority 480*, *Authority Strike* and *Sulfentra* only. [6] For use in CLEARFIELD varieties only. [8] CLEARFIELD varieties not controlled [9] Including Ethiopian mustard (*Brassica carinata*) [10] Controlled at the higher rates. [11] *Authority Strike* only. [12] For control of marked weeds when emerging from seed (not controlled if emerged at time of application) [13] *Centurion* and *Select* only.

Table 16a. Herbicides to Control Emerged Weeds Before Seeding or After Seeding but Prior to Crop Emergence

HERBICIDE	Page	Herbicide Mode of Action Group	Pre-seeding	Pre-emergent	Barley	Canaryseed	Canola	Chickpea	Corn, Field	Corn, Sweet	Dry Bean	Field Pea	Flax	Forage Grasses	Lentil	Oat	Potatoes	Rye	Soybean	Wheat
Enlist Duo	221	4,9	✓	✓	✓				✓									✓		✓
Glyphosate[1]	281	9	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
The following products may or must (+) be mixed with glyphosate – for the marked crops																				
+ 2,4-D (up to 294 g ae/acre)	105	4	✓	✓	✓													✓	✓[3]	✓
Authority Strike (burnoff component)	126	14	✓	✓				✓				✓	✓						✓	✓
Beloukha	139	26	✓	✓	✓	✓		✓			✓	✓			✓	✓		✓		✓
BlackHawk	145	4,14	✓	✓	✓	✓			✓							✓[4]		✓	✓	✓
Blackhawk EVO	147	4,14	✓	✓	✓	✓			✓							✓[4]		✓		✓
+ Bromoxynil	152	6	✓	✓	✓		✓									✓				✓
+ Bromoxynil/MCPA	159	4,6	✓		✓	✓			✓	✓			✓	✓		✓		✓		✓
Carfentrazone	167	14	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓		✓	✓		✓	✓	✓
Certitude	172	6,27	✓				✓													
Command Charge (burnoff component)	198	13,14	✓	✓			✓													
Conquer II	199	6,14	✓	✓	✓		✓			✓						✓		✓		✓
+ *Express FX*	235	2,4	✓		✓											✓				✓
+ *Express Pro*	237	2	✓		✓											✓				✓
+ Florasulam	248	2	✓		✓											✓				✓
+ Flucarbazone+Tribenuron	260	2	✓	✓																✓
Focus (burnoff component)	269	14,15	✓	✓					✓			✓			✓				✓	✓[5]
GoldWing	289	4,14	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓		✓	✓		✓		✓
Insight	324	14	✓	✓					✓											✓
+ *Heat Brands*	293	14	✓	✓	✓	✓		✓	✓	✓		✓		✓	✓	✓			✓	✓
+ *Heat Complete* (burnoff component)	298	14,15	✓	✓				✓	✓			✓			✓				✓	
+ *Huskie PRE*	302	6,27	✓	✓	✓															✓
Inferno Trio	319	2,14																		✓
+ *Intruvix /Intruvix II*	326	2,4,14	✓		✓											✓				✓
IPCO Trigon (burnoff component)	331	6,13,14					✓													
+ *Korrex II*	334	2,4	✓	✓	✓											✓				✓
+ MCPA (up to 200 g ae/acre)	340	4	✓		✓			✓[1,2]	✓[2]	✓[2]		✓[1,2]	✓[2]		✓[1,2]	✓		✓		✓
+ *Olympus*	365	2	✓	✓																✓
+ *Paradigm PRE*	376	2,4	✓		✓											✓				✓
Prospect	396	4,14	✓		✓		✓					✓	✓							✓
Quinclorac (*Facet L* only)	398	4,26	✓	✓			✓													
Smoulder	441	2,14	✓		✓															✓
Thunderhawk	468	2,4,14	✓	✓	✓											✓				✓
+ tribenuron	490	2	✓		✓	✓[3]					✓[3]	✓[3]		✓[3]		✓[3]			✓[3]	✓
Tough EC	474	6					✓	✓	✓	✓		✓								
Voraxor	518	14	✓	✓	✓				✓			✓			✓				✓	✓
Voraxor Complete (burnoff component)	520	14,15	✓	✓	✓				✓			✓			✓				✓	✓

[1] Maximum of 140 gae per acre in chickpea, field pea and lentil (see glyphosate page). [2] Amine formulations only. [3] Only for select products. See product page for details. [4] Applied a minimum of 7 days before planting. [5]Spring winter wheat only, NOT durum

Table 16b. Control of Emerged Weeds Before Seeding or After Seeding but Prior to Crop Emergence

HERBICIDE	Page	Herbicide Mode of Action Group	Brome (Downy, Japanese)	Foxtail Barley	Foxtail, Green	Quackgrass	Volunteer Cereals	Wild Oats	Buckwheat, Wild	Cleavers	Dandelion	Flixweed	Hemp-nettle	Kochia	Lamb's-quarters	Mustard, Wild	Narrow-leaved Hawk's-beard	Night-flowering catchfly	Russian Thistle	Shepherd's-purse	Smartweed (incl.lady's-thumb)	Stinkweed	Volunteer Canola (including glyphosate tolerant varieties)	Volunteer Flax
Enlist Duo	221	4,9	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Glyphosate (180 g ae/acre)[1]	281	9	•	S	•	•	•	•	•	•	S	•	•	•	•	•	•	S	•	•	•	•		•
Glyphosate (360 g ae/acre)[1]	281	9	•	•	•	•	•	•	•	•	S	•	•	•	•	•	•	•	•	•	•	•		•
Tough EC	474	6								•				•	•	•								
The following products may or must (+) be mixed with glyphosate – weeds marked are those that the product has activity on in addition to glyphosate																								
+ 2,4-D	105	4										•		•	•	•	•		•	•		•	•	
Authority Strike (burnoff component)	126	14							•	•				•	•				•	•		•	•	
Beloukha	139	26									S				•					•				
BlackHawk	145	4,14								•	•	•		•	•	S	•			•		•	•	
Blackhawk EVO	147	4,14							•	•	•			•	•	•	•	•		•			•	
+ Bromoxynil	152	6							•					•	•	•			•		•	•	•	
+ Bromoxynil/MCPA	159	4,6							•			•	•	•	•	•	•	•	•	•	•	•	•	
Carfentrazone, *Command Charge* (burnoff component)	167, 198	14								•				•	•				•	•		•	•	
Certitude	172	6,27												•									•	
Conquer II	199	6,14							S	•	S	S		•	•	S	S				•	S	•	
+ *Express FX*	235	2,4							•	•	•	•	•	•	•	•	•		•	•		•	•	
+ *Express Pro*	237	2								•	•						•	S					•	
+ Florasulam	248	2							•	•	•	•	•			•	•			•	•	•	•	
+ Flucarbazone+Tribenuron	260	2		•				S			S						•			•			•	
Focus (burnoff component)	269	14,15								•				•	•					•		•	•	
+ *Inferno Trio*	319	2,14						•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	
Inferno Trio	319	2,14						S	•	•	S		S	•	•	•	S		•	•		•	•[4]	
Insight	324	14						•	•					•	•				•				•	
GoldWing	289	4,14							S[5]	•	S	S[5]		•	•	•	•	•				•	•	
+ *Heat Brands*	293	14							•	•	•	•		•	•	•	•					•	•	
+ *Heat Complete* (burnoff component)	298	14,15							•	•	•	•		•	•	•	•					•	•	
+ *Huskie PRE*	302	6,27							•	•	S	•	•	•	•	•	•		•	•	•	•	•	
+ *Intruvix*	326	2,4,14							•	•	•	•	•	•	•	•	•		•	•		•	•	
+ *Intruvix II*	326	2,4,14	•		•		•	•	•	•	•	•	•	•	•	•	•		•	•		•	•	
IPCO Trigon (burnoff component)	331	6,13, 14							•	•				•	•	•			•	•	•	•	•	
+ *Korrex II*	334	2,4							•	•			•	•	•	•	•					•	•	
+ MCPA (up to 200 gae/acre)	340	4										S	•	•	•	•	•		•	•	•	•	•	
+ *Olympus*	365	2	•	•																				
+ *Paradigm PRE*	376	2,4							•	•	•	•	•	S	•	•	•	•		•	•	•	•	•
Prospect	396	4,14							S	•	•	•	•		•					•		S		
+ *Prospect*	396	4,14							•	•	•	•	•	S	•	•			•	•	•	•	•	
Quinclorac (*Facet L* only)	398	4,26			•					•														•
Smoulder	441	2,14							•	•				•	•	•	•					•	•	
Thunderhawk	468	2,4,14							•	•	•	•	•	•	•	•	•	•		•	•	•	•	
+ Tribenuron	490	2									•						•		•	•		•	•	
Voraxor/Voraxor Complete (burnoff component)	518, 520	14,15							•	•				•	•	•	•			S		S	•	

• Control. S – Suppression.

[1] Rates of application varies among brands. Consult the product page for application rates. [2] Spring seedlings only. [3] Initial burndown only. [4] Except CLEARFIELD varieties. [5] Control at high rate.

Table 17. Herbicides for Use as Harvest Aid or Desiccant Before Crop Harvest

HERBICIDE	Page	Herbicide Mode of Action Group	Alfalfa	Barley	Canola	Chickpea	Dry bean	Faba bean	Forage	Field Pea	Flax	Lentil	Oat	Potato	Soybean	Sunflower	Wheat
Beloukha	139	26		✓									✓	✓			✓
Carfentrazone[3,4]	167	14		✓		✓	✓	✓		✓			✓	✓	✓		✓
Diquat[3,5]	211	22			✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	
Glyphosate[1,2,6]	281	9		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓		✓
Heat Brands[3,4]	293	14		✓[8]	✓	✓	✓	✓		✓		✓[7]			✓	✓	✓[8]
Glufosinate 150[10]	275	10			✓[9]												
Glufosinate 150SN[10]	275	10	✓		✓[9]							✓[6]		✓[6]			
Glufosinate 280	275	10			✓[9]												
Valtera[3]	504	14				✓	✓			✓		✓					✓

[1] Rates of application vary among brands. Consult glyphosate page for specific application rates. [2] For pre-harvest perennial weed control and may provide harvest management benefit. [3] For rapid plant tissue dry down to facilitate harvest. [4] Should be tank mixed with glyphosate when used prior to harvest. Not for crops grown for seed when glyphosate used. [5] Refer to product page for surfactant requirements. [6] Not for crops grown for seed. [7] Red lentil only. [8] *Heat LQ* only. [9] For use only on Roundup Ready canola with the pod shatter reduction trait. [10]only certain *glufosinate 150* products may be used, please consult product page.

Table 18. Weed Control in Fallow

HERBICIDE	Page	Herbicide Mode of Action Group	Brome, Downy	Foxtail Barley	Foxtail, Green	Quackgrass	Wild Oats	Volunteer Cereals	Buckwheat, Wild	Dandelion	Flixweed/Tansy Mustard	Hemp-nettle	Kochia	Lamb's-quarters	Mustard, Wild	Narrow-leaved Hawk's-beard	Night-flowering Catchfly	Pigweed, Redroot	Russian Thistle	Shepherd's-purse	Smartweed (incl. Lady's-thumb)	Sow-thistle (perennial)	Stinkweed	Thistle , Canada	Volunteer Canola (including glyphosate tolerant varieties)	Volunteer Flax
Dicamba + 2,4-D	201	4							•		•		•	•	•			•	•		•			S		
Dicamba/Mecoprop/MCPA	207	4							•		•		•	•	•			•	•		•			S	•	
Glyphosate (180 g ae/acre)[2]	281	9	•	S	•	S	•	•	•	S	•	•	•	•	•	•	S	•	•	•	•	S	•	S	•[1]	•
Glyphosate (360 g ae/acre)[2]	281	9	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•[1]	•
IPCO Bifecta EZ	328	5,14	•		•				•	•			•	•	•			•	•	•	•				S	
The following products may ( ) or must (+) be mixed with glyphosate – weeds marked are those that the product has activity on in addition to glyphosate																										
+ 2,4-D	105	4									•		•	•	•	•	•		•	•			•		•	
+ *BlackHawk*	145	4,14							S	•[4]	•		•	•	•	•	•	•	•	•			•		•	
+ Bromoxynil	152	6							•				•		•				•		•		•		•	
+ Bromoxynil/MCPA	159	4,6							•		•	•	•	•	•		•	•	•	•	•		•		•	
Carfentrazone	167	14							•				•	•	•	•							•		•	
+ *Distinct* (low rate)	214	4,19							•	TG			•	•		•		•								
Distinct (high rate)	214	4,19							•	TG			•	•		•		•			•	S	•	TG	•	
+ *Express Pro*	237	2								•			•			•	S				•			S[3]	•	
+ Florasulam	248	2							•	•	•	•		•		•				•	•		•		•	
+ *Heat Brands*	293	14							•	•	•		•	•	•	•		•					•		•	
+ *IIntruvix/Intruvix II*	326	2,4,14	•		•		•	•	•	•	•	•	•	•	•	•			•	•			•		•	
Insight	324	14					•		•				•	•				•	•						•	
+ *Korrex II*	334	2,4							•	•	•	•	•	•	•	•				•	•	•	•		•	
+ tribenuron	490	2								•									•	•			•		•	
Voraxor	518	14							•				•	•	•	•		•		S			•		•	

• Control. S – Suppression. TG – Top growth control.
[1] Not including glyphosate tolerant canola. [2] Rates of application varies among brands. Consult the product page for application rates. [3] Fall rosettes and spring seedling. [4] Spring seedlings.

Table 19. Post-harvest Weed Control in Stubble

HERBICIDE	Page	Herbicide Mode of Action Group	Flixweed	Narrow-leaved Hawk's-beard	Shepherd's-purse	Stinkweed	Thistle, Canada	Quackgrass	Dandelion
2,4-D	105	4	•		•	•	S		S
Authority 480	449	14							
Authority Supreme	128	14,15				•			
BlackHawk	145	4,14	•	•	•	•			
Blackhawk EVO	147	4,14		•	•				•
Dicamba + Glyphosate	201	4,9	•		•	•	S	S	
Dicamba/Mecoprop/MCPA	207	4	•		•	•	S		
Distinct (low rate)♦	214	4,19		•			TG		TG
Distinct (high rate)	214	4,19		•			TG		•
Express FX	235	2,4	•	•		•	TG		•
Express Pro♦	237	2		•					•
Florasulam + glyphosate	243	2,9	•	•	•	•			•
Glyphosate	281	9	•	•	•	•	•	•	•
Heat Brands	293	14	•			•	TG		TG
Intruvix /Intruvix II	326	2,4,14	•	•		•	S		•
IPCO Bifecta EZ	328	5,14			•				•
Korrex II	334	2,4		•	•	•			•
MCPA	340	4	•		•	•	S		S
Paradigm PRE + gyphosate	376	2,4,9	•	•	•	•	•	•	•
Smoulder	441	2,14	•	•		•	•		•
Tribenuron	490	2		•			TG		•

• Control. S – Suppression. Levels of suppression vary depending on the product and growing conditions in the fall. Regrowth requiring in-crop treatments can be expected. TG – Top growth control.
♦ To be used only in a mix with glyphosate.

Table 20. Weed Control in Grass Pastures and Hayfields

HERBICIDE	Page	Herbicide Mode of Action Group	Absinthe	Bindweed, Field	Burdock	Thistle, Canada	Dandelion	Dock, Curled	Daisy, English	Flixweed	Foxtail Barley	Gumweed	Knapweed	Leafy Spurge	Narrow-leaved Hawk's-beard	Nodding Thistle	Poplar	Pussy Toes	Red Bartsia	Sage, Pasture	Snowberry	Sow-thistle, Perennial	Stinkweed	Tansy, Common	Wild Rose	Willow	Wormwood, Biennial
2,4-D (500 g/L)	105	4	S	S	•	S	S	•		•		S		S	•	S	S	S	•	S	S	S	•				•
2,4-DB	109	4		S		S	S	•[3]							•[3]							S	•				
Clearview[4]*/Reclaim II*	405	2,4	•[3]	S	•	•	•	•		•		•	•		•	•		•		•	•	•	•	•	•		•
Dicamba	201	4		S		S	S	S	S				S	S						S	•	S					
Dicamba + 2,4-D	201	4	S	S	•	S	S	S	S	•		S		S		S	S		•	S	•	S	•		•	S	
Escort	225	2				S	•										•[3]					S		•	•	•[3]	
Grazon XC	291	4			•	•	•	•						•[2]			•				•				•	•	
Kerb SC	332	3									•																
MCPA (500 g/L)	340	4		S		S	S	S		•		S		•[3]								S	•				•
MCPB/MCPA	344	4		S		S																S	•				
Milestone[4]*/Restore II*	410	2,4	•[3]		•	•	•	•		•		•	•		•							•		•	S		
Navius Flex/TruRange[5]	357	2,4				•	•			•			•	•			•				•	•	•	•	•	•	
Overdrive	373	4,19					S							S													•
Restore NXT[4]	413	4	•		•	•		•		•		•	•			•						•		•			
Sightline	433	2,4	•[3]			•	•	•		•			•		•	•		•				•	•	•	•		
Tordon 22K	472	4		•[2]		•							•	•[2]						•							

• Controlled. S – Top growth suppression only.
[1]Rates may vary between different brands. Check product page for specific rate for product and use. [2] May require multiple applications for complete control. [3] Controlled by the highest rate within this range. [4]Permanent grass pasture and rangeland only. [5]Rangeland or permanent pasture only.

Table 21. Weed Control in Shelterbelts

			USE			SHELTERBELT SPECIES												WEEDS																					
HERBICIDE	Page	Herbicide Mode of Action Group	Before Planting	After Planting (New & Established)	Established	American Elm	Birch	Caragana	Crabapple	Green Ash	Juniper	Lilac	Manitoba Maple	Poplar	Scots Pine	Siberian Elm	Willow	Barnyard Grass	Foxtail, Green and Yellow	Wild Oats	Buckwheat, Wild	Chickweed	Cleavers	Cocklebur	Dandelion	Flixweed	Hemp-nettle	Kochia	Lamb's-quarters	Mustard, Wild	Pigweed, Redroot	Quackgrass	Russian Thistle	Shepherd's-purse	Smartweed, Annual Species	Sow-thistle (Perennial)	Stinkweed	Thistle, Canada
Casoron	171	20		•		•		•	•	•	•	•	•			•	•		•		•	•						•	•	•	•	•		•	•			
Glyphosate	281	9	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Lorox L	338	5			•	•		•		•			•		•	•	•	S	•		•	•							•		•				•		•	
Metribuzin[3]	349	5	•					•		•		•		•					•[4]	•									•		•		•	•			•	
Simazine	436	5			•	•		•		•			•			•		•	•[1]	•	•								•						•			
Trifluralin	495	3	•		•	•		•		•					•	•		•	•	•	•	•							•		•		•					

• Control. S – Suppression. TG – Top growth control.

[1] Yellow foxtail only. [3] PPI tank mixed with *Trefland EC*, not all brands. [4] Green foxtail only.

Table 22a. Weed Control in Forage Crops - Crops

			GRASSES																						LEGUMES								COVER CROPS				
HERBICIDE	Page	Herbicide Mode of Action Group	Altai Wild Rye Grass	Bromegrass	Creeping Red Fescue	Crested Wheatgrass	Intermediate Wheatgrass	Kentucky Bluegrass	Meadow Fescue	Meadow Foxtail	Millets	Northern Wheatgrass	Orchardgrass	Pubescent Wheatgrass	Reed Canarygrass	Russian Wild Ryegrass	Ryegrass, Annual	Ryegrass, Perennial	Slender Wheatgrass	Streambank Wheatgrass	Tall Fescue	Tall Wheat grass	Timothy	Western Wheatgrass	Alfalfa	Alsike Clover	Cicer Milkvetch	Red Clover	Sainfoin	Sweet Clover	Trefoil, Bird's-foot	White Dutch Clover	Barley	Flax[16]	Oats	Canola	Wheat
2,4-D[8]	105	4	X	X	X	X	X	X	X	X	S	X	X	X	X	X	X		X	X	X	X	X	X	X								X				X
2,4-DB[8]	109	4		S[4]	S[4]	S[4]	S[4]		S[4]				S[4]							S[4]	S[4]	S[4]	S[4]		S	S		S			S	S	X		X		X
Authority 480	449		X[2]																																		
Avadex Liquid EC[18]	484	15																							S[1]	S[1]		S[1]		S[1]	S[1]		X	X		X	X
Bentazon[8]	141	6		S[2]	S[2]	S[2]				S[2]	S		S[2]										S[2]		X[2]	X[2]		X[2]	X[2]	X[2]				X			
Bromoxynil[8]	152	6		S[2]	S[2]	S[2]	S[2]		S[2]		S		S[2]		S[2]	S[2]			S[2]			S[2]	S[2]		X[2]								X	X	X		X
Bromoxynil / MCPA ester[8]	159	4,6		S[2]	S[2]	S[2]	S[2]		S[2]	S[2]			S[2]		S[2]	S[2]			S[2]	S[2]	S[2]	S[2]	X										X	X	X		X
Clethodim[8]	178	1																							S									X		X	
Clopyralid	188	4	X	X	X	X	X	X	X	X			X		X	X			X	X	X	X[9]	X										X	X	X	X	X
Curtail M	193	4																					E										X	X	X		X
Dicamba + 2,4-D	201	4		S	X[2]	S	S		S	S			S	S					S	S	S	S	S										X				X
Dicamba / Mecoprop / MCPA[8]	207	4		X[9]	X[9]	X[9]	X[9]	X[9]	X[9]	X[9]			X[9]	E[9]					E[9]	E[9]	E[9]	E[9]	E[9]	E[9]									X		X		X
Ethalfluralin[18]	229	3																							S[2]											X	
Eptam Liquid EC[18]	223	15																							S		S[2]			S[2]	S						
Fenoxaprop[8]	241	1																S[2]																			
Fluroxypyr / 2,4-D	265	2,4		X[2]	X[2]	X[2]	X[2]														X[2]		X[2]														
Imazamox+ Bentazon	309	2,6																							X	X		X	S								
Imazethapyr[8]	317	2																							X[15]											X[11]	
Infinity	321	6,27		E														X					X[2]										X				X
Infinity FX	323	4,6,27		E	X													X					X[2]														
Kerb SC	332	3																							E						E						
MCPA[8]	340	4		X[8,9]	X[8,9]	X[8,9]	X[8,9]	X[8,9]	X[8,9]				X[8,9]		X[8,9]	X[8,9]	X[8,9]		X[8,9]			X[8,9]	X[8,9]		S[5,6]	S[5]		S[5]					X	X	X		X
MCPB + MCPA[8]	344	4	S[4]	S[4]	S[4]	S[4]	S[4]		S[4]			S[4]		S[4]	S[4]	S[4]			S[4]	S[4]	S[4]	S[4]	S[4]	S[4]	S[2,8]	S		S					X		X		X
Metsulfuron[8]	353	2			X	X	X						X										E[8,17]										X				X
Odyssey NXT	312	2																							X[2]	S[2]		S[2]	S[2]	S[2]	X[2]						
Poast Ultra	388	1			X[2]																				X	X	X		X	X				X		X	
Prestige XC (see clopyralid / MCPA + fluroxypyr)	195	4		X[2]	X[2]	X[2]	X[2]														X[2]		X[2]										X				X
Princep Nine-T	436	5																							E						E						
Puma Advance	241	1																X[19]			X[19]																
Quizalofop[8]	401	1																							X[2]	X[2]	S[2]	X[2]	S[2]	S[2]	S[2]	S[2]		X		X	
Select Plus[2]	427	1																							X												
Stellar XL	254			X[2]						X[2]			X[2]		X[2]								X[2]														
Thifensulfuron / Tribenuron (2:1)[8]	464	2		X	X	X	X	E				X	X	X					X	X	X	X		X									X		X		X
Tralkoxydim[8]	476	1		X[2]	X[2]	X[2]	X[2]					X[2]							X[2]					S[2]	S[1]	S[1]		S[1]	S[1]	S[1]	S[1]	S[1]	X				X
Trifluralin[8,18]	495	3																							S[13]	S[14]	S[14]	S[14]	S[12]	S[12]	S[14]			X[7]		X	
Velpar DF CU	516	5																							E												

S – seedling only. E – Established only. X – seedling or established. [1] Underseeded only. [2] For seed production only. [4] DO NOT graze or harvest for livestock in the year of treatment. [5] Use MCPA sodium salt on seedling forages only when underseeded to flax, oats, wheat or barley. DO NOT use on Flemish varieties of alfalfa. [6] For use as a spot treatment only control red bartsia. [7] Apply to fall prior to seeding. [8] All products may not be registered for crops and weeds indicated. Check product labels. [9] For forage production only. [10] Check recommendations for varietal restrictions. [11] CLEARFIELD varieties only. [12] Liquid formulations in spring only. [13] *Bonanza 10G, Treflan EC* (spring only). [14] *Treflan EC* in spring only. [15] Apply to seedlings stands that will be in production for three years after application and establishment stands that will be in production for 2 years after application. [16] May not include Solin (low linolenic acid flax). Check product label for restrictions. [17] Fall application only. [18] For application prior to emergence of the crop. [19] forage or seed production.

Table 22b. Weed Control in Forage Crops - Weeds

			GRASSES						BROADLEAVED WEEDS																														VOLUNTEER CROPS			
HERBICIDE	Page	Herbicide Mode of Action Group	Barnyardgrass	Foxtail Barley	Foxtail, Green	Foxtail, Yellow	Quackgrass	Wild Oats / Tame Oat	Blue Bur	Buckwheat, Wild	Burdock	Chickweed	Cleavers	Cockle, Cow	Cocklebur	Dandelion	Dock, Curled	Flixweed	Goat's-beard	Goosefoot, Oat-leaved	Hawk's-beard, Narrow-leaved	Hemp-nettle	Knotweed, Prostrate	Kochia†	Lamb's-quarters	Lettuce, Prickly	Mustard, Wild	Night-flowering Catchfly	Pigweed, Prostrate	Pigweed, Redroot	Pigweed, Russian	Plantain, Common	Radish, Wild	Ragweed, False / Giant	Russian Thistle	Scentless Chamomile	Shepherd's-purse	Smartweed, Lady's-thumb	Sow-thistle (Annual)	Sow-thistle (Perennial)	Stinkweed	Sunflower, Prairie / Annual	Thistle, Canada	Cereal Grains (wheat, barley)	Flax	Canola	Alsike Clover
2,4-D	105	4							•		•				•	TG	•	•[5]	•	•	•[5]			•	•	•	•	•	•		•	•	•	•		•[5]	•	•	TG	•[5]	TG	TG			•	
2,4-DB	109	4								•						TG	S			•	•				•		•			•		•	•	•			•	S		TG	•		TG				
Authority 480	449									•														•	•					•				S												
Avadex Liquid EC	484	15						•[2]																																						
Bentazon	141	6										•	•		•										•		•		S				•		S		•	•			•		TG			•	
Bromoxynil	152	6							•	•				•	•									•	•		•		•	•	•				•			•			•						
Bromoxynil / MCPA Ester	152	4,6							•	•				•	•			•						•	•		•	•		S[4]					•	•[5]	•	•		TG	•		TG			•	
Clethodim	178	1	•		•	•	S	•																																				•			
Clopyralid	188	4								•																										•				TG			•				•
Curtail M	193	4								•	•				•	•[7]		•[5]						S	•	•	•			•	•	T	•	•		•[5]	•	•	•	TG	•[5]	•	TG			•	
Dicamba + 2,4-D	201	4							•	•	•		•	•	•			•	•		•[5]			•	•	•	•			•	•	•	•	•	•		•	•		TG		•	TG			•	
Dicamba / Mecoprop / MCPA	207	4								•			•	•				•				•	•	•	•		•	•	•	•					•		•	•	•	TG	•	•	TG			•	
Ethalfluralin	229	3	•		•	•		S[2]		•		•	S	•								S		•	•				•	•					S			S						S			
Eptam Liquid EC	223	15	•		•	•	S	•				•													•				•	•														•			
Fenoxaprop	241	1	•		•	•		•[2]																																						
Fluroxypyr / 2,4-D	265	4							•	•	•	S	•		•	•[5,6]	•[5]	•	•	•[5]				•	•	•	•			•[6]		•	•	•	•[6]		•	•[6]	S	TG	•	•	TG		•	•	
Imazamox+ Bentazon	309	2,6	•		•	•		•		S			S	•										S	•		•		•	•					•		•	•			•			•[1]		•	
Imazethapyr	317	2			S																						•			•							S	•			•					•[1]	
Infinity	321	6,27								•		•	•			S		•				•		•	•		•			•					•		•	•	•	S	•		S			•	
Infinity FX	323	4,6,27								•		•	•			S		•				•		•	•		•			•					•		•	•	•	S	•		S		•	•	
Kerb SC	332	3		•			•	•				•																																•			
MCPA	340	4							•		•				•		•	•		•		S[3]		•	•	•	•			•	•			•	TG		•[5]		TG	TG			TG				
MCPB + MCPA	344	4															•					S			•		•			•		•	S	•			•		S	TG	•[5]		•			•	
Metsulfuron	353	2							•	S		•		•				•				•			S		•		•	•					S	•	•	•	S	S	•		S			•[1]	
Odyssey NXT	312	2	•		•			•		S		•	•					•				S			S		•			•					•		•	•			•			•[1]		•[1]	
Poast Ultra	388	1	•	S	•	•	S	•																																				•			
Prestige XC (see clopyralid/ MCPA + fluroxypyr)	195	4								•		S	•			•[5]		•[5]				S		•	•		•			•	•					•	•	•	•	S	•	•	S		•	•	
Princep Nine-T	436	1	•			•		•[2]		•															•									•				•									•
Puma Advance	241	1	•		•	•		•																																						
Quizalofop	401	1	•	S	•	•	S	•																																				•			
Select Plus	427	1	•	•	•	•		•																																						
Stellar XL	251									•	•	•	•		•			•				•		•	•	•	•			•	•	•		•			•	•			•	•			•	•	
Thifensulfuron / Tribenuron (2:1)	457	2								•		•	S	•				•			•	•			•		•			•					•	S	•	•		S	•	•	S			•[1]	
Tralkoxydim	476	1	•		•	•		•																																						
Trifluralin	495	3	•		•	•		•[2]		•		•		•									•		•					•					•												
Velpar DF CU	516	5														TG					•															•				TG							

• Control. S –= Suppression. TG – Top growth control.

[1] Will not control CLEARFIELD varieties. [2] For control of wild oats only. [3] Controlled by MCPA K only. [4] Controls redroot pigweed only when a cereal cover crop is used.
[5] Spring seedlings only. [6] Controlled only when growing rapidly. [7] Spring germinating rosettes.

Table 23. Industrial Vegetation Products

HERBICIDE	Page	Herbicide Mode of Action Group	Selective	Bare Ground	Absinthe	Bindweed, Field	Burdock	Thistle, Canada	Dandelion	Dock, Curled	Daisy, English	Flixweed	Foxtail Barley	Gumweed	Knapweed	Leafy Spurge	Narrow-leaved Hawk's-beard	Nodding Thistle	Poplar	Pussy Toes	Red Bartsia	Sage, Pasture	Snowberry	Sow-thistle, Perennial	Stinkweed	Tansy, Common	Wild Rose	Willow	Wormwood, Biennial
2,4-D (500 g/L)	105	4	✓		S	S	•	S	S	•		•		S		S	•	S	S	S	•	S	S	S	•				•
2,4-DB	109	4	✓			S		S	S	•[3]							•[3]							S	•				
Arsenal Powerline[5]	123	2		✓		•	•	•								•			•					•	•		•		
Clearview/Sightline	433/405	2,4	✓		•[3]			•	•	•		•			•[3]		•	•		•				•	•	•			
Dicamba	201	4	✓			S		S	S	S	S				S	S						S	•	S					
Dicamba + 2,4-D	201	4	✓		S	S	•	S	S	S	S	•		S		S		S	S		•	S	•	S	•		•	S	
Escort[5]	225	2	✓					S	•										•[3]					S		•	•	•[3]	
Esplanade[4,5]	227	29		✓		•				•																			
MCPA	340	4	✓			S		S	S	S		•		S[S]		•[3]								S	•				•
MCPB/MCPA	344	4	✓			S		S																S	•				
Milestone	410	4	✓		•[3]			•	S[3]	•[3]					S[3]											S[3]			
Navius Flex[5]	357	2,4	✓					•	•			•			•	•			•				•	•	•	•	•	•	
Overdrive	373	4,19	✓						S							S													•
Restore NXT	413	4			•			•		•					•			•						•		•			
Telar	455	2	✓					•				•					•							•	•	•		S	
Tordon 22K[5]	437	4	✓			•[2]		•							•	•[2]						•							
Vanquish	508	4			•			•								•								•					

• Control. S – Top growth suppression only.
[1] Rates may vary between different brands. Check product page for specific rate for product and use. [2] May require multiple applications for complete control.
[3] Controlled by the highest rate. [4] Weeds emerging from seed only. [5] Soil residual control.

Special Weed Problems

This section identifies specific weeds and some herbicides recommended for control. Refer to the particular crop section or the product label for information on specific products that may be used on the crops and for application instructions.

Absinthe

2,4-D LV Ester (500 g/L) - In grass pastures with no legumes, spray 1.82 L per acre in late June, prior to flowering. Re-treat regrowth in late summer when plants have 6 to 10 inches (15 to 25 cm) of new growth. More than 1 season of treatment may be required.

Casaron - In poplar plantations and shelterbelts, absinthe is controlled with fall applications at a rate of 70 kg per acre.

Dicamba - In grass pasture and rangeland only, apply 240 g ae per acre (see dicamba page for specific formula rates) in 20 to 30 gallons (90 to 135 L) per acre for top growth control when leaves are fully expanded.

Reclaim II /Clearview/Sightline- In grass pastures and rangeland, apply *Reclaim II A/Clearview/Sightline A* at 55 grams per acre plus *Reclaim II B* or 2,4-D 700 ester (with Clearview/Sightline) at 0.69 L per acre or Clearview/Sightline A at 93 grams per acre for season long control.

Restore II /Milestone - In grass pastures and rangeland, apply *Restore II* at 0.97 L per acre or Milestone at 202 mL per acre when weeds are actively growing.

Alders

2,4-D LV Ester (500 g/L) - In grass pastures and non-crop land, apply 1.78 L per acre to the foliage of actively growing brush.

Dicamba + 2,4-D amine or LV ester (500 g/L) - In grass pastures, rangeland and non-crop land, apply dicamba at 2.1 L per 1,000 L of water with 2,4-D LV ester or amine at 4.0 L per 1,000 L of water to the foliage of actively growing brush in the spring or early summer and wet the foliage until the point of runoff.

Aspen Poplar (Trembling Aspen)

Dicamba + 2,4-D amine or LV ester (500 g/L) - In grass pastures, rangeland and non-crop land, apply dicamba at 1.32 L per acre with 2,4-D LV ester or amine at 1.78 L per acre in 20 gallons per acre (90 L per acre) water to the foliage of actively growing brush in spring or early summer.

Escort - In pasture and rangeland, apply *Escort* at 60 grams per acre with non-ionic surfactant at 0.2 L per 100 L spray solution in 10 to 20 gallons per acre (45 to 90 L per acre) water. Apply between mid-June and mid-August after the brush has leafed out, but before the leaves begin to turn their fall colours.

Navius Flex /TruRange - In grass pastures and rangeland, apply *Navius Flex/TruRange* at 135 grams per acre for control of trembling aspen.

Baby's Breath (Perennial)

Dicamba - In grass pastures with no legumes, apply 3.72 L per acre in 10 to 20 gallons per acre (45 to 90 L per acre) water when actively growing.

Reclaim II/Clearview/Sightline - In grass pastures and rangeland, apply *Reclaim II A /Clearview/Sightline A* at 81 grams per acre plus *Reclaim II B* at 0.69 L per acre or *Clearview/Sightline A* at 81 grams per acre for season long control.

Biennial Wormwood

2,4-D LV ester - In grass pastures and non-crop land, apply 2,4-D LV ester (500 g/L) at 1.78 L per acre to the foliage of actively growing plants.

Distinct - *Distinct* applied post-emergent in corn at 115 grams per acre plus a non-ionic surfactant and UAN (liquid 28-0-0) at 1.25 L per 100 L of spray solution will control biennial wormwood (2 to 8 leaf stage). Fallow or post-harvest, *Distinct* applied at 115 grams per acre tank-mixed with glyphosate and *Merge* adjuvant (200 mL per acre) controls biennial wormwood (2 to 8 leaf stage).

Glyphosate - In glyphosate tolerant corn and soybean, apply a single application of 360 g ae per acre.

MCPA - Amine 500 formulations applied at 0.45 to 0.71 L per acre, Ester 600 formulations at 0.42 to 0.61 L per acre and Na formulations at 0.81 to 1.1 L per acre will control biennial wormwood.

Overdrive - In grass pastures and non-crop land, apply at 115 grams per acre for control.

Reclaim II - In grass pastures and rangeland, apply *Reclaim II A* at 55 grams per acre plus *Reclaim II B* at 0.69 L per acre when weeds are actively growing for season long control.

Restore II /Milestone - In grass pastures, apply *Restore II* 0.97 L per acre or *Milestone* at 202 mL per acre for control.

Roundup Xtend /Roundup Xtend 2- Apply *Roundup Xtend* at 1.5 L per acre or *Roundup Xtend 2* at 1.14 L per acre for control of biennial wormwood (2 to 8 leaf stage).

Black Medic

Dichlorprop/2,4-D; Mecoprop-p; dicamba/mecoprop/MCPA; 2,4-D amine or LV ester - Apply in registered crops at registered rates to black medic in the 1 to 4 leaf stage for suppression only.

Chokecherry

2,4-D LV ester - In grass pastures and non-crop land, apply 2,4-D LV ester (500 g/L) at 1.78 L per acre to the foliage of actively growing brush.

Navius Flex/TruRange - In grass pastures and rangeland, apply *Navius Flex /TruRange* at 135 grams per acre for control of chokecherry (up to 3 metres).

Common Tansy

Glyphosate - Apply at 1.9 to 2.8 L per acre in 10 gallons of water per acre (40 L per acre) to actively growing plants that are 8 to 10 inches (20 to 25 cm) tall (summerfallow, stubble and noncropland).

Escort - In pastures, rangeland and rough turf, apply 8 grams per acre in 10 to 20 gallons per acre (45 to 90 L per acre) of water to actively growing plants of less than 4 inches (10 cm) tall. Add non-ionic surfactant at 0.2 L per 100 L of spray solution.

Navius Flex /TruRange - In grass pastures and rangeland, apply *Navius Flex/TruRange* at 68 grams per acre for control.

Reclaim II/Clearview/Sightline - In grass pastures and rangeland, apply *Reclaim II A* at 55 grams per acre or *Clearview/Sightline A* at 55 grams per acre plus *Reclaim II B* at 0.69 L per acre for season long control.

Restore II/Milestone - In grass pastures and rangeland, apply *Restore II* at 0.97 L per acre or *Milestone* at 202 mL per acre for suppression.

Curled Dock

2,4-DB - Apply 0.91 to 1.1 L per acre to young and actively growing plants to give top growth control.

Dicamba - As a patch treatment or in pasture and rangeland, apply 0.92 L per acre *Banvel II* in 10 to 20 gallons per acre (45 to 90 L per acre) water to actively growing weeds for top growth control.

Glyphosate - As a spot treatment, apply 2.83 to 4.86 L per acre (360 g/L formulations or equivalent of other formulations) in 10 gallons per acre (45 L per acre) water when most plants have reached the early bud stage. DO NOT disturb treated plants for at least 10 days following treatment.

MCPA amine, 2,4-D amine - Apply 0.445 to 0.69 L per acre of formulations containing 500 g/L MCPA or 2,4-D amine to give top growth control.

MCPB/MCPA - Apply 1.72 L per acre to plants at the rosette stage for control.

Dichlorprop/2,4-D - 0.71 L per acre for suppression before plants are 2 inches (5 cm) tall.

Reclaim II - In grass pastures and rangeland, apply *Reclaim II A* at 69 grams per acre plus *Reclaim II B* at 0.69 L per acre for season long control.

Restore II - In grass pastures and rangeland, apply *Restore II* at 0.86 L per acre to control curled dock (<4 leaf).

Diffuse and Spotted Knapweed

Dicamba - In grass pastures, rangeland and non-crop land, apply at 1.86 L per acre in 10 to 20 gallons per acre (45 to 90 L per acre) water to actively growing weeds.

Lontrel - Apply at a rate of 82 g ai per acre for control.

Navius Flex/TruRange - In grass pastures and rangeland, apply *Navius Flex/TruRange* at 68 grams per acre for control.

Reclaim II /Clearview/Sightline - In grass pastures and rangeland, apply *Reclaim II A* at 55 grams per acre plus *Reclaim II B* at 0.69 L per acre or *Clearview/Sightline A* at 55 grams per acre for season long control of spotted knapweed or apply *Reclaim II A* at 93 grams per acre plus *Reclaim II B* at 0.69 L per acre or *Clearview/Sightline A* at 93 grams per acre plus 2,4-D amine at 340 to 445 g ae per acre from the rosette to bud stage for diffuse knapweed control.

Restore II/Milestone - In grass pastures and rangeland, apply *Restore II* at 0.57 L per acre or *Milestone* at 120 mL per acre when actively growing to control spotted knapweed. Apply *Restore II* at 0.97 L per acre or *Milestone* at 202 mL per acre for suppression of diffuse knapweed.

Tordon 22K - In rangeland and grass pasture, apply 0.91 L per acre in 90 to 180 gallons per acre (400 to 800 L per acre) of water to actively growing weeds. **WARNING** - Picloram is a very persistent and water-soluble herbicide. DO NOT apply to permeable soil. DO NOT apply to irrigated areas. Take special precautions to prevent drift.

Field Bindweed

2,4-D amine - In grass pastures containing no legumes or as a spot treatment, apply 1.82 L per acre of formulations containing 500 g/L 2,4-D amine at early flowering stage.

2,4-DB - As a spot treatment in labelled crops apply 2.83 to 4.86 L per acre in 10 gallons per acre (45 L per acre) water at the bud stage. DO NOT disturb plants for at least 10 days following treatment. Heavy rainfall within 2 hours of application may wash chemical off the foliage and a repeat treatment may be required. Rainfall occurring within 6 hours after application may reduce control.

Bentazon - In labelled crops, apply 0.71 L per acre followed by 0.71 L per acre 7 to 10 days later. Apply in 20 to 35 gallons per acre (90 to 160 L per acre) water before field bindweed has developed a dark green colour and before it has begun trailing. Use a recommended surfactant (see recommendations under the appropriate crop).

Dicamba - As a patch treatment or in rangeland, apply 1.0 L per acre in 10 to 20 gallons per acre (45 to 90 L per acre) water. Apply when field bindweed is in the flowering stage and allow 3 weeks after treatment before resuming normal summerfallow tillage.

Flexstar GT - *Flexstar GT* applied at 840 mL per acre as a pre-seed or pre-emergent application for soybeans or as an early post-emergent application on 1 to 2 trifoliate leaf stage of glyphosate tolerant soybeans will control field bindweed from the cotyledon to 3 or 4 true leaf stage. For use in the Red River Valley of Manitoba only.

Glufosinate 200SN - Apply *Glufosinate 200SN* to *Glufosinate 200SN* tolerant corn or soybeans at 0.81 L per acre from emergence to 6 leaf stage of field bindweed for season long suppression.

Glyphosate - As a spot treatment, apply 2.8 to 4.9 L per acre (360 g/L formulations or equivalent of other formulations) in 10 to 30 gallons per acre (45 to 135 L per acre) at the full bloom stage or beyond. Allow 7 or more days after application before tillage.

MCPB/MCPA - Apply 1.72 L per acre to plants in spring during rapid growth.

Reclaim II - In grass pastures and rangeland, apply *Reclaim II A* at 55 grams per acre plus *Reclaim II B* at 0.69 L per acre when actively growing for top growth control.

Restore II - For season long control in grass pastures and rangeland only, apply *Restore II* at 0.97 L per acre.

Tordon 22K - In rangeland and grass pasture, apply 3.6 L per acre in 90 to 180 gallons per acre (400 to 800 L per acre) for spot treatment, using hand wand application equipment only, to a maximum of one acre of every two acre area of land. of water to actively growing weeds. **WARNING** - Picloram is a very persistent and water-soluble herbicide. DO NOT apply to permeable soil. DO NOT apply to irrigated areas. Take special precautions to prevent drift.

Field Horsetail

Glyphosate **-** *VP480* at a rate of 1750 g ae per acre plus a non-ionic surfactant at 0.5 mL per 100 L of spray solution is registered for the control of field horsetail in Christmas tree plantations. Research has shown that application in spring or early summer, just after the plants have emerged is the timing that gives the best level of control with glyphosate. The use of a silicone-based adjuvant such as *SylGard/Xiameter* or *Dynamax* will also improve control.

Casaron - In poplar plantations and shelterbelts, apply in early spring or late fall prior to annual weed emergence, or after cultivation has removed existing weeds at rate of 45 to 70 kg per acre.

MCPA amine, potassium and sodium salt mixtures - Apply 0.57 L per acre of formulations containing 500 g/L MCPA after the weeds have fully emerged for top growth control. May be used in wheat, oats, barley, flax and rye.

Foxtail Barley

Flexstar GT **-** *Flexstar GT* applied at 840 mL per acre as a pre-seed or pre-emergent application will control foxtail barley in glyphosate tolerant soybeans (see *FlexStar GT* page). For use in the Red River Valley of Manitoba only.

Focus - Apply in fall or spring as a pre-plant or pre-emergent treatment to wheat, spring or winter, corn or soybeans for pre-emergent suppression of foxtail barley.

Glyphosate - Prior to crop emergence, apply 1 to 2 L per acre (360 g/L formulations or equivalent of other formulations) in 5 to 10 gallons per acre (23 to 45 L per acre) water to foxtail barley at the seedling to heading stage. Late fall applications may provide better control of established plants than spring applications.

Glyphosate - In glyphosate tolerant canola, apply 2 applications, each at 0.5 L per acre (360 g/L formulations or equivalent of other formulations), for season long control.

Inferno Duo - Prior to crop emergence apply 12.75 grams per acre of *Inferno Duo* with 180 to 360 gae per acre of glyphosate.

Kerb SC - Apply registered rates in 20 gallons per acre (90 L per acre) water between October 1 and freeze-up. Use the lower rate on grey-wooded soils or where perennial bluegrass or fescues are the predominant pasture species. DO NOT use *Kerb* for foxtail barley removal in seed grass stands or desired foliage stands of timothy or fescue grass species. At recommended rates, pasture stands of perennial bluegrass and fescue may be reduced by 10 to 15 percent. Where perennial bluegrass and fescues are the dominant pasture species, use the lower rate of *Kerb*. Spray overlaps may seriously harm desirable pasture grass species. Where the grass stand comprises mostly foxtail barley and reseeding to a desirable grass species is required, delay seeding into the *Kerb*-treated soil until the end of June. DO NOT harvest or graze within 60 days of application with *Kerb*. Avoid using *Kerb* on soils having more than 6 percent organic matter.

Quizalofop - In registered crops apply 200 mL per acre to foxtail barley in the maximum 3 to 4 leaf + 3 tiller stage.

Olympus **+ glyphosate** - Preplant surface or postplant preemergence applications of *Olympus* at 5.8 grams per acre tankmixed with glyphosate at 360 g ae per acre controls foxtail barley (seedling to heading stages). For more consistent control of subsequent flushes, follow an application of *Olympus* + glyphosate with an in-crop application of *Varro*.

Goat's-Beard

2,4-D - Apply 125 to 227 g ae per acre in early fall or early spring.

Dicamba - In grass pasture and rangeland only, apply 1.86 L per acre in 20 to 30 gallons (90 to 135 L) per acre when leaves are fully expanded.

Dichlorprop + 2,4-D - Apply 1.62 L per acre in early spring or fall.

Reclaim II - In grass pastures and rangeland, apply *Reclaim II A* at 55 grams per acre plus *Reclaim II B* at 0.69 L per acre when actively growing for season long control.

Restore II - In grass pastures, apply 0.97 L per acre.

Gumweed

2,4-D LV ester - In grass pastures and non-crop land, apply 2,4-D LV ester at 227 to 340 g ae per acre to the foliage of actively growing plants.

MCPA amine, potassium and sodium salt formulations - Apply 0.71 L per acre of formulations containing 500 g/L MCPA for top growth control.

Reclaim II /Clearview/Sightline - In grass pastures and rangeland, apply *Reclaim II A/Clearview/Sightline A* at 55 grams per acre plus *Reclaim II B* at 0.69 L per acre or 2,4-D Amine (*Clearview* and *Sightline*) at 340 g ae per acre when actively growing for season long control.

Restore II/Milestone - In grass pastures, apply *Restore II* at 0.97 L per acre or *Milestone* at 120 mL per acre plus 2,4-D at 340 g ae per acre for season long control.

Hemp Dogbane

2,4-D amine or LV ester - Apply 1.38 to 1.82 L per acre of formulations containing 500 g/L 2,4-D in fall before frost and while plant leaves are green.

MCPA amine, potassium and sodium salt formulations - Apply 0.71 L per acre of formulations containing 500 g/L MCPA for top growth control.

Glyphosate - Apply 2.83 to 4.86 L per acre (360 g/L formulations – see glyphosate page for other rates) when hemp dogbane is in the early bud stage. Apply in 10 gallons per acre (45 L per acre) water. DO NOT disturb treated plants for at least 7 days after application.

Hoary Cress

Glyphosate - As a spot treatment in labelled crops, apply 2.83 to 4.86 L per acre (360 g/L formulations or equivalent of other formulations) in 10 to 30 gallons per acre (45 to 135 L per acre) water when most plants have reached the early bud stage. DO NOT disturb treated plants for at least 10 days following treatment.

Reclaim II - In grass pastures and rangeland, apply *Reclaim II A* at 55 grams per acre plus *Reclaim II B* at 0.69 L per acre acres when actively growing for season long control.

Restore II - For season long control in grass pastures and rangeland only, apply *Restore II* at 0.97 L per acre.

Leafy Spurge

2,4-D amine - Apply 1.82 L per acre of formulations containing 500 g/L 2,4-D at early flowering stage. Repeat at least once to new growth later in the season. Control of established plants and new seedlings will require continued applications for a period of at least 4 to 5 years.

Dicamba - Apply 0.84 L per acre in 10 to 20 gallons per acre (45 to 90 L per acre) water for top growth control when the weed is actively growing. Patch treatment or pasture.

Navius Flex/TruRange - In grass pastures and rangeland, apply *Navius Flex/TruRange* at 68 grams per acre for control.

Tordon 22K - In rangeland and grass pasture, apply 3.6 L per acre in 90 to 180 gallons per acre (400 to 800 L per acre) of water to actively growing weeds. **WARNING** - Picloram is a very persistent and water-soluble herbicide. DO NOT apply to permeable soil. DO NOT apply to irrigated areas. Take special precautions to prevent drift.

Overdrive - In grass pastures and non-crop land, apply at 115 grams per acre for top-growth control.

Locoweeds, Lupines, and Milk-vetches

2,4-D LV ester - In grass pastures and non-crop land, apply 2,4-D LV ester (500 g/L) at 1.78 to 2.75 L per acre at the full bloom stage.

Milkweed

Glyphosate - When making Preharvest applications, use 1.0 L per acre (360 g/L formulations or equivalent of other formulations). For patch treatments, apply 4.86 L per acre (360 g/L formulations or equivalent of other formulations) in 10 gallons per acre (45 L per acre) water. Apply when most plants have reached the bud to bloom stage. Reduced results may occur on plants treated after full bloom as not all milkweed plants reach the required stage of growth at the same time. Repeat treatments may be required. DO NOT disturb plants for 10 days following treatment. DO NOT apply to plants covered with dust.

Pasture Sage

2,4-D LV ester - In grass pastures and non-crop land, apply 2,4-D LV ester (500 g/L) at 1.2 L per acre to the foliage of actively growing plants.

Dicamba - In grass pastures, rangeland and non-crop land, apply dicamba at 1.86 L per acre in 10 to 20 gallons per acre (45 to 90 L per acre) water to actively growing weeds.

Reclaim II/Clearview/Sightline- In grass pastures and non-crop land, apply *Reclaim II A* at 81 grams per acre plus *Reclaim II B* at 0.69 L per acre or *Clearview/Sightline A* at 81 grams per acre for 12 months of control.

Tordon 22K - In rangeland and grass pasture, apply 1.82 L per acre in 90 to 180 gallons per acre (400 to 800 L per acre) of water to actively growing weeds. **WARNING** - Picloram is a very persistent and water-soluble herbicide. DO NOT apply to permeable soil. DO NOT apply to irrigated areas. Take special precautions to prevent drift.

Perennial Smartweed

Glyphosate - Apply 2.0 L per acre (360 g/L formulations or equivalent of other formulations) in 10 gallons per acre water. Apply when vines are a minimum of 8 inches (20 cm) tall, but before flowering.

Poplar

Dicamba + 2,4-D - In grass pasture and rangeland only, apply dicamba at 2.1 L plus 2,4-D 500 amine at 4 L or 2,4-D 600 ester at 3.3 L per 220 gallons (1000 L) of water and apply by wand to the point of runoff when leaves are fully expanded.

Escort - In pasture and rangeland, apply *Escort* at 40 grams per acre with non-ionic surfactant at 0.2 L per 100 L spray solution in 10 to 20 gallons per acre (45 to 90 L per acre) water. Apply between mid-June and mid-August after the brush has leafed out, but before the leaves begin to turn their fall colours.

Glyphosate - As a non-selective spot treatment, apply 1.21 to 2.43 L per acre (360 g/L formulations or equivalent of other formulations) in 10 to 30 gallons per acre (45 to 135 L per acre) water in the summer through early fall when brush is actively growing.

Navius Flex/TruRange - In grass pastures and rangeland, apply *Navius Flex/TruRange* at 135 grams per acre for control of black and balsam poplar as well as plains cottonwood and trembling aspen.

Povertyweed

Dicamba - As a spot treatment or in grass pasture or rangeland apply 1.86 L per acre in 10 to 20 gallons per acre (45 to 90 L per acre) water when weed is actively growing. Dicamba at 0.61 L per acre will provide only top growth control.

Tordon 22K - In rangeland and grass pasture, apply 1.82 L per acre in 90 to 180 gallons per acre (400 to 800 L per acre) of water to actively growing weeds. **WARNING** - Picloram is a very persistent and water-soluble herbicide. DO NOT apply to permeable soil. DO NOT apply to irrigated areas. Take special precautions to prevent drift.

Prairie Everlasting, Prairie Sage

2,4-D LV ester - In grass pastures and non-crop land, apply 2,4-D LV ester (500 g/L) at 1.78 L per acre to the foliage of actively growing plants in the early fall, and repeat in the spring.

Reclaim II/Clearview/Sightline - In grass pastures and rangeland, apply *Reclaim II A/Clearview/Sightline A* at 69 grams per acre plus *Reclaim II B* at 0.69 L per acre or for *Clearview/Sightline* mix with 445 g ae per acre of 2,4-D Amine when actively growing for 12 month control or *Reclaim II A/Clearview/Sightline A* at 81 grams per acre plus *Reclaim II B* at 0.69 L per acre or for *Clearview/Sightline* mix with 445 g ae per acre of 2,4-D Amine for 24 month control.

Purple Loosestrife

(dryland situations only)

Glyphosate - Apply 2.43 L per acre (360 g/L formulations or equivalent of other formulations) in 30 to 60 gallons per acre (135 to 270 L per acre) water when purple loosestrife is actively

growing and at or beyond the bloom stage. If using hand held equipment, apply a 1 to 2 percent solution until plants are wet. Use a 33 percent product solution if using a wiper applicator. DO NOT treat plants over open water. If possible, remove and destroy the flower heads before treatment to ensure prevention of seed set. For large monocultures of purple loosestrife, gradually work from the periphery inward over a number of years to allow competing vegetation to invade the treated area. Sprayed areas should be monitored for new seedlings to prevent re-infestation of purple loosestrife.

Reclaim II - In grass pastures and rangeland, *Reclaim II A* at 93 grams per acre plus *Reclaim II B* at 0.69 L per acre when actively growing for control.

Red Bartsia

2,4-D amine or LV ester - Apply 0.57 L per acre of formulations containing 500 g/L 2,4-D in 10 gallons per acre (45 L per acre) water. On hayland, treat within 10 days after first cutting. Roadsides and pastures should be sprayed as soon as the red bartsia appears, usually in early July. Repeat treatment if necessary for later germination.

Roses

Dicamba + 2,4-D amine or LV ester (500 g/L) - In grass pastures, rangeland and non-crop land, apply dicamba at 1.48 L per acre with 2,4-D LV ester or amine at 1.78 L per acre to the foliage of actively growing brush in the spring or early summer.

Escort - In pasture and rangeland, apply *Escort* at 12 grams per acre with non-ionic surfactant at 0.2 L per 100 L spray solution in 10 to 20 gallons per acre (45 to 90 L per acre) water. Apply between mid-June and mid-August after the brush has leafed out, but before the leaves begin to turn their fall colours.

Grazon XC - In permanent grass pasture and rangeland, apply *Grazon XC* at 2.5 L per acre for control.

Navius Flex/TruRange - In grass pastures and rangeland, apply *Navius Flex/TruRange* at 68 grams per acre for control of wild rose.

Reclaim II - In grass pastures and non-crop land, apply *Reclaim II A* at 81 grams per acre plus *Reclaim II B* at 0.69 L per acre for 2 years of control.

Russian Knapweed

Dicamba - In grass pasture and rangeland only, apply 3.72 L per acre in 20 to 30 gallons (90 to 135 L) per acre when leaves are fully expanded.

Reclaim II - In grass pastures and rangeland, apply *Reclaim II A* at 55 grams per acre plus *Reclaim II B* at 0.69 L per acre when weeds are actively growing for season long control.

Restore II/Milestone - In grass pastures and rangeland, apply *Restore II* 0.97 L per acre or *Milestone* at 202 mL per acre when actively growing for suppression.

Tordon 22K - In rangeland and grass pasture, apply 1.82 L per acre in 90 to 180 gallons per acre (400 to 800 L per acre) of water to actively growing weeds. **WARNING** - Picloram is a very persistent and water-soluble herbicide. DO NOT apply to permeable soil. DO NOT apply to irrigated areas. Take special precautions to prevent drift.

Saskatoon

2,4-D LV ester - In grass pastures and non-crop land, apply 2,4-D LV ester (500 g/L) at 1.78 L per acre to the foliage of actively growing brush.

Stinging Nettle

2,4-D amine - Apply 0.91 to 1.82 L per acre of formulations containing 500 g/L 2,4-D amine.

Restore II - In grass pastures and rangeland, apply *Restore II* 0.57 L per acre.

Toadflax (Yellow)

Dichlorprop/2,4-D - Apply 0.71 L per acre in 10 to 18 gallons per acre (45 to 80 L per acre) water in wheat or barley for toadflax suppression. Apply when majority of toadflax is no taller than 6 inches (15 cm). The use of Dichlorprop/2,4-D for suppression of toadflax in wheat or barley should be part of a long-term planned approach for toadflax control, which includes spring and fall tillage, fall patch spraying, fallow.

Glyphosate - Apply 2.83 to 4.86 L per acre (360 g/L formulations or equivalent of other formulations) when most plants have reached the early bud stage of growth. Allow 7 more days after application before tillage. A rate of 1.0 L per acre may be used with preharvest applications or when controlling in summerfallow situations.

Grazon XC - In permanent grass pasture and rangeland, apply *Grazon XC* at 1.9 L per acre for control. Use a recommended surfactant (such as any non-ionic surfactant) at the rate of 0.25 L per 100 L of water.

Metsulfuron plus 2,4-D - Apply 2 to 3 grams per acre *Ally* plus 0.34 to 0.45 L per acre 2,4-D LV ester or amine (500 g/L formulations) in 10 gallons per acre (45 L per acre) water for toadflax suppression in wheat, barley, and creeping red fescue. Add non-ionic surfactant at 0.2 L per 100 L of spray solution.

Navius Flex/TruRange - In grass pastures and rangeland, apply *Navius Flex/TruRange* at 68 grams per acre for suppression.

Thifensulfuron/tribenuron (2:1) - In registered crops, apply 8 grams per acre of DG formulations or 12 grams per acre of *Refine SG* in 10 gallons per acre (45 L per acre) water for suppression of toadflax. Apply when toadflax is less than 15 cm (6 inches) in height. Add non-ionic surfactant at 0.2 L per 100 L spray solution.

Tordon 22K - In rangeland and grass pasture, apply 3.6 L per acre in 90 to 180 gallons per acre (400 to 800 L per acre) of water to actively growing weeds. **WARNING** - Picloram is a very persistent and water-soluble herbicide. DO NOT apply to permeable soil. DO NOT apply to irrigated areas. Take special precautions to prevent drift.

Western Snowberry (Buckbrush)

2,4-D amine or LV ester (500 g/L) - Apply 1.82 L per acre 2,4-D amine or LV ester in a minimum of 20 gallons per acre (90 L per acre) water in spring or early summer. Retreatment may be necessary the following year.

Dicamba plus 2,4-D LV ester (500 g/L) - Apply 1.48 L per acre dicamba tank mixed with 1.82 L per acre 2,4-D LV Ester in 20 gallons per acre (90 L per acre) water in spring or early summer after the leaves are fully expanded.

Escort - Apply 10 grams per acre in 10 to 20 gallons per acre (45 to 90 L per acre) water between mid-June and mid-August after the brush has leafed out, but before the leaves turn their fall colours.

Navius Flex/TruRange - In grass pastures and rangeland, apply *Navius Flex/TruRange* at 68 grams per acre for control.

Reclaim II/Clearview/Sightline - In grass pastures and non-crop land, apply *Reclaim II A* at 81 grams per acre plus *Reclaim II B* at 0.69 L per acre or *Clearview/Sightline A* at 81 grams per acre for 2 years of control.

White Cockle

2,4-DB - Apply *Embutox 625* at 1.1 L per acre or *Caliber 400* at 1.7 L per acre or *Cobutox 600* at 1.1 L per acre for top growth control to registered crops only.

***Barricade II* + MCPA Ester (190 mL per acre)** - In registered crops apply to white cockle up to 10 cm in height.

Express SG - Apply in a mix with glyphosate prior to seeding registered follow crops to control spring rosettes. In rangeland apply 20 grams per acre from the early bud to pre-bloom stage.

Mecoprop - Apply 2.2 L per acre in 18 gallons per acre (*80 L per acre) of water for top growth control of established plants. Will also control seedlings. Apply to registered crops only.

Navius Flex/TruRange - In grass pastures and rangeland, apply *Navius Flex/TruRange* at 68 grams per acre for control.

Travallas - In registered crops apply to white cockle up to 10 cm tall or across.

Wolf Willow (Silverberry)

Dicamba + 2,4-D amine or LV ester (500 g/L) - In grass pastures with no legumes, apply dicamba at 2.1 L per 1000 L of water with 2,4-D LV ester or amine at 4.0 L per 1000 L of water to the foliage of actively growing brush in the spring or early summer and wet the foliage until the point of runoff.

Reclaim II/Clearview/Sightline - In grass pastures and non-crop land, apply *Reclaim II A* at 81 grams per acre plus *Reclaim II B* at 0.69 L per acre or *Clearview /Sightline A* at 81 grams per acre plus 2,4-D Amine at 445 g ae per acre for 2 years of control.

Wild Tomato

2,4-D or MCPA amine or ester (500 g/L) - Apply 0.34 to 0.45 L per acre to registered crops up to the 8 leaf stage of wild tomato.

Bromoxynil+MCPA ester - Apply 0.40 L per acre to registered crops from the 1 to 6 leaf stage of wild tomato.

Willow

2,4-D LV ester - In grass pastures and non-crop land, apply 2,4-D LV ester (500 g/L) at 1.78 L per acre to the foliage of actively growing brush.

Dicamba + 2,4-D - In grass pasture and rangeland only, apply dicamba at 1.7 L plus 2,4-D 500 amine at 3.24 L per acre in 20 to 30 gallons (90 to 135 L) of water per acre when leaves are fully expanded.

Escort - In pasture and rangeland, apply *Escort* at 40 grams per acre with non-ionic surfactant at 0.2 L per 100 L spray solution in 10 to 20 gallons per acre (45 to 90 L per acre) water. Apply between mid-June and mid-August after the brush has leafed out, but before the leaves begin to turn their fall colours.

Glyphosate - As a non-selective spot treatment, apply 1.21 to 2.43 L per acre (360 g/L formulations or equivalent of other formulations) in 10 to 30 gallons per acre (45 to 135 L per acre) water in the summer through early fall when brush is actively growing.

Grazon XC - In permanent grass pasture and rangeland, apply *Grazon XC* at 2.5 L per acre for control.

Navius Flex/TruRange - In grass pastures and rangeland, apply *Navius Flex /TruRange* at 135 grams per acre for control.

Soil Residual Herbicides

When applied at recommended rates in a crop, most herbicide residues will disappear within a few weeks after application and impose no restriction on cropping options the next year. However, some herbicide residues do not degrade quickly, and can persist in the soil for months or years following application, thereby restricting the crops that can be grown in rotation. Herbicide residues in the soil are deactivated in various ways including:

- Break down by chemical reactions,
- Break down by soil microbes,
- Escape to the atmosphere as a gas (volatilization),
- Break down by light (photodegradation),
- Leaching,
- Binding to soil particles.

Herbicides often disappear from the environment by more than one of these mechanisms. Many herbicides considered to be non-residual are bound temporarily to soil particles while they are broken down gradually by either soil microbes or chemical reactions. The binding action insures that the herbicide is not available to the crop in quantities that will cause damage.

As a general rule, breakdown processes are favoured by warm, moist soil conditions. During the winter, when the ground is frozen, and in the summer when the soil is dry, herbicide degradation is reduced. The residual activity of certain herbicides is also affected by soil organic matter and soil pH. These soil factors are seldom uniform across a field.

Herbicide carryover is aggravated by low levels of organic matter and is more likely to occur on eroded hilltops than in other parts of a field. The risk of herbicide carryover will also be greater in sprayer overlaps which are most common around headlands and slough margins.

Growers should be aware of the residual properties before applying any herbicide if they are to avoid cropping restrictions in following years. Knowledge of the limitations associated with herbicides that leave a soil residue, along with an accurate record of application (e.g. rates, locations) will serve to minimize rotational problems. Each herbicide used in mixes should be considered separately.

Soil tests using chemical extraction cannot always give a good indication of the potential injury risk from herbicide residue because of the influence of organic matter, clay and pH. Because of this, a field bioassay or laboratory bioassay, where plants are grown directly in the treated soil are best for detecting the potential for injury. These tests are not intended to be used to shortcut restrictions on the label, but provide information on rotational crops where none is available.

Injury symptoms from other causes can resemble herbicide carryover injury (e.g. cold weather, flooding, drought, insects, diseases, etc.). Consult with your local agronomist on potential causes before spending money on testing.

Herbicides that leave a soil residue and are of particular concern in Western Canada are found in the following chart.

Re-cropping Restrictions for Residual Herbicides:

Figures listed are the number of cropping seasons before each crop can be grown ("1" means that the crop can be grown the year following application). For plant-back restrictions less than one season; the delay is indicated with a "d" for number of days or with "mths" for the number of months. A blank space means that there are no recommendations given on the product label and a field bioassay is recommended by many product manufacturers to determine if these crops are safe to plant. A field bioassay is a strip of a test crop that covers an area of the field that is representative of the field variation and should include an untreated area.

PRODUCT	Alfalfa	Barley	Canaryseed	Clearfield canola	Non-Clearfield canola	Fababeans	Field corn	Dry beans	Field Peas	Flax	Forage grasses	Lentils	Mustard†	Oats	Potatoes	Rye	Soybeans	Sunflowers	Wheat (durum)	Wheat (spring)	Wheat (winter)
2,4-D*	1	1	1	1	1		1	1	1	1	1	1		1		1			1	1	1
Altitude FX3		1		1	1				1	1		1	2	1				1		1	3 mths
Amitrol 240		1d	1	1d	1d		10d*	10d*	5d*	1		1	1	1			6d	1	1d	1d	1d
AAtrex, Primextra II Magnum						1*	1		1*	1*											
Ares		1	1	1	2		1		1	2		1		1				2	2	1	
Assert (Black and Grey Wooded soils)		1	2	1	1				1	1				2				1	1	1	
Assert (Brown and Dark Brown soils)		1	2	1	2				2	2				2				1	1	1	
Authority 480◊	1	1	1	1	1	0	1		0	0		2	1	1	1		0	0	1	1	4 mths
Authority Strike◊	1	1				0	1		0	0		2	0		0		0	0	1	1	4 mths
Authority Supreme		1		1	1		1		0			2	1	1			0	0	1	1	4 mths
Clomazone, *Command Charge, IPCO Trigon*		1		0	0		1	1	1			1	0	1	1		0		1	1	4 mths
Clopyralid/MCPA (+/- fluroxypyr)	2	1	2	1	1	2	1	2	1*	1	1	2	1	1		1	2	2	1	1	1
Dicamba*		1		1*	1*		1	1*						1			1		0*	0*	1
Dicamba/Fluroxypyr		1	2	1	1	2	2	2	1	1	1	1	1	2	2	1	2	2	1	1	1
Eclipse, Clopyralid		1		1	1				10 mths*	1	1		1	1		1			1	1	
Ethalfluralin	0		2	0	0	0		0	0		2	0	0	2			0	0	1*	1*	
Express Pro		1d		10 mths	10 mths	10 mths	10 mths	10 mths	10 mths	10 mths		10 mths		1d			10 mths		1d	1d	1d
Fierce							7 days										0			7 days	
Flextstar GT							10 mths	10 mths									10 mths			10 mths	4 mths
Florasulam	1		1	1		1	1	1*	1		1	1	1	1		1	1	1	1	1	
Florasulam/fluroxypyr + MCPA		1		1	1				1					1					1	1	1
Florasulam + glyphosate (prior to Aug 1)		0d		1	1				1					0d					0d	0d	0d
Flucarbazone (Brown soils)																				1	
Flucarbazone (Dark Brown soils)		1		1	1				1*	1							1	1	1	1	
Flucarbazone (Black soils)		1		1	1			1	1*	1							1	1	1	1	
Flucarbazone (Grey-Wooded soils)		1		1	1				1*											1	
Fluroxypyr, *Sentrallas*	1***	1		1	1	1***	1***	1***	1	1	1	1	1	1	1***	1	1***	1***	1	1	1
Focus		1		1	1		0		0	1		0	1	1			0	0	1	0	0
Frontier Max							0*	0*													1
Heat Complete		**1**		**1**	**1**	**1**		**0**	**0**	**1**		**0**			**1**		**0**	**0**	**1**	**1**	4 mths
Imazamox/Imazethapyr*, *Odyssey Ultra Q**	1	1	2	1	2		1		1	2		1†††		1			1	2	2	1	
Imazethapyr	1	1		0					0			1								1	
Imazamox, Imazamox+bentazon, Image		1	1	1	1		1		1	1		1	2	1			1	1	1	1	3 mths
Infinity / Tundra / Velocity m3	1	1	1	1	1		1		1	1		2		1			1		1	1	
Kerb SC	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2
Korrex		0		1	1		1	1	1	1		1	1	0	1		1	1	0	0	0

PRODUCT	Alfalfa	Barley	Canaryseed	Clearfield canola	Non-Clearfield canola	Fababeans	Field corn	Dry beans	Field Peas	Flax	Forage grasses	Lentils	Mustard†	Oats	Potatoes	Rye	Soybeans	Sunflowers	Wheat (durum)	Wheat (spring)	Wheat (winter)
Metolachlor							1								1		1				4.5 mths
Metribuzin				2	2	0			0						0*		0*	2			
Metsulfuron (pH less than 7, Brown and Dark Brown		1	4		2					2		3	4	1					1	1	
Metsulfuron (pH less than 7, other soils)		1	4		1					1		3	4	1					1	1	
Metsulfuron (pH 7 to 7.9, Brown and Dark Brown soils)		1	4		3					3		4	4	2					1	1	
Metsulfuron (pH 7 to 7.9, other soils)		1	4		2					3		4	4	1					1	1	
Muster	2	1	2		2	2		2	2	1	2*	2	2	1					1	1	1
Nicosulfuron	10 mths	10 mths		10 mths	10 mths		10 mths										10 mths			1	4 mths
Option	1	1		1	1		1	1	1					1	1		1			1	1
Paradigm PRE, Exhilarate	1	1		1	1	1	1	1	1	1		2	1	1	1		1	1		1	
Permit WG		2 mths		2	2		1 mths	0	1					2 mths	1		1	2	2 mths	2 mths	2 mths
Pixxaro		1		1	1		1		1	1		2	1	1			1	1		1	
Quinclorac		0		1	1				1	2		2						1	0	0	
*Reflex**							1	0									1			1	0
Rexade		1		1	1				1	1		2	1	1			1	1		1	
Rimsulfuron, *Sortan IS*		1		1	1	1	0	1	1	1		1		1	1		1	1	1	1	4 mths
Signal FSU		1		1	1				1	1	1	1	1	1		1			1	1	
Simplicity		1		1	1				1	1		1	1	1			1			1	
Smoulder		1d		11 mths	11 mths		11 mths		11 mths	11†† mths		11††† mths		1			11 mths		1d	1d	1d
Tandem		1		1	1				1	1		1	1	1						1	
Thifen:triben (2:1) + fluroxypyr	2	1	2	1	1	2	2	2	1	1	1	1	1	1	2	1	2	2	1	1	1
Thifen:triben (25:25) + fluroxypyr	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
Travallas		10 mths		10 mths	10 mths	10 mths	10 mths	10 mths	10 mths	10 mths		10 mths		10 mths					10 mths	10 mths	10 mths
Trifluralin	0	1*	2	0	0	0	1*	0	0	1*	2	0	0	2		0	0	0	1*	0*	1*
Triallate	0	0	0	0	0	1	1	1	0	0		1	0	2		1	1	1	0	0	0
Triallate/trifluralin		0	2	0	0				0	0		0	0	2		1	1	1	0	0	0
Valtera (Crop uses)	11 mths	11 mths	1	11 mths	11 mths	1	1	9 mths	0	1	1	1	1	1	1	1	0	9 mths	1	0	4 mths
Varro, Predicade	1	1	1	1	1		1	1	1	1	1†	1	1	1			1	1	1	1	10 mths
Voraxor , Voraxor Complete		1		1	1		1	1	1	1		1	1				1		1	1	3 mths

*** The minimum re-cropping intervals are listed. These intervals may be longer than those listed depending on the use rates, region, province, soil types, environment, time of application and crop variety. Refer to product page for more information.**

**** Drought restrictions apply to drought conditions (80% of normal June to September rainfall) for high pH soils (greater than pH 7.5) and severe drought (less than 65% of normal June to Sept. rainfall) for all soils.**

***** May not be supported for all products; see product page for details.**

† May not be valid for all varieties or crop types. See product page for details.

†† in the Brown soil zone, DO NOT seed flax for 22 months.

††† Clearfield lentils ONLY.

◊ Replant intervals are for high rate

0 - May be seeded or reseeded the year of application. No re-cropping restrictions. 1 - Next cropping season after application. 2 - Two cropping seasons after application. NR - Not recommended.

Note: The re-cropping intervals listed may not be sufficient to prevent crop injury during periods of below average rainfall.

Effect of Rainfall on Herbicide Efficacy

Required Interval	Product
15 minutes	Diquat
30 minutes	clodinafop
1 hour	*Axial Xtreme, Axial Xtreme iPak, Blackhawk EVO, Broadband,* bromoxynil, bromoxynil/MCPA ester, bromoxynil/MCPA+fluroxypyr, carfentrazone, clethodim, dicamba/fluroxypyr, *Enforcer D, Erebus Xtreme, Exhilarate,* fenoxaprop, flucarbazone, Inferno Trio, flucabazone+tribenuron, fluroxypyr, *Infinity, Insight Liquid SC, Oxbow, OnDeck, Paradigm PRE,* pinoxaden, *Pixxaro, Poast Ultra, Predicade,* quizalofop, *Refine SG, Shieldex,* Thifen:Triben (25:25), tralkoxydim, *Traxos, Tundra, Varro, Varro FX, Velocity m3*
2 hours	2,4-D LV Ester, *Aatrex* (post-emergent application), *Ares SN, Avenza*, metsulfuron+2,4-D LV Ester, *Enlist Duo,* fluroxypyr + 2,4-D ester, MCPA Ester, *Simplicity, Travallas, Tridem*
3 hours	*Altitude,* dicamba/mecoprop-p/MCPA, imazamox, imazamox/imazethapyr, *Odyssey Ultra Q, Solo Ultra Q, imaxamox/quizalofop*
4 hours	2,4-D Amine, *Cirpreme, Distinct*, glufosinate (all), *Hurricane*, *Manipulator 620*, MCPA Amine, metsulfuron + 2,4-D Amine, *Navius Flex/TruRange*, nicosulfuron, *Overdrive, Permit WG* (post-emergent applications), *Reflex, Rexade,* rimsulfuron, *Signal FSU, Tandem*, thifensulfuron:tribenuron (2:1) 75% WDG, *Steadfast IS , Advantage Glufosinate 280*
6 hours	*Assert,* clopyralid/MCPA (+/- fluroxypyr), MCPA-K, MCPA Sodium Salt, metribuzin, *Muster, Option,* quinclorac, *Tordon 22K,* tribenuron, *Triton K, Ultra Blazer, Advantage Glufosinate Plus*
8 hours	Bentazon, *CleanStart*
No specific recommendation*	2,4-DB, *Akito,* bromoxynil/2,4-D ester, clopyralid, dicamba, dichlorprop/2,4-D, *Enforcer D, Escort, Express FX*, *Express Pro,* florasulam/fluroxypyr + MCPA, florasulam + glyphosate, fluroxypyr+MCPA, fluroxypyr+MCPA+bromoxynil, glyphosate, *Grazon XC,* imazamox+bentazon, imazethapyr, *Korrex II, Lorox L*, MCPB/MCPA, mecoprop-p, *Momentum, Optica Trio, Reclaim II, Restore II, Restore NXT, Topline,* topramazone

*** The products listed make no specific time recommendation on the label. The required rainfree period could be up to 8 hours. See the product page in the guide or consult the product label.**

Note: The term "Rainfastness" refers to the time needed between application and rainfall to avoid significant reduction in efficacy. Rainfall shortly after application of most post-emergent herbicides may reduce weed control. Effect will vary with product, the interval between spraying and rainfall and the intensity and duration of the rainfall. These guidelines are based on label information. Use the longest time interval on the component products when considering tank mixes.

Products Available as Prepackaged Tank Mixes

Product Name (Manufacturer)	Component 1 or A	Component 2 or B	Component 3 or C	Crops	Weeds Controlled	Area Treated per Package	
						Acres	Ha
Ammo DR (Agracity)	dicamba (*Ammo*)	Thifensulfuron: tribenuron - 2:1 (*MPower R*)	2,4-D Ester	Barley, spring wheat	See component products	40/960	16/388
Anaconda (Agracity)	Imazamox (*Samurai*)	Bentazon (*Boa*)	Quizalofop (*MPOWER Quiz*)	Field pea	See component products	40	16
Boa IQ (Agracity)	Imazamox (*Samurai*)	Quizalofop (*Quiz*)		Dry beans, faba bean, field pea, soybean	See component products	20/120	8/48
Boa Pro (Agracity)	Imazamox (*Samurai*)	Bentazon (*Boa*)		Field peas, soybeans	See component products	40	16
Deathstar (Agracity)	Imazamox (*Battlefront*)	Fluroxypyr (*Foxxy*)	MCPA 600 Ester	Barley, wheat (spring, durum)	See component products	40	16
Cirpreme (XC) (Corteva)	*Paradigm*	*Lontrel 360 (XC)* (see Clopyralid)	Must be mixed with MCPA purchased separately	Wheat (including durum) and barley	See component products includes Canada thistle, cleavers and dandelion	40	16
Command Charge	*Aim*	*Command 360ME*		Prior to seeding canola	See component products	80	32
Emphasis (ADAMA) *Revenge B* (Agracity) *COOP/IPCO Octagon* (FCL/IPCO)	Carfentrazone	Bromoxynil		Prior to seeding canola	Weeds controlled by component products plus: Volunteer canola	80	32
Davai Q Plus (ADAMA)	Imazamox (*Davai 80 SL*)	Quizalofop (ADAMA *Quizalofop*)		Dry beans, soybeans, CLEARFIELD lentil, field peas	See component products	40	16
Foxxy M (Agracity) *Trophy* (Nufarm) *Viking Lidingo* (Viking)	Fluroxypyr *(Nufarm Fluroxypyr, Foxxy, ADAMA Fluroxypyr, Viking Fluroxypyr)*	MCPA *(Nufarm MCPA Ester 600, MCPA Ester 600, ADAMA MCPA 2 EH Estter 600, Viking MCPA Ester 600)*		Barley, wheat (spring, durum)	See component products	40	16
Glyphosate + clopyralid (*Eclipse XC* - Corteva),	Clopyralid *(Lontrel=Eclipse A)*	Glyphosate *(VP480=Eclipse B)*		Glyphosate tolerant canola varieties	See component products	40	16
Intruvix (FMC)	*Express FX*	*Aim EC*		Barley, oats, wheat (spring, durum, winter)	See component products	80	32
IPCO Trigon (IPCO)	Carfentrazone *(IPCO C-Zone)*	Bromoxynil *(IPCO/ COOP Brotex 4AT)*	Clomazone (*IPCO Clomazone*)	Prior to seeding canola	See component products	80	32
Ninja Master (Agracity) *Viking Floro* (Viking)	Imazamox/Imazethapyr *(Ninja)* Imazamox/Imazethapyr *(Viking Skien)*	Clethodim (*Independence*) Clethodim (*Viking Clethodim*)		Field pea	See component products	160	64
Odyssey Ultra Q (BASF)	*Odyssey NXT*	*quizalofop (Caziva Ultra Q*	*Merge* (adjuvant)	Field peas, CLEARFIELD lentil	See component products	40	16
Predicade (FMC)	*Barricade II* (Predicade Broadleaf)	*Varro* (Predicade Grass)	MCPA 600 Ester	Wheat (spring, durum, winter)	See component products	40	16
Python (ADAMA Canada)	Imazamox (*Python A = Davai 80SL*)	Bentazon (*Python B*)		Field peas, soybeans	See component products	40	16
Refine M (FMC), *Broadside* (Loveland)	Thifensulfuron/tribenuron (*Refine SG*)	MCPA Ester		Wheat (durum, spring, winter), barley, oat	See component products	80	32

Products Available as Prepackaged Tank Mixes *continued*

Product Name (Manufacturer)	Component 1 or A	Component 2 or B	Component 3 or C	Crops	Weeds Controlled	Area Treated per Package	
						Acres	Ha
Retain SG (Loveland) *Foxxy Pro RX* (Agracity)	Thifensulfuron/tribenuron (2:1)	Fluroxypyr	2,4-D 700 ester	Wheat (spring, durum) barley	Weeds Controlled by *Refine SG* plus non-Group 2 resistant cleavers	40	16
Emphasis (ADAMA) Revenge B (Agracity) IPCO/COOP Octagon (Interprovincial Cooperatives) Viking Vardo (Viking)	Bromoxynil (*Bromotril 240 EC, Buck, IPCO/ COOP Brotex 4AT, Viking Bromoxynil*)	Carfentrazone *(Emphasis A, Revenge, IPCO C-Zone , Viking Carfentrazone)*		canola	See component products	80	32
Revenge Pro (Agracity) *COOP/IPCO Convex* (Interprovincial Cooperative) *Viking Solna* (Viking)	carfentrazone (*Revenge, IPCO C-Zone, Viking Carfentrazone*)	2,4-D (*MPOWER 2,4-D Ester 700, IPCO/COOP 2,4-D Ester 700, Viking 2,4-D Ester 700*)		Barley, rye, spring wheat	See component products	80	32
IPCO Convex (IPCO) *Revenge Pro* (Agracity)	Carfentrazone	2,4-D Ester		Prior to seeding barley, rye, wheat (spring, durum, winter) or in chem-fallow	Weeds controlled by the component products plus chickweed, horsetail, jimsonweed, kochia, Pennsylvania smartweed and tansy mustard	80	32
Samurai Master (Agracity)	Imazamox (*Samurai*)	Clethodim (*Independence*)		Field pea	See component products	80	32
Solo Ultra Q (BASF)	*Solo ADV*	*quizalofop (Caziva Ultra Q)*		CLEARFIELD lentil, CLEARFIELD canola	See component products	40	16
Tandem (Corteva)	*Simplicity*	*fluroxypyr*		Wheat (spring, durum, winter)	see component products	40	16
Thunderhawk (Nufarm)	*Thunderhawk A* (Goldwing)	*Thunderhawk B* (Florasulam)		Prior to the seeding of barley, oats, wheat (spring only)	See component products	80	32
TraxosTwo (Syngenta)	*Traxos*	*OcTTain* (fluroxypyr+ 2,4-D)		Wheat (spring, durum)	See component products	20	8
Voraxor Complete	Voraxor	Zidua		Prior to the seeding of field corn, soybeans, field pea, lentil	See component products	39 to 80	15.8 to 32

Note: See the component products listed for information concerning staging, application information, safety precautions, the effect of weather and grazing, re-cropping, harvest interval and storage precautions. The more stringent recommendation of the two products should be followed. Mix products in the order listed.

2,4-D

Herbicide Group
4 - 2,4-D

Company and Formulation:

	PCP# (Product Name)	
	600 Amine*	700 Ester**
ADAMA Canada		33111
AgraCity		30460 (MPOWER 2,4-D)*** 34808 (*2,4-D ESTER 700 II*)
Albaugh	31332	29979
Federated Cooperatives		32882
Interprovincial Cooperative Limited	17511	27819
Loveland Products Canada	5931	27818 (*Salvo*)
Nufarm Agriculture	14726	27820
Sharda Cropchem	33920 (*USHA6*)	34240 (*Lima 660EC*)
Viking		34813

*** formulated as a solution.**
**** formulated as an emulsifiable concentrate.**
***** Note: This product is no longer manufactured but inventories still remain in distribution. This product may be removed from future editions.**

- **600 Amine:** 564 g ae/L present as dimethylamine salt.
- **700 Ester:** 660 g ae/L present as 2-ethylhexyl ester.
  - Container size - various

Crops, Rates and Staging:

Application rates for individual products may vary from those listed. Refer to the label for product specific use rates. Rates greater than those listed may cause crop injury.

When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

Post-emergent:

Crop	Maximum Safe Rate (g ae per acre)	Stage
Wheat*, barley, spring rye (including durum)	227 to 283*** (Esters) 227 (Amines)	4 leaf to early flag leaf.
Fall rye, winter wheat**	213 (Esters) 205 (Amines)	In spring, apply after winter cereals begin to grow but before emergence of the flag leaf. From full tillering to prior to flag leaf stage.
Corn**	227 (Amines) 213 (Esters)	Apply as an overall spray before corn is 6 inches (15 cm) tall and before the 6 leaf stage. After 6 inches (15 cm) use a directed spray. Avoid making applications under hot/humid conditions onto corn.
Seedling and established grasses for forage and seed production**	213 (Esters and Amines)	Apply from the 3 leaf stage to emergence of the flag leaf of seedling grasses. For established grasses for seed production, apply in spring up to emergence of the flag leaf.
Established forage grass (not for seed production)**	426 (Esters and Amines)	Apply in spring up to emergence of the flag leaf of established grasses, or in the fall after harvest.

Crop	Maximum Safe Rate (g ae per acre)	Stage
Established grass pastures	907 (Esters and Amines)	No restrictions, apply when weeds are actively growing. For control of brush species, apply at time of rapid growth (usually May to mid-June, and September prior to colour change).

*** Viking 2,4 D Ester is only registered on wheat (including durum and winter wheat).**
**** Note: Registered for use only with certain brands of 2,4-D; use of non-registered products is at the risk of the user.**
***** Note: Rates above 227 g ae per acre can result in crop injury. This injury is typically offset by the benefits of improved weed control.**

Pre-plant or Pre-emergent:

- ***Barley, rye, wheat (spring, winter)*** – Apply 134 to 213 g ea per acre (weeds less than 8 cm) to a maximum of 294 g ae per acre (weeds greater than 8 cm) of *Nufarm 2,4-D Ester 700* or *ADAMA 2,4-D Ester 700 Liquid Herbicide* only prior to seeding or after seeding but prior to emergence of the crop.
- ***Soybean*** – Apply from 134 to 213 g ae per acre of 2,4-D 700 Ester (*Nufarm 2,4-D Ester 700, ADAMA 2,4-D Ester 700 Liquid Herbicide* and *Loveland Salvo* only) 7 days prior to seeding.

Rate per acre*		Formulation	
(g ae)	(oz. ae)	564 g ae/L (600 Amine)	660 g ae/L (700 Ester)
113	4	201 mL	172 mL
125	4.4	222 mL	189 mL
134	4.75	225 mL	202 mL
170	6	301 mL	258 mL
205	7.25	364 mL	311 mL
213	7.5	377 mL	322 mL
227	8	402 mL	344 mL
283	10	503 mL	430 mL
340	12	603 mL	515 mL
483	17	854 mL	730 mL
510	18	905 mL	773 mL
907	32	1608 mL	1374 mL

*** Actual product rates vary somewhat between products for similar uses. Check the product labels for the specific use rate for the product selected.**

Weeds, Rates and Staging:

Apply at lower rates when weeds are small (2 to 4 leaf stage) and actively growing. Higher rates are needed when weeds are larger, in heavy populations, or growing under stressful conditions (excessively cold, hot, dry or wet).

For pre-seed or pre-emergent application of *NuFarm 2,4-D 700 Ester* or *ADAMA 2,4-D Ester 700 Liquid Herbicide* only, apply 134 to 213 g ae per acre to control weeds less than 8 cm tall or 294 g ae per acre before the emergence of cereals to control weeds greater than 8 cm tall or harder to control weeds.

Note: The rates listed differ slightly from product to product. Check individual product labels for exact use rates.

Susceptible Weeds:

125 to 227 g ae per acre

- Bluebur
- Burdock
- Cocklebur
- Daisy fleabane
- False flax
- Flixweed (late fall application or spring seedlings)
- Goat's-beard
- Kochia
- Lamb's-quarters
- Mustards (except dog and tansy mustard)
- Narrow-leaved hawk's-beard (fall application to seedlings or spring application at 1 to 2 leaf stage)
- Plantain
- Prickly lettuce
- Ragweed (common, false and giant)
- Russian pigweed
- Russian thistle
- Shepherd's-purse**
- Stinging nettle
- Stinkweed**
- Sweet clover
- Thyme-leaved spurge
- Volunteer canola (including all herbicide tolerant varieties)
- Wild radish
- Wild sunflower

Harder to control weeds:

227 to 340 g ae per acre

- Annual sow-thistle
- Biennial wormwood*
- Blue lettuce*
- Burdock (top growth only of bolting plants)
- Canada thistle***
- Common chickweed
- Common groundsel**
- Common peppergrass
- Dandelion*
- Flixweed (spring prior to bolting)
- Hairy galinsoga
- Knotweed
- Leafy spurge*
- Mustard (dog and tansy)
- Narrow-leaved hawk's-beard (spring prior to bolting)
- Oak-leaved goosefoot
- Pineappleweed
- Prostrate pigweed
- Purslane
- Redroot pigweed
- Russian knapweed*
- Russian thistle
- Sheep sorrel
- Smartweed (including lady's-thumb)
- Tumble pigweed
- Wild buckwheat*
- Velvetleaf
- Yellowrocket*

Top growth control only (at rates for harder to control weeds):

- Bull thistle
- Buttercup
- Curled dock
- Field bindweed
- Gumweed
- Hedge bindweed
- Hoary cress
- Horsetail
- Mouse-eared chickweed
- Perennial sow-thistle
- Tartary buckwheat
- Volunteer sunflower

*** Control of seedlings at rates given above and top growth control only of established plants.**
**** Spring seedlings. Winter annual weeds – apply in late fall or early spring prior to bolting.**
***** Suppression only. Apply when Canada thistle plants are actively growing and have 6 to 8 inches (15 to 20 cm) of new growth. Regrowth will be present the following spring and in-crop treatments will be required.**

Formulation Characteristics:

Formulation	Risk of Vapour Drift	Activity on Weeds	Risk of Crop Injury
Ester	Medium	Fast	Medium
Amine	Very low	Medium	Low
Choline salt	Very, very low	Medium	Low

Application Information:

- **Water Volume:**
  - ***Ground:*** Minimum 20 L per acre. Water rates depend on product and use. Consult label for details. Higher application volumes (40 L per acre or greater) reduce the risk of crop injury.
- **Nozzles and Pressure:** 40 psi (275 kPa) when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use nozzles and pressures designed to deliver proper coverage with ***ASABE coarse*** droplets.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
2,4-D	POST (foliar)	Synthetic auxin	Moves throughout the plant (Symplast)	Broadleaf only	4

Effects of Growing Conditions:

Best weed control occurs when temperatures are above 21°C (daytime) or 10°C (nighttime) and humidity is above 70 percent. DO NOT apply if temperature exceeds 27°C.

Tank Mixes:

None listed on *2,4-D amine or ester labels*.

Restrictions:

- **Rainfall:**
  - ***2,4-D amine:*** within 4 hours will reduce control.
  - ***2,4-D ester:*** within 2 hours will reduce control.
- **Restricted Entry Interval:** DO NOT enter treated fields for at least 12 hours.
- **Grazing:** DO NOT permit lactating dairy animals to graze fields within 7 days of application. DO NOT harvest forage or cut for hay within 30 days of application. Withdraw meat animals from treated fields at least 3 days before slaughter.
- **Re-cropping:** No recropping guidelines are provided on the labels. As a general guideline, there should be no cropping restrictions the year following an in-crop treatment.
- **Aerial Application:** Some formulations may be applied by air. Check the label for detailed instructions.
- **Storage:** 2,4-D ester may be frozen. 2,4-D amine requires heated storage.
- **Buffer Zones:**
  Hand-held or backpack sprayers, inter-row hooded sprayers and spot treatments are exempt from buffer zone requirements.

Crop	Application method	Buffer Zones (metres†) Required for the Protection of:		
		Aquatic Habitats of Depths		Terrestrial habitat
		Less than 1 m	Greater than 1 m	
Field crops	Ground*	1	1	1
	Fixed wing aircraft	10	0	45
	Helicopter	10	0	40
Fallow, pastures, rangeland	Ground*	1	1	2
	Fixed wing aircraft	15	0	60
	Helicopter	15	0	50

See the Key to Product Pages in the introduction for an explanation of the different habitats.

*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**

† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Refer to introduction.

Hazard Rating:

***Amine 600* formulations:**

Warning – Poison

***Ester 700* formulations:**

Danger – Poison

Warning – Skin Irritant

Refer to the Introduction for an explanation of the symbols.

2,4-DB

Herbicide Group
4 - 2,4-DB

Company:
Interprovincial Cooperative Limited (*Cobutox 625* – PCP#27911)
Nufarm Agriculture (*Embutox* – PCP#27912)
Loveland Products Canada (*Caliber 625* – PCP#27910)

Formulation:
625 g/L 2,4-DB formulated as an emulsifiable concentrate.
- Container size - 10 L

Crops and Staging:
When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

Crop	Stage
Seedling alfalfa, bird's-foot trefoil*	1 to 4 trifoliate leaf stage
Clover (alsike**, red**, white, Dutch but NOT sweet clover)*	As soon as possible after emergence of the 1st trifoliate leaf
Wheat, barley or oats	5 leaf to emergence of the flag leaf
Field corn	15 inches (40 cm) to prior to tasseling using drop nozzles.
Pastures containing forage legumes	After cutting or grazing and regrowth less than 3 inches (7.5 cm)

*** With or without a cereal cover crop.**
**** Alsike and red clovers may be damaged by 2,4-DB applications.**

Seedling Forage Grasses*:
Apply from 2 to 4 leaf stage of:
- Bromegrass (smooth)
- Fescue (creeping red, meadow, tall)
- Orchard grass
- Timothy
- Wheatgrass (crested, intermediate, streambank, tall)

*** Not for seed production. Not for feeding in the establishment year.**

Weeds and Staging:
Weeds controlled at the 0.71 L per acre rate from the 2 to 4 leaf stage:
- Lamb's-quarters
- Mustard (ball, wild, wormseed)
- Ragweed
- Redroot pigweed
- Shepherd's-purse
- Stinkweed

Weeds controlled at higher recommended rates (0.91 to 1.1 L per acre):

Weed	Stage
Bull thistle	Rosette to early bud stage
Canada thistle*	6 inch (15 cm) to early bud
Chicory	Rosette
Curled dock**	Young and actively growing
Dandelion*	Prior to bud
Field bindweed*	Late summer
Horsetail*	4 to 5 inches (10 to 13 cm)
Narrow-leaved hawk's-beard	Apply at rosette stage after alfalfa has gone dormant
Oak-leaved goosefoot	Up to 2 leaf stage
Perennial sow-thistle*	Rosette
Plantain	Prior to flowering
Smartweed (green, lady's-thumb)**	Seedlings

Weed	Stage
Wild buckwheat	Up to 2 leaf stage
Wild radish	Up to 2 leaf stage
Yellow rocket	Late September to mid-October

*** Top growth control**
**** Suppression**

Refer to individual product labels for details on application rates to use for different weed species.

Rates:

Crop	Rate (L per acre)
Cereals, seedling forage legumes and grasses	0.71 to 0.91
Corn and pastures containing forage legumes	0.71 to 1.11

Application Information:

- **Water Volume:** 61 to 81 L per acre.
- **Nozzles and Pressure:** 30 to 40 psi (200 to 275 kPa) when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use nozzles and pressures designed to deliver proper coverage with a minimum of fine droplets.

How it Works:

Refer to How Do Herbicides Work in introduction for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
2,4-DB	POST (foliar)	Synthetic auxin	Moves throughout the plant (Symplast)	Broadleaf only	4

Effects of Growing Conditions:

Severe damage to legumes can occur if high temperatures (more than 27°C) or high humidity prevail at the time of application. DO NOT apply under dry soil/drought conditions.

Tank Mixes:

Herbicides:

Underseeded Legumes:

- MCPA amine (35 g ae per acre*)
  *** 500 g/L formulation**
- This tank mix may increase crop damage (stunting).
- Follow all precautions and restrictions on both product labels.

Fertilizers: None registered.

Insecticides: None registered.

Fungicides: None registered.

Note: The above mixes are those listed on 2,4-DB labels only.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Not specified on the label. A period of up to 8 hours may be required. Contact the manufacturer for more details.
- **Grazing Restrictions:** DO NOT graze or cut treated crops or forage until 30 days after application.
- **Re-cropping Interval:** No restrictions the year after application.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** May be frozen.

Sprayer Cleaning:

No sprayer clean-out information is provided on the labels. 'Method B' in the introduction, is typically considered effective in cleaning solvent based formulations such as emulsifiable concentrates. Contact the manufacturer for detailed clean-out instructions.

Hazard Rating:

Caution – Poison

Refer to the Introduction for an explanation of the symbols.

AAtrex Liquid

Herbicide Group 5 - atrazine

Company:
Syngenta Canada (PCP#18450)

Formulations:
480 g/L atrazine formulated as a liquid suspension.
- Container size - 2 x 10 L

Crops, Rates and Staging:
Corn (silage, field, sweet): 0.33 to 1.25 L per acre* using the following application methods:
- ***Pre-plant incorporated (PPI).***
- ***Pre-emergent surface (after planting but before emergence of weeds and crop):*** Recommended only on irrigated fields. Inconsistent weed control will occur if 0.5 inches (1.25 cm) of water/precipitation does not occur within 7 days of application.
- ***Post-emergence:*** 1 to 6 leaf stage and when corn is less than 12 inches (30 cm) tall. Add 1.11 to 2.23 L per acre of oil concentrate or 6.88 L per acre crop oil. Crop injury may occur when *AAtrex* and oil is applied post-emergence during cold weather.

When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

*** Use the low rate on crops grown on sandy soils, and where weed infestations are light.**

It is recommended that any products containing atrazine not be used in areas treated with this product during the previous season.

Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Weeds and Staging:
For pre-plant incorporated, pre-emergent and post-emergent (when weeds are less than 4 inches or 10 cm tall) control of the following weeds:
- Lamb's-quarters
- Mustard (wild, wormseed)
- Purslane
- Ragweed
- Redroot pigweed
- Smartweed (including lady's-thumb)
- Volunteer clover
- Wild buckwheat
- Wild oats

Application Information:
- **Water Volume:** Minimum 61 L per acre.
- **Nozzles and Pressure:** 30 to 45 psi (200 to 300 kPa) when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage and a minimum of fine droplets that are prone to drift.
- **Screens:** Use a 50 mesh or coarser screen and filter system.

How it Works:
Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
atrazine	PPI (soil active) POST (foliar)	PSII Inhibitor/ Membrane disruptor	Little foliar; upward soil applied (Apoplast)	Broadleaf & grass	5

Effects of Growing Conditions:
Post-emergent applications made during periods of cold weather may cause crop lightening. Hot, dry weather preceding post-emergent applications may result in reduced weed control. *AAtrex* will move with soil if eroded.

Tank Mixes:
Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides:
- **Pre-Emergent and Pre Plant Incorporated:**
  - *Dual II Magnum*
  - Glyphosate
- **Post-Emergent*:**
  - *Dual II Magnum*
  - Bromoxynil/MCPA (*Buctril M* only)**
  - Bromoxynil (*Pardner* only)

    *** DO NOT use oils or adjuvants with post-emergent tank mixes.**

    **** DO NOT treat after the 6 leaf stage, crop injury may occur.**

Fertilizers: For pre-emergent applications, nitrogen solutions or complete liquid fertilizers may replace all or part of the water as a carrier. *AAtrex* may be impregnated onto dry granular fertilizers. DO NOT impregnate onto nitrate, super- phosphate or limestone.

DO NOT apply *AAtrex* with nitrogen fertilizer after corn has emerged, as crop injury will occur.

Insecticides: None registered.

Fungicides: None registered.

Note: The above mixes are those listed on the *AAtrex* label only.

According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product..

Restrictions:

- **Rainfall:** Within 2 hours of post-emergence applications may result in reduced weed control.
- **Grazing Restrictions:** DO NOT graze or cut for feed before ear emergence.
- **Pre-harvest Interval:** Leave at least 45 days from application to harvest for sweet corn and 60 days for field corn.
- **Re-cropping Interval:** All crops, except corn and triazine-tolerant canola, may be affected the year following the use of atrazine. Flax, peas and faba beans have some tolerance to atrazine residues and are usually not affected by rates of up to 0.9 L per acre applied the previous year. Other more sensitive crops may be affected 2 or more growing seasons after application.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** DO NOT freeze.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:	
	Aquatic Habitats	Terrestrial habitat
Ground only*	10	10

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

- DO NOT mix or load within 30 metres of any wells, lakes, streams, ponds, dugouts or sinkholes.

Sprayer Cleaning:

Refer to 'Method A' in the general section on sprayer cleaning in the introduction. Let solution stand for several hours. Scrub inside surfaces but do not enter tank. Flush sprayer system with water.

DO NOT clean equipment upslope of water bodies or ditches, near cropland or shelterbelts. Clean your sprayer away from areas where family members or others are likely to frequent or walk.

Hazard Rating:

Caution – Eye Irritant

Keep out of reach of children. Harmful if swallowed.

Refer to the Introduction for an explanation of the symbols.

Advantage Glufosinate Plus

Herbicide Group
4 – quinclorac (broadleaf)
10 – glufosinate

Company:
Advantage Crop Protection Inc.

Formulation:
***Advantage Glufosinate Plus* (PCP#34985):** 146 g/L glufosinate ammonium and 15 g/L quinclorac formulated as a solution.
- Container size – 10 L, 120 L, 500 L, 1000 L

Crops and Staging:
Liberty Link Canola – cotyledon to early bolting stage. Temporary crop discoloration (bronzing, speckling) may be observed after application.
DO NOT apply products that contain quinclorac more than once every two years.

Weeds, Rates and Staging:

Weed	Weed Stage (from emergence to stage)	Rate (L per acre)
Cow cockle	4 leaf	0.54
Green foxtail	6 leaf (max. 3 tillers)	
Barnyard grass	4 leaf	0.81
Wild mustard	5 leaf	
Lamb's-quarter, smartweed (lady's thumb)	6 leaf	
Stinkweed	8 leaf	
Volunteer flax	2.5 inches (6 cm)	0.81
Russian thistle	3 inches (8 cm)	
Wild buckwheat	3 leaf	1.08
Redroot pigweed, round-leaved mallow, quackgrass*	4 leaf	
Volunteer wheat, volunteer barley*	4 leaf (max. 2 tillers)	
Hemp-nettle (1 to 3 leaf pairs), shepherd's-purse	6 leaf	
Common chickweed (max. 4 leaf pairs), sow-thistle	8 leaf	
Kochia	3 inches (8 cm)	
Canada thistle*, scentless chamomile	4 inches (10 cm)	
Cleavers	3 whorls (nodes)	1.35
Stork's-bill and heavy populations of wild buckwheat	3 leaf	
Quackgrass (light to moderate** or heavy infestations*)†, wild oats	4 leaf (max. 2 tillers except quackgrass)	
Heavy infestations† volunteer wheat, volunteer barley*	4 leaf (max. 2 tillers)	
Hemp-nettle	8 leaf (1 to 4 leaf pairs)	
Dandelion rosettes	6 inches (15 cm) across	
Flixweed, Canada thistle*	4 inches (10 cm)	

Weed	Weed Stage (from emergence to stage)	Rate (L per acre)
Quackgrass***		1.62
Canada thistle**		

*** Top growth suppression. Plants may return from surviving growing points.**
**** Extended top growth suppression.**
***** Season long control.**
†The company does not provide guidelines for weed densities. When in doubt as to the infestation level, use the high rate or contact the manufacturer.

Application Information:

- **Water Volume: 110 l/ ha**

Apply *Advantage Glufosinate Plus* in a minimum of 110 litres of water per hectare at a pressure of 275 kPa and at a ground speed of 6 to 8 km/h. If check valves are used, apply at 310 kPa. The use of 80° or 110° flat fan nozzles is highly recommended for optimum spray coverage and canopy penetration.

- DO NOT use flood jet nozzles, controlled droplet application equipment or air-assisted spray equipment.
- Uniform, thorough coverage of foliage is important to achieve consistent weed control.

Application of the spray at a 45° angle forward will result in better spray coverage. Follow directions elsewhere on the label for the correct rate and timing of application.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
Glufosinate	POST (foliar)	Glutamine Synthase inhibitor/membrane disruptor	Little movement due to rapid cell leakage (Symplast)	Broadleaf & grass	10
Quinclorac	POST (foliar)	Synthetic Auxin	Throughout the plant (Symplast)	Broadleaf only	4

Effects of Growing Conditions:

Advantage Glufosinate Plus activity is influenced by environmental conditions. Cool temperatures (less than 10°C), drought, and low humidity conditions slow weed growth. Applications made under these stressed conditions may result in reduced weed control. DO NOT apply to crop that is under stress from conditions such as frost, hail, drought or extremes in temperature. Cool weather may delay weed control and if prolonged may results in poor weed control.

Tank Mixes:

Herbicides:

Note: Do not tank mix *Advantage Glufosinate Plus* with herbicides, fertilizers or chemical additives unless recommended on this label or the label of each tank mix partner.

***Liberty Link Canola* only:**
Advantage Clethodim 240 – 26 mL per ac
FBN Clethodim 240 – 26 mL per ac

Note: The above mixes are those listed on the *Advantage Glufosinate Plus* label only.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction. According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Restrictions:

- **Rainfall:** Within 6 hours of application may reduce control.
- **Restricted Entry Interval:** DO NOT re-enter treated areas for 12 hours after application.
- **Grazing Restrictions:** DO NOT graze, cut for hay, or feed other portions of the treated canola to livestock.
- **Preharvest Interval:** DO NOT within 60 days of harvest when tank-mixed with clethodim or alone.
- **Re-cropping Interval:** in case of crop failure, only canola may be reseeded the same year. No restrictions for canola. 70 days for spring wheat, durum and barley. 10 months for field peas, sunflowers, flax and lentils. 12 months for oats.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** DO NOT Freeze. Store in a cool, dry place. Store this product away from food or feed.

- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground	1		1

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:
Refer to the general section on sprayer cleaning in the introduction.

Hazard Rating:
Warning– Poison
Caution – skin and eye irritant
Refer to the Introduction for an explanation of the symbols.

Akito

Herbicide Group
2 - florasulam
4 - fluroxypyr, clopyralid

Company:
UPL AgroSolutions Canada (PCP#33657)

Formulation:
2.5 g/L florasulam, 100 g/L fluroxypyr, and 80 g/L clopyralid formulated as an emulsifiable concentrate.
- Container sizes - 2 x 8.1 L, 97.2 L

Crops and Staging:
Note: *The use of this chemical may result in contamination of groundwater particularly in areas where soils are permeable (for example, sandy soil) and/or the depth to the water table is shallow. Use should be avoided in these areas.*

Wheat (spring, durum, winter), barley: 3 leaf stage to just before the emergence of the flag leaf.
Oats: From the 3 to 6 leaf stage.
When tank mixing, check broadleaf product description for additional restrictions.

Weeds, Rates and Staging:
Apply early to the main flush of actively growing broadleaved weeds.
Weeds controlled:
- Canada thistle** (10 cm to pre-bud)
- Cleavers (1 to 8 whorls)
- Common chickweed
- Dandelion (up to 30 cm in diameter)
- Kochia (2 to 8 leaf)
- Narrow-leaved hawk's-beard*
- Scentless chamomile
- Shepherd's-purse
- Sow-thistle (perennial)
- Volunteer canola (not CLEARFIELD varieties)
- Volunteer flax (up to 12 cm)
- Wild buckwheat

*** Suppression only.**
**** Season long control, with some regrowth in the fall.**

Rates:
Note: Maximum of one application of this product per year.
400 mL per acre
Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Application Information:

- **Water Volume:**
  - ***Ground:*** Minimum 40 L per acre.
- **Nozzles and Pressure:** Use a combination of nozzles and pressure designed to deliver thorough, even coverage. DO NOT apply with spray droplets smaller than ***ASAE S572.1 coarse*** classification.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
florasulam	POST (foliar) with little soil activity	ALS Amino Acid synthesis inhibitor	Toward regions of growth (symplast)	Broadleaf only	2
fluroxypyr	POST (foliar)	Synthetic auxin	Moves through the plant (symplast)	Broadleaf only	4
clopyralid	POST (foliar)	Synthetic auxin	Moves through the plant (symplast)	Broadleaf only	4

Effects of Growing Conditions:

Warm, moist growing conditions promote active weed growth and enhance the activity of *Akito* by allowing maximum foliar uptake and contact activity. Weeds hardened off by cold weather or drought stress may not be adequately controlled or suppressed and re-growth may occur.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides:

- **In all wheat (spring, durum, winter):**
  - MCPA Ester 600 (up to 0.43 L per acre)
  - 2,4-D Ester 700 (up to 0.52 L per acre)
  - *Simplicity GoDri**
  - *Axial**
  - *Traxos**
- **In barley:**
  - MCPA Ester 600 (up to 0.19 L per acre)
  - 2,4-D Ester 700 (up to 0.52 L per acre)
- **In oats:**
  - MCPA Ester 600 (up to 0.36 L per acre)

  *** Tank-mixes with *Akito* alone or *Akito* + MCPA or 2,4-D**

Note: The above tank mixes are those listed on the *Akito* label only.

According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. See the general guidelines for mixing pesticides for more information.

Restrictions:

- **Rainfall:** No restrictions listed.
- **Restricted Entry Interval:** DO NOT re-enter treated fields for 12 hours.
- **Grazing Restrictions:** MUST NOT be grazed or fed to livestock for 7 days after treatment.
- **Pre-harvest Interval:** Leave 60 days between application and harvest.
- **Re-cropping Interval:** Wheat, barley, oat, rye, canola, flax, or mustard may be seeded in the year following treatment or fields can be summerfallowed. DO NOT seed field peas for at least 10 months following treatment. If severe drought conditions are experienced during the months of June to August inclusive in the year of application, delay seeding field peas an additional 12 months (total 22 months following application).
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store in cool (above 5°C), dry, locked, well-ventilated area. If product is frozen, bring to room temperature and agitate before use.

- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground only*	1	0	1

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:
Refer to 'Method A' in the general section on sprayer cleaning in the introduction. Let solution stand for an extended period for better results. Flush sprayer system with water. See the label for product specific cleaning details.

Hazard Rating:
Danger – Eye and Skin Irritant
Refer to the Introduction for an explanation of the symbols.

Altitude FX3

Herbicide Group
2 - imazamox
4 - fluroxypyr

Company:
BASF Canada

Formulations:
Altitude FX3 contains the following separate components:

***AC 299,263 120 AS* (PCP#26705):** 120 g/L imazamox formulated as a solution.
- Container size - 2.68 L

***Starane II* (PCP#29463):** 333 g/L of fluroxypyr formulated as an emulsifiable concentrate.
- Container size - 5 L

MCPA, 2,4-D, or *Curtail M* must be added and are purchased separately.

Crops and Staging:
CLEARFIELD wheat varieties: 3 leaf (after appearance of first tiller) to 6 leaf stage to ensure optimal crop tolerance. Apply only to CLEARFIELD wheat varieties; application to any other variety of wheat or any other crop will result in crop death.

Weeds and Staging:
Grasses:
Apply from 1 to 4 leaf stage to a maximum of two tillers.
- Barnyard grass
- Foxtail (green, yellow)
- Japanese brome*
- Persian darnel
- Volunteer cereals (barley, canary seed, oats, non-CLEARFIELD spring wheat, durum)
- Wild oats

Broadleaves:
Apply up to 4 leaf stage unless otherwise indicated.
- Cleavers (1 to 4 whorls)
- Cow cockle
- Green smartweed
- Kochia
- Lamb's-quarters
- Redroot pigweed
- Round-leaved mallow*
- Russian thistle*
- Shepherd's-purse
- Stinkweed
- Stork's-bill (1 to 8 leaf)*
- Volunteer canola (except CLEARFIELD varieties)
- Volunteer flax (1 to 12 cm)
- Wild buckwheat
- Wild mustard

*** Suppression**

Rates:

***AC 299,263 120 AS*:** 67 mL per acre.
Starane II: 126 mL per acre.
Altitude FX3 must be tank mixed with one of the registered tank mix options found under the "tank mix" section below. Add a non-ionic surfactant (such as *Agral 90* or *Ag-Surf II*) at 0.25 L per 100 L of spray solution. Surfactant not included.
DO NOT apply *Altitude FX3* or other products containing imazamox or fluroxypyr more than once per season.
Refer to the product label for complete mixing instructions for this product and its mixes. A general guide to mixing can be found in the introduction.

Application Information:

- **Water Volume:** 20 to 40 L per acre.
- **Nozzles and Pressure:** Maximum 40 psi (275 kPa) when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage of ***ASABE coarse*** droplets.
- **Screens:** Use 50 mesh or coarser on both nozzle and primary plumbing screens.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
imazamox	POST (foliar)	ALS Amino Acid inhibitor	Toward regions of growth (Symplast)	Broadleaf & grass	2
fluroxypyr	POST (foliar)	Synthetic Auxin	Toward regions of growth (Symplast)	Broadleaf only	4

Effects of Growing Conditions:

Initial crop injury may be observed after application but this is outgrown and should not affect yield. Severe crop injury will occur as a result of spray overlap. AVOID SPRAYER OVERLAP.
DO NOT spray if temperatures of 5°C are forecast within 3 days of application. Treat crops during warm weather when weeds are actively growing and soil moisture is adequate for rapid growth. Under cool or dry conditions, control of some weeds may be severely reduced.

Tank Mixes:

Herbicides:

- ***Altitude FX3* must be mixed with one of the following:**
  - MCPA or 2,4-D Ester (213 g ae per acre)
  - *Curtail M* (0.61 to 0. 81 L per acre)

Restrictions:

- **Rainfall:** Rainfall within 3 hours after application may reduce activity.
- **Restricted Entry Interval:** DO NOT enter treated fields for at least 12 hours.
- **Grazing Restrictions:** DO NOT graze the treated crop within 14 days of application or cut for hay within 42 days of application.
- **Pre-harvest Interval:** DO NOT apply within 79 days of harvest.
- **Re-cropping Interval:** Winter wheat may be seeded 3 months after application. Barley, canola (all varieties), field peas, flax, lentil, oats, and spring wheat may be grown safely the year following application. Condiment mustard may be grown the second season following *Altitude FX3* application. Conduct a field bioassay the year before growing any other crop than those listed above.
  Note: *Where less than 125 mm of accumulated rainfall is received between June 1 and September 1 in the year of application, or additionally for the brown soil zone where less than 15 mm is received in any single month through June, July and August, regardless of total rainfall during that time, delay planting canaryseed, canola (non-CLEARFIELD), flax, tame oats, winter wheat and durum wheat by an additional year. If the same drought conditions as described above occur in either the year of application or the year following, delay planting tame mustard by an additional year.*
  - *As with other herbicides that break down through microbial activity, additional conditions that may slow breakdown and increase the risk of follow crop injury are soil pH of less than 6.5, organic matter of less than 3 percent, very sandy soils and prolonged cold.*
- **Aerial Application:** DO NOT apply by air.
- **Storage:** DO NOT freeze. Store in a cool, dry place above 5°C. Combustible – DO NOT store near heat or open flame.

- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground only*	15	15	15

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:
Refer to 'Method C' in the general section on sprayer cleaning in the introduction.

Hazard Rating:
Starane II:

Warning – Eye Irritant

Caution – Skin Irritant

Refer to the Introduction for an explanation of the symbols.

Ammo DR

Herbicide Group
2 - thifensulfuron, tribenuron
4 - dicamba, 2,4-D

This product is a a prepackaged tank mix of Ammo (see dicamba), MPower 2,4-D 700 Ester (see 2,4-D) and MPower R (see thifensulfuron:tribenuron (2:1)). Information listed is restricted to Crops, Weeds, Rates and Tank mixes. For other detailed restrictions and general information on the component products see the product pages listed above.

Company:
AgraCity Crop & Nutrition

Formulation:
The *Ammo DR* package contains the following components:
***Ammo* (PCP#34024):** 480 g ae/L dicamba formulated as an emulsifiable concentrate.
- Container sizes - 4.7 L, 113 L

-plus-
***MPOWER 2,4-D 700 Ester* (PCP#30460):** 660 g ae/L 2,4-D formulated as an emulsifiable concentrate.
- Container sizes - 9.8 L, 235 L

plus-
***MPOWER R* (PCP#30945):** 50% thifensulfuron + 25% tribenuron formulated as water dispersible granules.
- Container sizes - 320 g, 24 x 320 g

Crops and Staging:
Spring wheat, barley: 4 to 5 leaf stage

Weeds and Staging:
Unless otherwise noted below, apply to young and actively growing weeds that are less than 4 inches (10 cm) in height or width unless otherwise specified.
Weeds controlled or suppressed by thifensulfuron:tribenuron (2:1) plus the 'susceptible weeds' controlled by 2,4-D plus the weeds controlled by the cereal rate of dicamba (either alone or mixed with 2,4-D).

Rates:
Note: Maximum of ONE APPLICATION of this or other products containing these components per year.
***Ammo*:** 118 mL per acre.
-plus-
2,4-D Ester: 245 mL per acre.
-plus-
***MPOWER R*:** 8 g per acre.
Add *Agral 90, Agsurf II,* or *Citowett Plus* at 0.2 L per 100 L of spray solution if not mixed with a wild oat herbicide.
MPOWER R (thifensulfuron:tribenuron (2:1)) may degrade if left in the sprayer for an extended period. Apply within 24 hours of mixing.
Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Tank Mixes:
None registered.

According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

See component products for more information on restrictions, application details and handling. Unless indicated differently above use the most limiting restrictions across all components for the mix.

Anaconda

Herbicide Group
1 - quizalofop
2 - imazamox
6 - bentazon

*This product is a prepackaged tank mix of Boa Pro (see imazamox/bentazon) and **Quiz** (see quizalofop). Information listed is restricted to Crops, Weeds, Rates and Tank mixes. For other detailed restrictions and general information on the component products see the product pages listed above.*

Company:
AgraCity

Formulation:
The *Anaconda* package contains the following components:

***Samurai* (PCP#33033):** 70% imazamox formulated as a water dispersible granule.
- Container sizes - 470 g, 24 x 470 g

-plus-

***Boa* (PCP#33011):** 480 g/L bentazon formulated as an emulsifiable concentrate.
- Container sizes - 14.5 L, 348 L

-plus-

***Quiz* (PCP#33481):** 96 g/L quizalofop-P-ethyl formulated as an emulsifiable concentrate.
- Container sizes - 8 L, 192 L

Crops and Staging:

Crop	Leaf Stage	Days to Harvest
Field pea	3 to 6 true leaf stage	65

Weeds and Staging:
Weeds controlled by *Boa Pro* (see Imazamox/Bentazon) plus the weeds controlled by *Quiz* (see quizalofop) at 150 mL per acre.

Rates:
Note: Maximum of ONE APPLICATION of this or other products containing imazamox per year.

Samurai: 11.7 g per acre.

-plus-

Boa: 362 mL per acre.

-plus-

Quiz: 200 mL per acre.

Add *Assassin* or *Merge* at 0.5 L per 100 L of spray solution PLUS 28 percent UAN at 0.81 L per acre (both sold separately). Failure to include UAN or adjuvant will result in significantly reduced product performance.

Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Tank Mixes:
None registered.

Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found in the introduction.

See component products for more information on restrictions, application details and handling. Unless indicated differently above use the most limiting restrictions across all components for the mix.

Ares SN

Herbicide Group
2 -imazamox, imazapyr

Company:
Corteva Agriscience (PCP#33167)

Formulation:
33 g/L imazamox and 15 g/L imazapyr formulated as a solution.
- Container sizes - 1 x 9.8 L jug, *Surjet* 8.1 L jug

Crops and Staging:
CLEARFIELD canola: 2 to 7 leaf stage.
CLEARFIELD oilseed mustard (*Brassica juncea*): 2 to 7 leaf stage.

Weeds, Rates and Staging:
Merge or *Surjet* adjuvant must be used at a rate of 0.5 L per 100 L of spray solution.

At 244 mL per acre, *Ares SN* will control:
- ***Grasses*** - From 1 to 6 true leaf stage with up to 2 tillers:
  - Barnyard grass
  - Foxtail (green and yellow)
  - Japanese brome*
  - Persian darnel
  - Volunteer cereals (barley, canaryseed, durum, oats and wheat - NOT including CLEARFIELD varieties)
  - Wild oats

  *** Spring germinating Japanese brome maximum 4 leaf stage.**
- ***Broadleaf Weeds*** - up to 4 leaf stage unless otherwise indicated:
  - Chickweed
  - Cleavers (up to 4 whorls)
  - Cow cockle
  - Green smartweed
  - Hemp-nettle
  - Lamb's-quarters **
  - Redroot pigweed
  - Round-leaved mallow
  - Russian thistle
  - Shepherd's-purse
  - Stinkweed
  - Stork's bill
  - Volunteer canola (not CLEARFIELD varieties)
  - Volunteer tame mustard (not CLEARFIELD oilseed varieties - *B. juncea*)
  - Wild buckwheat**
  - Wild mustard

  **** up to 6 leaf stage**

DO NOT apply *Ares SN* more than once per year or follow *Ares SN* with other products containing the active ingredient imazamox or imazapyr in the same year. Refer to the product label for complete mixing instructions for this product and its mixes. A general mixing guide can be found in the introduction.

Application Information:
- **Water Volume:** 20 to 40 L per acre.
- **Nozzles and Pressure:** Maximum 40 psi (275 kPa) when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE medium*** droplets.
- **Screens:** Use 50 mesh or coarser filter screens for both nozzles and in-line screens. Use 16 mesh suction screens.

How it Works:
Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
imazamox	POST (foliar)	ALS Amino Acid inhibitor	Toward regions of growth (Symplast)	Broadleaf & grass	2
imazapyr	POST (foliar)	ALS Amino Acid inhibitor	Toward regions of growth (Symplast)	Broadleaf only	2

Effects of Growing Conditions:

DO NOT apply to any crops that have been subjected to stress from conditions such as hail damage, flooding, drought, hot, humid weather, widely fluctuating temperature conditions, prolonged cold weather or injury from prior herbicide applications, as crop injury may result. DO NOT spray if temperatures of 5°C or lower are forecast within 3 days of application. Treat crops during warm weather when weeds are actively growing and soil moisture is adequate for rapid growth. Under cool or dry conditions, control of some weeds may be severely reduced.

Tank Mixes:

Herbicides:

- ***In CLEARFIELD canola only. DO NOT apply to CLEARFIELD oilseed mustard:***
  - *Lontrel XC* (52 mL per acre)

Fungicides: None registered.

Insecticides: None registered.

Fertilizers: None registered.

Note: The above mixes are those listed on the *Ares SN* label only.

According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Rainfast within 2 hours of application.
- **Restricted Entry Interval:** DO NOT re-enter treated fields for 12 hours.
- **Pre-harvest Interval:** DO NOT apply within 60 days of harvest of registered crops.
- **Grazing Restrictions:** No information is provided on the label. DO NOT feed treated crops to livestock prior to crop maturity.
- **Re-cropping Interval:** Fields treated with *Ares SN* can be seeded after a minimum of 10 months to spring wheat, barley, canaryseed, chickpea, CLEARFIELD canola/oilseed *B. juncea*, field corn, field pea, or lentil. Non-CLEARFIELD canola, durum, flax and sunflowers may be seeded the second full season after application.
  If rainfall was less than 140 mm during the growing season (June 1st to August 31st) in the year of application, delay seeding rotational crops an additional 12 months. CLEARFIELD crops will be the lowest risk recropping options under these conditions. Contact Corteva Agriscience for additional advice regarding crops grown in rotation. The company recommends that a field bio-assay (a test strip grown to maturity) be conducted the year before growing any crops other than those listed above.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store in a cool, dry place.
- **Buffer Zones:**

Application method	Crop	Buffer Zones (metres†) Required for the Protection of Terrestrial Habitat
Field Sprayer	CLEARFIELD Canola CLEARFIELD Canola Quality *Brassica Juncea*	1

† **Distance measured as metres from the downwind edge of the spray boom to sensitive habitat. DO NOT apply in areas where surface water from the treated area can run off into aquatic habitats.**

Sprayer Cleaning:

Refer to 'Method C' in the general sprayer cleaning section in the introduction.

Hazard Rating:

No specific hazards.

Arsenal PowerLine

Herbicide Group 2 - imazapyr

Company:
BASF Canada (PCP#23713)

Formulations:
240 g/L imazapyr present as the isopropylamine salt, formulated as a solution.
- Container size - 2 x 9.5 L

Crops and Staging:
For control of undesirable vegetation in non-cropland sites (including grazed or hayed areas within these site), low volume foliar brush control* and cut stump treatment. DO NOT use in residential or recreational areas, where bystanders could be exposed during or after application. DO NOT apply to cropland.

*** Please refer to the product label for forestry site preparation and for low volume foliar brush control**

Weeds, Rates and Staging:
Must be applied post-emergence to small, emerged and vigorously growing weeds. Apply with either a non-ionic surfactant at 0.25 L per 100 L of spray solution or methylated seed oil (MSO) at 1 L per 100 L of spray solution. Use higher rate in range for larger weeds or where heavy or well-established infestations occur.

Apply ONE APPLICATION of this product or other products containing Imazapyr per year.

Weeds controlled at 0.95 to 1.21 L per acre:
- Clovers
- Dandelion
- Mustards**
- Foxtail (green, yellow)**

Weeds controlled at 1.21 L per acre:
Above weeds plus:
- Black medick
- Bladder campion
- Bluegrass (annual, Canada)
- Bromegrass
- Bull thistle
- Burdock
- Canada thistle
- Cinquefoil (rough, sulfur)
- Fescues
- Poplar
- Fleabanes
- Field bindweed
- Goat's-beard
- Goldenrod
- Groundsel (common)
- Hemp-nettle**
- Lamb's-quarters**
- Leafy spurge
- Maple
- Milkweed
- Mouse-eared chickweed
- Mulleins
- Old witchgrass
- Ox-eye daisy
- Pigweeds**
- Pineappleweed
- Plantains
- Poison ivy
- Quackgrass
- Ragweed
- Russian thistle**
- Sheep-sorrel
- Stinkweed
- Sow-thistle (annual)*
- Toadflax
- Tufted vetch
- Wild buckwheat**
- Wild grape
- Wild raspberry
- Wild rose
- Wild strawberry
- Yellow nutsedge

**** NOT Group 2 resistant biotypes**

Weeds controlled at 1.21 to 1.86 L per acre*:**
- *Phragmites australis subsp. australis* (European Common Reed)***

***** For control of non-native invasive *Phragmites* only in dry areas. NOT intended for native *Phragmites* control or application where surface water is present. Contact local authorities for definitive *Phragmites* identification. Apply as a low volume directed spray to cover all of the foliage in late summer or early fall while foliage is still green and fully elongated. NOT for application to the soil.**

Cut Stump Treatment:
Control the regrowth of undesirable shrubs and trees after cutting, on non-crop areas. Apply to the cambium (boundary between bark and wood) of freshly cut stump surfaces in summer and autumn months. DO NOT over apply solution causing runoff or pooling.

Mix† at a rate of 63 to 94 mL* with 1 L of water to cut stump to control re-growth of the following brush species:
- Alder
- Aspen
- Ash
- Birch
- Cherry
- Dogwood
- Mountain ash
- Maple
- Oak
- Poplar
- Willow

*** A rate in the upper end of the range is recommended for larger diameter stumps. Antifreeze (ethylene glycol) may be used to prevent freezing.**

† Spray or brush the solution on the cambium area of the freshly cut stump surface. Ensure that the solution thoroughly wets the entire cambium area.

Application Information:

- **Water Volume:** Minimum 40 to 222 L of water per acre.
- **Nozzles and Pressure:** Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE S572.1 medium*** droplets by ground.
- **Equipment:**
  - ***High volume spray equipment:*** High pressure handguns and vehicle mounted high volume directed spray equipment. Use the least amount of water practical to obtain uniform coverage of foliage to avoid runoff from the foliage.
  - ***Boom Sprayer◊†:*** Conventional boom mounted, manifold mounted, and off-centered nozzles. Sprayers without drift reduction systems should use between 25 to 60 psi (175 kPa to 425 kPa).
  - ***Low volume hand held equipment:*** Backpack, knapsack, and other pump-up type pressure sprayers used to direct applications to weed foliage.

  † A foam reducing agent may be added at the recommended label rate, if needed.

  ◊ Spray tank with the agitator running. Boom height must be 60 cm or less above the weed canopy or ground.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
Imazapyr	POST (foliar)	Amino acid synthesis inhibitor	Towards Areas of Growth (Symplast)	Broadleaf and grass	2

Effects of Growing Conditions:

For maximum activity, apply *Arsenal PowerLine* when used alone or with tank mix partners when weeds are small and actively growing.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides:

- *Banvel VM* (0.85 to 1.86 L per acre)
- Glyphosate (except MA salt - see glyphosate)

Fungicides: None registered.
Insecticides: None registered.
Fertilizers: None registered.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** No rainfast period is specified on the label. Contact manufacturer for more information.
- **Restricted Entry Interval:** DO NOT enter into treated areas DO NOT re-enter treated area within 12 hours after application.
- **Grazing Restrictions:** There are no grazing restrictions following application. DO NOT cut forage for hay for 7 days after application.
- **Re-cropping Interval:** DO NOT apply to cropland.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store at temperatures above -12°C. DO NOT mix or store in unlined steel (except stainless steel) containers or spray tanks.
- **Buffer Zones:** Hand-held or backpack sprayer and spot treatment do not require buffer zones.

Use	Buffer Zones (metres†) Required for the Protection of:	
	Aquatic Habitats	Terrestrial habitat
Non-crop areas and forestry site preparation	1	20**
Control of *Phragmites* at high rate	1	30**

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
**** Buffer zones for protection of terrestrial habitats are not required for use on rights-of-way, including roadside and railroad ballast, rail and hydro rights-of-way, utility easements and roads.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Refer to 'Method C' in the general section on sprayer cleaning in the introduction. See the label for product specific cleaning details.

Hazard Rating:

Caution – Eye Irritant

Potential Skin Sensitizer

Refer to the Introduction for an explanation of the symbols.

Audible

Herbicide Group
2 - thifensulfuron, tribenuron
4 - fluroxypyr

This product is a prepackaged tank mix of the equivalent of thifensulfuron/tribenuron and fluroxypyr. Information listed is restricted to Crops, Weeds, Rates and Tank Mixes. For other detailed information on the component products see the product pages listed above.

Company:
Albaugh

Formulation:
The *Audible* package contains the following components:

***Draft* (PCP#31904):** 50% thifensulfuron methyl + 25% tribenuron methyl formulated as a water dispersible granule.
- Container size - 2 x 324 g

***Audible B* (PCP#33387):** 333 g ae/L fluroxypyr formulated as an emulsifiable concentrate.
- Container size - 2 x 5 L

Crops and Staging:
Barley, spring wheat (including durum) and oats: 2 leaf up to and including initiation of stem elongation.
Winter wheat: In the spring from 3 tiller stage until the emergence of the flag leaf.

Weeds and Staging:
Apply from the seedling to 4 leaf or whorl stage (up to 10 cm tall or wide) unless otherwise indicated for the following weeds:
- *Weeds controlled by thifensulfuron/tribenuron plus:*
  - Cleavers (1 to 8 whorls)
  - Kochia (2 to 8 leaf)
  - Stork's bill (1 to 8 leaf)*
  - Volunteer flax (1 to 12 cm)

  *** Suppression only.**

Rates:
Draft: 8 g per acre.
Audible B: 125 mL per acre.

Add *Agral 90, AgSurf, Citowett Plus* at 0.2 L per 100 L of spray solution.

Thifensulfuron and tribenuron may degrade if left in the sprayer for an extended period. Apply within 24 hours of mixing.

Note: Maximum of ONE APPLICATION per year of this or other products containing thifenulfuron, tribenuron or fluroxypyr.

Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Tank Mixes:
Herbicides: None registered.

According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found in the introduction.

See component products for more information on restrictions, application details and handling. Unless indicated differently above use the most limiting restrictions across all components for the mix.

Authority 480

Herbicide Group
14 - sulfentrazone

(this referring text to be removed in the 2027 edition)
see Sulfentrazone

Authority Strike

Herbicide Group
14 - sulfentrazone, carfentrazone

Company:
FMC Corporation

Formulation:
***Authority Strike* (PCP#34867):** 380 g/L sulfentrazone and 42 g/L carfentrazone-ethyl formulated as a suspension emulsion.
- Container size – 4.52 L

Crops, Rates and Staging:
Apply in the spring prior to seeding or up to 3 days after seeding the following crops:

At 113 mL per acre:
Wheat (spring and durum), mustard

At 113 mL per acre or 162 mL per acre:
Chickpea, faba bean, field pea, flax, soybean, sunflower

All applications require moisture for proper activation.

For burn-off control of emerged weeds, if glyphosate is not used with *Authority Strike*, the addition of an adjuvant is required. Use a non-ionic surfactant (NIS) at 0.25 L per 100 L of spray solution or use Merge at 1 L per 100 l of spray solution.

Weeds, Rates and Staging:
At 113 mL per acre:
Controls the following weeds when applied to the soil prior to emergence:
- Kochia

The following emerged weeds are controlled by *Authority Strike* up to the 10 cm stage unless otherwise indicated (burn-off):
- Common lamb's-quarters[2]
- Black nightshade[1]
- Eastern black nighshade[1]
- Morning glory[3]
- Redroot pigweed
- Tall waterhemp[1]
- Velvetleaf

At 162 mL per acre:
Controls the following weeds when applied to the soil prior to emergence:
- Cleavers[4]
- Common groundsel
- Common lamb's-quarters
- Common purslane
- Common waterhemp
- Eastern black nightshade
- Large crabgrass
- Powell pigweed
- Redroot pigweed
- Smooth crabgrass
- Wild buckwheat
- Yellow woodsorrel

The following emerged weeds are controlled by *Authority Strike* up to the 10 cm stage unless otherwise indicated (burn-off):
- Carpetweed
- Cleavers
- Cocklebur
- Common lamb's-quarters
- Common purslane
- Common waterhemp
- Black nightshade
- Eastern black nightshade
- Flixweed
- Hairy nightshade
- Jimsonweed
- Kochia
- Morning glory
- Pennsylvania smartweed (seedling)
- Pigweed (prostrate, smooth, tumble)
- Russian thistle[1]
- Shepherd's purse
- Stinkweed
- Tall waterhemp
- Tansy mustard
- Volunteer canola (including glyphosate-tolerant)

[1] Up to 5 cm tall.
[2] Up to 7.5 cm tall.
[3] Up to 3 leaves.
[4] Weed suppression is a visual reduction in weed competition (reduced population or vigour) as compared with an untreated area. The degree of suppression will vary with weed size and environmental conditions prior to and following treatment.

DO NOT APPLY *Authority Strike* to:
- Coarse textured (sand, loamy sand, sandy loam) soils,
- Fine textured soils with less than 1.5 percent organic matter,
- Soils with organic matter content greater than 6 percent,
- Soils with a pH of 7.8 or greater

DO NOT apply *Authority Strik*e to field treated with *Authority Strike* (or other products containing sulfentrazone) in the previous year.

Application Information:

- **Water Volume:**
  - ***Ground:*** Minimum 40 L per acre. Use as high water volume as practical to achieve even distribution over the soil surface.
- **Nozzles and Pressure:** Maximum 30 psi (175 kPa) if using conventional nozzles. Low drift nozzles may require higher pressures for proper performance. Use nozzles and pressure designed to deliver proper coverage with ASABE medium droplets or larger.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
Sulfentrazone	PRE (residual soil activity)	PPO Inhibitor/ Membrane disruptor	Little movement (symplast)	Broadleaf	14
Carfentrazone-ethyl	POST (foliar)	PPO Inhibitor/ Membrane disruptor	Little movement due to rapid cell leakage(symplast)	Non-selective broadleaf	14

Effects of Growing Conditions:

All applications require rainfall for proper activation of the sulfentrazone component. If weed growth begins before activation occurs, poor control may result on emerged weeds. A moderate rainfall (10 to 20 mm) or equivalent irrigation is required within 10 to 14 days to activate pre-emergent surface treatments. Dry conditions that persist after any application may reduce weed control. On sandy soils, heavy rainfall following application may cause leaching of *Authority Strike* that may result in reduced weed control and increased risk of crop injury.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides:

- ***Pre-seed or Pre-emergent:*** Glyphosate 0.5 to 1 L per acre (360 g ae/L)

Aim EC:

- *Authority Strike* (113 mL per acre) + *Aim EC* (4 mL per acre). The additional carfentrazone will control the same weeds as *Aim EC* labelled at 24 mL per acre rate.
- *Authority Strike* (113 mL per acre) + *Aim EC* (10 mL per acre). The additional carfentrazone will control the same weeds as *Aim EC* labelled at 30 mL per acre rate.

Note: the above Tank Mixes are those listed on the *Authority Strike* label only.

According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Heavy rainfall shortly after application may reduce the weed control of the carfentrazone component. Moderate rainfall (see 'Effects of Growing Conditions' above for details) within a few days of application is required for proper activity of the sulfentrazone component.
- **Re-entry:** DO NOT re-enter treated fields for 12 hours.
- **Preharvest Interval:** Not applicable
- **Grazing:** No restrictions
- **Re-cropping:**
  - Registered crops may be seeded anytime following application.
  - Winter wheat may be seeded 4 months after application.
  - Alfalfa, barley, canola, field corn, mustard (following use of high rate), spring and durum wheat (following use of high rate) may be seeded 12 months after application.
  - Sweet corn, lentils and sorghum may be seeded 24 months after application.
  - For all other crops 36 months must pass following application and a successful field bioassay indicating adequate tolerance before planting.
  - For each year of drought experienced, add one year to the intervals above and conduct a field bioassay to confirm tolerance of the rotational crop. Longer recropping intervals should be used under dry conditions.
- **Aerial Application:** DO NOT apply by aircraft.
- **Storage:** Store above 5ºC to keep from freezing. If frozen, and solid crystals are observed, warm to above 15ºC and shake or roll container periodically to dissolve solids.

- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground only*	1	0	10

See the Key to Product Pages for an explanation of the different habitats.
*** Buffer zones can be reduced by 70% when using shrouds and by 30% when using cones mounted less than 12 inches from the crop canopy.**
† Distance is measured from the downwind edge of the boom to sensitive areas.

Sprayer Cleaning:
Refer to the general section on sprayer cleaning in the introduction. Let solution stand for an extended period for better results. Flush sprayer system with water. See the label for product specific cleaning details.

Hazard Rating:
Danger – Poison
Refer to the Introduction for an explanation of the symbols.

Authority Supreme

Herbicide Group
14 - sulfentrazone
15 - pyroxasulfone

Company:
FMC Corporation (PCP#32562)

Formulation:
250 g/L pyroxasulfone and 250 g/L sulfentrazone formulated as a suspension concentrate.
- Container size - 2 x 8 L

Crops, Rates and Staging:
Pre-plant or pre-emergent surface (up to 3 days after seeding): chickpea, field pea, soybean, sunflowers.
Fall application (prior to registered crops): when soil temperatures have dropped below 10ºC but prior to freeze up.
Broadcast in early spring: dormant, established alfalfa (seed production only) when no new crop growth is present.*
**Note: Since this use is registered under the User Requested Minor Use Label Expansion program, the manufacturer assumes no responsibility for herbicide performance. Users of this product do so at their own risk.*
Note: Maximum ONE APPLICATION of products containing pyroxasulfone over a 12 month period.
Maximum of ONE APPLICATION of *Authority Supreme* or other products containing sulfentrazone over 24-months. In case of extremely low rainfall in any of those years, a subsequent application of herbicides containing sulfentrazone should be further delayed by the equivalent number of years in which extremely low rainfall occurred.
Note: The use of this chemical may result in contamination of groundwater particularly in areas where soils are permeable (e.g. sand, loamy sand or sandy loam) and/or the depth to the water table is shallow.
After a fall application any registered crop can be seeded the following spring.

Treatment	Rate (per acre)	
	Soil Type	
	Medium Texture (1 to 3 percent O.M.)*	Medium-Fine to Fine Texture (3 to 6 percent O.M.)*
Setup Treatment	162 mL	
Residual Treatment	202 mL	243 mL

*** O.M. = organic matter content**

Coarse	Medium	Medium-Fine	Fine
Sand, loamy sand, sandy loam	Loam, silt loam, silt	Sandy clay loam, sandy clay, silty clay loam	Silty clay, clay loam, clay

Refer to the product label for complete mixing instructions for this product and its mixes. A general guide to mixing can be found in the introduction.

DO NOT apply *Authority Supreme* to:

- coarse textured soils
- soils with less than 1 percent organic matter content or greater than 6 percent organic matter content
- soils with pH greater than 7.8.

Weeds and Staging:

Control of the following weeds emerging from seed (not controlled if emerged at application):

- Barnyard grass
- Brome (downy, Japanese)
- Cleavers
- Common groundsel
- Cow cockle
- Eastern black nightshade
- Foxtail (green, yellow)
- Kochia
- Lamb's-quarters
- Palmer amaranth
- Pigweed (green, redroot)
- Purslane
- Ragweed, common*
- Stinkweed
- Waterhemp
- Wild buckwheat
- Wild mustard*
- Wild oats*
- Witchgrass
- Yellow woodsorrel

*** Suppression only.**

Application Information:

- **Water Volume:** Minimum of 40 L per acre.
- **Nozzles and Pressure:** Maximum 30 to 40 psi (200 to 275 kPa) when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE medium*** droplets.
- DO NOT mechanically incorporate in the fall or spring as this can destroy the herbicide barrier and allow weed escapes.
- DO NOT apply to frozen soils or existing snow cover to prevent run-off of the herbicide.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
sulfentrazone	PRE (surface) with residual soil activity	PPO Inhibitor/ Membrane disruptor	Little movement (Symplast)	Broadleaf	14
pyroxasulfone	PRE (surface) with residual soil activity	Long-chain Fatty Acid Inhibitor	Little movement (Symplast)	Broadleaf & grass	15

Effects of Growing Conditions:

Moisture is necessary to activate both the pyroxasulfone and sulfentrazone components in soil for effective weed control. Moderate rainfall will improve weed control activity. A minimum of 12.5 mm (0.5 inches) of rainfall or irrigation is required in one event to activate the product. Dry weather following applications may reduce effectiveness. Heavy rainfall shortly after application may reduce weed control and increase the risk of injury. Extremes in environmental conditions such as temperature, moisture, soil conditions, and cultural practices may affect activity. Temporary growth suppressions may occur on eroded knolls, hilltops, areas with coarse gravelly deposits, low organic matter and/or high soil pH.

Tank Mixes:

Herbicides:

Prior to All Crops:

- Glyphosate (180 to 360 g ae per acre)
- *Express SG* (6 grams per acre)*+ glyphosate (rates above) – peas and soybeans only

  *** See precautions on 'Tribenuron' regarding potential pulse crop injury.**

According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Avoid application when heavy rain is forecast. A minimum of 12.5 mm (0.5 inches) of rainfall or irrigation is required in one event after application to activate the product.
- **Restricted Entry Interval:** DO NOT enter treated fields for at least 12 hours.
- **Grazing Restrictions:** DO NOT graze stubble after a post harvest fall application.
- **Pre-harvest Interval:** Not applicable.
- **Re-cropping Interval:** Registered crops may be seeded any time after treatment. Winter wheat may be seeded 4 months after application. Barley, canola, field corn, mustard, oats, sunflower, or wheat (spring and durum) may be seeded 12 months after application. Lentils may be seeded 24 months after application. All other crops require 36 months from application to seeding. ***Note:*** *If there is a lack of adequate or normal soil moisture due to drought conditions following an application of Authority Supreme, the minimum rotational crop interval listed must be extended for one additional year and a representative bioassay of the field must be conducted with the potential rotational crop and adequate soil moisture to determine the crop sensitivity to Authority Supreme.*
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store in a cool, dry place over 5°C in original container. DO NOT freeze, but if frozen raise product temperature to 15°C and shake or roll to dissolve crystals.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground only*	5	3	10

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Refer 'Method A' in the general section on sprayer cleaning in the introduction.

Hazard Rating:

Warning – Contains the Allergen Sulfites

Refer to the Introduction for an explanation of the symbols.

Avenza

Herbicide Group
1 - pinoxaden
2 - florasulam
4 - fluroxypyr

Company:
Corteva Agriscience

Formulation:
The *Avenza* package contains the following components:

***Avenza A* (PCP#33455):** 5 g/L florasulam and 100 g/L fluroxypyr formulated as a suspension concentrate.
- Container sizes - 8.1 L, 64.8 L, 97.2 L

-plus-

***Avenza B* (PCP#33278):** 50 g/L pinoxaden formulated as an emulsifiable concentrate.
- Container sizes - 10 L, 80 L, 120 L

Crops and Staging:
Spring wheat (excluding durum), winter wheat and barley: 3 leaf to just prior to flag leaf emergence.

Weeds and Staging:
Grass Weeds controlled: (1 to 6 leaf, prior to 4th tiller)
- Barnyard grass†
- Foxtail (green, yellow)
- Proso millet
- Volunteer canary seed
- Volunteer oats
- Wild oats

Broadleaf Weeds controlled when tank mixed with 235 mL per acre of MCPA Ester 600:
- Burdock (seedlings up to 4 leaf)
- Canada thistle†
- Chickweed
- Cleavers
- Cocklebur
- Cow cockle
- Dandelion (seedlings, rosettes, overwintered rosettes (up to 25 cm in diameter))†
- Flixweed
- Hemp-nettle
- Kochia
- Lamb's-quarters
- Mustard (ball, wild)
- Narrow-leaved hawk's-beard
- Plantain
- Prickly lettuce
- Ragweed
- Redroot pigweed
- Russian thistle
- Shepherd's-purse
- Smartweed
- Sow-thistle (annual, perennial)
- Stinkweed
- Stork's-bill (1 to 8 leaf)
- Vetch
- Volunteer canola (all varieties)
- Volunteer flax
- Wild buckwheat
- Wild radish
- Wild sunflower (annual)

†Top growth control only.

Rate:
Avenza A at 405 mL per acre plus *Avenza B* at 500 mL per acre + MCPA Ester 600 at 235 mL per acre.

When tank mixed with 235 mL per acre MCPA Ester 600 additional surfactant is NOT required.

Refer to the product label for complete mixing instructions for this product and its mixes. A general guide to mixing can be found in the introduction.

Application Information:
- **Water Volume:** 20 to 40 L per acre.
- **Nozzles and Pressure:** Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE coarse*** droplets. For ground applications use 30 to 40 psi (200 to 275 kPa) pressure. Flat fan nozzles of 80° or 100° are recommended.

How it Works:
Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
pinoxaden	POST (foliar)	ACCase Lipid synthesis inhibitor	Toward growth areas (Symplast)	Grasses only	1
florasulam	POST (foliar) with little soil activity	ALS Amino Acid Inhibitor	Toward growth areas of plant (Symplast)	Broadleaf only	2
fluroxypyr	POST (foliar)	Synthetic Auxin	Throughout the plant (Symplast)	Broadleaf only	4

Effects of Growing Conditions:

Weed control following application of *Avenza* may be reduced or delayed under stress conditions such as drought, heat, insufficient fertility, flooding or prolonged cool temperatures. Grass escapes or re-tillering may occur if application is made during prolonged stress conditions. Optimum weed control will be obtained if application of *Avenza* herbicide is delayed until the stress conditions have ended and weeds are once again actively growing.

Tank Mixes:

Herbicides:

- MCPA Ester 600 (235 mL per acre)

Fungicides: None registered.

- *Stratego* (label rates)
- *Tilt* (label rates)

Insecticides: None registered.

Fertilizers: None registered.

Note: The above mixes are those listed on the Avenza label only.
According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Restrictions:

- **Rainfall:** Rainfast within 1 hour of application.
- **Restricted Entry Interval:** DO NOT enter treated fields for at least 12 hours.
- **Pre-harvest Interval:** DO NOT harvest the treated crop for grain within 60 days of application.
- **Grazing Restrictions:** DO NOT graze for 7 days or silage/hay for 30 days following application.
- **Re-cropping Interval:** Fields previously treated with *Avenza* can be seeded the following year to alfalfa, barley, canola, corn, dry common beans, faba bean, flax, lentil, mustard (brown, oriental and/or yellow) oats, peas, potatoes (except seed potatoes), soybeans, sunflower or wheat.
- **Aerial Application:** DO NOT apply by aircraft.
- **Storage:** Store in original containers in a secure, dry, well ventilated, heated storage.
- **Buffer Zones:** Hand-held or backpack sprayers, inter-row hooded sprayers and spot treatments are exempt from buffer zone requirements.

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground only*	1	0	1

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

This product utilizes a combination of 'Method A' and 'Method B' for cleanout requiring the use of All Clear Spray Tank Decontaminator plus ammonia for the second rinse. Refer to the general section on sprayer cleaning in the introduction. Let solution stand for an extended period for better results. Flush sprayer system with water before reuse. See the label for product specific cleaning details.

Hazard Rating:

Avenza A:

Warning – Eye and Skin Irritant

Avenza B:

Danger – Eye and Skin Irritant

Refer to the Introduction for an explanation of the symbols.

Axial MAXX

This product is a prepackaged tank mix of Axial Xtreme and Talinor. Information listed is restricted to Crops, Weeds, Rates and Tank Mixes. For other detailed information on the component products see the individual product pages.

Herbicide Group
1 - pinoxaden
4 - fluroxypyr
6 - bromoxynil
27 - bicyclopyrone

Company:
Syngenta Canada (PCP#30391)

Formulation:
The *Axial Maxx* package contains two components :

***Axial MAXX A* (PCP#35294):** 37.5 g/L bicyclopyrone + 175 g/L bromoxynil formulated as an emulsifiable concentrate.
- Container sizes - 8.1 L, 64.8 L.

***Axial MAXX B* (PCP#35293):** 50 g/L pinoxaden + 87.5 g/L fluroxypyr formulated as an emulsifiable concentrate.
- Container sizes - 10 L, 80 L

Crops and Staging:
Spring wheat (not including durum), spring barley: 2 leaf to 6 leaf stage on the main stem (up to 3 tillers).

Weeds, Rates and Staging:
Weeds controlled/suppressed by the component products.
For optimum results, apply *Axial Maxx* to actively growing weeds. An early application will maximize crop yields by reducing weed competition.

Rate:
***Axial MAXX A*:** 405 mL per acre
***Axial MAXX B*:** 500 mL per acre

Note: Maximum of one application of this or other products containing (list other relevant active ingredients) per year.

Tank Mixes:
Herbicides: None registered
Fungicides: None registered.
Insecticides: None registered.
Fertilizers: None registered. Do not mix with AMS (ammonium sulfate)
See component products for more information on restrictions, application details and handling. Unless indicated differently above use the most limiting restrictions across all components for the mix.

Axial Xtreme

(this referring text to be removed in the 2027 edition)
see Pinoxaden/fluroxypyr

Herbicide Group
1 - pinoxaden
4 - fluroxypyr

Axial Xtreme iPak

Herbicide Group
1 - pinoxaden
4 - fluroxypyr
6 - bromoxynil
27 - pyrasulfotole

This product is a prepackaged tank mix of Axial Xtreme and Infinity. Information listed is restricted to Crops, Weeds and Rates. For other detailed information on the component products see the product pages listed above.

Company:
Syngenta Canada

Formulation:
The *Axial Extreme iPak* package contains the following components:

***Axial Xtreme* (PCP#30391):** 50 g/L pinoxaden and 87.5 g/L fluroxypyr formulated as an emulsifiable concentrate.
- Container sizes - 1 x 10 L, 80 L

***Infinity* (PCP#28738):** 37.5 g/L pyrasulfotole and 210 g/L bromoxynil formulated as an emulsifiable concentrate.
- Container sizes - 1 x 6.7 L, 53.6 L

Crops and Staging:
Spring wheat (NOT including durum) and barley*:* 1 to 6 leaf stage prior to the emergence of the 4th tiller and before the first node can be felt in the stem.

Weeds and Staging:
Weeds controlled by the component products.

Rates:
***Axial Extreme*:** 0.5 L per acre (no adjuvant required)

***Infinity*:** 0.33 L per acre

Maximum ONE APPLICATION of this or other products containing the active ingredients pinoxaden, pyrasulfotole or bromoxynil per year.

See component products for more information on restrictions, application details and handling. Unless indicated differently above use the most limiting restrictions across all components for the mix.

AXXE Broad Spectrum Herbicide

Herbicide Group N/A

Company:
BioSafe Systems (PCP#32719)

Formulations:
36% Ammonium Salt of Fatty Acid
- Container sizes - 9.46, 18.9, 114, 208, 984, 1041 L

Crops and Staging:
For pre-seed burndown, spot application or shielded inter-row application in field crops, pastures, and non-crop areas on farms. Avoid contact with desirable vegetation or crop injury will occur.

Weeds and Staging:
Axxe is non-selective and will burn any tissues contacted whether weed or crop. Application to small seedlings that have not established an extensive root will be controlled. Application to larger annuals and perennial weeds will result in top-growth control where plants may regrow from lateral buds or perennial roots following treatment. Un-emerged seedlings will not be controlled.

Application Rates:
Mix *Axxe* at a 13.8% v/v or 13.8 L per 100 L of spray solution and apply until the point of run-off or at the application volumes below based on weed size. Apply *Axxe* spray solutions only when weed surfaces are dry as water on the plant surface will dilute the herbicide rate. DO NOT apply to weeds when wet from dew, rain or irrigation.

Height of plants (weeds)	0 to 3 cm	3 to 6 cm	6 cm and larger
Axxe rate (L/acre)	18.2	35.2	106
Minimum total application volume (L/acre)	131.5	253	309

Application Information:
- **Water Volume:** 131.5 to 309 L per acre.
- **Nozzles and Pressure:** Use low spray pressure to reduce foaming and avoid contact with desirable plants. Most spray nozzles are designed to operate at 70 to 105 kPa (10 to 15 psi) and provide uniform spray coverage of weeds. DO NOT apply this product through any type of irrigation system.

How it Works:
Axxe is a contact herbicide that is not translocated in plants and causes the loss of plant cell membrane integrity, exposing the cell contents to the atmosphere, resulting in rapid dry-down (necrosis) and death of the contacted tissues.

Tank Mixes:
None registered.

Restrictions:
- **Rainfall:** Within 3 hours of application may result in reduced weed control.
- **Restricted Entry Interval:** No restrictions.
- **Pre-harvest Interval:** Not for application directly to crops.
- **Grazing Restrictions:** No restrictions. Ammonium salts of fatty acids are a food additive.
- **Re-cropping Interval:** *Axxe* has a short life in soil and most crops can be seeded immediately after use.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store product in original container in a secure, dry area away from other pesticides, food or feed.
- **Buffer Zones:** None indicated. TOXIC to terrestrial plants and aquatic organisms. Avoid overspray of water and sensitive habitats.

Hazard Rating:
Warning – Eye Irritant

Caution – Skin Irritant

Refer to the Introduction for an explanation of the symbols.

Barricade M

Herbicide Group
2 - thifensulfuron, tribenuron
4 - fluroxypyr, MCPA

This product is a prepackaged tank-mix of Barricade SG, Perimeter II (see fluroxypyr) and Albough MCPA Ester 600 or Adama MCPA Ester (see MCPA). Information listed is restricted to Crops, Weeds and Tank Mixes. For other detailed restrictions and other general information on the component products see the product pages listed above.

Company:
FMC of Canada Ltd.

Formulation:
The *Barricade M* package contains three components:
***Barricade SG* (PCP#29544):** 25% thifensulfuron plus 25% tribenuron formulated as a water soluble granule.
- Container size – 486 g jug

-plus-
***Perimeter II* (PCP# 30094):** 333 g/L (fluroxypyr) formulated as an emulsifiable concentrate.
- Container size – 3.4 L jug

-plus-
***Albaugh MCPA Ester 600* (PCP# 32311) or *Adama MCPA Ester* (PCP#34073):** 600 g/L MCPA formulated as an emulsifiable concentrate.
- Container size – 7.6 L jug

Crops and Staging:
Spring wheat (including durum), winter wheat, barley and oats: 3-leaf to initiation of stem elongation of spring wheat (including durum), spring barley or oats. Apply to winter wheat in the spring from the 3 tiller stage to just before the flag leaf stage.

Weeds and Staging:
Unless otherwise noted below, apply to young and actively growing weeds that are less than 10 cm in height or width.
Weeds Controlled:
- Annual smartweed (green, lady's-thumb)
- Canada thistle (less than 6 inches (15 cm) tall or across and prior to budding)*
- Cleavers (1 to 9 whorls)
- Common chickweed (1 to 6 leaf)
- Cow cockle
- Dandelion (spring and fall rosettes, up to 15 cm)
- Flixweed
- Hemp-nettle (up to 8 leaf)
- Kochia
- Lamb's-quarters
- Narrow-leaved hawk's- beard
- Night-flowering catchfly
- Ragweed (common)
- Redroot pigweed
- Round-leaved mallow (1 to 5 leaf)
- Russian thistle
- Scentless chamomile
- Sow-thistle (perennial)
- Stinkweed
- Stork's-bill (1 to 6 leaf)
- Tufted vetch (up to 15 cm)
- Volunteer canola (all types, up to 4 leaf stage)
- White cockle
- Wild buckwheat
- Wild carrot*
- Wild mustard
- Volunteer flax (up to 12 cm)

*** Suppression only.**

Rates:
***Barricade SG*:** 12 g per acre.
-plus-
Perimeter II: 85 mL per acre.
-plus-
MCPA Ester 600: 190 mL per acre.
The addition of a surfactant is not required. *Barricade SG* may degrade if left in the sprayer for an extended period. Apply within 24 hours of mixing. Do apply with any products that may alter the pH of the spray solution.

Tank Mixes:
Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.
Herbicides:
- *Codinafop*
- *Simplicity*
- *Traxos*

Insecticides: None registered.
Fertilizers: None registered.
Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

See component products for more information on restrictions, application details and handling. Unless indicated differently above use the most limiting restrictions across all components for the mix.

Batalium

Herbicide Group
2 – flucarbazone
4 – fluroxypyr, MCPA
6 - bromoxynil

Company:

UPL AgroSolutions Canada Inc. (PCP#35024)

Formulation:

16.7 g/L flucarbazone, 74.1 g/L fluroxypyr, 197 g/L MCPA and 197 g/L bromoxynil formulated as a suspension concentrate

- Container size – 2 x 11.5 L and 114.7 L

Crops, and Staging:

Wheat (spring, durum, winter): 2 to 6 total leaves (4 leaves on main stem plus 2 tillers)

Weeds and Staging:

Apply to actively growing weeds under ideal environmental conditions.

Grass Weeds Controlled and Suppressed (S) – 1 to 6 leaf stage unless otherwise indicated:

- Barnyard grass (S)
- Green foxtail
- Japanese brome (1 to 4 leaf)
- Volunteer oat
- Wild oat
- Yellow foxtail (S)

Broadleaf weeds – up to 8 leaf stage unless otherwise indicated:

- American nightshade*
- Bluebur*
- Buckwheat (common, tartary, wild)
- Canada thistle†
- Cleavers (1 to 4 whorls)
- Cocklebur*
- Common groundsel
- Common ragweed
- Cow cockle*
- Flixweed*
- Kochia (up to 5 cm)
- Lamb's-quarters
- Mustard (ball [2 to 4 leaf], wild**, wormseed)
- Night-flowering catchfly*
- Perennial sow-thistle†
- Prickly lettuce†† (up to 12 leaf)
- Redroot pigweed**
- Russian thistle*
- Scentless chamomile*
- Shepherd's-purse**
- Smartweed (green**, lady's-thumb*, pale*)
- Stinkweed (2 to 9 leaf)
- Stork's bill (S) (1 to 8 leaf)
- Volunteer canola**
- Volunteer flax (1 to 12 cm)
- Volunteer sunflower*
- Wild tomato*

*** Up to 4 leaf**
**** 2 to 6 leaf**
† Top growth suppression only
†† Suppression in winter wheat only

Rate:

Apply at 575 mL per acre with a non-ionic surfactant at 0.25 L per 100 L of solution.
Refer to the product label for complete mixing instructions.
Note: *Maximum one application of Batalium per growing season.*

Application Information:

- **Water Volume:**
  - ***Ground:*** 22 to 45 L per acre
  - ***Aerial:*** Minimum of 11 L per acre
- **Nozzles and Pressure:** Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE coarse*** droplets. For ground applications use 30 to 50 psi (207-345 kpa) pressure. Flat fan nozzles of 80° or 110° are recommended. For aerial application, apply at no less than 43 psi (300 kpa) pressure.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Introduction section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
flucarbazone	POST (foliar) with soil residual activity	ALS Amino Acid Inhibitor	Toward growth areas of plant (symplast)	Broadleaf and grasses	2
fluroxypyr	POST (foliar)	Synthetic Auxin	Throughout the plant (symplast)	Broadleaf only	4

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
MCPA	POST (foliar)	Synthetic Auxin	Throughout the plant (symplast)	Broadleaf only	4
Bromoxynil	POST (foliar)	PSII Inhibitor/ Membrane disruptor	Little (apoplast)	Broadleaf only	6

Effects of Growing Conditions:

For best results apply to wheat and weeds that are actively growing. Wheat exposed to water-logged or saturated soils, temperature extremes, drought, low fertility, or plant disease at application time could show injury symptoms. Weed control also may be reduced by these conditions.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides:

Tank mix with MCPA Ester 600 at 185 mL per acre for additional control of hemp-nettle (up to 4 leaf stage).

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions.

Restrictions:

- **Rainfall:** Within 1 hour of application may reduce control.
- **Re-entry:** DO NOT re-enter treated fields for 12 hours.
- **Preharvest Interval:** Leave 80 days between application and harvest.
- **Grazing:** DO NOT graze treated fields.
- **Re-cropping:** The following crops may be planted 11 months after an application of *Batalium*:

Soil Zones and Rotational Crops			
Grey-Wooded	Black	Dark Brown	Brown
Spring Wheat	Spring Wheat	Spring Wheat	Spring Wheat
Barley	Barley	Barley	
Canola	Canola	Canola	
Field Pea*	Field Pea*	Field Pea*	
	Field Bean	Flax	
	Flax	Durum Wheat	
	Durum Wheat	Soybean	
	Soybean	Sunflower	
	Sunflower		

*Field pea may be grown the year following *Batalium* application providing the following are all met:

1. Soil pH must be below 7.5
2. Organic matter must be above 4%, and
3. Precipitation must be equal to or above 10-year average (minimum 100 mm within 60 days of application in year of application)

- **Aerial Application:** May be applied by aircraft.
- **Storage:** Store in a cool, dry place. Store this product away from food or feed.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1	
Field sprayer	2	1	1
Fixed wing aircraft	5	1	70
Helicopter	5	2	55

See the Key to Product Pages in the introduction for an explanation of the different habitats.

† Distance is measured from the downwind edge of the boom to sensitive areas.

Sprayer Cleaning:

Refer to 'Method B' in the general section on sprayer cleaning in the Introduction. Let solution stand for an extended period for better results. Flush sprayer system with water. See the label for product specific cleaning details.

Hazard Rating:

Warning – Poison

Eye irritant and skin irritant

Potential skin sensitizer
Refer to the Introduction for an explanation of the symbols.

Beloukha

Herbicide Group 26 –pelargonic acid

Company:

Belchim Crop Protection Canada

Formulation:

***Beloukha Herbicide* (PCP#33685):** 500 g/L pelargonic acid formulated as emulsifiable concentrate.
***Beloukha Agricultural Herbicide* (PCP#33686):** 680 g/L pelargonic acid formulated as emulsifiable concentrate.

- Container size - 2 x 9.46 L

Crops and Staging:

Preseed burndown: Prior to seeding or up to 3 days after seeding and prior to emergence of cereal and pulse crops.
Post-harvest and Non-crop areas: Total vegetation control.
Harvest Aid:

- ***Wheat, barley, oats:*** when seed moisture is less than 30 per cent. Harvest when vegetation is dry.
- ***Potato:*** use at onset of senescence of foliage at least 2 weeks prior to harvest.
  One repeat application may be required 7 to 14 days after the first.

Weeds and Staging:

Apply when weeds are up to 10 cm tall. Repeat application may be required on a 7 to 14 day interval as required for complete control, especially of biennial and perennial species.

Weeds controlled:

- Annual sow-thistle*
- Barnyard grass*
- Black medic
- Bluegrass
- Bromegrass*
- Canada fleabane*
- Chickweed (common, mouse-eared)
- Cranesbill
- Dandelion*
- Dutch clover*
- Fescue
- Fireweed*
- Field bindweed*
- Goosefoot (lamb's-quarters, maple leaved)
- Common groundsel
- Henbit
- Knotweed (prostrate)*
- Mayweed (chamomile)*
- Meadow fescue*
- Nettle (common)*
- Nightshade (black)
- Perennial ryegrass
- Perennial sow-thistle
- Plantain
- Purslane
- Redroot pigweed
- Shepherd's-purse
- Wall rocket (annual)
- Willowherb*

*** Suppression only**

Rate:

Maximum FOUR APPLICATIONS per year.

	Rate (L/acre)	
	500 g/L	680 g/L
Post-harvest and non-crop areas	6.5 to 10.9	4.9 to 8.1
Harvest Aid: wheat, barley, oats	4.5 to 8.9	3.2 to 6.5
Harvest Aid: potato	6.5 to 8.9	4.9 to 6.5

Application Information:

- **Water Volume:**
  - ***Harvest Aid:***
    - ***Wheat, barley, oats*** **-** 80 to 121 L per acre
    - ***Potatoes*** **-** 121 L per acre. Up to 445 L per acre of water if top-growth is dense
  - ***Pre-seed, post-harvest and non-crop areas:*** 121 L per acre
- **Equipment, Nozzles and Pressure:**
  - ***Boom Sprayer:*** Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ASABE medium droplets.
  - ***Hand-held and High Volume:*** Spray all leaf surfaces uniformly to complete wetness but not to run-off.
  - ***Selective Placement Equipment:***
    - ***Shielded sprayers*** - use according to manufacturer's directions.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
pelargonic acid	POST (foliar)	Inhibition of lipid synthesis	Little movement due to rapid cell leakage	Broadleaf and grass	26

Effects of Growing Conditions:

DO NOT apply *Beloukha* during periods of extreme weather conditions, drought, or heavy rainfall. Allow the correct environmental conditions (i.e. irrigate in drought or allow to dry in wet conditions) for at least 3 days prior to applying.

Tank Mixes:

None registered.

Restrictions:

- **Rainfall:** No rainfast period is specified on the label; required interval may be up to 8 hours. Contact manufacturer for more
- information.
- **Restricted Entry Interval:** DO NOT enter treated fields until spray has dried.
- **Pre-harvest Interval:** Not specified.
- **Grazing Restrictions:** Not specified. DO NOT graze treated areas.
- **Re-cropping Interval:** No restrictions.
- **Aerial Application:** DO NOT apply by aircraft.
- **Storage:** Store above 5°C. Store in a cool, dry, secure and well-ventilated area.
- **Buffer Zones:** Avoid spraying in situations where drift may occur. DO NOT apply during periods of dead calm.

Application method	Buffer Zones (metres†) Required for the Protection of Terrestrial Habitat:
Ground*	1

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Refer to 'Method C' in the general section on sprayer cleaning in the introduction.

Hazard Rating:

Warning – Eye and Skin Irritant

Caution – Poison

Refer to the Introduction for an explanation of the symbols.

Bentazon

Herbicide Group 6 - bentazon

Company:

BASF Canada (*Basagran* – PCP#12221, *Basagran Forté* – PCP#22006)
AgraCity (*Boa* – PCP#33011)
Nufarm Agriculture (*Berserk* – PCP # 34190)
Sharda CropChem Canada (*Benta Super* – PCP#32827)
UPL AgroSolutions Canada (*Broadloom* – PCP#32661)
Viking (*Viking Bentazon* – PCP#34758)

Formulation:

480 g/L bentazon formulated as a solution. *Basagran Forté* has a built-in adjuvant. Other products require the addition of an adjuvant.

- Container sizes:
  - ***Basagran, Benta Super, Broadloom:*** 2 x 9 L, 450 L (*Broadloom* only)
  - ***Boa:*** 2 x 7.5 L, 348 L
  - ***Basagran Forté, Berserk:*** 2 x 10 L
  - ***Viking Bentazon:*** 2 x 14.5 L, 348 L

Crops and Staging:

All Products:

Crop	Stage
Soybean	No restrictions
Dry bean***	After the first trifoliate leaf
Corn	No restrictions
Pea	After 3 leaf pairs but prior to flowering
Faba bean	After 2 to 3 leaf stage or at least 4 inches (10 cm) tall
Flax	After 2 inches (5 cm) in height

***Basagran Forté* only:**

Crop	Stage
Forage millet and forage sorghum (forage and seed production)*	3 to 10 inches (7.5 to 25 cm) prior to canopy closure
Established clover (alsike, red) for seed production only*	3 to 10 inches (7.5 to 25 cm) prior to canopy closure

***Basagran, Berserk, Broadloom, Boa* and *Benta Super* only:**

Crop	Stage
Spring wheat (excluding durum)**	No restrictions (limited to the 4 leaf to flag leaf by 2,4-D staging)
Solin (low linolenic acid flax)	After 2 inches (5 cm) in height
Forage grasses for seed production*: Bromegrass, creeping red fescue, crested wheatgrass, meadow foxtail, orchardgrass, timothy.	1 to 7 leaf stage
Forage legumes (seedlings) for seed production*: Alfalfa, alsike clover, red clover, sainfoin.	After the third trifoliate leaf
Established alfalfa for seed production.*	Prior to flowering
Established clover (Sweet, or Red) and sainfoin for seed production.*	3 to 10 inches (7.5 to 25 cm) prior to canopy closure

*** One application per season.**
**** *Basagran, Benta Super, Broadloom, Viking Bentazon, and Boa* only at 0.4 L per acre. Must be tank mixed with 2,4-D (no adjuvant required).**
***** Test a small area of a new variety for tolerance before widespread use. Refer to product labels for a list of dry bean types registered for *Basagran, Benta Super, Berserk and Boa. Basagran Forté* registered for all dry bean types but not tested for tolerance on all types.**
When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

Weeds, Rates and Staging:

***Basagran Liquid, Berserk, Broadloom, Boa* and *Benta Super* only:** Add *Assist* or *XA Oil Concentrate* at 0.4 to 0.8 L per acre. Use the low rate of *Assist* or *XA Oil Concentrate* only if hot, humid conditions (above 28°C and 80 percent relative humidity) prevail. *Citowett Plus* may be used on peas at 0.25 L per 100 L spray mixture. Ammonium sulphate may be added for applications to soybean and dry beans with *Assist oil concentrate* only.

Benta Super can also be applied with *Citowett Plus* at 0.25 L per 100 L of spray solution.

***Basagran Forté* only:** *Basagran Forté* does not require the addition of *Assist* or *XA oil concentrate*. Ammonium sulphate can be added for applications to soybean only.

Apply the rate listed when weeds in the table are within the recommended height:

Annual Weeds	0.71 L per acre		0.91 L per acre	
	Inches	Maximum Leaf Stage	Inches	Maximum Leaf Stage
Buttercup			2 to 4	6*
Cleavers			1 to 3 whorl stage	
Cocklebur	3 to 7	6*	7 to 12	10*
Common chickweed			1 to 3 weeks after emergence	
Common groundsel			2 to 4	
Common ragweed			1 to 2	6
Corn spurry			1 to 4	
Flower-of-an-hour	1 to 2	6*	2 to 4	10*
Giant ragweed			2 to 6	4
Hairy galinsoga			2 to 3	6*
Hairy nightshade			0.2 to 0.8	6
Jimsonweed			2 to 6	10
Lady's-thumb (smartweed)	1 to 3	6*	3 to 8	10
Lamb's-quarters			0.5 to 1.0	8
Purslane			1 to 2	6
Redroot pigweed (suppression only)			0.5 to 1.5	4
Russian thistle (suppression only*)			1 to 3	4*
Shepherd's-purse	Rosette to 4	6*	4 to 10	6
Stinkweed	Rosette to 2	6*	2 to 6	6
Stork's-bill			1.5 to 4	2 to 6 leaf stage
Volunteer canola	0.75 to 6	8	0.75 to 6	8
Wild mustard	1 to 5	6*	5 to 10	10
Wild radish			1 to 2	6
Canada thistle	6 to 8			
Field bindweed (suppression only)	1 to 2.5			
Yellow nutsedge	6 to 8			

* ***Basagran Forté* and *Berserk* only.**

Basagran, Boa and *Benta Super* may be applied in spring wheat (except durum) at 0.4 L per acre when tank mixed with 2,4-D amine or ester at 143 to 190 g ae per acre to control the weeds controlled by 2,4-D plus lady's-thumb, redroot pigweed and daisy fleabane. No adjuvant is required for this mix.

Refer to the product label for complete mixing instructions for this product and its mixes. A general guide to mixing can be found in the introduction.

Application Information:

- **Water Volume:**
  - ***Ground:*** 40 to 160 L per acre. A minimum of 80 L per acre is recommended for optimum control.*
  - ***Aerial:*** 20 to 40 L per acre.
- **Nozzles and Pressure:** Maintain 40 to 60 psi (275 to 425 kPa)* when using conventional flat fan nozzles capable of delivering high water volumes with ***ASABE medium*** droplets. Low drift nozzles may require higher pressures for proper performance. Contact the herbicide manufacturer regarding the suitability of low drift nozzles for use with this product. Direct nozzles 45° forward to improve contact with vertical targets.

  *** Higher water volumes and pressures should be used when the weeds are at the upper end of their recommended treatment stage.**

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
bentazon	POST (foliar)	PSII Inhibitor/Membrane disrupter	Little (Apoplast)	Broadleaf only	6

Effects of Growing Conditions:

Poor results will occur if temperatures are cool. Optimum results are achieved when applied at daytime temperatures between 20 and 28°C. Applications at temperatures greater than 28°C may result in crop injury. May result in crop injury when applied to crops that are stressed due to severe weather conditions such as frost, drought or water saturated soil.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides:

- ***In soybean*:**
  - *Pinnacle* (2.2 to 3.2 grams per acre)
  - *Berserk* or *Broadloom* plus *Pursuit* or *Ultra Blazer* plus *Assist* or *XA oil concentrate*
- ***In dry bean**:*
  - *Basagran, Berserk, Broadloom, Boa* and *Benta Super* only (0.71 L per acre) plus *Reflex** plus *Agral 90*.
- ***In spring wheat (not including durum)*:**
  - *Basagran, Berserk, Broadloom, Boa* and *Benta Super* only (0.4 L per acre) may be tank mixed with 2,4-D amine or ester at 143 to 190 g ae per acre. This tank mix DOES NOT need any adjuvant.

  *** For use in the Red River Valley of Manitoba only.**

Fungicides: None registered.

Insecticides: None registered

Fertilizers:

- ***In soybean*:**
  - *Basagran*, *Basagran Forté*, *Berserk, Broadloom, Boa* and *Benta Super* plus UAN (4 L per acre) or AMS (2.4 L per acre)
- ***In dry bean:***
  - *Basagran, Berserk, Broadloom, Boa* or *Benta Super* plus AMS (1.5 percent v/v). Use with *Assist oil concentrate*.
- DO NOT add fertilizer with *Assist* or *XA Oil Concentrate* when tank mixing with *Pinnacle*. The risk of crop injury increases with the use of fertilizer mixes under hot, humid conditions.
- Use of fertilizer mixes is not recommended for use under western Canadian environmental conditions for other crops.

When mixing Bentazon refer to the tank mix partner label for any additional restrictions and precautions.

Allow 4 days between application of Bentazon and other herbicides, fertilizers or insecticides.

Note: The above mixes are those listed on the Bentazon labels only.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 6 to 8 hours will reduce control.
- **Restricted Entry Interval:** DO NOT enter treated field for 12 hours.
- **Grazing Restrictions:** Allow 30 days between treatment with *Basagran Forté* and harvest of forage sorghum and millet for hay. Otherwise DO NOT graze treated crops or cut for feed prior to crop maturity.
- **Pre-harvest Interval:** 50 days for Bentazon + 2,4-D in wheat, 84 days for Bentazon + *Reflex* in dry beans in Manitoba. Other uses are restricted only by appropriate staging.
- **Re-cropping Interval:** No restrictions the year after application.

- **Aerial Application:** May be applied by air for weed control in dry beans or soybeans only. *Assist* or *XA Oil Concentrate* at 0.05 to 0.1 L per acre must be added. DO NOT use *Assist* or *XA Oil Concentrate* in excess of 0.1 L per acre as substantial crop injury could occur. DO NOT apply fertilizer mixes in soybean or 2,4-D tank mix in wheat by air. Crop canopy should NOT cover the weeds.
- **Storage:** May be frozen.
- **Buffer Zones:**

Application method	Crop	Buffer Zones (metres††) Required for the Protection of: Terrestrial habitat
Ground†	Sorghum**, forage millet**, forage grasses and legumes, peas*	1
	Corn, dry bean, faba bean, flax, pea**, soybean, spring wheat*	2
Fixed wing airplane***	Dry bean	20
	Soybean	35
Helicopter***	Dry bean	20
	Soybean	30

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** *Basagran, Berserk, Broadloom, Boa* and *Benta Super* only**
**** *Basagran Forté* only**
***** *Basagran, Berserk* and *Broadloom* only**
† Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.
†† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Refer to 'Method B' in the general sprayer cleaning section in the introduction.

Hazard Rating:

***Basagran, Boa, Benta Super, Viking Bentazon*:**

Caution – Poison

Potential Skin Sensitizer

***Basagran Forté*:**

Warning – Poison

Danger – Corrosive to Eyes

Warning – Contains the Allergen Soy

Potential Skin Sensitizer

Berserk, Broadloom: Caution – Eye Irritant

Refer to the Introduction for an explanation of the symbols.

BlackHawk

Herbicide Group
4 - 2,4-D
14 - pyraflufen-ethyl

Company:
Nufarm Agriculture (PCP#32111)

Formulation:
473 g/L 2,4-D ester and 6.1 g/L pyraflufen-ethyl formulated as an emulsifiable concentrate.
- Container sizes - 2 x 9 L, 96 L, 480 L

Crops and Staging:
Apply pre-seeding or up to 3 days after seeding the following crops:
- Wheat (spring, durum, winter)
- Barley
- Corn (field)
- Canaryseed (including hairless varieties for human consumption)
- Rye (spring, fall)
- Soybean
- Triticale
- Chemfallow

Oats – 7 days prior to seeding.

Post-harvest: Apply in the fall (up until soil freeze). Crops not listed above can be planted one month after application.

Weeds, Rates and Staging:
Apply 300 mL per acre to young, actively growing weeds that are less than 5 cm in height or width, unless indicated otherwise.
- Annual sow-thistle
- Bluebur (up to 4 leaf)
- Burdock (up to 4 leaf)
- Cleavers
- Cocklebur
- Dandelion (spring seedlings)
- Cow cockle*
- False flax
- Fleabane (Canada*, daisy)
- Flixweed
- Goat's-beard
- Kochia
- Lamb's-quarters
- Mallow
- Mustards (except dog and tansy)
- Narrow-leaved hawk's-beard**
- Plantain
- Pigweed (redroot, Russian)
- Prickly lettuce
- Ragweed (common, false, giant)
- Shepherd's-purse
- Stinging nettle
- Stinkweed
- Sweet clover (seedling)
- Thyme-leaved spurge
- Volunteer canola (all varieties)
- Wild buckwheat*
- Wild mustard*
- Wild sunflower

*** Suppression**
**** Up to 5 cm in the fall, up to 2 leaf in spring**
† *Blackhawk* applied alone requires the addition of a non-ionic surfactant *(Nufarm Enhance, Agral 90)* at 0.25 L per 100 L of spray solution.

Maximum TWO APPLICATIONS of *Blackhawk, Conquer II* or *Goldwing* at the low (133 mL per acre) rate listed in this Guide (maximum 3.67 grams per acre of the pyraflufen active) WITHIN A TWO YEAR TIME SPAN.

Blackhawk may degrade if left in the sprayer for an extended period under alkaline conditions. Apply within 24 hours of mixing.

Application Information:
- **Water Volume:** Minimum 20 L per acre up to 40 L per acre (recommended).
- **Nozzles and Pressure:** Flat fan nozzles operated at a pressure of 30 to 40 psi (210 to 275 kPa) are recommended. Use nozzles and pressure designed to deliver thorough, even coverage with ***ASABE medium*** droplets. Boom height must be 60 cm or less above the crop or ground.
- **Screens:** Use 50 mesh or coarser on both nozzle and primary plumbing screens.

How it Works:
Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
2,4-D	POST (foliar)	Synthetic Auxin	Moves throughout the plant (Symplast)	Broadleaf only	4
pyraflufen	POST (foliar), with slight soil activity	PPO Inhibitor/ Membrane disruptor	Little movement due to rapid cell leakage (Symplast)	Non-selective Broadleaf	14

Effects of Growing Conditions:

Control may be reduced if weeds are under stress (e.g. drought, heat or cold stress). Weeds hardened off by cold weather or drought may not be adequately controlled or suppressed.

Tank Mixes:

Herbicides:

Pre-seed and Pre-emergent:

- Glyphosate (180 to 360 g ae per acre) (no surfactant required)

Note: The above mixes are those listed on the *Blackhawk* label only.

According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product..

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** No rainfast period is specified on the label. Consult the manufacturer.
- **Restricted Entry Interval:** DO NOT enter treated fields for 12 hours.
- **Pre-harvest Interval:** DO NOT harvest for feed or forage for 30 days.
- **Grazing Restrictions:** DO NOT graze the treated crop or cut for hay for 30 days after application. DO NOT allow lactating dairy cows to graze for 7 days after application. Animals intended for meat should be withdrawn from treated fields 3 days before slaughter.
- **Storage:** Store in a cool, dry place away from direct sunlight. DO NOT Freeze.
- **Buffer Zones:**

Application method	Buffer Zones (metres †) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground*	1	1	2

*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**

† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Refer to 'Method A' in the general section on sprayer cleaning in the introduction.

Hazard Rating:

Danger – Poison

Warning – Contains the Allergen Soy

Skin and Eye Irritant
Potential Skin Sensitizer
Refer to the Introduction for an explanation of the symbols.

Blackhawk EVO

Herbicide Group
4 – dichlorprop, 2,4-D
14 – pyraflufen-ethyl

Company:
Nufarm Agriculture Inc

Formulation:
***Blackhawk EVO* (PCP#34904):** 7.3 g/L pyraflufen-ethyl plus 284 g /L 2,4-D Ester plus 284 g /L dichlorprop formulated as an emulsifiable concentrate.

- Container size – 2x10L, 120L, 480L

Crops and Staging:
Wheat (spring, durum, winter), barley, spring and winter rye, triticale, field corn, canary grass: Pre-seed or prior to crop emergence - maximum of 3 days after seeding

Oats: Apply up to a minimum of 7 days prior to planting

Fall burndown: Applications can be made up until soil freeze in the fall with no spring re-cropping restrictions

Weeds and Staging:
Unless otherwise noted below, apply to young and actively growing weeds up to 5cm in height or width.

Weeds Controlled:

- Annual sowthistle
- Black medic*
- Broadleaf plantain
- Canada fleabane (including glyphosate-resistant biotypes)
- Cleavers (including glyphosate-resistant biotypes)
- Common ragweeds (including group 2 and glyphosate resistant biotypes)
- Dandelion
- Kochia (including group 2 and glyphosate resistant biotypes)
- Lamb's-quarters (including group 2 and 5 resistant biotypes)
- Narrow-leaved hawk's-beard (in fall, and at the 1-2 leaf stage in spring)
- Night-flowering catchfly
- Powell's amaranth
- Redroot pigweed (including group 2 and 5 resistant biotypes)
- Shepherd's-purse
- Volunteer canola (all herbicide tolerant types)
- Wild buckwheat
- Wild mustard

*** Suppression only.**

Rate:
Blackhawk EVO: 250 to 375 mL per acre. 250 mL per acre is the standard rate, apply up to 375 mL per acreduring stressful conditions, for larger weeds, or for optimum wild buckwheat control.

Note: Do not use Blackhawk EVO as a pre-emergence treatment and a postharvest/fall burn-down application on the same fields in the same year.

Product degradation may occur under alkaline conditions (pH>7.5). Use the spray preparation within 24 hours.

Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Application Information:
- **Water Volume:**
  - ***Ground***: Minimum 20-40 L/acre
- **Nozzles and Pressure:** Use a combination of nozzles and pressure designed to deliver thorough, even coverage. Flat fan nozzles are recommended. Do not apply with spray droplets smaller than ASAE medium droplets. Spray pressure between 30 to 40 psi (210 to 275 kPa) is recommended.
- **Screens:** Use a 50 mesh or larger screen and filter system.

How it Works:
Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
2,4-D, Dichlorprop	POST (foliar)	Synthetic Auxin	Moves throughout the plant (Symplast)	Broadleaf only	4
Pyraflufen-ethyl	POST (foliar) with slight soil activity	PPO Inhibitor/ Membrane disruptor	Little movement due to rapid cell leakage (Symplast)	Non-selective broadleaf	14

Effects of Growing Conditions:

Warm, moist growing conditions promote active weed growth and enhance the activity of *Blackhawk EVO* by allowing maximum foliar uptake and contact activity. Weeds hardened off by cold weather or drought stress may not be adequately controlled or suppressed and regrowth may occur.

Tank Mixes:

Tank mix partners applied at label rates and include recommended adjuvants unless otherwise noted.

Herbicides: Glyphosate (follow label rates)

Fungicides: None registered.

Insecticides: None registered.

Fertilizers: None registered.

According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 1 hour of application may reduce control. Avoid application when heavy rainfall is forecast.
- **Re-entry:** DO NOT re-enter treated fields for 12 hours.
- **Grazing:** Do not graze field corn for 75 days after application, or cereal grain crops until 30 days after application. Withdraw meat animals from treated fields at least 3 days before slaughter.
- **Re-cropping:** Grow all major crops the year after application.
- **Aerial Application:** DO NOT apply by aircraft.
- **Storage:** Do not allow to freeze. Store in a cool, well-ventilated area and out of the reach of children and animals.
- **Buffer Zones:**

Application method	Buffer Zones (metres †) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground*	1	1	2

See the Key to Product Pages for an explanation of the different habitats.
*** Buffer zones can be reduced by 70% when using shrouds and by 30% when using cones mounted less than 12 inches from the crop canopy.**
† Distance is measured from the downwind edge of the boom to sensitive areas.

Sprayer Cleaning:

Refer to 'Method A' in the general section on sprayer cleaning in the intorduction. Let solution stand for an extended period for better results. Flush sprayer system with water. See the label for product specific cleaning details.

Hazard Rating:

Warning – Poison
Eye irritant
Potential skin sensitizer
Refer to the Introduction for an explanation of the symbols.

Boa IQ

Herbicide Group
1 - quizalofop
6 - bentazon

This product is a prepackaged tank mix of Boa (see bentazon) and Quiz (see quizalofop). Information listed is restricted to Crops, Weeds, Rates and Tank mixes. For other detailed restrictions and other general information on the component products see the product pages listed above.

Company:
AgraCity

Formulation:
The *Boa IQ* package contains the following components:
***Boa* (PCP#33011):** 480 g/L bentazon formulated as a solution.
- Container sizes - 2 x 9.1 L, 455 L

-plus-
***Quiz* (PCP#33481):** 96 g/L quizalofop formulated as an emulsifiable concentrate.
- Container sizes - 6 L, 150 L

Crops and Staging:

Crop	Leaf Stage	Days to Harvest
Dry bean	No stage restrictions	30
Faba bean	No stage restrictions	30
Field pea	No stage restrictions	65
Soybean	No stage restrictions	80

Weeds and Staging:
Broadleaf weeds controlled by *Boa* (see Bentazo) at 0.91 L per acre plus the grass weeds controlled by *Quiz* (see Quizalofop) at 0.3 L per acre.

Rates:
Boa: 0.91 L per acre
-plus-
Quiz: 0.3 L per acre.
Boa IQ requires the addition of *Assassin* or *Merge* adjuvant at 0.5 L per 100 L of spray solution, and which must be purchased separately. Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Tank Mixes:
None registered.

See component products for more information on restrictions, application details and handling. Unless indicated differently above use the most limiting restrictions across all components for the mix.

Broadband

Herbicide Group
1- pinoxaden
2- florasulam

Company:
Syngenta Canada

Formulation:
***Broadband* (PCP#29138):** 92.7 g/L pinoxaden and 7.7 g/L florasulam formulated as an emulsifiable concentrate.
- Container sizes - 10.5 L, 84.2 L

***Adigor Adjuvant* (PCP#28151):** 11.3 L, 90.4 L

Crops and Staging:
Barley, spring wheat (NOT including durum): up to the emergence of the flag leaf.

When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

Weeds, Rates and Staging:
Apply *Broadband* at 263 mL per acre and *Adigor* adjuvant at 280 mL per acre.

Grass weeds - 1 to 6 leaves and prior to the emergence of the 4th tiller:
- Barnyard grass
- Foxtail (green, yellow)
- Proso millet
- Volunteer oats
- Volunteer canary seed
- Wild oats

Broadleaf weeds - 1 to 6 leaf stage:
- Annual smartweed (including lady's-thumb)
- Common chickweed
- Cleavers
- Hemp-nettle†
- Pigweed, redroot†
- Shepherd's-purse
- Sow-thistle (annual, perennial**)†
- Stinkweed
- Volunteer canola*
- Wild buckwheat
- Wild mustard

† Suppression only.
*** Not CLEARFIELD varieties.**
**** Applications made at advanced leaf stages will reduce product effectiveness.**

Maximum ONE APPLICATION per year of this or other products containing the active ingredient pinoxaden.
Maximum ONE APPLICATION of this or other products containing florasulam over a TWO YEAR TIME SPAN.

Application Information:
- **Water Volume:** 20 to 40 L per acre.
- **Nozzles and Pressure:** Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE medium*** droplets. Low drift nozzles may require higher pressures for proper performance.

How it Works:
Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
pinoxaden	POST (foliar)	ACCase Lipid synthesis inhibitor	Toward growth areas (Symplast)	Grasses only	1
florasulam	POST	ALS Amino Acid synthesis Inhibitor	Toward growth areas (Symplast)	Broadleaf	2

Effects of Growing Conditions:
DO NOT apply to crops or weeds that are stressed (frost, low fertility, drought or flooding, disease or insect damage) as crop injury or reduced weed control may result.

Temporary crop injury may occur with tank-mixes under extreme weather conditions or when the crop is suffering from stress due to inadequate or abnormally high moisture levels or extreme temperatures.

Tank Mixes:

Herbicides:

- *Curtail M* (0.6 L per acre)
- MCPA LV500 ester (280 mL per acre)

Fungicides:

- Propiconazole (*Tilt* only at label rates)

Fertilizers: None registered

Note: The above mixes are those listed on the *Broadband* label only.

According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 1 hour of application may reduce control.
- **Restricted Entry Interval:** DO NOT re-enter treated fields within 12 hours.
- **Pre-harvest Interval:** Leave 60 days between treatment and harvest.
- **Grazing Restrictions:** DO NOT cut for livestock feed within 30 days or grazed by livestock within 7 days of treating the crop.
- **Re-cropping Interval:** No restrictions the year following treatment.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store in dry, heated storage.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:	
	Aquatic Habitats	Terrestrial habitat
Ground only*	5	30

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Refer to 'Method A' in the general section on sprayer cleaning in the introduction.

Hazard Rating:

Warning – Eye Irritant

Refer to the Introduction for an explanation of the symbols.

Bromoxynil

Herbicide Group 6 - bromoxynil

Company:

Bayer (*Pardner*)
Interprovincial Cooperative Limited (*IPCO Brotex 240*, *IPCO Brotex 480*, IPCO Brotex 4AT, CO-OP Brotex 4AT*)
ADAMA Canada (*Bromotril*)
WinField United Canada (*Starbuck**)
Albaugh (*Brox 240 EC*)
AgraCity (*MPOWER Buck*)

** Note: This product is no longer manufactured but inventories still remain in distribution. This product may be removed from future editions.*

Formulation:

***Pardner* (PCP#18001), *MPOWER Buck* (PCP#33399):** 280 g/L bromoxynil formulated as an emulsifiable concentrate.

- Container sizes: 2 x 8 L (*Pardner*), 8.1 L (*MPOWER Buck*)

***Bromotril* (PCP#28276), *Brox 240 EC* (PCP#32622), *Starbuck* (PCP#33919), & *Brotex 240* (PCP#28519):** 240 g/L bromoxynil formulated as an emulsifiable concentrate.

- Container sizes - 2 x 9.7 L, 115 L (*Brotex 240*, *Brox 240 EC* and *Starbuck* only), 116.4 L (*Bromotril II* only), 500 L (*Brox 240 EC* only).

***IPCO Brotex 480* (PCP#31348), *IPCO Brotex 4AT* (PCP#33554), *CO-OP Brotex 4AT* (PCP#33828):** 480 g/L bromoxynil formulated as an emulsifiable concentrate.

- Container size - 2 x 9.7 L

Crops, Staging and Rates:

***Pardner*:** 0.40 to 0.48 L per acre.

***Brotex 240, Brox 240 EC, Starbuck, & Bromotril*:** 0.49 to 0.57 L per acre.

***IPCO Brotex 480 & IPCO Brotex 4AT*:** 0.24 to 0.28 L per acre.

See the following chart for registered crops and specific rates and stages. NR = Not Registered.

Crop	Stage	Rate (L per acre)				
		Pardner, MPOWER Buck	*Brotex 240*	*Bromotril*	*Brox 240/ Starbuck*	*IPCO Brotex 480/ IPCO Brotex 4AT*
Barley, oats, triticale, wheat (spring and durum**)	2 leaf stage to early flag	0.40 to 0.48	0.49 to 0.57	0.49 to 0.57	0.49 to 0.57	0.24 to 0.28
Winter wheat	2 to 4 leaf stage (fall application) First growth to early flag leaf (spring application)	0.40 to 0.48	0.49 to 0.57	0.49 to 0.57	0.49 to 0.57	0.24 to 0.28
Corn (field or sweet)	4 to 8 leaf	0.40 to 0.48	0.49 to 0.57	0.49 to 0.57	0.49 to 0.57	0.24 to 0.28
Corn (field or sweet) with drop pipes	Beyond 8 leaf	0.40 to 0.48	0.49 to 0.57	0.49 to 0.57	0.49 to 0.57	0.24 to 0.28
Canaryseed (seed production only)	3 to 5 leaf	0.40	0.49	0.49	0.49	0.24
Seedling alfalfa	2 to 6 trifoliate leaf stage	0.40	0.49	0.49	0.49	0.24
Established alfalfa (seed production only)	Up to 10 inches (25 cm); apply no more than twice in one growing season	0.40 to 0.48	0.49 to 0.57	0.49 to 0.57	0.49 to 0.57	0.24 to 0.28
Fall rye	First growth to early flag leaf (spring application only)	0.40 to 0.48	0.49 to 0.57	0.49 to 0.57	0.49 to 0.57	0.24 to 0.28

Crop	Stage	Rate (L per acre)				
		Pardner, MPOWER Buck	*Brotex 240*	*Bromotril*	*Brox 240/ Starbuck*	*IPCO Brotex 480/ IPCO Brotex 4AT*
Flax and solin (low linolenic acid flax)	2 to 4 inches (5 to 10 cm)	0.40	0.49	0.49	0.49	0.24
Forage millet and sorghum	4 leaf to 8 inches (20 cm)	0.40	0.49	NR	0.49	0.24
Industrial Hemp	2 to 4 leaf	NR	NR	NR	NR	0.24***
Seedling grasses (seed production only): bromegrass, fescue (creeping red, meadow), orchard grass, reed canary grass, Russian wildrye, timothy, wheatgrass (crested, intermediate, slender, tall)	2 to 4 leaf (establishment year only)	0.40 to 0.48	0.49 to 0.57	NR	0.49 to 0.57	0.24 to 0.28
Pearl millet and sorghum (grain)*	4 leaf to 8 inches (20 cm)	0.40	NR	NR	NR	NR
Prior to direct-seeding cereal crops (mixed with glyphosate only)	Apply according to weed stage	0.40	0.49	NR	0.49	0.24
Pre-seed/pre-plant prior to seeding canola (mixed with glyphosate only)	Apply according to weed stage	0.40 to 0.51	0.61	NR	0.49 to 0.57	0.29

*** NOTE: Since application to grain pearl millet and sorghum is registered under User Requested Minor Use Label Expansion program, the manufacturer assumes no responsibility for herbicide performance. *Users of this product on grain pearl millet and sorghum do so at their own risk.***
** ***Pardner* only.**
***** Make one application of 0.24 L per acre or two applications of 0.12 L per acre 10 days apart within the staging window given.**

Weeds and Staging:

Weeds controlled at the 1 to 4 leaf stage:

- American nightshade
- Annual smartweed (green, pale, lady's-thumb)
- Bluebur
- Cocklebur
- Common ragweed
- Cow cockle*
- Kochia**
- Pigweed*†
- Russian thistle**
- Stinkweed*
- Volunteer canola*
- Wild mustard*

Weeds controlled at the 1 to 8 leaf stage:

- Buckwheat (tame, tartary, wild)
- Common groundsel
- Lamb's-quarters

*** Controlled with high rate only.**
**** Apply before plants are 2 inches high.**
† Not controlled in seedling alfalfa.

Application Information:

- **Water Volume:**
  - ***Ground***:
    - ***Corn, millet, sorghum*** - 80 to 120 L per acre.
    - ***Seedling grasses*** - 60 L per acre.
    - ***Other crops*** - 40 L per acre.
  - ***Aerial (wheat and barley only):*** 8 to 16 L per acre.
- **Nozzles and Pressure:** Maximum 40 psi (275 kPa) when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver ***ASABE medium*** droplets.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
bromoxynil	POST (foliar)	PSII Inhibitor/Membrane disrupter	Little (Apoplast)	Broadleaf only	6

Effects of Growing Conditions:

Avoid spraying if temperatures are greater than 25°C. Leaf scorching may occur in corn and flax if applied during or after adverse growing conditions, such as cool and wet or hot (greater than 27°C) and humid weather.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Crop	Tank Mixes
Spring wheat	2,4-D†, *Achieve Liquid*, MCPA
Winter wheat	2,4-D, *Achieve Liquid*, MCPA
Barley	2,4-D†, *Achieve Liquid*, MCPA†
Oats	MCPA
Fall rye, canaryseed	MCPA*
Flax	MCPA (amine, ester or K salt)
Seedling forage grasses***	MCPA
Corn	*Accent*♦ + surfactant (field corn only), *AAtrex*** (0.4 L/acre)
Prior to seeding: cereals, canola††	Glyphosate
Prior to seeding (*Koril* only)	*Aim, CleanStart*

*** The ester formulations are preferred but other formulations can be used.**
**** DO NOT add oil or surfactant to this mix. DO NOT use atrazine formulations that contain oil.**
***** *Brox 240 EC, IPCO Brotex 240, IPCO Brotex 480, IPCO Brotex 4AT, Starbuck* and *Pardner* only.**
† May be applied by air.
†† *Brotex 480, MPOWER Buck* and *Pardner* only. Not all glyphosate products/formulations are registered for this use. Refer to individual product labels.
♦ Since the use of this tank mix on corn is registered under the User Requested Minor Use program, the manufacturer assumes no responsibility for herbicide performance. Users of this tank mix on corn do so at their own risk.

Fertilizers: None registered.
Insecticides: None registered.
Fungicides: None registered.

According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product..

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 1 hour of application will reduce control.
- **Restricted Entry Interval:** DO NOT enter treated fields for 24 hours.
- **Grazing Restrictions:** DO NOT graze treated wheat, barley, oats, forage millet, sorghum or seedling alfalfa crops or cut for feed within 30 days of application. DO NOT graze other treated crops or cut for hay prior to crop maturity. DO NOT graze or feed industrial hemp to livestock.
- **Re-cropping Interval:** No restrictions.
- **Aerial Application:** Registered for aerial application on wheat and barley. The use of low water volumes, 8 to 16 L per acre may result in less effective weed control than seen with ground application.
- **Storage:** *IPCO Brotex 480* must be stored at temperatures of 7°C or higher. Others may be stored at freezing temperatures and they will return to original state by warming to room temperature (20 to 22°C) and shaking thoroughly.

- **Buffer Zones:**

Application method	Buffer Zones (metres †) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground *	1	1	1
Fixed wing aircraft**	20	5	55
Helicopter**	20	3	45

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy**
**** Wheat and barley crops only.**
† Distance is measured from the downwind edge of the boom to sensitive areas.

Sprayer Cleaning:
Refer to the general section on sprayer cleaning in the introduction.

Hazard Rating:
All:
Warning – Poison
***IPCO Brotex 240, Bromotril, IPCO Brotex 4AT, Starbuck, Brox 240*:**
Warning – Eye and Skin Irritant
Potential Skin Sensitizer
Refer to the Introduction for an explanation of the symbols.

Bromoxynil / 2,4-D Ester

Herbicide Group
4 - 2,4-D
6 - bromoxynil

Company:
Bayer (*Thumper*)
ADAMA Canada (*Thrasher**)
Interprovincial Cooperative Limited *(Leader)**
Sharda CropChem *(Swipe)*
** **Note:** This product is no longer manufactured but inventories still remain in distribution. This product may be removed from future editions.*

Formulation:
***Thumper* (PCP#22659), *Swipe* (PCP#34380):** 280 g/L bromoxynil and 280 g/L 2,4-D ester formulated as an emulsifiable concentrate.
- Container size - 8 L

***Leader* (PCP#28853) & *Thrasher* (PCP#28779):** 225 g/L bromoxynil and 225 g/L 2,4-D ester formulated as an emulsifiable concentrate.
- Container sizes - 10 L, 115 L* 120 L**

*** *Leader* only**
**** *Thrasher* only**

Crops and Staging:
Spring wheat (including durum) and barley at the 4 leaf to early flag leaf stage.
When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

Weeds and Staging:
Weeds controlled at the 1 to 4 leaf stage:
- American nightshade
- Ball mustard
- Bluebur
- Cocklebur
- Common ragweed
- Cow cockle
- Flixweed
- Jimsonweed
- Night-flowering catchfly
- Redroot pigweed
- Shepherd's-purse
- Smartweed (green, lady's-thumb, pale)
- Volunteer canola
- Volunteer sunflower

Weeds controlled at the 1 to 8 leaf stage:
- Buckwheat (tame*, Tartary, wild)
- Common groundsel
- Lamb's-quarters
- Stinkweed
- Wild mustard

*** up to 4 leaf stage with *Approve***

Weeds controlled from 1 to 12 leaf (max. 2 inches tall):
- Kochia
- Russian thistle

Rates:
***Thumper, Swipe*:** 0.4 L per acre
***Leader*, *Thrasher*:** 0.5 L per acre

Application Information:
- **Water Volume:**
  - ***Ground:*** 20 to 40 L per acre.
  - ***Aerial:*** 12 to 16 L per acre. Use the higher volume when there is a heavy crop canopy, or when the majority of weeds are cow cockle, smartweed, or pigweed.
- **Nozzles and Pressure:** Use 40 psi (275 kPa) when using conventional 80° or 110° flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE coarse*** droplets.
- **Screens:** All strainer and nozzle screens must be 50 mesh or coarser.

How it Works:
Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
bromoxynil	POST (foliar)	PSII Inhibitor/Membrane disrupter	Little (Apoplast)	Broadleaf only	6
2,4-D	POST (foliar)	Synthetic Auxin	Symplast	Broadleaf only	4

Effects of Growing Conditions:
Less than acceptable weed control may be expected if weeds are under stress because of excessive moisture, drought, or cool weather.

Tank Mixes:
Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.
Herbicides:
- ***In wheat (spring, durum) and barley*:**
  - *Liquid Achieve*
- ***In wheat (spring, durum, winter):***
  - *Varro**
- ***In wheat (spring, durum) only*:**
  - *Clodinafop 240 EC*[Δ]

  *** *Thumper and Swipe* only.**

  [Δ] Manufacturers may only support specific mixes. Contact the manufacturer for more information.

Insecticides: None registered.

Fungicides: None registered.

Fertilizers: None registered.

Note: The above mixes are those listed on the Bromoxynil/2,4-D Ester labels only.

According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:
- **Rainfall:** No rainfast period is specified on the label; required interval may be up to 8 hours. Contact manufacturer for more information.
- **Restricted Entry Interval:** DO NOT enter treated fields for at least 24 hours.
- **Grazing Restrictions:** DO NOT graze or cut for livestock feed within 30 days of application. Withdraw meat animals 3 days before slaughter.
- **Pre-harvest Interval:** DO NOT harvest within 30 days of application.

- **Re-cropping Interval:** No restrictions the year after application.
- **Aerial Application:** May be applied by air.
- **Storage:** May be frozen. Shake well before using after being frozen.
- **Buffer Zones:**

Application method	Buffer Zones (metres †) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground *	1	1	1
Fixed wing aircraft	20	5	55
Helicopter	20	3	45

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy. Hand-held or backpack sprayers, inter-row hooded sprayers and spot treatments are exempt from buffer zone requirements.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Refer to 'Method C' in the general section on sprayer cleaning in the introduction.

Hazard Rating:

All Products:

Warning – Poison

Thumper and Swipe:

Caution – Skin and Eye Irritant

Leader* and *Thrasher:

Warning – Skin and Eye Irritant

Potential Skin Sensitizer

Refer to the Introduction for an explanation of the symbols.

Bromoxynil + Carfentrazone-ethyl

Herbicide Group
6 – bromoxynil
14 – carfentrazone-ethyl

This product is a prepackaged tank mix of bromoxynil and carfentrazone. Information listed is restricted to Crops, Weeds, Rates and Tank mixes. For other detailed restrictions and other general information on the component products see the product pages listed above.

Company:
ADAMA (*Emphasis Max*)
Agracity (*Revenge B, Revenge B Extreme*)
Interprovincial Cooperatives (*IPCO/COOP Octagon*)
Viking (*Viking Vardo*)

Formulation:
The bromoxynil + carfentrazone packages contain two components each:

***Emphasis A* (PCP#33987 – *Emphasis*), *Revenge* (PCP#33716 – *Revenge B, Revenge B Extreme*), *IPCO C-Zone* (PCP#33580 – *IPCO/COOP Octagon, Viking Carfentrazone* (*PCP#34736 – Viking Vardo*):** 240 g/L carfentrazone-ethyl formulated as an emulsifiable concentrate.

- Container sizes - 2 x 600 mL (*Emphasis, Revenge B , Revenge B Extreme*), 2.4 L (*Octagon*) , 2.4 L (Viking Vardo)

-plus one of-

Bromotril 240EC (PCP#28276 – *Emphasis*): 240 g/L bromoxynil formulated as an emulsifiable concentrate.

- Container size - 2 x 9.7 L

-or-

***Buck* (PCP#33399 – *Revenge B*, Revenge B Extreme):** 280 g/L formulated as an emulsifiable concentrate.

- Container size - 2 x 8.1 L

-or-

***IPCO/COOP Brotex 4AT* (PCP#33554/33828 – *IPCO/COOP Octagon*):** 480 g/L bromoxynil formulated as an emulsifiable concentrate.

- Container size - 2 x 9.7 L

-or-

Viking Bromoxynil (PCP# 34746 - Viking Vardo): 280 g/L formulated as an emulsifiable concentrate.

- Contain sizer - 2 x 8.1 L

Crops and Staging:
Apply prior to the seeding of canola

Weeds and Staging:
Weeds controlled by carfentrazone and bromoxynil plus:

- Volunteer canola – fully expanded cotyledon to 4 leaf stage.

Rates:
Carfentrazone: 15 mL per acre, 30 mL per acre for *Emphasis A* and *Revenge B Extreme* only
-plus either-
Bromotril 240EC: 240 mL per acre.
-or-
MPOWER Buck: 202 mL per acre.
-or-
IPCO/COOP Brotex 4AT: 118 mL per acre.
-or-
Viking Bromoxynil: 202 ml per acre.

Tank Mixes:
Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides: Glyphosate (label rates)

See component products for more information on restrictions, applications details and handling. Unless indicated differently above use most limiting restrictions across all components for the mix.

Bromoxynil / MCPA Ester

Herbicide Group
4 - MCPA
6 - bromoxynil

Company:

Bayer (*Buctril M*)
Nufarm Agriculture (*Mextrol 450*)*
ADAMA Canada (*Badge*)
AgraCity (*Canuck*)
Albaugh (*Brox M, Double Trouble*)
Interprovincial Cooperative Limited (*Logic M*)
Sharda CropChem *(Brilliant)*
Viking (*Viking Hamar*)

* ***Note:*** *This product is no longer manufactured but inventories still remain in distribution. This product may be removed from future editions.*

Formulation:

Buctril M **(PCP#18022), C*anuck*** **(PCP#34173), *Brilliant*** **(PCP#34383), *Viking Hamar*** **(PCP# 34806):** 280 g/L bromoxynil and 280 g/L of MCPA Ester formulated as an emulsifiable concentrate.

- Container sizes:
  - ***Buctril M:*** 8 L
  - ***Canuck:*** 2 x 8 L, 120 L, 384 L
  - ***Viking Hamar:*** 2 x 8 L

Mextrol 450 **(PCP#26999), *Badge*** **(PCP#16164), *Logic M*** **(PCP#28109) & *Brox M (PCP# 32472)*** **and *Double Trouble*** **(PCP#33787), *Double Trouble*** **(PCP#33787):** 225 g/L bromoxynil and 225 g/L of MCPA Ester formulated as an emulsifiable concentrate.

- Container sizes:
  - ***Logic M:*** 10 L, 115 L
  - ***Badge:*** 10 L, 120 L
  - ***Mextrol 450:*** 100 L, 500 L
  - ***Brox M*** **and *Double Trouble:*** 2 x 9.7 L, 115 L, 500 L

Crops and Staging:

Field Crops:

- ***All Products*****:**

Crop	Stage
Barley, oats, spring wheat (including durum)	2 leaf to early flag
Winter wheat	2 to 4 leaf stage in the fall or after growth resumes up to early flag leaf
Fall rye	When growth commences in spring to early flag leaf
Canaryseed (*Logic M* and *Viking Hamar* only - including hairless varieties for human consumption)	3 to 5 leaf stage
Flax and solin (low linolenic acid flax)	2 inches (5 cm) to early bud stage. Best tolerance occurs when flax is 2 to 4 inches (5 to 10 cm) tall.
Corn	4 to 6 leaf stage

Seedling forage grasses: 2 to 4 leaf stage.

- ***All Products*****:**
  - Bromegrass
  - Fescue (creeping red, meadow)
  - Reed canarygrass
  - Russian wild-rye
  - Timothy
  - Wheatgrass (crested, intermediate, slender, tall)
- ***Buctril M, Logic M, Brilliant and Badge and Viking Hamar only*****:**
  - Fescue (tall)
  - Meadow bromegrass
  - Meadow foxtail
  - Orchard grass
  - Wheatgrass (streambank)

Established Forage Grasses:

- Timothy (seed or hay) - prior to emergence of the flag leaf.

Perennial Cereal Rye* (*Buctril M, Brilliant*, *Canuck* and *Viking Hamar* only):

- ***Established stands*:** 2 leaf up to early flag leaf stage.
- ***Establishment year*:** 2 to 4 leaf stage in the fall, or from the time growth commences to early flag leaf stage in the spring.
  **** Since the use of this tank mix on perennial cereal rye is registered under the User Requested Minor Use Label Expansion program, the manufacturer assumes no responsibility for herbicide performance. Users of this tank mix on perennial cereal rye do so at their own risk.***

Weeds and Staging:

Weeds up to 4 leaf stage:

- American nightshade
- Annual smartweeds (green, lady's-thumb, pale)
- Bluebur
- Ball mustard
- Cocklebur
- Cow cockle
- Flixweed
- Jimsonweed
- Kochia**
- Night-flowering catchfly
- Redroot pigweed*
- Russian thistle**
- Scentless chamomile***
- Shepherd's-purse
- Volunteer canola
- Volunteer sunflower

*** May not be controlled in flax.**
**** Control before plants are 2 inches tall.**
***** Spring seedlings only.**

Weeds up to 6 leaf stage:

- Wild tomato (*Buctril M, Logic M , Viking Hamar* & *Badge* only)

Weeds up to 8 leaf stage:

- Buckwheat (tame, tartary, wild)
- Common groundsel
- Common ragweed
- Lamb's-quarters
- Mustard (wild, wormseed)
- Stinkweed

Weeds suppressed in winter wheat from the 2 to 12 leaf stage:

- Prickly lettuce (All except *Logic M* and *Buck M*)

Weeds where top growth is controlled:

- Canada thistle
- Perennial sow-thistle

Rate:

***Buctril M, Brilliant, Canuck & Viking Hamar*:** 0.4 L per acre.
***Mextrol 450, Badge, Brox M, Double Trouble & Logic M*:** 0.5 L per acre.

Application Information:

- **Water Volume:**
  - ***Corn*:** 80 to 120 L per acre.
  - ***Flax, Solin*:** 20 to 40 L per acre.
  - ***Cereals*:** 20 to 40 L per acre.
  - ***Seedling forage grasses*:** 60 L per acre.
  - ***Established timothy*:** 60 L per acre.
  - ***Perennial Cereal Rye*:** Not less than 20 L per acre.
  - ***Aerial*:** 8 to 16 L per acre.
- **Nozzles and Pressure:** Use 40 psi (275 kPa) when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE coarse*** droplets

Refer to specific labels for recommended water volumes.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
bromoxynil	POST (foliar)	PSII inhibitor/Membrane disrupter	Little (Apoplast)	Broadleaf only	6
MCPA	POST (foliar)	Synthetic Auxin	Symplast	Broadleaf only	4

Effects of Growing Conditions:

Best weed control when humidity is high at the time of spraying and for the following day or two. Prolonged cool conditions may result in reduced weed control. Spraying during early morning may increase the risk of flax injury.

Avoid spraying in temperatures greater than 25°C.

DO NOT apply to flax, canaryseed or corn if daytime temperatures exceed 27°C within 48 hours before or after application.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicide Tank Mix Table:

Crop & Tank Mixes	*Badge*	*Buctril M & Brilliant*	*Logic M*	*Mextrol 450*	*Canuck*	*Brox M*	*Double Trouble*	*Viking Hamar*
Flax (including solin):								
Poast Ultra + Merge adjuvant	✓	✓	✓	✓	✓	✓	✓	✓
Clethodim + adjuvant	✓*	✓**	✓	✓*	✓	✓**	✓**	✓**
Spring wheat (including durum) and barley:								
Liquid Achieve	✓	✓	✓	✓	✓	✓	✓	✓
Ally	✓	✓	✓	✓	✓	✓	✓	✓
MCPA (amine, ester & K)	✓	✓	✓	✓	✓	✓	✓	✓
Refine SG (4 g/acre)#		✓	✓		✓	✓	✓	
Puma Advance		✓						
Puma Advance + *Refine SG* (rates above)		✓						
Spring wheat (including durum):								
Everest	✓	✓	✓		✓		✓	✓
Varro		✓						
Spring wheat only (NOT including durum):								
Axial	✓	✓						
Spring wheat only (NOT including durum) and barley:								
Axial		✓						✓
Winter wheat:								
Refine SG (4 g/acre)#			✓			✓	✓	
Oats:								
MCPA (amine, ester & K)	✓	✓	✓	✓	✓	✓	✓	
Corn:								
AAtrex	✓	✓	✓	✓	✓	✓	✓	

*** *Select* only**
**** *Select* and *Centurion* only.**
 # Requires the addition of a surfactant as per *Refine SG*.

Fertilizers: None registered.

Insecticides: None registered.

Fungicides: None registered.

Note: The above mixes are those listed on the bromoxynil/MCPA Ester labels only.

According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Rainfall within 1 hour of application may reduce weed control.
- **Restricted Entry Interval:** DO NOT enter treated fields for at least 24 hours, or 15 days for corn to be harvested by hand.
- **Grazing Restrictions:** DO NOT graze treated grain or established timothy crops or cut for feed within 30 days of application. DO NOT graze meadow foxtail in the year of treatment. DO NOT graze other treated forage grasses within 56 days of treatment.
- **Pre-harvest Interval:** DO NOT harvest perennial cereal rye within 30 days of application, or flax or solin within 60 days of application.

- **Re-cropping Interval:** No re-cropping restrictions the year after treatment.
- **Aerial Application:** May be applied by air to wheat, barley, and oats only. Use higher water volume (see 'Application Information') when the majority of weeds are cow cockle, smartweed, hemp-nettle, pigweed, and Canada thistle.
- **Storage:** May be frozen. Shake the container well when thawed to reconstitute components before use.
- **Buffer Zones:**

Application method	Crop	Buffer Zones (metres †) Required for the Protection of:		
		Aquatic Habitats of Depths		Terrestrial habitat
		Less than 1 m	Greater than 1 m	
Ground only*	All	1	1	4
Fixed wing aircraft	Oats	15	2	60
	Barley, wheat	20	5	60
	Rye	1	0	60
Helicopter	Oats	15	1	50
	Barley, wheat	20	3	50
	Rye	1	0	50

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance is measured from the downwind edge of the boom to sensitive areas.

Sprayer Cleaning:

Refer to the general section on sprayer cleaning in the introduction.

Hazard Rating:

All Products:

Warning – Poison

Warning – Potential Skin Sensitizer

Caution – Eye Irritant

Refer to the Introduction for an explanation of the symbols.

Bromoxynil + MCPA + Fluroxypyr

Herbicide Group
4 - fluroxypyr, MCPA
6 - bromoxynil

Company:

Nufarm Agriculture (*Enforcer M*)
ADAMA Canada (*ForceFighter M*, ForceFighter All In*)
AgraCity (*Foxxy Canuck*)
Interprovincial Cooperatives (*IPCO Emit, CO-OP Emit*)
Sharda CropChem (*Pierce*)
Viking (*Viking Trycka*)

***Note:** This product is no longer manufactured but inventories still remain in distribution. This product may be removed from future editions.*

Formulation:

***Enforcer M* (PCP#30691), *IPCO Emit* (PCP# 34600), *CO-OP Emit* (PCP#34614), *Pierce* (PCP#34328), *ForceFighter All In* (PCP#35007):** 80 g/L fluroxypyr, 200 g/L bromoxynil and 200 g/L MCPA Ester co-formulated as an emulsifiable concentrate.

- Container sizes - 2 x 10 L, 2 x 11.37 L and 90.96 L (*ForceFighter All In* only), 120 L, 480 L, 454.8 L (*ForceFighter All In* only)

-or-

The *ForceFighter M* package contains the following components:

***Badge* (PCP#16164):** 225 g/L bromoxynil and 225 g/L MCPA Ester formulated as an emulsifiable concentrate.

- Container sizes - 2 x 10 L, 120 L

***Fluroxypyr 180 EC* (PCP#30815):** 180 g/L fluroxypyr formulated as an emulsifiable concentrate.

- Container sizes - 9.6 L, 115.2 L

-or-

The *Foxxy Canuck* package contains the following components:

***Canuck* (PCP#34173):** 280g/L bromoxynil and 280 g/L MCPA ester formulated as an emulsifiable concentrate.

- Container sizes - 2 x 8 L, 384 L

***Foxxy* (PCP#32952):** 180 g/L fluroxypyr formulated as an emulsifiable concentrate.

- Container sizes - 9.6 L, 230 L

-or-

The Viking Trycka package contains the following components:

***Viking Hamar* (PCP# 34806):** 280 g/L bromoxynil and 280 g/L MCPA ester formulated as an emulsifiable concentrate

- Contain size - 2 x 8 L

***Viking Fluroxypyr* (PCP#34778):** 180 g/L fluroxypyr formulated as an emulsifiable concentrate.

- Container size - 9.6 L

Crops and Staging:

Wheat (durum, spring) oats* and barley: 2 leaf stage until the flag leaf is fully emerged.
Winter wheat:** in spring once tillered until the flag leaf is fully emerged.
Canaryseed* (including for human consumption): from the 3 to 5 leaf stage.
Forage Grasses for seed production only*†:

- ***Seedlings:*** Apply from the 3 to 6 leaf stage.
- ***Established:*** Up to the first node detectable in the stem.
  - Bromegrass (meadow, smooth, Hybrid)

† NOTE: Since these uses are registered under the User Requested Minor Use Label Expansion (URMULE) program, the manufacturer assumes no responsibility for herbicide performance. Those who apply these uses do so at their own risk.
*** *Enforcer M, IPCO Emit* and *CO-OP Emit* only.**
**** *Enforcer M, IPCO Emit* and *CO-OP Emit, Pierce* only.**

When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

Weeds and Staging:

Apply to emerged weeds up to the 6 leaf stage unless otherwise indicated.

***Enforcer M, IPCO Emit* and *CO-OP Emit, Pierce* only applied at the 0.25 L per acre rate will control the following weeds (see "Rates:" below):**

- Kochia (up to 5 cm tall)
- Lamb's-quarters
- Wild buckwheat*
- Wild mustard

***Enforcer M, IPCO Emit, CO-OP Emit, Pierce* (at the high rate), *ForceFighter M, Foxxy Canuck or Viking Trycka* will control the following weeds (see "Rates:" below):**

Weeds listed above plus:

- American nightshade†
- Bluebur†
- Buckwheat (tame, Tartary, wild)
- Canada thistle (top growth control only)
- Chickweed
- Cleavers (up to 6 whorls)
- Cocklebur†
- Common groundsel
- Common ragweed
- Cow cockle†
- Flixweed†
- Hemp-nettle
- Mustard (ball†, wild, wormseed)
- Night-flowering catchfly†
- Perennial sow-thistle (top growth control only)
- Redroot pigweed*
- Russian thistle (< 5 cm tall)†
- Scentless chamomile†
- Shepherd's-purse†
- Smartweed† (green, lady's-thumb, pale)
- Stinkweed
- Stork's-bill*
- Velvetleaf†
- Volunteer canola/rapeseed†
- Volunteer flax
- Volunteer sunflower†

*** Suppression only.**

† Up to 4 leaf stage only.

Rates:

***Enforcer M, IPCO Emit, CO-OP Emit, Pierce*:** 0.25 to 0.51 L per acre

-or-

ForceFighter All In: 0.57 L per acre

-or-

***ForceFighter M*:**

- ***Badge*:** 0.5 L per acre
- ***Fluroxypyr 180 EC*:** 0.24 L per acre

-or-

Foxxy Canuck, Viking Trycka:

- ***Canuck, Viking Hamar:*** 0.4 L per acre
- ***Foxxy, Viking Fluroxypyr:*** 0.24 L per acre

Application Information:

- **Water Volume:**
  - ***Enforcer M, IPCO Emit, CO-OP Emit, Pierce, ForceFighter All In, Viking Trycka:*** Minimum 20 to 40 L per acre; Use the higher volume when there is a heavy crop canopy or weeds are at an advanced stage.
  - ***ForceFighter M* and *Foxxy Canuck:*** Minimum 40 L per acre.
- **Nozzles and Pressure:** Use 40 psi (275 kPa) if applying without drift reduction nozzles. Drift reduction nozzles may require higher pressures for proper performance. Select the nozzle and pressure combination that produces of ***ASABE coarse*** droplets while maintaining good coverage of foliage.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
MCPA, fluroxypyr	POST (foliar)	Synthetic auxin	Moves throughout the plant (Symplast)	Broadleaf only	4
bromoxynil	POST (foliar)	PSII Inhibitor/ Membrane disrupter	Little (Apoplast)	Broadleaf only	6

Effects of Growing Conditions:

Optimum activity is experienced between 12 to 24°C when weeds are actively growing. Weeds may not be actively growing and as a result reduced activity will occur when temperatures are below 8°C or above 27°C. Frost 3 days before or after an application may reduce crop tolerance and weed control efficacy.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides (*Enforcer M, IPCO Emit, CO-OP Emit, Pierce*):

- ***In wheat (durum, spring, winter), barley and oats:***
  - *Nufarm Boost* (see thifensufuron/tribenuron) at 2.7 g/acre.
- ***In wheat (durum, spring, winter) and barley*:**
  - Tralkoxydim (*Liquid Achieve* and *Nufarm Tralkoxydim* only)
- ***In wheat (spring and durum only) and barley*:**
  - Fenoxaprop (*Puma Advance* only)
- ***In spring wheat (including durum) only*:**
  - Clodinafop 240 EC (*Signal* only)
  - *Simplicity*
  - *Varro*
- ***In wheat (spring and durum only) and barley:***
  - *Liquid Achieve*
- ***In spring wheat only:***
  - *Everest*

Herbicide - Viking Trycka

- ***In wheat (spring and durum only) and barley:***
  - *Liquid Achieve*
- ***In Spring Wheat only:***
  - *Everest*

Insecticides: None registered.

Fungicides: None registered.

Fertilizers: None registered.

Note: The above mixes are those listed on the Bromoxynil+MCPA+Fluroxypyr labels only.
According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** No rainfast period is specified on the label; required interval may be up to 8 hours. Contact manufacturer for more information.
- **Restricted Entry Interval:** DO NOT enter treated fields for 24 hours.
- **Grazing Restrictions:** DO NOT graze or cut for livestock feed within 30 days of application. Withdraw meat animals from treated feed 3 days before slaughter.
- **Pre-harvest Interval:** DO NOT harvest within 60 days of application.
- **Re-cropping Interval:** Barley, canola, flax, forage grasses, lentil, mustard, oats, pea, rye and wheat can be seeded the following year or fields can be fallowed.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store in a ventilated room above freezing. If frozen, allow container to warm and shake well before using.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground only* (*Enforcer M, IPCO Emit, CO-OP Emit, Pierce* only)	1	1	1
Ground only* (*ForceFighter M, ForceFighter All In, Viking Trycka and Foxxy Canuck*)	1	1	4

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

- Spray when winds are under 16 km per hour, but not dead calm.

Sprayer Cleaning:
The manufacturer provides no recommendations on how to clean equipment used to apply this product. As a petroleum based emulsifiable concentrate, 'Method B' in the general section on sprayer cleaning in the introduction may be the most effective.

Hazard Rating:
Enforcer M, IPCO Emit, CO-OP Emit, Pierce:

Warning – Poison

Caution – Skin and Eye Irritant, Potential Skin Sensitizer

ForceFighter:

Warning – Poison

Foxxy Canuck and Viking Trycka:

Danger – Poison

Refer to the Introduction for an explanation of the symbols.

Callisto 480 SC*

Herbicide Group 27 - mesotrione

** for use in Manitoba only*

Company:
Syngenta Canada (PCP#27833)

Formulations:
480 g/L of mesotrione formulated as a suspension
- Container size – 4 x 2.4 L

Crops, Rates and Staging:
Field corn – 2 leaf up to and including 6 leaf

Weeds, Rates and Staging:
Apply Callisto at 63 mL per acre with Aatrex Liquid 480 at minimum 250 mL per acre + Agral 90 at 2 L per 1000 L of solution.

Note: DO NOT make a foliar post-emergent application of any organophosphate or carbamate insecticide within 7 days before or 7 days after a Callisto 480 SC application or severe injury may occur to corn. **DO NOT** cultivate corn within 7 days before or after a post-emergent Callisto 480 SC application.

Weeds Controlled:
- Volunteer canola - cotyledon to 4 leaf

Application Information:
- **Water Volume:**
  - ***Ground:*** minimum 40 L per acre
- **Nozzles and Pressure:** Do not apply with spray droplets smaller than ***ASAE S572.1*** droplets medium classification.
- **Screens:** 50 mesh or larger.

How it Works:
Refer to How Do Herbicides Work in the Weed Control Introduction section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
mesotrione	POST (foliar)	HPPD Pigment Inhibitor	Towards regions of growth (Symplast)	Broadleaf only	27

Effects of Growing Conditions:
Under unfavorable conditions such as drought, heat, flooding, prolonged cool temperatures or insufficient fertility, adequate control may not be achieved and re-growth may occur.

Tank Mixes:
Callisto must be applied with Aatrex 480 at minimum 250 mL per acre + Agral 90 at 2L per 1000 L of solution.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the Introduction.

Restrictions:

- **Rainfall:** 3 hours
- **Re-entry:** DO NOT re-enter treated fields for 12 hours.
- **Pre-harvest Interval:** grain corn 100 days, silage corn 45 days.
- **Re-cropping:** Canola, spring wheat, oats, barley, field corn (grain or silage), soybean – 11 months if total precipitation during the (April to September) year of application is equal or greater than the 30 year average for local location. For all other crops perform a field bioassay.
- **Aerial Application:** DO NOT apply air.
- **Storage:** May be frozen. Store this product away from food or feed. Store in a cool, dry place.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Field sprayer	1		4

See the Key to Product Pages in the introduction for an explanation of the different habitats.
† Distance is measured from the downwind edge of the boom to sensitive areas.

Sprayer Cleaning:

Use a combination of 'Method A' and 'Method B' in the general section on sprayer cleaning in the Introduction.

Hazard Rating:

Caution eye irritant.
Potential skin sensitizer
Refer to the Introduction for an explanation of the symbols.

Carfentrazone

Herbicide Group
14 - carfentrazone-ethyl

Company:

FMC Corporation (*Aim EC* – PCP#28573)
AgraCity (*Revenge* – PCP#33716)
Albaugh (*InStep* – PCP#33956)
Interprovincial Cooperatives (*IPCO C-Zone* – PCP#33580)
WinField United Canada (*Foremost* – PCP#34275)
Viking (*Viking Carfentrazone* – PCP# 34736)

Formulations:

240 g/L carfentrazone-ethyl formulated as an emulsifiable concentrate.

- Container sizes:
  - *Aim EC* - 8 x 1.2 L, 4 x 4.8 L
  - *Revenge, Viking Carfentrazone* - 2 x 4.8 L
  - *InStep* - 4 x 2.4 L
  - *IPCO C-Zone* - 2.4 L (sold only as a component of *CO-OP IPCO Octagon*)
  - *Foremost* - 4 x 2.4 L

Crops, Rates and Staging:

Pre-seeding, pre-emergence (up to 3 days after seeding)†:
Use a non-ionic surfactant at 0.25 to 0.35 L per 100 L of spray solution or use *Merge* at 1 L per 100 L of spray solution when used alone or if mixed with glyphoste at less than180 g ae per acre. Destination MSO at 1 L per 100 L spray solution, Journey or Destinaire HSOC at 0.5 L per 100 L spray solution are only registered for use with *AIM EC* only. See label for specific mixes.

From 14.8 to 29.5 mL per acre prior to the seeding of:

- Sorghum

From 14.6 to 47.3 mL per acre prior to the seeding of:

- Barley
- Buckwheat
- Canola (rapeseed)
- Chickpea
- Corn (field and sweet)
- Dry bean
- Faba bean
- Field pea
- Flax
- Hops (hooded sprayer only)†
- Lentil
- Millet (pearl and proso)
- Mustard
- Oats
- Potatoes†
- Rye
- Safflower
- Soybean
- Sunflower
- Triticale
- Wheat (including spring, winter and durum)

† ***Aim EC* only**

Harvest aid treatment*:
Use *Agral 90* or *Ag-Surf* at 0.25 L per 100 L of spray solution or use *Merge* at 1 L per 100 L of spray solution when used alone.

Post-harvest: *Aim EC* can be applied as post-harvest burndown after harvest. DO NOT make more than two applications in total per year, including post-harvest.

Crop	Rate (mL per acre)
Barley, oats, wheat, millet, dry bean, chickpea, faba bean, field pea, soybean, triticale	29.5 to 47.3
Sorghum	29.5
Potato**	94† to 142

*** DO NOT apply as a tankmix with glyphosate to crops if grown for seed purpose.**
**** A second application of 94 to 142 mL per acre may be applied in potato.**

Weeds, Rates and Staging:

Apply to listed weeds up to 10 cm in height unless otherwise indicated:

Weeds	Rate (mL per acre)
Eastern black nightshade (up to 5 cm), lamb's-quarters (up to 7.5 cm), redroot pigweed, waterhemp (up to 5 cm), velvetleaf	14.8
Above weeds plus: Flixweed**, hairy nightshade, lamb's-quarters, pigweed (prostrate, smooth, tumble, waterhemp), Pennsylvania smartweed (seedling), purslane, round-leaved mallow, stinkweed**, tansy mustard	23.5
Above weeds plus: Cleavers*, cocklebur, eastern black nightshade, kochia, jimsonweed, Russian thistle (up to 5 cm)**, shepherd's-purse*, volunteer canola (all varieties)	29.5
Above weeds plus: Burclover, corn spurry, prickly lettuce, venice mallow (up to 5 cm)	47.3

*** *Aim*, *IPCO C-Zone* and *Foremost* only.**
**** *Aim, IPCO C-Zone*, *Revenge* and *Foremost* only.**

Application Information:

- **Water Volume:** Use a minimum of 40 L per acre. Higher spray volumes is required for dense weed stands. Weed control improves with the amount of coverage.
- **Nozzles and Pressure:** Maximum 35 psi (210 kPa) if using conventional nozzles. Low drift nozzles may require higher pressure for proper performance. Use nozzles and pressure designed to deliver proper coverage with ***ASABE medium*** droplets.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
carfentrazone-ethyl	POST (foliar)	PPO Inhibitor/ Membrane disruptor	Little movement due to rapid cell leakage (Symplast)	Non-selective Broadleaf	14

Effects of Growing Conditions:

Extremes in environmental conditions such as temperature, moisture, soil conditions, and cultural practices may affect activity. Under warm moist conditions, herbicide symptoms may be accelerated. While under very dry conditions, the expression of herbicide symptoms may be reduced as weeds hardened off by drought are less susceptible.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides:

- *Authority 480*
- *Authority Supreme*
- Glyphosate (180 to 360 g ae per acre)
- 2,4-D Ester (134 to 214 g ae per acre) (see 2,4-D for crop options – prior to seeding or after seeding and prior to crop emergence)
- MCPA ester (102 to 202 g ae per acre) plus glyphosate (wheat, barley, rye, oats, flax)†
- Bromoxynil†† (57 g active ingredient per acre – canola, wheat, barley, oats)
- Bromoxynil + glyphosate†† (rates and crops above)
- *Command 360 ME* + glyphosate† (prior to seeding canola – all varieties)
- *Express SG* + glyphosate† (fallow or a minimum of 24 hours prior to seeding barley, oats, wheat (spring, winter, durum), dry bean, faba bean, field pea, lupin and soybean)
- *Express FX* + glyphosate† (fallow or prior to seeding wheat [spring, durum and winter], barley and oats)
- *Express Pro* + glyphosate† (fallow and prior to seeding wheat [spring, durum and winter] oats and barley)

Harvest aid treatment:

- ***Barley, chickpea, dry beans, faba bean, field pea, millet, oats, sorghum, and wheat:***
  - Glyphosate* (360 g ae per acre)
- ***Potato only:*** Reglone** (0.51 to 0.9 L per acre)

  *** IPA or K salt only.**

  **** For potato desiccation – should a second desiccation application be required after a first application of *Aim EC* plus *Reglone* tank mix, use *Aim EC* at 94 to 142 mL per acre alone or as a tank mix with *Reglone* at 0.51 L per acre.**

  † *Aim* only.

  †† *Aim, Foremost and Revenge* only.

Note: The above mixes are those listed on the Carfentrazone labels only.

According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Rainfall within 1 hour after application may reduce activity. Heavy rainfall shortly after application may reduce activity.
- **Restricted Entry Interval:** DO NOT enter treated fields for 12 hours.
- **Pre-harvest Interval:** Leave 7 days between application and harvest for potatoes and 3 days for all other registered crops for harvest aid uses.
- **Grazing Restrictions:** No restrictions.
- **Re-cropping Interval:** There are no rotational restrictions on crops registered for pre-seed use. All other crops may be planted 12 months after application.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store in a cool, dry place and avoid excess heat.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of Terrestrial Habitat
Ground only*	5

*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches above the crop canopy.**

† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat. DO NOT apply in areas where surface water from the treated area can run off into aquatic habitats.

Sprayer Cleaning:

Refer to 'Method A' in the general section on sprayer cleaning in the introduction.

Hazard Rating:

Caution – Eye and Skin Irritant

Refer to the Introduction for an explanation of the symbols.

Carfentrazone + 2,4-D Ester

Herbicide Group
4 - 2,4-D
14 - carfentrazone

This product is the equivalent of a prepackaged tank mix of carfentrazone and 2,4-D 700 ester. Information listed is restricted to Crops, Weeds, Rates and Tank mixes. For other detailed restrictions and other general information on the component products see the product pages listed above.

Company:
AgraCity (*Revenge Pro*)
Interprovincial Cooperative Ltd. (*COOP/IPCO Convex*)
Viking (*Viking Solna*)

Formulation:
The carfentrazone + 2,4-D ester package contains the following components:
***Revenge* (PCP#33716 - *Revenge Pro*), *IPCO C-Zone* (PCP#33580 - *COOP/IPCO Convex*), *Viking Carfentrazone* (PCP #34736 - *Viking Solna*):** 240 g/L carfentrazone formulated as a emulsifiable concentrate.

- Container sizes - 1.2 L

Revenge Pro, COOP/IPCO Convex - 1.2 L
Viking Carfentrazone - 2.4 L
-plus-
***MPOWER 2,4-D Ester 700 II* (PCP#34808 - *Revenge Pro*), *IPCO/COOP 2,4-D Ester 700* (PCP#27819/32882 - *IPCO/COOP Convex*) , *Viking 2,4-D Ester 700* (PCP# 34813 - *Viking Solna*):** 660 g ae/L 2,4-D formulated as an emulsifiable concentrate.

- Container sizes -

R***evenge Pro, COOP/IPCO Convex - 2 x 8.69L***
Viking 2,4-D Ester 700 - 2 x 9.8 L

Crops and Staging:
Apply to the soil surface up to 1 day prior to seeding spring wheat, durum wheat*, winter wheat*, barley, rye, or in chemfallow.
*** *IPCO/COOP Convex* and *Viking Solna* only.**

Weeds and Staging:
Apply 15 mL per acre of *IPCO C-Zone* plus 217 mL per acre of 2,4-D Ester 700 plus glyphosate (sold separately) at 180 to 360 g ae per acre controls the weeds controlled by the component products (glyphosate at 180 g ae per acre) plus:

- Chickweed
- Horsetail
- Jimsonweed
- Kochia (all biotypes)
- Smartweed (Pennsylvania)
- Tansy mustard

Tank Mixes:
Herbicides: Glyphosate (IPA, DMA, K+)
Fungicides: None registered.
Insecticides: None registered.
Fertilizers: None registered.
Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found in the introduction.

See component products for more information on restrictions, application details and handling. Unless indicated differently above use the most limiting restrictions across all components for the mix.

Casoron

Herbicide Group 20 - dichlobenil

Company:
UPL AgroSolutions Canada (PCP#12533)

Formulation:
4 percent dichlobenil formulated as a granular.
- Container size - 22.7 kg

Crops:
Poplar plantations
Shelterbelts consisting of the following species:
- Ash
- Barberry
- Boxwood Caragana
- Cedar (White, Eastern Red)
- Crabapple
- Elm
- Euonymus (Burning bush)
- Forsythia
- Honeysuckle
- Juniper
- Lilac
- Linden
- Locust
- Maple
- Mock orange
- Rose
- Spirea
- Willow

NOTE: DO NOT apply to shelterbelts with mugo pine, firs, hemlock, holly, spruce or other shallow rooted species or injury may result. DO NOT apply in or around greenhouses. DO NOT use on light sandy soils.

Weeds and Staging:
Apply in early spring or late fall prior to annual weed emergence, or after cultivation has removed existing weeds.
- Annual blugrass
- Artemisia (absinthe,* wormwood, sage)
- Bindweed*
- Canada thistle*
- Chickweed
- Dandelion*
- Foxtail (green and yellow)
- Groundsel
- Horsetail
- Knotweed
- Kochia
- Lamb's-quarters
- Loosestrife
- Mustard
- Nutsedge*
- Pigweed
- Plantain
- Purslane
- Quack grass*
- Sheep sorrel*
- Shepherd's-purse
- Smartweed
- Sow-thistle
- Spurge
- Vetch*
- Wild buckwheat*

*** Controlled with fall applications at the higher rates.**

Rates:
45 to 70 kg per acre. At the low rate, a 15 kg bag will treat a 4 yd by 407 yd (4 m by 340 m) strip of shelterbelt. At the high rate, a 15 kg bag will treat a 4 yd by 256 yd (4 m by 214 m) strip of shelterbelt. If application is followed by 0.5 to 1.0 inches (1.3 to 2.5 cm) of irrigation, the lower rates are recommended.

How it Works:
Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
dichobenil	PRE (soil active)	Cellulose synthesis inhibitor	Upward (Apoplast)	Broadleaf & grass	20

Effects of Growing Conditions:
DO NOT apply during periods of high soil temperatures (more than 15°C).

Tank Mixes:
None registered.

Restrictions:
- **Rainfall:** Does not reduce activity.
- **Restricted Entry Interval:** DO NOT enter treated areas for at least 24 hours.
- **Grazing Restrictions:** DO NOT graze in treated area.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store in a cool, dry place. DO NOT freeze.
- **Buffer Zones:** Site characteristics and conditions that may lead to runoff include, but are not limited to, heavy rainfall, moderate to steep slope, bare soil, poorly draining soil (e.g., soils that are compacted, fine textured or low in organic matter). Avoid application of this product when heavy rain is forecast.

Equipment Cleaning:
Refer to the general section on sprayer cleaning in the introduction.

Hazard Rating:
No specific rating. Keep out of reach of children. Harmful if swallowed. Avoid skin or eye contact.

Certitude

Herbicide Group
6 - bromoxynil
27 - topramezone

Company:
BASF Canada

Formulation:
The *Certitude* package contains the following components:
***Certitude A* (PCP#33908) or Component A:** 336 g/L topramezone formulated as a suspension.
- Container size - 291 mL

-plus-
***Certitude B* (PCP#33893):** 235 g/L bromoxynil formulated as an emulsifiable concentrate.
- Container size - 9.71 L

-plus-
***Merge* (PCP#24702):** 50% surfactant blend plus 50% solvent formulated as a surfactant.
- Container size - 8.1 L

Crops and Staging:
Canola: Pre-seed

Weeds and Staging:
Weeds controlled:
- Kochia*†
- Lamb's quarters†
- Shepherd's purse†
- Volunteer canola* (cotyledon to 6-leaf)
- Wild mustard†

*** Controls all herbicide resistant biotypes/varieties.**
† Up to 10 cm in height.

Rate:
Certitude A: 7 mL per acre
-plus-
Certitude B: 243 mL per acre
-plus-
Merge: 202 mL per acre
Note: Maximum of ONE APPLICATION of *Certitude* per season.

Application Information:
- **Water Volume:**
  - ***Ground:*** 20 to 40 L per acre.
    Note: 40 L per acre is recommended for thorough coverage and optimal efficacy on herbicide resistant kochia.
- **Nozzles and Pressure:** Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE medium*** droplets by ground. Low drift nozzles may require higher pressures for proper performance. DO NOT apply in periods of dead calm.

How it Works:
Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
topramezone	POST (foliar)	HPPD Pigment Inhibitor	Little (apoplast) some uptake by roots	Broadleaf & grass	27
bromoxynil	POST (foliar)	PSII Inhibitor/ Membrane Disrupter	Little (apoplast)	Broadleaf only	6

Effects of Growing Conditions:

Warm, moist growing conditions promote active weed growth. Weeds hardened off by environmental stress such as cold weather, drought or excessive heat may not be adequately controlled. DO NOT apply in periods of dead calm. DO NOT apply if temperatures of 5°C or lower are forecast within 3 days of application.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides: Glyphosate (180 to 360 g ae per acre)

Fungicides: None registered.

Insecticides: None registered

Fertilizers: None registered.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Rainfall within 1 hour will reduce control.
- **Restricted Entry Interval:** DO NOT re-enter treated fields for at least 24 hours.
- **Pre-harvest Interval:** There is no required pre-harvest interval between a pre-seed application and harvest.
- **Grazing Restrictions:** DO NOT graze or feed other portions of the treated canola to livestock.
- **Re-cropping Interval:** Winter wheat can be seeded 4 months after application. Alfalfa, barley, canola, field corn, field pea, lentils, navy (white) bean, potato, soybean, spring wheat (including durum) can be seeded 1 year after application.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store in a cool, dry place. *Certitude B* formulations will solidify at temperatures below -20°C, but it will be usable again at temperatures above 0°C.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground*	1	1	2

See the Key to Product Pages in the introduction for an explanation of the different habitats.

*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**

† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Refer to 'Method A,' in the general section on sprayer cleaning in the introduction. Let solution stand for an extended period for better results. Flush sprayer system with water. See the label for product specific cleaning details. Refer to the tank mix partner's product label for any additional cleaning instructions.

Hazard Rating:

Danger – Poison

Danger – Corrosive to Eyes and Skin

Warning – Eye Irritant

Warning – Contains the Allergen Soy

Refer to the Introduction for an explanation of the symbols.

Cirpreme*/Cirpreme XC

Herbicide Group
2 - florasulam
4 - halauxifen, clopyralid

Company:
Corteva Agriscience

Formulation:
The *Cirpreme** package contains the following components:
***Paradigm* (PCP#31304):** 20% halauxifen and 20% florasulam formulated as a water dispersible granule
- Container size - 1 x 800 g

***Lontrel 360* (PCP#23545):** 360 g/L clopyralid formulated as a solution.
- Container size - 1 x 6.7 L

The *Cirpreme XC* package contains:
Cirpreme A (PCP#34180): 20% halauxifen and 20% florasulam formulated as a water dispersible granule
- Container size - 1 x 800 g

Lontrel XC (PCP#32795): 600 g/L clopyralid formulated as a solution.
- Container size - 1 x 4.1 L

* ***Note:*** *This product is no longer manufactured but inventories still remain in distribution. This product may be removed from future editions.*

Crops and Staging:
Spring wheat (including durum), winter wheat and barley: 3 leaf to just prior to emergence of the flag leaf

Weeds and Staging:
Apply to emerged, young and actively growing weeds that are less than 8 leaf stage unless otherwise stated.
The use of MCPA 600 Ester is recommended at 189 to 283 mL per acre.

Weeds controlled - *Cirpreme* + MCPA 600 Ester at 283 mL per acre:
- Alfalfa, volunteer (up to 25 cm in height)
- American dragonhead (up to bud stage or 15 cm)
- Annual sunflower
- Barnyard grass (up to 5 leaf, 2 tiller)
- Burdock
- Canada fleabane (up to 15 cm in height)
- Chickweed
- Cleavers (1 to 9 whorl)
- Cocklebur
- Cow cockle
- Dandelion (seedlings, overwintered rosettes & mature plants)
- Field horsetail (top growth)
- Flixweed (up to 8 leaf and 8 cm in height)
- Hemp-nettle
- Henbit (up to 8 leaf or 15 cm)
- Lamb's-quarters
- Mustard (wild, ball*)
- Narrow-leaved hawk's-beard (up to bolting and 30 cm in height)
- Plantain (top growth)
- Prickly lettuce
- Ragweed, common (up to 6 leaf)
- Redroot pigweed
- Round-leaved mallow (up to 6 leaf)
- Scentless chamomile (up to the bud stage and 15 cm)
- Shepherd's-purse (up to bolting and 20 cm in height)
- Smartweed, annual (green, lady's-thumb)
- Sow thistle, annual (up to 4 leaf)
- Sow-thistle, perennial (up to the bolting stage & 20 cm in height)
- Stinkweed
- Stork's-bill (up to 8 leaf)
- Thistle, Canada (up to the bud stage)
- Velvetleaf (up to 5 leaf)
- Vetch
- Volunteer canola
- Volunteer flax (up to 15 cm)
- Volunteer sunflower
- Wild buckwheat
- Wild radish

Weeds suppressed:
- Kochia**
- Night-flowering catchfly (up to bolting, 15 cm in height)
- White cockle (spring seedlings and over-wintered plants up to bud stage)

*** Best results are obtained when applied to actively growing weeds in the 1 to 4 leaf (seedling) stage**
****Light to moderate infestations (up to 150 plants per m^2; up to 15 cm in height)**

Rate:

Paradigm/Cirpreme A: 10 grams per acre.
-plus-
Lontrel 360: 84 mL per acre.
-or-
Lontrel XC: 52 mL per acre.
It is recommended that *Cirpreme/Cirpreme XC* be mixed with MCPA Ester 600 at 283 mL per acre (not supplied).
Add *Agral 90, Agsurf II*, or *Citowett Plus* at 0.2 L per 100 L of spray solution or *Merge* at 0.5 L per 100 L of solution.
Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Application Information:

- **Water Volume:**
  - ***Ground:*** 20 to 40 L per acre
- **Nozzles and Pressure:** Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE coarse*** droplets by ground. Sprayers without drift reduction nozzles should use between 30 to 40 psi (200 to 275 kPa). Low drift nozzles may require higher pressures for proper performance.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
florasulam	POST (foliar)	ALS Amino Acid Inhibitor	Toward areas of growth (Symplast)	Broadleaf only	2
halauxifen	POST (foliar)	Synthetic Auxin	Throughout the plant (Symplast)	Broadleaf only	4
clopyralid	POST (foliar)	Synthetic Auxin	Throughout the plant (Symplast)	Broadleaf only	4

Effects of Growing Conditions:

Control is best with actively growing weeds. Weeds hardened off by cold weather or drought stress may not be adequately controlled or suppressed and regrowth may occur. For best results, ensure thorough spray coverage of target weeds.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.
Herbicides:

- **All registered crops:**
  - MCPA 600 Ester (189 to 280 mL per acre)
  - *Axial*
- **Wheat (Spring, durum, winter) only:**
  - *Simplicity OD**,
  - *Simplicity GoDRI**

*Cipreme XC only

Fungicides: None registered.
Insecticides: None registered.
Fertilizers: None registered.
Note: The above mixes are those listed on the *Cirpreme/Cirpreme XC* labels only.
According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.
Adding ingredients in the correct order is critical for optimum performance. Add water dispersible granule *Paradigm/Cirpreme A* first, followed by the grass tank-mix then add the *Lontrel* component, add MCPA Ester and recommended surfactant as required.
General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 1 hour may reduce control.
- **Restricted Entry Interval:** DO NOT re-enter treated fields for 12 hours.
- **Pre-harvest Interval:** DO NOT harvest the treated crop within 60 days after application.
- **Grazing Restrictions:** Livestock may be grazed on treated crops 7 days following application. DO NOT cut the treated crop for hay or silage within 21 days after application.
- **Re-cropping Interval:** Alfalfa, spring wheat, barley, canola (including oilseed quality *B. juncea*), dry bean (*Phaseolus vulgaris* species including pinto, kidney and white types), faba beans, flax, field peas, potatoes (except seed potatoes), mustard (oriental, brown and yellow), soybeans, oats, or sunflower may be seeded 10 months after application. Lentils can be planted 22 months after application.

- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store in original containers in a secure, dry heated storage.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground only*	1	1	1

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:
Refer to to 'Method C' in the introduction. Let solution stand for an extended period for better results. Flush sprayer system with water. See the label for product specific cleaning details.

Hazard Rating:
Paradigm/Cirpreme A:
Potential Skin Sensitizer
Refer to the Introduction for an explanation of the symbols.

Cirray

Herbicide Group 1 - pinoxaden, fenoxaprop-p-ethyl

Company:
Bayer

Formulation:
***Cirray* (PCP#34306):** 50 g/L pinoxaden and 50 g/L fenoxaprop-p-ethyl formulated as an emulsifiable concentrate with cloquintocet-mexyl at 25 g/L as a safener.
- Container sizes - 6.48 L, 103.6 L

Crops and Staging:
Spring wheat and barley: 1 to 6 leaves on the main stem plus 3 tillers

Weeds, Rates and Staging:
Apply 323 mL per acre to actively growing weeds with 1 to 6 leaves on the main stem, plus 3 tillers.
Weeds controlled:
- Green foxtail
- Yellow foxtail
- Barnyard grass
- Wild oats
- Persian darnel

Note: Maximum of ONE APPLICATION of this product or other product containing fenoxaprop or pinoxaden per year.
Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Application Information:
- **Water Volume:**
  - ***Ground:*** minimum 20 L per acre.
  - ***Aerial:*** 12 L per acre
- **Nozzles and Pressure:** Use a combination of nozzles and pressure designed to deliver thorough, even coverage with no smaller than ***ASABE medium*** droplets by ground or air. Low drift nozzles may require higher pressures for proper performance.
- **Screens:** 50 mesh nozzle screens.

How it Works:
Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
pinoxaden	POST	Lipid synthesis inhibitor	Symplastic	Selective	1
fenoxaprop-p-ethyl	POST	Lipid synthesis inhibitor	Symplastic	Selective	1

Effects of Growing Conditions:

Weed control can be reduced or delayed under stress conditions such as drought, heat, or insufficient fertility, flooding, or prolonged cool temperatures. Grass escapes or re-tillering may occur if application is made during prolonged stress conditions. DO NOT apply to crop that is stressed by conditions, such as frost, low fertility, drought, flooding, disease, or insect damage as crop injury may result.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted. Consult label of broadleaf herbicide prior to use.

Herbicides:

- 2,4-D Ester LV 700
- *Ally*
- *Attain XC*
- Bromoxynil/MCPA Ester†
- *Frontline XL*
- *Infinity***
- MCPA Amine 500
- MCPA Ester†
- Mecoprop-P (150 g ae/L)***
- *Pixxaro*
- *Prestige XC*
- *Refine SG*
- *Refine SG* + *Buctril M*
- *Refine SG* + MCPA Ester†*
- *Thumper*
- *Trophy*†

† A reduction in barnyard grass control may be observed.
*** Suppression only of green foxtail.**
**** For control of common ragweed and suppression of round-leaved mallow only.**
***** A reduction in wild oat control may be observed.**

Fungicides: *Tilt 250E*.
Insecticides: None registered
Fertilizers: None registered.
Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Rainfall within 1 hour may reduce control.
- **Restricted Entry Interval:** DO NOT re-enter treated fields for 12 hours.
- **Pre-harvest Interval:** Leave 65 days between application and harvest for grain or straw.
- **Grazing Restrictions:** DO NOT graze or feed to livestock for 30 days after treatment.
- **Re-cropping Interval:** There are no crop rotation limitations the year following application.
- **Aerial Application:** May be applied by aircraft.
- **Storage:** Store this product away from food or feed. Keep in original container, tightly closed, during storage. Store in a cool, dry, well-ventilated area away from feed and foodstuffs, and out of reach of children and animals. Keep away from fire or open flame, or other sources of heat. If frozen, allow to thaw and agitate thoroughly prior to use.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground*	1	0	1
Fixed wing aircraft	1	0	25
Helicopter	1	0	25

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Refer to 'Method B' in the general section on sprayer cleaning in the introduction. Let solution stand for an extended period for better results. Flush sprayer system with water. See the label for product specific cleaning details.

Hazard Rating:

Danger – Eye and Skin Irritant
Potential Skin Sensitizer
Refer to the Introduction for an explanation of the symbols.

Clethodim

Herbicide Group 1 - clethodim

Company:

UPL AgroSolutions Canada (*Select* – PCP#22625 & *Amigo* – PCP#22644; *Select 1EC* – PCP# 34250)
ADAMA Canada (*Arrow** – PCP#28224 & *X-ACT Adjuvant* – PCP#28225; *Arrow All In* – PCP#33225
Advantage Crop Protection (*Advantage Clethodim 240* – PCP#33721 & *Advantage Clethodim Adjuvant* – PCP#33902)
AgraCity (*Independence* – PCP#32851 & *Empire Adjuvant* – PCP#33380)
Albaugh (*Clethodim 240* – PCP#32334 & *Surf-Act* – PCP#32313; *Deputy* – PCP#33703 & *Surf-Act* – PCP#32313).
BASF Canada (*Centurion* – PCP#27598 & *Amigo* – PCP#22644); *Centurion ADV* – PCP# 34836)
Interprovincial Cooperative Ltd. (*IPCO GraminX* – PCP#33659 & *IPCO X-Surf Adjuvant* – PCP#33660; *CO-OP Patron II* – PCP#33661 & *CO-OP Patron II Adjuvant* – PCP#33662; *IPCO GraminX Complete* – PCP#34933; *CO-OP Patron Complete* – PCP#34934)
Loveland Products Canada (*Shadow RTM* – PCP#29277 & *Amigo* – PCP#22644; *Shadow XL* – PCP 34960)
Nufarm Agriculture (*Statue* – PCP#32885)
WinField United Canada (*Antler 240EC* – PCP#32880 & *Journey HSOC* – PCP#33800; *Antler 360 Unpacked* – PCP#33866)
Viking (*Viking Clethodim* – PCP#34745)

* ***Note:*** *This product is no longer manufactured but inventories still remain in distribution. This product may be removed from future editions.*

Formulation:

Arrow All In, Select 1EC, Shadow XL, IPCO GraminX Complete, CO-OP Patron Complete, Centurion ADV: 120 g/L clethodim formulated as an emulsifiable concentrate.

- Container sizes:
  - *Arrow All In* - 2 x 6 L
  - *Select 1EC, Centurion ADV* - 2 x 6.1 L, 97.6 L
  - *Shadow XL* - 6 L, 97.6 L
  - *IPCO GraminX Complete & CO-Op Patron Complete* - 6.1 L, 97.6 L

Antler 360 Unpacked: 360 g/L clethodim formulated as an emulsifiable concentrate.

- Container size - 4 x 4 L

Other products: 240 g/L clethodim formulated as an emulsifiable concentrate.

- Container sizes:
  - *Statue* - 2 x 3 L clethodim, adjuvant sold separately
  - *Independence* - 6 L clethodim + 15 L adjuvant
  - *Antler 240* - 3 L clethodim + 7.5 L adjuvant
  - Other products - 3 L clethodim + 9 L adjuvant

Crops, Rates and Staging:

Crops are tolerant at all growth stages at maximum rates, but "Pre-harvest Intervals" must be observed to prevent excess residue in the grain (see "Restrictions:" section below).

To a maximum rate of 150 mL per acre for 120 g/L formulations, 50 mL per acre for *Antler 360 Unpacked*, and 75 mL per acre for other formulations:

- Chickpea*
- Dry bean# (black, great northern, navy, pink, pinto, red)
- Faba bean$^{\Delta\Delta\Delta\dagger}$
- Prairie Carnation**†

To the maximum rate in the Weeds, Rates and Staging chart below:

- Alfalfa (seedling only)
- Buckwheat$^{\Delta\Delta\Delta\Delta}$
- Canola
- Caraway$^{\Delta\dagger}$
- Carinata$^{\Delta\Delta\Delta}$
- Coriander**†
- Dill (seed production)***$^{\Delta\Delta\dagger}$
- Fenugreek***†
- Field pea
- Flax (including Solin)
- Hops$^{\Delta\Delta\Delta\dagger}$
- Lentil
- Mustard, condiment (brown, oriental, yellow)
- Mustard, oilseed types (*B. juncea*)$^{\Delta}$
- Potato
- Safflower (6 to 8 leaf)$^{\Delta\dagger}$
- Soybean
- Sunflower

*** Apply up to the 9 node stage (7 inches or 18 cm maximum height)**
**** Apply in the 2 to 5 leaf stage, one application per year.**
***** Apply in the 3 to 5 leaf stage, one application per year.**
 # *Select, Centurion, Centurion ADV, Shadow RTM, Antler 360 Unpacked, Statue,Independence* and *Viking Clethodim* are registered for all *Phaseolus vulgaris* varieties. Since not all varieties of dry beans have been tested for tolerance to clethodim, first use of clethodim should be limited to a small area of each variety to confirm tolerance. *Antler, Arrow All In,* and *Clethodim 240* and *Deputy* are registered for use on black, great northern, navy, pink, pinto, and red dry bean types only. Centurion and Centurion ADV are registered for use on navy and pink dry bean types only.

[Δ] ***Select, Centurion, Centurion ADV, Shadow RTM, Statue, IPCO GraminX, CO-OP Patron II, Advantage Clethodim, IPCO GraminX Complete, CO-OP Patron Complete*** **and** ***Independence, Independence*** **and** ***Viking Clethodim*** **only.**
[ΔΔ] ***Select, Centurion, Centurion ADV, Shadow RTM, IPCO GraminX, CO-OP Patron II, IPCO GraminX Complete, CO-OP Patron Complete*** **and** ***Advantage Clethodim*** **only.**
[ΔΔΔ] ***Select, Centurion*****, Centurion ADV,** ***Shadow RTM, IPCO GraminX, CO-OP Patron II, IPCO GraminX Complete*** **and** ***CO-OP Patron Complete*** **only.**
[ΔΔΔΔ] ***Select*** **and** ***Centurion*** **only.**
[†] ***NOTE: Since these uses are registered under the User Requested Minor Use Label Expansion (URMULE) program, the manufacturer assumes no responsibility for herbicide performance.*** ***Those who apply these uses do so at their own risk.***

When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

Weeds, Rates and Staging:

DO NOT apply more than a combined total rate of 37.5 g clethodim active ingredient (300 mL per acre of 120 g/L formulations, 100 mL per acre of 360 g/L formulations, or 150 mL per acre of 240 g/L formulations), or other products containing clethodim, to the same field per season.

Adjuvants: Clethodim products must be applied with 0.5 L of *Amigo* adjuvant (*Centurion, Shadow RTM, Antler 360 Unpacked* or *Select*), *Empire* (*Independence*), *Nufarm Carrier* adjuvant (*Statue*), *X-ACT* (*Antler 240EC, Arrow*), *Surf-Act* (*Clethodim 240, Deputy, Advantage Clethodim Adjuvant (Advantage Clethodim 240), IPCO X-Surf (IPCO GraminX*), *Patron II* adjuvant (*CO-OP Patron II*) or Viking Phosphate Ester Adjuvant (*Viking Clethodim*) per 100 L of spray solution (unless otherwise indicated on the label). For spray water sources high in bicarbonate ions (CO3) see 'Effects of Growing Conditions' section following.

Arrow All In, *Select 1EC, Centurion ADV, IPCO GraminX Complete* and *CO-OP Patron Complete* do not require the addition of an adjuvant since it is built into the formulations. Optional - *Arrow All In* can be applied with additional adjuvant when circumstances are not ideal for weed control (heavy weed pressure, drought). Use 30% phosphate ester surfactant at 0.5 L per 100 L solution, methylated seed oil at 0.5 L per 100 L solution or non-ionic surfactant at 0.25 L per 100 L solution.

Weed	Rate (mL per acre)			Stage
	240 g/L	120 g/L	360 g/L	
Barnyard grass, foxtail (green, yellow)*†, proso millet, volunteer cereals (barley*†, canary seed, corn, oats*†, wheat*†), wild oats†	50**	100**	33.3**	Apply at 2 to 6 leaf stage. † Apply at the 2 to 4 leaf stage when treated with the lowest rate. For best results in either case, apply at the 2 to 3 leaf stage.
Moderate to heavy infestations of the above grasses, plus Persian darnel, Japanese brome[Δ], foxtail barley[Δ]	75	150	50	
Quackgrass (suppression only)	75	150	50	2 to 6 leaf stage or 3 to 6 inches (6 to 15 cm) tall. For best results, apply at the 3 to 5 leaf stage.
Quackgrass (season long control), Japanese brome (max 3 tillers)[Δ], foxtail barley (max 3 tillers)[Δ]	150***	300	100	

*** Apply to light infestations of these weeds only for the lowest rate. The manufacturers do not provide guidelines for weed densities under light infestations. When in doubt as to the level of weed infestation, use the higher rate or contact the manufacturer.**
**** At this rate, clethodim should NOT be tank mixed with any other pesticide and should only be applied under the following growing conditions: good crop stand, within the recommended leaf staging (2 to 3 leaf is optimum timing) prior to tillering, light weed infestations, adequate moisture and fertility, absence of stress, and good growing conditions.**
***** Apply with 1 L of adjuvant per 100 L of spray solution.**
[Δ] ***Select, Centurion, Centurion ADV, Shadow RTM, IPCO GraminX, CO-OP Patron II, IPCO GraminX Complete*** **and** ***CO-OP Patron Complete*** **only.**

Refer to the product labels for complete mixing instructions. A general guide to mixing can be found in the introduction.

Application Information:

- **Water Volume:**
  - ***Ground:*** 20 to 40 L per acre. Use 40 L per acre under dense weed infestations or dense crop canopies.
  - ***Aerial:*** Minimum of 11.3 L per acre.
- **Nozzles and Pressure:** Use 40 psi (275 kPa) when using conventional 80° flat fan nozzles tilted forward at a 45° angle. Low drift nozzles may require higher pressures for proper performance. Use nozzles and pressure designed to deliver proper coverage with ***ASABE medium*** droplets or larger.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
clethodim	POST (foliar)	ACCase Lipid synthesis inhibitor	Toward regions of growth (Symplast)	Grasses only	1

Effects of Growing Conditions:

Clethodim will be less effective when plants are stressed by lack of moisture, excessive moisture, low temperature and/or very low relative humidity. Re-growth of tillers may occur if application is made under any of the above stress conditions.

Clethodim activity is reduced by levels of bicarbonate ions in spray water equal to or greater than 500 ppm. The addition of ammonium sulphate at 1.6 L per acre (490 g per L liquid) or 0.8 kg per acre (99 percent dry), or the addition of 28-0-0 liquid fertilizer at 0.5 L per acre to the tank prior to the addition of clethodim has been shown to restore control.

Tank Mixes:

Clethodim may be tank mixed with other pesticides at the all but the lowest rates. Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Add the recommended amount of adjuvant with all tank mixes unless otherwise indicated.

Herbicides:

- ***In flax (not including solin):***
  - Bromoxynil/MCPA Ester (label rates) [Δ]
  - *Curtail M*[†]
  - MCPA Ester (rates for flax)
- ***In Solin (low linolenic flax):***
  - Bromoxynil/MCPA Ester (label rates) [Δ]
  - *Curtail M*[†]
- ***In canola:***
  - *Muster*[†]
  - *Lontrel 360*
- ***In CLEARFIELD canola only:***
  - *Pursuit* at 42 to 85 mL per acre[†]
- ***In Liberty Link canola:***
  - *Glufosinate 150SN* (*Liberty 150 SN* and *Interline* only) at label rates mixed with 360 g/L formulations at 17 mL per acre, 240 g/L formulations at 25 mL per acre, and 120 g/L formulations at 50 mL per acre.
  - *Glufosinate 150SN* (*Liberty 150 SN* and *Interline* only) at label rates mixed with *Antler 360 Unpacked* up to 50.6 mL per acre, *Select 240 EC, Centurion, CO-OP Partron II, IPCO GraminX, Shadow RTM* and *Viking Clethodim* up to 75 mL per acre. Add adjuvant for clethodim product to the tank first, then Glufosinate 150SN and then Clethodim.
  - *Glufosinate 150 SN (Liberty 150 SN and Interline only) at label rates mixed with Shadow XL and Select 1EC up to 153 mL per acre.*
  - *Glufosinate 150 SN (Liberty 150 SN only) at label rates mixed with Centurion ADV up to 153 mL per acre.*
  - *Glufosinate 150SN* (*Liberty 150 SN* and *Facet L*).
- ***In field peas:***
  - *Pursuit*
- ***In Glyphosate tolerant soybean:***
  - Glyphosate (360 to 720 g ae per acre)[†]*

[†] **Apply with the 150 mL per acre rate of *Arrow All In*, , Centurion ADV, Select 1EC, Shadow XL, Arrow All In, IPCO GraminX Complete and CO-OP Patron Complete, 50 mL per acre rate of *Antler 360 Unpacked*, or the 75 mL per acre rate of other clethodim formulations only.**

[Δ] **Manufacturers may only support specific mixes. Contact the manufacturer for more information.**

* ***Select, Shadow RTM, Antler, Arrow, Arrow All In, IPCO GraminX, CO-OP Patron II, IPCO GraminX Complete, CO-OP Patron Complete* only and *Centurion ADV*.**

Allow 4 days between application of clethodim and any other chemical not recommended as a tank mix combination on the label.

Fertilizer: None registered.
Insecticide: None registered.
Fungicides: None registered.

According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 1 hour may reduce control.
- **Restricted Entry Interval:** DO NOT enter treated fields for 12 hours.
- **Grazing Restrictions:** DO NOT graze or cut treated crops for forage until 60 days after application of clethodim to annual crops, and 30 days after application to seedling alfalfa.

- **Pre-harvest Interval:**

Pre-harvest Interval (days)	Crops
21	Hops
30	Alfalfa, fenugreek
40	Dill seed
60	Canola, carinata, chickpeas (Desi and Kabuli) coriander, dry beans, faba bean, flax (including Solin), lentil, or mustard (brown, yellow, oriental), potatoes
70	Safflower
72	Sunflower
75	Field peas, soybeans

- **Aerial Application:** *Select, Centurion, Centurion ADV, Shadow RTM, IPCO GraminX* and *CO-OP Patron II* may be applied by air in carinata, canola, chickpea, dry bean, faba bean, flax, field pea, lentil, mustard, potato, soybean, sunflower only. *Antler 360 Unpacked*, *Independence*, *Statue* and *Viking Clethodim* may be applied by air in canola, chickpea, dry bean, flax, field pea, lentil, mustard, potato, soybean, sunflower only. *Antler, Arrow 240, Arrow All In*, *Clethodim 240* and *Deputy* may not be applied by air.
- **Storage:** May be stored at any temperature. Shake well before use.
- **Buffer Zones:**
  - ***Antler, Arrow, Statue:*** Leave a 15 meter buffer by ground and a 30 meter buffer by air (where aerial application is permitted) between the edge of sensitive habitats and the closest spray pass.
  - ***Arrow All In* (ground only), *Clethodim 240 & Deputy* (ground only), *Independence, Statue, Viking Clethodim:***

Application method	Crop	Buffer Zones (metres†) Required for the Protection of:		
		Aquatic Habitats of Depths		Terrestrial habitat
		Less than 1 m	Greater than 1 m	
Ground only*	All	1	1	1
Fixed wing aircraft	Desi and Kabuli chickpeas, dry common beans, faba bean	1	1	20
	Other registered crops	5	1	40
Helicopter	Desi and Kabuli chickpeas, dry common beans, faba bean	1	1	20
	Other registered crops	5	1	35

  - ***Select, Centurion, Centurion ADV, Shadow RTM, Antler 360 Unpacked, CO-OP Patron II, IPCO GraminX, IPCO GraminX Complete* and *CO-OP Patron Complete:***

Application method	Crop	Buffer Zones (metres†) Required for the Protection of:		
		Aquatic Habitats of Depths		Terrestrial habitat
		Less than 1 m	Greater than 1 m	
Ground only*	Desi and Kabuli chickpeas, dry common beans, Prairie carnation, pigeon pea	1	1	1
	Other registered crops	1	1	2
Fixed wing aircraft	Desi and Kabuli chickpeas, dry common beans, faba bean	4	1	30
	Other registered crops	10	1	60
Helicopter	Desi and Kabuli chickpeas, dry common beans, faba bean	1	1	30
	Other registered crops	10	1	50

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Refer to 'Method B' in the general sprayer cleaning section in the introduction.

Hazard Rating:

***Select, Shadow, Independence, Statue, Centurion, Centurion ADV,* and *Viking Clethodim*:**

Warning – Skin and Eye Irritant

Antler, Antler 360 Unpacked, Arrow, Arrow All In* and *Patron:

Caution – Skin and Eye Irritant

Refer to the Introduction for an explanation of the symbols.

Clodinafop

Herbicide Group 1 - clodinafop

Company:

Syngenta Canada (*Horizon NG* – PCP#29089; built in adjuvant)
ADAMA Canada (*Ladder 240 EC** – PCP#29495; *ADAMA Adjuvant 80* – PCP#30419; *Ladder All In* – PCP#32497; built in adjuvant)
Albaugh (*Slam'R* – PCP#31053*; Albaugh Surfactant* – PCP#32599; *Winner* – PCP#33786; *Albaugh Surfactant* – PCP#32599)
AgraCity (*Aurora* – PCP#29711; *Chem Spray COC Adjuvant* – PCP#29712)
Farmers Business Network Canada (*Foax* – PCP#31261; *CropOil 83/17 Adjuvant* – PCP#30978)
Loveland Products Canada (*Foothills NG* – PCP#30341; built in adjuvant)
Nufarm Agriculture (*Signal* – PCP#29172*; Nufarm Enhance* – PCP#29952)
WinField United Canada (*Cadillac Unpacked* – PCP#30428; *Cadillac One* – PCP#32539; built in adjuvant)
Viking (*Viking Clodinafop* – PCP# 34749; *Viking Crop Oil Concentrate* – PCP# 34811)
*** Note:** *This product is no longer manufactured but inventories remain in distribution. This product may be removed from future editions.*

Formulation:

Horizon NG*, Foothills NG*: 60 g/L clodinafop-propargyl formulated as an emulsifiable concentrate.

- Container sizes** - 15.14 L, 121.1 L

Cadillac One*, Ladder All In*: 80 g/L clodinafop-propargyl formulated as an emulsifiable concentrate.

- Container sizes** - 11.3 L, 90.6 L

Cadillac Unpacked, Foax, Ladder 240 EC, Aurora, Signal, Slam'R, Viking Clodinafop, Winner: 240 g/L clodinafop-propargyl formulated as an emulsifiable concentrate.

- Container sizes** - 3.68 L, 7.36 L, 14.72 L, 18.4 L, 22.8 L, 58.9 L, 92 L, 115 L
  - ***CropOil 83/17, and Albaugh Surfactant:*** 3.78 L,
  - ***Nufarm Enhance:*** 4 L, 16 L, 64 L
  - ***ADAMA Adjuvant 80:*** 4 L, 12 L
  - ***Viking Crop Oil Concentrate:*** 15 L, 188 L

*** These products have a built in adjuvant system and do not require the addition of an adjuvant.**
**** Package sizes are totals across all containers in the pack and availability varies of each by company. Not all sizes may be available from each company.**

Crops and Staging:

Spring wheat (including durum) - prior to the emergence of the 4th tiller.
When tank mixing, check broadleaf product description for additional restrictions.

Weeds, Rates and Staging:

NG Formulations: 376 mL per acre, no additional adjuvant required.
-or-
Cadillac One, Ladder All In: 283 mL per acre, no additional adjuvant required.
-or-
240 EC Formulations: 93 mL per acre plus recommended adjuvant at 0.8 L per 100 L spray solution. For *Signal* only add *Nufarm Enhance* adjuvant or *Journey HSOC*, for *Ladder 240EC* only add *ADAMA Adjuvant 80* at 0.25 L per 100 L spray solution, for *Slam'R* only add *Albaugh Surfactant* at 0.25 L per 100 L spray solution.

For control of:

Weed	Stage
Barnyard grass	1 to 5 leaf prior to tillering
Foxtail (green, yellow)	1 to 5 leaf stage, prior to emergence of 3rd tiller
Volunteer canaryseed, wild oats	1 to 6 leaf, maximum 3 tillers
Volunteer oats	3 to 6 leaf, maximum 3 tillers

NG Formulations: 474 mL per acre, no additional adjuvant required;
-or-
Cadillac One, Ladder All In: 356 mL per acre, no additional adjuvant required.
-or-
240 EC Formulations: 115 mL per acre plus recommended adjuvant at 1.0 L per 100 L spray solution of the recommended adjuvant. For *Signal* only add *Nufarm Enhance* adjuvant or *Journey HSOC*, for *Ladder 240 EC* only add *ADAMA Adjuvant 80* at 0.32 L per 100L spray solution for *Slam'R* and *Winner* only add *Albaugh Surfactant* at 0.25 L per 100 L spray solution..

For control of:

Weed	Stage
Persian darnel	1 to 5 leaf prior to tillering

Apply at the 2 to 3 leaf stage for optimum control. Optimum weed control and yield response occurs when weeds are controlled before tillering. Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Application Information:

- **Water Volume:**
  - ***Ground:*** 20 L to 40 L per acre.
  - ***Aerial:*** 12 L per acre.
- **Nozzles and Pressure:** 40 to 45 psi (275 to 310 kPa) when using conventional 80° or 110° flat fan stainless steel nozzles tilted forward at an angle of 45°. Low drift nozzles may require higher pressures for proper performance. Consult with herbicide manufacturer regarding the suitability of low drift nozzles for use with this product.

Tank Mixes:

Mixes provide control of wild oats, green foxtail, and weeds/insects controlled by the tank mix partner unless otherwise noted.

Herbicides:

	Aurora	*Cadillac Unpacked*	*Cadillac One*	*Foax*	*Ladder*	*Ladder All In*	*NG Formulaitons*	*Nufarm Clodinafop*	*Signal*	*Slam'R & Winner*
2,4-D amine (160 to 212 g ae/acre)††	•	•	•	•	•	•	•	•	•	•
Bromoxynil#	•	•	•	•	•	•	•	•	•	•
Bromoxynil/MCPA*** #	•	•	•	•	•	•	•	•	•	•
Bromoxynil/2,4-D (label rates)	•	•	•	•	•	•	•	•	•	•
Curtail M (0.6 to 0.81 L/acre)	•	•	•	•	•	•	•	•	•	•
Dichlorprop/2,4-D (0.71 L/acre)**	•Δ	•Δ	•Δ	•Δ	•Δ	•Δ	•Δ	•Δ	•Δ	•Δ
MCPA 600 amine or 600 ester†† (0.34 to 0.45 L/acre)	•	•	•	•	•	•	•	•	•	•
MCPA Sodium Salt (0.48 to 1.09 L/acre)*		•	•		•	•	•		•	
Mecoprop-p (2.2 to 2.8 L/acre)		•	•		•	•	•		•	•
Metsulfuron (3 g/acre)††† #	•	•	•	•	•	•	•	•	•	•
Pulsar (80 acres/case)			•			•	•			•
Pulsar + MCPA Ester (rates above)			•			•	•			•

	Aurora	*Cadillac Unpacked*	*Cadillac One*	*Foax*	*Ladder*	*Ladder All In*	*NG Formulaitons*	*Nufarm Clodinafop*	*Signal*	*Slam'R & Winner*
Refine SG (8 g/acre)[†††]			•			•	•		•	
Trophy (20 acres/case)		•	•		•	•	•		•	

Refer to the broadleaf herbicide label for crop staging, and other information. When tank mixing *Clodinafop 240 EC*, always add the broadleaf herbicide first, followed by clodinafop, with the adjuvant added last. Reductions in green foxtail and wild oats control may be observed when tank mixed with 2,4-D amine and MCPA amine.

Insecticides:

- *Lambda-cyhalothrin*[#] (25 to 33 mL per acre)[G]

Fungicides:

- *Propiconazole*[#] (0.1 L[#] to 0.2 L per acre)[G]
- Clodinafop may also be mixed with *Lambda-cyhalothrin*[#] plus *propiconazole*[#] at the rates above[G].

Fertilizers: None registered.

[#] Check product label for specific tank mix partners and appropriate rates
[Δ] NOT for use with *Estaprop XT* or *Dichlorprop DX*.
*** Rate above 0.81 L per acre may cause crop injury.**
**** Barnyard grass also controlled.**
***** Barnyard grass and Persian darnel also controlled. May be applied by air.**
[††] See 2,4-D for equivalent formulation rates.
[†††] Additional adjuvants are not required.
[G] All products except *Aurora*.

Note: The above mixes are those listed on the clodinofop labels only.

Clodinafop manufacturers may also support mixes with pesticides that are not on the clodinafop labels. Check with each manufacturer for the products they support. Mixes must be applied according to the most restrictive use limitations for all products added to the tank.

According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found in the introduction.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
clodinafop	POST (foliar)	ACCase Lipid synthesis inhibitor	Toward growth areas (Symplast)	Grasses only	1

Effects of Growing Conditions:

For optimum results, apply to actively growing weeds. DO NOT apply to crops or weeds that are stressed by hot or cool conditions, frost, drought, low fertility, water-saturated soil, disease or insect damage as crop injury and poor weed control may result.

Restrictions:

- **Rainfall:** Within 30 minutes may reduce control.
- **Restricted Entry Interval:** DO NOT enter treated fields for at least 12 hours.
- **Grazing Restrictions:** DO NOT graze or harvest treated crops for forage within 3 days of application.
- **Pre-harvest Interval:** Leave at least 60 days from application to harvest.
- **Re-cropping Interval:** No restrictions in the year following treatment.
- **Storage:** May be frozen.
- **Aerial Application:** May be applied by air.

- **Buffer Zones:**

Application method	Buffer Zones (metres †) Required for the Protection of:	
	Aquatic Habitats	Terrestrial habitat
Ground*	15	0
Aerial	72	76

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Refer to 'Method B' in the general tank cleaning section in the introduction. If mixed with other pesticides, the cleaning method above should be combined with the method recommended for the tank mix partner if different from above.

Hazard Rating:

240 EC formulations:

Caution – Poison

Warning – Eye and Skin Irritant

NG Formulations:

Caution – Skin Irritant

Cadillac One, Ladder All In:

Danger – Corrosive to Eyes

All products except *Ladder*:

Warning – Contains the Allergen Soy

Refer to the Introduction for an explanation of the symbols.

Clomazone

Herbicide Group 13 - clomazone

Company:
FMC Corporation (*Command 360 ME* – PCP#27827)
Interprovincial Cooperatives (*IPCO Clomazone* – PCP#33910)
Sharda CropChem Limited (*Czar* – PCP#34338)

Formulation:
360 g/L clomazone formulated as a microcapsule suspension.
- Container sizes:
  - *Command 360ME* - 2 x 5.4 L
  - *IPCO Clomazone* - 10 L (sold only as a component of the copack *IPCO Trigon*)
  - *Czar* - 2 x 5 L

Crops, Rates and Staging:
Pre-plant only:
- 101 mL per acre: Mustard (brown, oriental, yellow)*, Ethiopian mustard (*Brassica carinata*)*, camelina*
- up to 135 mL per acre: Canola (all varieties)

Broadcast after seeding but prior to crop emergence:
- up to 135 mL per acre: Dry beans*
  * ***Command 360 ME*** only

Weeds, Rates and Staging:
Apply pre-emergent to weeds.
Apply 101 mL per acre for suppression of:
- Cleavers
- Chickweed (suppression only - *Command* only)

Apply 135 mL per acre for control of:
- Cleavers
- Chickweed (suppression only - *Command* only)

Maximum ONE APPLICATION per year of clomazone or other products containing the active ingredient clomazone.
DO NOT APPLY clomazone to:
- sandy soils
- soils with greater than 10 percent organic matter
- fields receiving applications of solid manure, unless it has been thoroughly incorporated to a depth of 10 to 15 cm

Application Information:
- **Water Volume:** minimum 40 L per acre.
- **Nozzles & Pressure:** Use 30 psi (207 kPa) when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Select the nozzle and pressure combination that produces of ***ASABE coarse*** droplets while maintaining good coverage of foliage.

How it Works:
Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
clomazone	PRE (soil active)	DOXP Pigment synthesis inhibitor	Upward (Apoplast)	Broadleaf (& grass at higher rates)	13

Effects of Growing Conditions:
Rainfall (5 to 10 mm), or equivalent irrigation, is required within 7 to 10 days for activation. Dry conditions that persist after application may reduce weed control. Heavy rainfall after application may dilute the active layer and result in reduced weed control.
DO NOT apply when temperature exceed 25°C due to increased risk of vapour drift. Temporary whitening/yellowing of the crop may occur when emerging from treated soil. Under some conditions, temporary whitening or yellowing of leaves may occur on approved rotational crops where undesirable soil residues of Clomazone exist. Refer to the label for more details.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides:

- **Canola (prior to seeding):**
  - Carfentrazone
  - Carfentrazone + glyphosate

According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Moderate rainfall after application is required for activation. Heavy rainfall shortly after application may reduce activity.
- **Restricted Entry Interval:** DO NOT enter treated fields for at least 12 hours.
- **Grazing Restrictions:** DO NOT graze the treated crop or cut for hay.
- **Re-cropping Interval:** Winter wheat may be sown 4 months after application. Canola, corn (field, sweet), dry bean (kidney, navy), field pea, potatoes, soybean, lentil, barley, oats and wheat (spring or durum) may be planted the year after application. All other crops may be planted 16 months after application. Under some conditions, temporary whitening or yellowing of leaves may occur on approved rotational crops where undesirable soil residues of clomazone exist. Refer to label for more information on recropping precautions.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store above 5°C to keep from freezing. If frozen, thaw before use. If solid crystals are observed, warm to above 15°C and shake or roll container periodically to dissolve solids. DO NOT store near heat or open flame.
- **Buffer Zones:** DO NOT apply clomazone within 90 metres of sensitive plants and sensitive terrestrial habitats or within 370 metres of fruit, nursery and greenhouse production. A buffer zone of 370 metres should also be observed for applications adjacent to residential areas and established vegetation. DO NOT apply clomazone directly to surface water or to areas where runoff is likely to occur.
  See the Key to Product Pages in the introduction for an explanation of the different habitats.
  † Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.
  - Spray when winds are under 16 km per hour, but not dead calm.

Sprayer Cleaning:

Refer to 'Method A or B' in the general section on sprayer cleaning in the introduction.

Hazard Rating:

Caution – Poison

Potential Skin Sensitizer

Refer to the Introduction for an explanation of the symbols.

Clopyralid

Herbicide Group 4 - clopyralid

Company:

Corteva Agriscience (*Lontrel XC*)
Sharda CropChem Canada (*Pyralid*)
AgraCity (*Clobber*)
Advantage Crop Protection (*Advantage Clopyralid 360*)
Albaugh (*Spur 360*)
Viking (*Viking Clopyralid*)

Formulation:

***Lontrel XC* (PCP#32795):** 600 g/L clopyralid formulated as a solution.

- Container size - 4 x 2.67 L

***Clobber* (PCP#33114), *Advantage Clopyralid 360* (PCP#33795), *Spur 360* (PCP#34501), *Viking Clopyralid* (PCP#34779):** 360 g/L clopyralid formulated as a solution.

- Container sizes:
  - *Advantage Clopyralid 360* - 4.45 L
  - *Clobber, Viking Clopyralid* - 2 x 8.9 L

***Pyralid* (PCP#32265):** 300 g/L clopyralid formulated as a solution.

- Container size - 4 x 4.45 L

Crops, Rates and Staging:

Clopyralid Rate (g ai per acre)	Formulation (mL per acre)					
	360 g/L forms		*Lontrel XC*		*Pyralid*	
	mL per acre	mL per 1000 m^2	mL per acre	mL per 1000 m^2	mL per acre	mL per 1000 m^2
31	85	-	52	-	102	-
41	112	28	68	17	136	34
61	170	42	102	25	204	50
82	240	56	137	34	272	67
121	340	83	202	50	403	100

Note: The use of this chemical may result in contamination of groundwater particularly in areas where soils are permeable (for example, sandy soil) and/or the depth to the water table is shallow. Use should be avoided in these areas.

Barley, wheat (spring, durum, winter), oats: Apply in spring at 41 to 61 g ai per acre from the 3 leaf to flag leaf emergence stage.

Flax and solin (low linolenic acid flax): Apply at 82 to 121 g ai per acre from the 2 to 4 inches (5 to 10 cm) in height.

Canaryseed (including for human consumption - *Lontrel XC* only): Apply at 41 g ai per acre from the 3 leaf to just prior to flag leaf emergence.

Canola: Apply at 61 to 121 g ai per acre from the 2 to 6 leaf stage. Argentine (*B. napus)* and Polish (*B. rapa*) varieties only; application to any other canola type oilseeds may cause crop injury.

Corn (*Lontrel XC *only): Apply at 41 g ai per acre from spike to V6.

Seedling forage grasses*: Apply at 61 to 121 g ai per acre from the 2 to 4 leaf stage.

Established grasses*: Apply at 61 to 121 g ai per acre at the shot blade stage, or in the fall after harvest or in early spring.

Seedling and established grasses* for forage and seed production including:

- Bromegrass (smooth)
- Fescue (creeping red, meadow, tall)
- Kentucky bluegrass
- Meadow foxtail
- Orchardgrass
- Reed canarygrass
- Timothy
- Wheatgrass (crested, intermediate, slender, streambank, tall**)
- Wildrye (Altai, Russian)

Clopyralid at 121 g ai per acre:
Fallow: Stage according to weeds.
Shelterbelts*: containing villosa lilac, acute willow, Colorado spruce, white spruce, buffaloberry and chokecherry*.
Plantation poplar (including hybrid poplar)*
*** NOTE: Since these uses are registered under the User Requested Minor Use Label Expansion program, the manufacturer assumes no responsibility for herbicide performance. Users of this product for these uses do so at their own risk.***
**** for forage use only**

When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

Weeds, Rates and Staging:

Apply to weeds when young and actively growing.

Weeds Controlled		Rate* (g ai per acre)
Alsike clover Canada thistle*†	Vetch (*Vicia* spp.) Volunteer soybean ΔΔ	61
Canada thistle**† Common groundsel Common ragweed Knapweed (spotted and diffuse)Δ Ox-eye daisy (suppression) Perennial sow-thistle (top growth only)	Scentless chamomile Sheep sorrel (suppression) Volunteer alfalfa - 2 to 20 inches (5 to 50 cm) tall Wild buckwheat	82
Canada thistle***† Ox-eye daisy	Sheep sorrel	121

Δ *Lontrel XC* and *Advantage Clopyralid 360* only.
ΔΔ *Lontrel XC* only.
† Canada thistle - after all thistles have emerged and when the majority are in the rosette to pre-bud stage.
*** Top growth suppression for 6 to 8 weeks. Some regrowth may occur by end of season, but will not interfere with crop harvest.**
**** Provides season long control of Canada thistle. Not all root stalks will be killed and some regrowth may occur by the end of the growing season.**
***** Provides season long control of Canada thistle with suppression into the following year.**

Application Information:

- **Water Volume:** 40 to 80 L per acre.
- **Nozzles and Pressure:** Maximum 30 to 40 psi (200 to 275 kPa) with conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use nozzles and pressures designed to deliver thorough, even coverage with ***ASABE medium*** or larger droplets.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
clopyralid	POST (foliar)	Synthetic Auxin	Moves throughout the plant (Symplast)	Broadleaf only	4

Effects of Growing Conditions:

Poor control may occur under dry conditions. Injury to flax may occur when tank mixing with MCPA. To reduce the risk of crop injury, DO NOT apply tank mixes if temperature exceeds 27°C.

Tank Mixes:

Herbicides:
Clopyralid applications following applications of products containing bromoxynil (*Approve*, *Badge*, *Bromotril*, *Buctril M*, *Enforcer*, *Koril*, *Logic M, Mextrol, Pardner, Thumper*) should be delayed by 14 days to allow the Canada thistle to recover from leaf burn.

Recommended rates of clopyralid may be used for each crop unless otherwise indicated. Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides	Crop (rate g ai per acre – if different from label rates range above)					
	Canola	Flax	Barley	Spring Wheat (Not durum)	Oats and Canaryseed*	Corn
Select	(61 to 121)	(82 to 121)	-	-	-	-
Poast Ultra	(61 to 121)	(61 to 121)	-	-	-	-

Herbicides	Crop (rate g ai per acre – if different from label rates range above)					
	Canola	Flax	Barley	Spring Wheat (Not durum)	Oats and Canaryseed*	Corn
Glyphosate (glyphosate tolerant canola and corn only)	(41)	-	-	-	-	(41)*
2,4-D ester or amine (170 to 227 g ae/acre)	-	-	(41 to 61)	(41 to 61)	-	-
MCPA Ester or amine (0.28 to 0.38 mL/acre - 600 g/L)	-	(61)	(41 to 61)	(41 to 61)	(41 to 61)	-
Poast Ultra plus MCPA (rates above)	-	(61 to 121)	-	-	-	-
Select plus MCPA (rates above)	-	(31 to 41)	-	-	-	-
Tralkoxydim *(Achieve* only*)* + MCPA Ester (rates above)	-	-	(31 to 41)	(31 to 41)	-	-
Fluroxypyr + MCPA Ester	-	-	(31 to 41)	(31 to 41)	-	-
Tralkoxydim + Fluroxypyr + MCPA Ester	-	-	(31 to 41)	(31 to 41)	-	-

***Lontrel XC* only**

Fungicides: None registered.

Insecticides: None registered.

Fertilizers: None registered.

Note: The above mixes are those listed on the clopyralid labels only.

According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Adding ingredients in the correct order is critical for optimum performance.

Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** No rainfast period is specified on the label; required interval may be up to 8 hours. Contact manufacturer for more information.
- **Restricted Entry Interval:** DO NOT enter treated fields for 12 hours.
- **Grazing Restrictions:** For field corn, do not graze or harvest for silage within 40 days of treatment. For all other crops or areas treated with this product may be grazed immediately following treatment.
- **Re-cropping Interval:** Clopyralid residues in the soil may affect succeeding crops. The year after application, replant to wheat, barley, oats, rye, flax, forage grasses, mustard or canola. DO NOT use manure from animals fed or bedded with clopyralid-treated straw, except on fields that are to be sown to clopyralid-tolerant crops.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store in heated storage. If product is frozen, bring to room temperature and agitate before use.
- **Buffer Zones:** Leave a buffer of 2 meters from the most downwind point of application and sensitive terrestrial habitats.

Sprayer Cleaning:

No detailed cleaning procedures are indicated on the label. Use a commercial all purpose spray sprayer cleaning product for adequate cleaning. Contact the manufacturer for more information.

Hazard Rating:

Lontrel XC:

Keep out of reach of children.

Other Clopyralid products:

Caution – Poison

Danger – Eye Irritant

Refer to the Introduction for an explanation of the symbols.

Clopyralid + Fluroxypyr

Herbicide Group
4 - clopyralid, fluroxypyr

Company:
Loveland Products Canada (*Momentum*)
Sharda Crop Chem (*Inertia*)

Formulation:
***Momentum* (PCP#30456), *Inertia* (PCP#34225):** 90 g/L clopyralid and 90 g/L fluroxypyr formulated as an emulsifiable concentrate.
- Container size - 8.99 L

Crops and Staging:
Apply at the 3 leaf to just before the flag leaf stage of barley, wheat (spring, durum).
When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

Weeds and Staging:
The following weeds are controlled at the 1 to 4 leaf per whorl stage unless specified:
- Canada thistle**
- Cleavers
- Kochia (2 to 8 leaf)
- Stork's-bill (1 to 8 leaf)*
- Volunteer flax (1 to 12 cm)
- Wild buckwheat

*** Suppression only.**
**** Season long control, some regrowth may occur in the fall. Apply from the 4 inch (10 cm) to pre-bud stage.**

Rates:
0.45 L per acre.
Apply a maximum of ONE APPLICATION of this product or other products containing either clopyralid or fluroxypyr per year.

Application Information:
- **Water Volume:** 40 L per acre.
- **Nozzles and Pressure:** Use 30 to 40 psi (200 to 275 kPa) if applying without drift reduction nozzles. Drift reduction nozzles may require higher pressures for proper performance. Select the nozzle and pressure combination that produces of ***ASABE coarse*** droplets while maintaining good coverage of foliage.

How it Works:
Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
clopyralid, fluroxypyr	POST (foliar)	Synthetic Auxin	Moves throughout the plant (Symplast)	Broadleaf only	4

Effects of Growing Conditions:
When weeds are stressed because of drought, flooding, hot or cool (less than 8°C) temperatures, weeds are not actively growing and control may be reduced. DO NOT apply to weeds stressed longer than 20 days from lack of moisture as poor control can result.

Tank Mixes:
Herbicides:
- MCPA Ester 500 (0.34 to 0.45 L per acre)
- MCPA Ester 600 (0.28 to 0.38 L per acre)

***Momentum* alone or tank mixed with MCPA Ester rates above may be mixed with the following:**
- ***In spring wheat (including durum) and barley:***
  - Tralkoxydim† (0.20 L per acre) plus registered adjuvant
  - Fenoxaprop 120 EC† (0.16 to 0.31 L per acre).
- ***In spring wheat (including durum):***
  - Clodinafop† (label rates)
  - *Simplicity OD* (0.2 L per acre)
  - *Traxos* (label rate)

  † Note: The manufacturer may not support all brand of these products. See the label or contact the manufacturers for more information.

Check the labels of mix partners for additional crop staging restrictions.

Insecticides: None registered.

Fungicides: None registered.

Fertilizers: None registered.

Note: The above mixes are those listed on the *Momentum* and *Inertia* labels only.

According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** No rainfast period is specified on the label; required interval between application and rain without loss of control may be up to 8 hours. Contact manufacturer for more information.
- **Restricted Entry Interval:** DO NOT enter treated fields for at least 12 hours.
- **Grazing Restrictions:** DO NOT graze treated fields or cut for hay within 3 days of application.
- **Pre-harvest Interval:** Leave 60 days between application and harvest.
- **Re-cropping Interval:** Wheat, barley, oats, rye, flax, canola, mustard and peas may be planted the year after application or the field may be fallowed. DO NOT under-seed crops to forage legumes the year after treatment. DO NOT sow any other crops until the second year after application. Apply manure bedded with straw from treated crops only to the crops listed above.
  - *DO NOT seed to field peas for at least 10 months following treatment. Very dry soil conditions following application can result in a risk of injury to field peas grown in rotation. If severe drought conditions are experienced during the months of June to August inclusive in the year of application delay seeding field peas an additional 12 months (22 months following application). Contact your local Loveland Products Canada representative or retailer for more information before seeding field peas following drought conditions in the previous year.*
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store in a cool (above 5°C), dry area. If product is frozen, bring to room temperature and agitate before use.
- **Buffer Zones:**
  - Hand-held or backpack sprayers, inter-row hooded sprayers and spot treatments are exempt from buffer zone requirements.

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground only*	1	0	1

See the Key to Product Pages in the introduction for an explanation of the different habitats.

*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**

† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

  - Spray when winds are under 16 km per hour, but not dead calm.

Sprayer Cleaning:

No specific cleaning recommendations are provided on the *Momentum* or *Inertia* labels. As a petroleum based emulsifiable concentrate, 'Method B' in the general section on sprayer cleaning in the introduction may be the most effective. Check with the manufacturer for more information.

Hazard Rating:

Warning – Eye Irritant

Refer to the Introduction for an explanation of the symbols.

Clopyralid / MCPA

Herbicide Group
4 - clopyralid, MCPA

Company:
Nufarm Agriculture (*Curtail M*)
AgraCity (*Clobber M*)
Albaugh (*Spur-M*)
Sharda CropChem (*Certain*)
Viking (*Viking Drammen*)

Formulation:
***Curtail M* (PCP#30914), *Clobber M* (PCP#34157), *Certain* (PCP#34356), *Spur-M* (PCP#34458), *Viking Drammen* (PCP#34798):** 50 g/L clopyralid and 280 g/L MCPA Ester formulated as an emulsifiable concentrate.

- Container sizes:
  - *Curtail M, Certain, Spur-M* – 2 X 8 L (*Curtail M* and *Certain* only), 112 L
  - *Clobber M* – 2 x 12 L. 96 L, 576 L
  - *Viking Drammen* – 2 x 12 L, 96 L, 576 L

Crops and Staging:
Apply at the 3 leaf to just before the flag leaf stage of the following crops:

- Barley
- Canaryseed* (including hairless varieties for human consumption)
- Oat
- Flax and solin (low linolenic acid flax) at 2 to 6 inches (5 to 15 cm) height.
- Timothy (established for seed, and hay or forage production)*
- Wheat (spring, durum)

**** NOTE: Since these uses are registered under the User Requested Minor Use Label Expansion (URMULE) program, the manufacturer assumes no responsibility for herbicide performance. Those who apply these uses do so at their own risk.***

When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

Weeds, Rates and Staging:
The following weeds are controlled at the 1 to 4 leaf stage unless specified:

At 0.61 L per acre:

- Burdock
- Canada thistle (low infestations)***
- Cocklebur
- Field horsetail†
- Flixweed**
- Lamb's-quarters
- Plantain†
- Prickly lettuce
- Ragweed
- Shepherd's-purse**
- Stinkweed**
- Sunflower (annual, volunteer)
- Wild mustard
- Wild radish
- Vetch

At 0.81 L per acre, the above weeds plus:

- Buckwheat (tartary, wild)
- Canada thistle (medium to high infestations)***
- Common groundsel
- Dandelion*
- Kochia (suppression only)**
- Pigweed (redroot, Russian)
- Scentless chamomile**
- Smartweed
- Sow-thistle (annual, perennial†)
- Volunteer canola

*** Spring rosettes only.**
**** 2 to 4 leaf stage, (spring seedlings only for winter annual weeds).**
***** Season long control, some regrowth may occur in the fall. Apply from the 4 inch (10 cm) to prebud stage.**
† Top growth control only.

Application Information:
- **Water Volume:**
  - ***Cereals and Flax:*** 40 to 60 L per acre
  - ***Canary seed and timothy:*** 40 to 80 L per acre
- **Nozzles & Pressure:** Use 30 to 40 psi (200 to 275 kPa) when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Select the nozzle and pressure combination that produces of ***ASABE coarse*** droplets while maintaining good coverage of foliage. Flat fan tips tilted forward at a 45° angle are recommended in flax.

How it Works:
Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
MCPA, clopyralid	POST (foliar)	Synthetic Auxin	Moves throughout the plant (Symplast)	Broadleaf only	4

Effects of Growing Conditions:

When weeds are stressed because of drought, flooding, hot or cool (less than 15°C) temperatures, weeds are not actively growing and control may be reduced. DO NOT apply to weeds stressed longer than 20 days from lack of moisture as poor control can result.

Tank Mixes:

Curtail M at 0.81 L per acre should be used in all tank mixes unless otherwise indicated. See labels for adjuvant rates.

In spring wheat (including durum) and barley:

- *Achieve Liquid* (0.20 L per acre) plus adjuvant

Check product labels for additional crop staging restrictions.

Fertilizers: None registered.

Insecticides: None registered.

Fungicides: None registered.

Note: The above mixes are those listed on the *Curtail M* label only.

According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 6 hours will reduce control.
- **Restricted Entry Interval:** DO NOT enter treated fields for at least 12 hours.
- **Grazing Restrictions:** DO NOT graze treated fields or cut for hay within 7 days of application.
- **Pre-harvest Interval:** Leave 60 days between application and harvest.
- **Re-cropping Interval:** Wheat, barley, oats, rye, corn, flax, canola, forage grasses and mustard may be planted the year after application. DO NOT under-seed crops to forage legumes the year after treatment.
  - DO NOT seed to field peas for at least 10 months following treatment. Very dry soil conditions following application can result in a risk of injury to field peas grown in rotation. If severe drought conditions are experienced during the months of June to August inclusive in the year of application delay seeding field peas an additional 12 months (22 months following application). Contact your local Nufarm Agriculture representative or retailer for more information before seeding field peas following drought conditions in the previous year.
  - DO NOT sow any other crops until the second year after application. Apply manure bedded with straw from treated crops only to the crops listed above.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store in a cool (above 5°C), dry area. If product is frozen, bring to room temperature and agitate before use.
- **Buffer Zones:**

Application method	Buffer Zones (metres †) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground only*	1	1	4

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.
Spray when winds are under 16 km per hour, but not dead calm.

Sprayer Cleaning:

No detailed cleaning procedures are indicated on the label. Use a commercial all purpose spray sprayer cleaning product for adequate cleaning. Contact the manufacturer for more information.

Hazard Rating:

Caution – Poison

Caution – Eye Irritant

Refer to the Introduction for an explanation of the symbols.

Clopyralid / MCPA + fluroxypyr

Herbicide Group 4 - fluroxypyr, clopyralid, MCPA

Company:

Corteva Agriscience (*Prestige Brands*)
ADAMA Canada (*Esteem*, Esteem All In*)
AgraCity (*Foxxy CM*)
Interprovincial Cooperatives (*IPCO State, CO-OP State*)
NuFarm Canada (*TruSlate Pro*)
Viking (*Viking Stavanger*)
Sharda Cropchem (*Repute)*
***Note:** This product is no longer manufactured but inventories still remain in distribution. This product may be removed from future editions.*

Formulation:

The *Prestige XC* package has the following components:
***Prestige XC A* (PCP#29462):** 333 g ae/L fluroxypyr formulated as an emulsifiable concentrate.
- Container sizes - 3.3 L

***Prestige XC B* (PCP#29465):** 50 g/L clopyralid and 280 g/L MCPA Ester formulated as an emulsifiable concentrates.
- Container sizes - 2 x 8.0 L

-or-
The *Foxxy CM* package has the following components:
Foxxy (PCP#32952): 180 g/L fluroxypyr formulated as an emulsifiable concentrate.
- Container sizes - 6.4 L, 230 L

***Clobber M* (PCP#34157):** 50 g/L clopyralid and 280 g/L MCPA ester formulated as an emulsifiable concentrate.
- Container sizes - 2 x 8 L or 576 L

-or-
The *Esteem* package has the following components:
***ADAMA Fluroxypyr* (PCP#30815):** 180 g/L fluroxypyr formulated as an emulsifiable concentrate.
- Container size - 9.6 L

ADAMA Clopyralid 360* (PCP#32898)*: 360 g/L clopyralid formulated as a solution.
- Container size - 3.32 L

***ADAMA MCPA 2 EH Ester 600* (PCP#31669):** 600 g/L MCPA Ester formulated as an emulsifiable concentrate.
- Container size - 11 L

-or-
***Prestige XL* (PCP#31428), *Repute* (PCP#35280):** 61.56 g/L fluroxypyr and 42.72 g/L clopyralid and 239.5 g/L MCPA Ester formulated as an emulsifiable concentrate.
- Container sizes - 2 x 9.5 L per case, 113.6 L drum

-or-
***CO-OP State* (PCP#34610), *IPCO State* (PCP#34597):** 77 g/L fluroxypyr, 60 g/L clopyralid and 210 g/L MCPA ester formulated as an emulsifiable concentrate.
-or-
***Truslate Pro* (PCP#34546):** 77 g/L fluroxypyr, 60 g/L clopyralid and 210 g/L MCPA ester formulated as an emulsifiable concentrate.
- Container size - 10 L

-or-
The Viking Stavanger package has the following components:
***Viking Fluroxypyr* (PCP#34778):** 180 g/L fluroxypyr formulated as an emulsifiable concentrate.
- Container size - 6.4 L, 230 L

***Viking Drammen* (PCP#34798):** 50 g/L clopyralid and 280 g/L MCPA Ester formulated as an emulsifiable concentrate.
- Container size - 2 x 8 L, 576 L

-or-
***Esteem All In* (PCP#35128):** 59.7 g/L fluroxypyr, 40 g/L clopyralid and 240.5 g/L MCPA ester formulated as an emulsifiable concentrate.
- Container size 2 x 10.93 L, 116.5 L

Crops and Staging:

Cereals:

- ***Spring wheat (including durum), barley, oats†† and canaryseed*†† (including hairless varieties for human consumption):*** 3 leaf to just before the emergence of flag leaf stage
- ***Winter wheat††:*** Apply in the spring from the 3 tiller stage to just before the emergence of flag leaf

Forage Grasses* grown for seed production:

- ***Seedling and established stands:*** 4 leaf until the emergence of the flag leaf.
  - Bromegrass (meadow††, smooth†††, hybrid†)
  - Fescue (creeping red, tall)†††
  - Timothy†††
  - Wheatgrass (crested†††, intermediate†††, slender†)

**** NOTE: Since these uses are registered under the User Requested Minor Use Label Expansion (URMULE) program, the manufacturer assumes no responsibility for herbicide performance. Users of this product on forage grasses and canary seed do so at their own risk.***

† ***Prestige Brands* only.**

†† ***Prestige Brands*, *CO-OP State*, *IPCO State*, and *TruSlate Pro* only.**

††† ***Prestige Brands*, *Esteem, Esteem All In*, *CO-OP State*, *IPCO State*, and *TruSlate Pro* only.**

Improved Grass Pastures: *Prestige XL*, *CO-OP State*, *IPCO State* and *TruSlate Pro* only may be applied to improved grass-only tame pastures at the rates listed below.

Weeds, Rates and Staging:

DO NOT follow application of these products with another application of these products or other products containing fluroxypyr in the same year. Unless otherwise stated, the following weeds will be controlled if sprayed in the 2 to 4 leaf stage.

Only *Prestige XC A* at 125 mL per acre plus *Prestige XC B* at 607 mL per acre or *Prestige XL* at 708 mL per acre or *Esteem All In* at 730 mL per acre; or *CO-OP State*, *IPCO State*, or *TruSlate Pro* at 500 mL per acre or Esteem (*ADAMA Fluroxypyr 180* at 240 mL per acre plus *ADAMA Clopyralid* at 84 mL per acre plus *ADAMA MCPA Ester 600* at 280 mL per acre) or *Viking Stavanger* (*Viking Fluroxypyr* 180 at 240 mL per acre plus *Viking Drammen* at 600 mL per acre) controls:

- Burdock
- Canada fleabane‡‡‡
- Canada thistle (light infestations)
- Chickweed‡
- Cleavers†
- Cocklebur
- Field horsetail***
- Flixweed (spring seedlings only)
- Kochia
- Hemp-nettle (2 to 6 leaf)‡
- Lady's thumb (up to 8 leaf) ‡‡
- Lamb's-quarters
- Plantain***
- Prickly lettuce
- Ragweeds
- Shepherd's-purse
- Stinkweed
- Stork's-bill (1 to 8 leaf)
- Vetch
- Volunteer flax (1 to 12 cm)
- Volunteer sunflower
- Wild annual sunflower
- Wild buckwheat††
- Wild mustard
- Wild radish

***Prestige XC A* at 166 mL per acre plus *Prestige XC B* at 809 mL per acre or *Esteem* (*ADAMA Fluroxypyr 180* at 320 mL per acre plus *ADAMA Clopyralid 360* at 111 mL per acre plus *ADAMA MCPA 2EH Ester 600* at 365 mL per acre*)* or *Foxxy CM* (*Foxxy* at 324 mL per acre plus *Clobber M* at 809 mL per acre) or *Viking Stavanger* (*Viking Fluroxypyr* at 320 mL per acre plus *Viking Drammen* at 800 mL per acre) or *Prestige XL* at 947 mL per acre or *Esteem All In* at 970 mL per acre controls:**

The weeds controlled by Prestige Brands *above plus:*

- Annual sow-thistle
- Canada thistle* (moderate to heavy infestations)
- Chickweed (up to 6 cm)Δ
- Common groundsel
- Dandelion**
- Flixweed**
- Hemp-nettle (2 to 6 leaf stage)Δ
- Perennial sow-thistle*
- Redroot pigweed
- Round-leaved mallow (1 to 6 leaf)
- Russian pigweed
- Scentless chamomile
- Smartweed
- Tartary buckwheat
- Volunteer canola

*** Spray when 4 to 6 inches (10 to 15 cm) high. Season long control, with some regrowth in the fall.**

**** Spring rosettes only.**

***** Top growth control only.**

† **1 to 4 whorls with *Esteem* and *Foxxy CM*; 1 to 8 whorls with *Prestige Brands, CO-OP State, IPCO State, TruSlate Pro and Esteem All In*.**

†† **1 to 4 leaf with *Foxxy CM* , *Viking Stavanger*, 1 to 8 leaf with *Esteem, Esteem All In, CO-OP State, IPCO State, TruSlate Pro* and *Prestige Brands*.**

Δ **Suppression only with *Foxxy CM and Viking Stavanger, CO-OP State, IPCO State,* and *Truslate Pro*, control with *Esteem*, *Esteem All In* and *Prestige Brands*.**

‡ **Suppression only with *CO-OP State*, *IPCO State* or *TruSlate Pro* only.**

‡‡ ***Prestige XL* only.**

‡‡‡ ***Truslate Pro* only**

Application Information:

- **Water Volume:**
  - ***Ground:*** 20 to 40 L per acre.
  - ***Aerial:*** 12 to 20 L per acre. Consult label for buffer zones.
- **Nozzles and Pressure:** Maximum 30 to 40 psi (200 to 275 kPa) with conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use nozzles and pressure designed to deliver proper coverage with ***ASABE S572.1 coarse*** droplets. Tilt nozzles forward at a 45° angle to improve coverage of vertical targets.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
fluroxypyr	POST (foliar)	Synthetic Auxin	Throughout the plant (Symplast)	Broadleaf only	4
clopyralid	POST (foliar)	Synthetic Auxin	Throughout the plant (Symplast)	Broadleaf only	4
MCPA	POST (foliar)	Synthetic Auxin	Throughout the plant (Symplast)	Broadleaf only	4

Effects of Growing Conditions:

The activity of clopyralid/MPCPA + fluroxypyr is influenced by weather conditions. The temperature range for optimum activity is 12°C to 24°C. Reduced activity will occur when temperatures are below 8°C or above 27°C. Frost 3 days before or after application may reduce weed control and crop tolerance. Weed control may be reduced during stress conditions (drought or heat stress) or if heavy infestations exist.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides:

- **In wheat (spring, durum, winter*) and barley:**
  - *Liquid Achieve*‡
  - *Puma Advance***
- **In wheat (spring, durum, winter):**
  - *Simplicity OD***
  - *Simplicity GoDRI**

  *** *Prestige XL* only.**

  **** *Prestige XL*, *CO-OP State*, *IPCO State*, *Repute* and *TruSlate Pro* only.**

  ‡ Not registered with *CO-OP State*, *IPCO State* or *TruSlate Pro*.

Insecticides: None registered.

Fungicides: None registered.

Fertilizers: None registered.

According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 4 hours of post-emergent application may result in reduced weed control.
- **Restricted Entry Interval:** DO NOT enter treated fields for at least 12 hours.
- **Grazing Restrictions:** DO NOT graze or cut for animal feed treated cereal or forage crops unless indicated below.
  - ***Wheat, barley, oats, or improved grass pastures:*** DO NOT cut or graze treated fields for 7 days after application. Withdraw meat animals from treated fields at least 3 days before slaughter.
- **Pre-harvest Interval:** DO NOT harvest treated crops within 60 days of application.
- **Re-cropping Interval:** Wheat, oats, barley, rye (not under-seeded to forage legumes, clover or alfalfa), flax, canola, field pea* and mustard may be seeded the season following application.

  **** NOTE: DO NOT seed to field pea for at least 10 months following treatment. Very dry soil conditions following application can result in a risk of injury to field pea grown in rotation. If severe drought conditions are experienced during the months of June to August inclusive in the year of application delay seeding field pea an additional 12 months (22 months following application).***
  - *Contact the manufacturer for more information before seeding field peas following drought conditions in the previous year.*
  - DO NOT seed legume forages or crops other than those listed above until the second season following application.
- **Aerial Application:** Only *Prestige Brands CO-OP State*, *IPCO State*, *TruSlate Pro* and *Esteem All In* may be applied by air.
- **Storage:** Store product in original containers in a secure, dry, heated area. If the product is frozen, bring to room temperature and agitate before use.

- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground only* (*Prestige* Brands, *CO-OP State*, *IPCO State*, *TruSlate Pro and Esteem All In)*	1	0	1
Ground only* (*Esteem, Foxxy CM*, Viking Stavanger)	1	1	4
Fixed wing aircraft**	4	0	70
Helicopter**	1	0	55

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones for ground applications can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
**** Only *Prestige Brands, CO-OP State, IPCO State, TruSlate Pro* and *Esteem All In* may be applied by air.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Prestige XL , CO-OP State, IPCO State, TruSlate Pro and Esteem All In: Refer to 'Method A' or 'Method B' using a specialized spray tank cleaner in the general section on sprayer cleaning in the introduction.

Other Products: Refer to 'Method C' in the general section on sprayer cleaning in the introduction. The addition of detergent to the second rinse is helpful for cleaning products with oil based formulations such as emulsifiable concentrates.

Hazard Rating:

Danger – Poison

Warning – Eye and Skin Irritant

Potential Skin Sensitizer

Refer to the Introduction for an explanation of the symbols.

Command Charge

Herbicide Group
13 - clomazone
14 – carfentrazone-ethyl

This product is a prepackaged tank mix of the equivalent of Command 360 ME (Command Charge A) and the equivalent of Aim EC (Command Charge B). Information listed is restricted to Crops, Weeds, Rates and Tank mixes. For other detailed restrictions and other general information on the component products see the product pages listed above and select the most restrictive.

Company:

FMC Corporation

Formulation:

The *Command Charge* package contains the following components:

***Command Charge A* (PCP#33558):** 360 g/L clomazone formulated as a microcapsule suspension.

- Container size - 2 x 5.4 L

-plus-

***Command Charge B* (PCP#33535):** 240 g/L carfentrazone-ethyl formulated as an emulsifiable concentrate.

- Container size - 2 x 1.2 L

Crops and Staging:

Apply prior to seeding canola and mustard.

DO NOT apply *Command Charge* to:

- Sandy soils
- Soils with greater than 10 percent organic matter
- Fields receiving applications of solid manure unless it has been thoroughly incorporated to a depth of 10 to 15 cm.

Weeds and Staging:

Emerged weeds controlled by *Command Charge B* (see *Aim EC*) and cleavers emerging from seed controlled by *Command Charge A* (see *Command 360 ME*).

Rate:

Note: MAXIMUM OF ONE APPLICATION per year of this or other products containing clomazone.

***Command Charge A*:** 135 mL per acre.

-plus-

***Command Charge B*:** 30 mL per acre.

Recommended to be tank mixed with glyphosate. If no glyphosate is used, add *Agral 90* or *Agsurf* at 0.25 L per 100 L of spray solution or *Merge* at 1 L per 100 L of spray solution. Tank mixes with glyphosate do not require a surfactant.

Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides: Glyphosate (182 to 364 g ae per acre)

Note: The above Tank Mixes are those listed on the *Command Charge* label only.

According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

See component products for more information on restrictions, applications details and handling. Unless indicated differently above use most limiting restrictions across all components for the mix.

Conquer II

Herbicide Group
6 - bromoxynil
14 - pyraflufen-ethyl

Company:

Nufarm Agriculture (PCP#33350)

Formulation:

15 g/L pyraflufen-ethyl and 467 g/L bromoxynil formulated as an emulsifiable concentrate.

- Container sizes - 2 x 9.71 L, 77.7 L

Crops and Staging:

Canola, wheat (spring, durum, winter), barley, fall rye, oats, triticale, corn, canary seed: Apply prior to seeding or post-seeding but prior to crop emergence.

Fallow: Apply to small, actively growing weeds

Weeds, Rates and Staging:

Apply *Conquer II* at 122 mL per acre to control:

- Annual sowthistle*
- Cleavers
- Cow cockle*
- Dandelion*
- Flixweed*
- Kochia
- Lamb's-quarters
- Narrow-leaved hawk's-beard*
- Night-flowering catchfly (Seedling)
- Redroot pigweed
- Stinkweed*
- Volunteer canola (cotyledon to 4 leaf)
- Wild buckwheat*
- Wild mustard*

*** Suppression only, control when mixed with the appropriate rate of glyphosate. Refer to the glyphosate label for rate recommendation.**

Apply *Conquer II* at 122 mL per acre plus glyphosate at 180 to 360 g ae per acre (see glyphosate) to control all weeds controlled by *Conquer II* alone and glyphosate alone plus:**

- Pineappleweed*
- Shepherd's-purse
- Stinkweed
- Wild buckwheat
- Wild mustard*

*** Suppression only, control when mixed with the appropriate rate of glyphosate. Refer to the glyphosate label for rate recommendation.**
**** present as isopropylamine or potassium salt**

Apply *Conquer II* at up to 242 mL per acre to control:

- Volunteer canola seedlings beyond the 3 leaf stage

Maximum TWO APPLICATIONS of *Conquer II, Blackhawk*, or *Goldwing* at the low (133 mL per acre) rate listed in this Guide (maximum 3.67 grams per acre of the pyraflufen-ethyl active) over A TWO YEAR TIME SPAN.

Application Information:

- **Water Volume:** 40 L per acre.
- **Nozzles & Pressure:** Flat fan nozzles with a spray pressure of 30 to 40 psi (210 to 275 kPa) is recommended. DO NOT apply with spray droplets smaller than the ***ASABE medium*** classification.
- **Screens:** Use a 50 mesh or coarser screen and filter system.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
bromoxynil	POST (foliar)	PSII Inhibitor/ Membrane disrupter	Little (Apoplast)	Broadleaf only	6
pyraflufen-ethyl	POST (foliar) with slight soil activity	PPO Inhibitor/ Membrane disruptor	Little movement due to rapid cell leakage (Symplast)	Non-selective Broadleaf	14

Effects of Growing Conditions:

Warm, moist growing conditions promote active weed growth and enhance the activity of *Conquer II* by allowing maximum foliar uptake and contact activity. Weeds hardened off by cold weather or drought stress may not be adequately controlled or suppressed and regrowth may occur. Weed control may be reduced if the plants are beyond the recommended application growth stage, and during stress conditions, e.g. drought, heat or cold stress, or in heavy infestations where overlapping leaves prevent spray contact. For best results, ensure thorough spray coverage of target weeds.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides

- ***Pre-Emergent and Pre Plant Incorporated:*** Glyphosate (Follow label rates)

Fertilizers: None registered.

Insecticides: None registered.

Fungicides: None registered.

Restrictions:

- **Rainfall:** Within 1 hour of application may reduce control.
- **Restricted Entry Interval:** DO NOT re-enter treated fields for 24 hours.
- **Grazing Restrictions:** DO NOT use treated areas for grazing or green feed until 30 days after application.
- **Re-cropping Interval:** Registered crops can be seeded immediately after application. Any crops not listed can be seeded 30 days after an application of *Conquer II*.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store in a cool, dry, secure place. DO NOT freeze. Heated storage required. Store above 3°C.
- **Buffer Zones:**

Application method/rate	Buffer Zones (metres †) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground* - 112 mL/acre	1	1	1
Ground* - 242 mL/acre	1	1	2

See the Key to Product Pages in the introduction for an explanation of the different habitats.

*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy**

† Distance measured as metres from the downwind edge of the spray boom to sensitive areas.

Sprayer Cleaning:

Refer to 'Method A' in the general section on sprayer cleaning in the introduction. Let solution stand for an extended period for better results. Flush sprayer system with water. See the label for product specific cleaning details.

Hazard Rating:

Danger – Poison

Warning – Contains the Allergen Soy
Potential Skin Sensitizer

Refer to the Introduction for an explanation of the symbols.

Dicamba

Herbicide Group 4 - dicamba

Company:

BASF Canada (*Engenia, Banvel VM)*
Gharda Chemicals (*Oracle* distributed by UAP)
Bayer (*Xtendimax*, Xtendimax 2*)
Corteva Agriscience (*FeXapan*)*
Sharda Cropchem (*Disha 480*)
AgraCity (*Ammo*)
Viking (*Viking Dicamba*)

* ***Note:*** *This product is no longer manufactured but inventories still remain in distribution. This product may be removed from future editions.*

Formulation:

***Banvel VM* (PCP#29249), *Disha 480* (PCP#33851):** 480 g ae/L dicamba formulated as a solution of a diglycolamine salt.
***Engenia* (PCP#32220):** 600 g ae/L dicamba formulated as a solution of N,N-Bis-(3-aminopropyl) methylamine salt.
***Oracle* (PCP#26722), *Ammo* (PCP#34024), *Viking Dicamba* (PCP#34737):** 480 g ae/L dicamba formulated as a solution of a dimethylamine salt.
***Xtendimax* (PCP#31896), *FeXapan* (PCP#32188):** 350 g ae/L dicamba formulated as a solution of a diglycolamine salt.
***Xtendimax 2* (PCP#33501):** 474 g ae/L dicamba as a monoethanolamine salt.

- Container sizes - various

Crops, Rates and Staging:

Note: The use of these chemicals may result in contamination of groundwater, particularly in areas where soils are permeable (e.g. sand, loamy sand and sandy loam soils) and/or the depth to the water table is shallow (less than 2 m). Avoid use in these situations.

Oracle is registered for the all of the uses below. *Banvel VM* is only registered for pasture and rangeland uses below.

Crop	Stage	g acid equivalent per acre	Rate (mL per acre) Rate (mL per acre)			
			480 g/L forms	*Engenia*	350 g/L forms	*Xtendimax 2*
Spring wheat*	2 to 5 leaf	45 to 56	93 to 117	75 to 95	127.5 to 161	94 to 119
Barley*	2 to 5 leaf	45 to 56	93 to 117	75 to 95	127.5 to 161	94 to 119
Oats*	2 to 5 leaf	45 to 56	93 to 117	75 to 95	127.5 to 161	94 to 119
Canaryseed*	3 to 5 leaf	56	117	95	161	119
Winter wheat*	In spring 6 to 10 inches (15 to 25 cm) - prior to flag leaf	45 to 56	93 to 117	75 to 95	127.5 to 161	94 to 119
Spring rye*	2 to 3 leaf	45 to 56	93 to 117	75 to 95	127.5 to 161	94 to 119
Corn, field	Broadcast up to 8 inches (20 cm). When higher, use drop-nozzles. Apply no later than 2 weeks prior to tassel emergence and prior to 20 inches (50 cm).	117 to 242	243 to 505	200 to 400	333 to 692	246 to 510
Corn, field + 2,4-D		56	117	95	161	119
Red fescue (for seed production)	Seedling: 2 inches (5 cm) tall. Established: up to the flag leaf stage.	117	243	200	333	246
Pastures	Established and actively growing	408 to 710	850 to 1,480	530 to 1182	1174 to 2550	866 to 1882

Crop	Stage	g acid equivalent per acre	Rate (mL per acre) Rate (mL per acre)			
			480 g/L forms	*Engenia*	350 g/L forms	*Xtendimax 2*
Seedling grasses (for seed and forage production): Fescue (creeping red, meadow, tall), meadow foxtail, orchardgrass, smooth bromegrass, timothy, wheatgrass (crested, intermediate, pubescent, slender, streambank, tall)	2 to 4 leaf	45 to 56	93 to 117	75 to 95	127.5 to 161	94 to 119
Fall stubble	Apply according to weed stage.	480	1000 (1.0 L)	800	1376	1024
Fall stubble + glyphosate	Apply according to weed stage.	240	500	400	692	510
Pre-seeding cereals	Apply according to weed stage.	61	127	100	175	
Chemfallow + 2,4-D	Apply according to weed stage.	45 to 56	93 to 117	75 to 95	127.5 to 161	94 to 119
Chemfallow + glyphosate	Apply according to weed stage.	56 to 117	117 to 243	95 to 200	161 to 333	119 to 246

*** Should be mixed with a tank mix partner for broad spectrum control**

In Dicamba Tolerant Soybeans:
Apply to Roundup Ready 2 Xtend (dicamba and glyphosate tolerant) and Xtendiflex (dicamba, glyphosate and glufosinate tolerant) soybeans from prior to the emergence of the crop (Pre-plant or Pre-emergence) and/or after the emergence of the crop (Post-emergent) to the crop once or twice up to the early flower stage (R1) of the crop.

Crop	Rate (mL per acre)		
	Engenia	350 g/L forms	*Xtendimax 2*
Dicamba tolerant Soybeans	200 to 400	333 to 692	246 to 510

Weeds, Rates and Staging:

Apply to annual broadleaf weeds at the 2 to 3 leaf stage and to winter annual rosettes up to 2 inch (5 cm) across.

Dicamba applied alone at 45 to 56 g ae per acre will control:

- Cleavers (high rate only)
- Cow cockle
- Corn spurry
- Canada thistle*
- Perennial sow-thistle*
- Smartweed (green, lady's-thumb)
- Tartary buckwheat
- Wild buckwheat

Dicamba at 117 to 242 g ae per acre will control:

- Canada thistle**
- Canada fleabane
- Field bindweed**
- Kochia
- Lamb's-quarters
- Mustard (hare's-ear, Indian, tumble, wild, wormseed)
- Perennial sow-thistle**
- Pigweed (redroot, Russian)
- Ragweed (common, false, giant)

Dicamba at 408 g ae per acre in rangeland or 480 g ae per acre in fallow will control:

Weeds listed above plus:

- Curled dock*
- English daisy
- Goldenrod
- Tansy ragwort

Dicamba at 892 g ae per acre will control:

Weeds listed above plus:

- Diffuse knapweed
- Goat's-beard
- Ground cherry
- Pasture sage
- Povertyweed
- Sheep sorrel
- Thyme-leaved spurge

*** Top growth only.**

**** Three consecutive years of treatment are required for complete control.**

The following chart indicates weed and brush controlled by dicamba + 2,4-D mixes at the listed rates.

Weeds	Rate (g ae per acre)†	
	Dicamba	2,4-D
Poison ivy	322	426
Wild carrot	408	426
Aspen poplar	634	852
Prickly rose, western snowberry†††	710	852
	Rate (L per 1000 L of water)††	
Alder, aspen poplar, cherry, western snowberry, wolf willow, wild rose	408	745

† Applied by broadcast sprayer.
†† Apply to the foliage and stems to the point of run-off using high volume equipment.
††† Ester formulations of 2,4-D only.

Canada thistle, Perennial sow-thistle in fallow: Apply prior to the bud stage. Must be applied to thistle plants with 6 to 10 inches (15 to 25 cm) of new growth.

Canada thistle control in fall after harvest: When thistles exhibit new growth and at least 2 weeks prior to a killing frost.

Refer to label for full lists of weeds controlled by dicamba plus tank mixes in cereals, pastures, fallow and other situations.

When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

Brush control in pastures: When brush is actively growing and is 6 feet (2 metres) in height or less (in spring or early summer). Growth greater than 2 metres may be cut and allowed to regrow prior to treatment.

Application Information:

- **Water Volume:**
  - ***Preseeding burnoff:*** 20 to 45 L per acre.
  - ***Annual crops:*** at least 45 L per acre.
  - ***Pastures, fallow and stubble:*** 45 to 90 L per acre.
  - ***Corn:*** 90 to 140 L per acre.
  - ***Brush:*** high volumes to the point of run-off.
- **Nozzles and Pressure:**
  - ***Broadcast application:***
    - *Dicamba tolerant soybeans (Enginia, FeXapan and Xtendimax only)*: Use nozzles that deliver **extremely coarse** to **ultra coarse** spray droplets (volume median diameter of **450 microns or more**) as defined by ***ASABE standard S572.1*** and as shown in the nozzle manufacturer's catalog.
    - *Other Uses:* Maximum 40 psi (275 kPa) with conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver even coverage of ***ASABE coarse*** droplets.
  - ***Brush Control:*** Use high volume spray equipment producing large droplets including, but not limited to, hand-wand, boomless nozzle and Radi-Arc technologies.

Note: Refer to product labels for detailed application information

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
dicamba	POST (foliar) PRE (soil active)	Synthetic Auxin	Thoughout the plant (Symplast)	Broadleaf only	4

Effects of Growing Conditions:

Crop damage (stunting, reduced seed set) can occur if the chemical is applied at any time other than the recommended stage.
DO NOT apply to crop under stress from adverse environmental conditions, such as excess moisture, drought and disease. Apply when air temperature is between 10 and 25°C.

DO NOT apply:

- when there is a risk of severe temperature fall in the night;
- under high humidity, temperatures above 30°C, or fog conditions, to prevent drift to sensitive crops;
- when wind is blowing toward a nearby sensitive crop;
- when winds are below 3 km per hour or above 15 km per hour.

Tank Mixes:

Herbicides:

	Spring wheat	Winter wheat	Barley	Oats	Seedling grasses
2,4-D Amine 160 g ae/acre	✓	✓	✓		✓
MCPA Amine (0.34 L/acre)	✓	✓	✓	✓	✓
MCPA K (0.44 L/acre)	✓	✓	✓	✓	✓
Sencor (0.11 to 0.17 L/acre)	✓		✓		
Ally (2 g/acre)	✓		✓		

In Canaryseed: MCPA amine (0.34 L per acre – 500 g ai/L formulation)

In Corn, Spring rye: 2,4-D amine (160 g ae per acre)

In Chemical fallow, stubble: 2,4-D, glyphosate products.

In Red fescue: 2,4-D amine (287 g ae per acre)

In Preseeding burnoff: Glyphosate (136 g ae per acre - see glyphosate for product rates)

Insecticides: None registered.

Fungicides: None registered.

Fertilizers: None registered.

Note: The above mixes are those listed on the dicamba labels only.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** No rainfast period is specified on the label; required interval may be up to 8 hours. Contact manufacturer for more information.
- **Restricted Entry Interval:** DO NOT enter treated fields for 12 hours.
- **Grazing and Harvest Intervals:**
  - ***Canaryseed:*** Use only as birdseed.
  - ***Corn:*** DO NOT graze cattle or harvest for silage until 7 days after treatment of dicamba alone or for at least 12 weeks following dicamba tank mixes with other herbicides.
  - ***Cereals, seedling grasses, pasture:*** DO NOT harvest for silage for or graze lactating dairy cattle until 7 days after treatment. If treated vegetation has been consumed by dry dairy animals or meat animals within 30 days of dicamba application, feed the animal with untreated diet for 30 days before slaughter. Meat animals or dry dairy animals may graze or feed on treated pasture 3 days after dicamba application without restrictions on slaughter. Feed untreated forage within 3 days of slaughter.
  - ***Dicamba tolerant Soybeans:*** Pre-harvest interval of 7 to 10 days for soybean forage and 13 to 15 days for soybean hay. A plant back interval of 120 days is required for those not on the dicamba label.
- **Re-cropping Interval:** Grow only cereals, corn, soybeans or white beans the year after treatment with the 1.0 L per acre rate. Grow only cereals, corn, field beans, soybeans or canola the year after applications of 0.5 L per acre. If applications are made after September 1, or if dry weather persists after application, crop injury may occur the following spring.
- **Aerial Application:** May be applied by air on cereals only. Use a minimum water volume of 8 L per acre.
- **Storage:** May be stored at freezing temperatures.
- **Buffer Zones:**
  Buffers are not required for hand-held and backpack applications.

Application method	Crop	Buffer Zones (metres†) Required for the Protection of:		
		Aquatic Habitats of Depths		Terrestrial habitat
		Less than 1 m	Greater than 1 m	
Ground*	Barley, oats, rye, wheat, canary seed, seedling forage grasses	0	0	1
	Corn, established forage grasses, red fescue	1	1	4
	Dicamba tolerant soybeans (*Engenia* and *Xtendimax* only)	1	1	4
	Stubble, fallow	1	1	5
	Pasture and rangeland	1	1	10

Application method	Crop	Buffer Zones (metres†) Required for the Protection of:		
		Aquatic Habitats of Depths		Terrestrial habitat
		Less than 1 m	Greater than 1 m	
Winged airplane	Barley, oats, rye, wheat	0	0	50
Helicopter		0	0	45

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:
Refer to `Method A' in the general section on sprayer cleaning in the introduction.

Hazard Rating:
Caution – Poison

Warning – Eye Irritant

Refer to the Introduction for an explanation of the symbols.

Dicamba / Fluroxypyr

Herbicide Group
4 - dicamba, fluroxypyr

Company:
Sharda Cropchem (*Diflux* – PCP#33988)

Formulation:
86.9 g/L dicamba and 113.3 g/L fluroxypyr formulated as an emulsifiable concentrate.
- Container sizes - 2 x 9.82 L, 78.6 L

Crops and Staging:
Barley and spring wheat (including durum): 2 to 5 leaf stage.
When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

Weeds, Rates and Staging:
Unless otherwise indicated apply when weeds are at the 2 to 3 leaf stage and rosettes are less than 2 inches (5 cm) across.
Applications at 246 mL per acre controls:
- Cleavers
- Kochia (up to 9-leaf)
- Wild buckwheat*

Applications at 371 mL per acre controls the weeds above plus:
- Lamb's-quarters*
- Redroot pigweed*
- Russian thistle
- Stork's-bill*
- Volunteer flax
- Wild buckwheat (up to 9-leaf)

*** Suppression only.**
ONE APPLICATION per year is permitted.

Application Information:
- **Water Volume:** Minimum 45 L per acre. If applying near sensitive crops such as soybeans, fruit trees, grapes, ornamentals, peas, lentils, potatoes, or tomatoes use 90 L per acre of water.
- **Nozzles and Pressure:** Use a maximum pressure between 40 and 45 PSI (275 to 310 kPa) for conventional flat fan nozzles. If applying near sensitive crops such as soybeans, fruit trees, grapes, ornamentals, peas, lentils, potatoes, or tomatoes use a maximum of 22 PSI (22 kPa). Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE medium*** droplets.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
Dicamba, fluroxypyr	POST (foliar)	Synthetic Auxin	Moves throughout the plant (Symplast)	Broadleaf only	4

Effects of Growing Conditions:

DO NOT apply to crops that are stressed (frost, low fertility, drought or flooding, disease or insect damage) as crop injury or reduced weed control may result. DO NOT apply these products when temperatures are expected to exceed 30°C as off-target movement is more likely to occur, during and after application. Avoid application under high humidity or fog.

Tank Mixes:

Herbicides:

- ***Barley, Spring wheat, and durum only:***
  - MCPA LV600 ester (0.23 L per acre)
- ***Spring wheat, and durum:***
  - *Horizon NG* (376 mL per acre)
  - *Horizon NG* (376 mL per acre) + MCPA LV600 ester (0.23 L per acre)
  - *Traxos* (label rate)
  - *Traxos* (label rate) + MCPA Ester (rates above)

Fertilizers: None registered

According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.
Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 1 hour may reduce control.
- **Restricted Entry Interval:** DO NOT enter treated fields for at least 12 hours.
- **Pre-harvest Interval:** Leave 60 days between treatment and harvest.
- **Grazing Restrictions:** Treated crops may be grazed, or cut for hay or silage after 7 days when used alone, or a minimum of 12 weeks when mixed or longer if the intervals are longer for the tank mix partner.
- **Re-cropping Interval:** Wheat, barley, oats, rye, forage grasses, flax, canola, mustard, lentils and peas may be grown the following season. There are no re-cropping restrictions the second year after application.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** May be frozen. If frozen, bring to room temperature and agitate before use. This product is combustible. DO NOT store near heat or open flame.
- **Buffer Zones:**
  - Handheld or backpack applications do not require a buffer.

Application method	Buffer Zones (metres†) Required for the Protection of:	
	Aquatic habitat	Terrestrial habitat
Ground only*	15	15

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

  - Legumes are particularly sensitive to dicamba + fluroxypyr.

Sprayer Cleaning:

Refer to 'Method B' in the general section on sprayer cleaning in the introduction.

Hazard Rating:

Warning – Eye and Skin Irritant

Refer to the Introduction for an explanation of the symbols.

Dicamba / Mecoprop / MCPA

Herbicide Group 4 - dicamba, mecoprop-p, MCPA

Company:
Loveland Products Canada (*Sword* – PCP#27892)
Interprovincial Cooperative Limited (*Tracker XP* – PCP#27790)

Formulation:
275 g/L MCPA + 62.5 g/L mecoprop-p + 62.5 g/L dicamba formulated as a solution.
- Container sizes - 2 x 10 L, 500 L (*Sword* only), 1000 L (*Sword* only)

Crops and Staging:
All Products:
Cereals:

Crop	Stage
Barley	2 to 4 leaf (3 leaf for best crop safety)
Canaryseed (including for human consumption), oats, spring wheat (including durum)	2 to 5 leaf (3 to 4 leaf for best crop safety)
Winter wheat	Spring application only; up to 12 inches (30 cm) high (top leaf extended)
Fallow	Fall stubble

***Sword* only:**
- ***Seedling grasses grown for forage only (NOT for seed production)*:*** Apply at the 2 to 4 leaf stage.
  - Creeping red fescue
  - Wheatgrass (crested, intermediate)
  - Meadow foxtail
  - Orchardgrass
  - Smooth bromegrass
  - Timothy
- ***Established grasses for forage only (NOT for seed production)*:*** Apply up to flag leaf stage.
  - Bromegrass (meadow, smooth)
  - Fescue (creeping red, meadow, tall)
  - Kentucky bluegrass
  - Meadow foxtail
  - Orchardgrass
  - Timothy
  - Wheatgrass (crested, intermediate, pubescent, slender, streambank, tall, western)

**** NOTE: Use only one application per year by ground. Since applications to forage grasses in western Canada has been registered under the User Requested Minor Use program, the manufacturer assumes no responsibility for herbicide performance. Application to forage grasses are at the risk of the user.***

Weeds and Staging:
Weeds controlled at 0.4 to 0.6 L per acre from the 2 to 3 leaf stage unless otherwise indicated:
- Bindweed* (field, hedge)
- Buckwheat (tame, tartary, wild)
- Canada thistle (6 to 8 inches (15 to 20 cm))*
- Cleavers (1 to 2 whorls)
- Corn spurry
- Cow cockle
- Flixweed
- Hemp-nettle (less than 2 pairs of true leaves)
- Kochia
- Lamb's-quarters
- Mustards (ball, tall, wild, wormseed, yellow)
- Night-flowering catchfly
- Pigweed (prostrate, redroot)
- Ragweed, common
- Russian thistle (less than 2 inches (5 cm))
- Shepherd's-purse
- Smartweed (green, lady's-thumb)
- Sow-thistle (annual, perennial*)
- Stinkweed
- Volunteer canola
- Volunteer sunflowers

*** Top growth control only**

Use the higher rate under adverse weather conditions, when weed density is high, for cleavers control, winter annual control and for suppression of Canada thistle and perennial sow-thistle.

Although dicamba/mecoprop-p/MCPA is registered up to the 5 leaf stage of the crop for the rates listed here, the low rate should be used when the crop is at the 5 leaf stage for optimum crop safety.

For Canada thistle, post-harvest or fallow application, use 0.81 L per acre.

Application Information:

- **Water Volume:**
  - ***Ground:*** Minimum 40 L per acre.
  - ***Aerial:*** Minimum of 12 L per acre
- **Nozzles and Pressure:** 30 to 40 psi (200 to 275 kPa) when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage of ***ASABE coarse*** droplets.
- **Screens:** Use a 50 mesh or coarser screen and filter system.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
dicamba, mecoprop, MCPA	POST (foliar)	Synthetic Auxin	Moves throughout the plant (Symplast)	Broadleaf only	4

Effects of Growing Conditions:

Hot and dry or cold and wet weather prior to spraying may result in reduced weed control and increased crop injury.
DO NOT apply within 2 weeks of a killing frost.

Tank Mixes:

Herbicides:

- ***Wheat and Barley:***
  - *Sencor* or linuron for chickweed control.

Fertilizers: None registered.
Insecticides: None registered.
Fungicides: None registered.
Note: The above mixes are those listed on the dicamba/mecoprop-p/MCPA labels only.
Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Activity may be reduced if rainfall occurs within 3 hours of application. Contact manufacturer for more information.
- **Restricted Entry Interval:** DO NOT enter treated fields for 12 hours.
- **Grazing Restrictions:** DO NOT graze or harvest for livestock feed within 7 days of application.
- **Pre-harvest Interval:** Leave at least 80 days from application to harvest.
- **Re-cropping Interval:** No restrictions the year after application.
- **Aerial Application:** All may be applied by air.
- **Storage:** DO NOT freeze.
- **Buffer Zones:** Buffers are not required for hand-held and backpack applications.

Application method	Crops	Buffer Zones (metres†) Required for the Protection of:		
		Aquatic Habitats of Depths		Terrestrial habitat
		Less than 1 m	Greater than 1 m	
Ground *	Standing Crops	1	1	5
	Fallow and stubble	1	1	5
Fixed wing airplane	Cereals	1	0	60
	Canaryseed	1	0	75
	Forage	1	0	75
	Fallow and stubble	5	1	100
Helicopter	Cereals	1	0	50
	Canaryseed	1	0	60
	Forage	1	0	60
	Fallow and stubble	4	1	80

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:
Refer to the general section on sprayer cleaning in the introduction.

Hazard Rating:
Caution – Poison

Warning – Eye Irritant

Potential Skin Sensitizer

Refer to the Introduction for an explanation of the symbols.

Dichlorprop/2,4-D

Herbicide Group
4 - dichlorprop, 2,4-D

Company/Products:
Nufarm Agriculture (*Estaprop XT*)
Interprovincial Cooperative Limited (*Dichlorprop-DX*)

Formulation:
***Estaprop XT* (PCP#29660); *Dichlorprop-DX* (PCP#29664):** 210 g/L of dichlorprop-P and 400 g/L of 2,4-D ester formulated as an emulsifiable concentrate.

- Container sizes:
  - ***Estaprop XT*** - 2 x 9.7 L
  - ***Dichlorprop-DX*** - 2 x 10L, 115 L

Crops and Staging:
Wheat (spring, durum) and barley: 4 leaf until the early flag leaf stage.
Winter wheat: in spring from tillering to the early flag leaf stage.
When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

Weeds and Staging:
Treat weeds when young and actively growing and before they are shielded by the crop. Additional stage restrictions indicated are the minimum indicated over all labels. Check individual labels for exceptions.

- Bluebur
- Burdock
- Canada thistle*
- Cocklebur
- Curled dock*
- Dandelion***
- Flixweed
- Kochia (up to 2 inches)
- Lamb's-quarters
- Mustards (ball, dog, hare's-ear, Indian, tumble, wild, wormseed)
- Night-flowering catchfly♦
- Oak-leaved goosefoot
- Pigweed (redroot, Russian)
- Prickly lettuce (2 to 12 leaf)†
- Ragweed (Common, giant†† ♦♦)
- Round-leaved mallow
- Russian thistle (up to 2 inches)
- Shepherd's-purse
- Sow-thistle (annual, perennial*)
- Spreading atriplex (cotyledon to 10 leaf)††
- Stinkweed
- Stork's-bill
- Toadflax**
- Volunteer canola

Control the following weeds up to the 4 leaf stage:

- Smartweed (including lady's-thumb)
- Tartary buckwheat
- Volunteer Sunflower
- Wild buckwheat

*** Top growth control only**
**** Suppression only; treat before the majority reach 6 inches (15 cm)**
***** Season long control in winter wheat**
♦ Spring annuals only
♦♦ Treat prior to the 6 leaf stage
† In winter wheat only
†† *Estaprop XT* in winter wheat only

Rates:
486 mL per acre.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
dichlorprop, 2,4-D	POST (foliar)	Synthetic Auxin	Moves throughout the plant (Symplast)	Broadleaf only	4

Application Information:

- **Water Volume:**
  - ***Ground:*** 20 to 97 L per acre*. Use a minimum of 40 L of water per acre to reduce the risk of drift.
  - ***Aerial:*** Minimum 12 L per acre.
- **Nozzles and Pressure:** 30 to 40 psi (200 to 275 kPa) when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use nozzles and pressure designed to deliver proper coverage with ***ASABE coarse*** droplets or larger.

  *** May vary by product. Check label closely.**

Effects of Growing Conditions:

Applications made under dry conditions may result in reduced control. Crops under stress from adverse environmental conditions, such as excess moisture, frost or drought, may be injured. Best weed control when adequate soil moisture is present and warm temperatures prevail. DO NOT apply when daytime temperatures exceed 27°C.

Tank Mixes:

Herbicides:

Tank Mix Partner (Mixed at label rates unless otherwise indicated)	Crops			
	Spring wheat	Durum	Winter wheat	Barley
Clodinafop[Δ]	•	•		
Fenoxaprop[Δ]	•	•		•[†]
Thifensulfuron/tribenuron[Δ††]	•	•	•	•
Tralkoxydim [Δ]	•	•	•	•

[†] ***Vigil WB*** **only.**
[††] ***Estaprop XT*** **only.**
[Δ] **Manufacturers may only support mixes with specific products. Contact the manufacturer for more information.**

Note: Always refer to the label for the tank mix partner in this guide for additional restrictions on staging and varieties.

Insecticides: None registered.

Fungicides: None registered.

Fertilizers: None registered.

Note: The above mixes are those listed on dichlorprop-P+2,4-D labels only.

Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** No rainfast period is specified on the label; required interval may be up to 8 hours. Contact manufacturer for more information.
- **Restricted Entry Interval:** Leave 12 hours before entering treated fields.
- **Grazing Restrictions:** DO NOT graze the treated crop or harvest for hay or feed within 40 days of application. Withdraw meat animals from treated fields at least 3 days before slaughter.
- **Pre-harvest Interval:** Leave 40 days from spraying until harvest of winter wheat and 60 days for other crops.
- **Re-cropping Interval:** No restrictions the year after application. Fields treated with *Estaprop XT* may be replanted after a minimum of 30 days.
- **Aerial Application:** May be applied by air. Refer to specific product labels for full details for application by air.
- **Storage:** May be frozen.

- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat**
	Less than 1 m	Greater than 1 m	
Ground	1	1	1
Fixed wing aircraft	5	1	30
Helicopter	3	1	30

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
**** Handheld or backpack sprayers do not require a buffer zone.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:
Refer to 'Method A' in the general section on sprayer cleaning in the introduction.

Hazard Rating:
Warning – Poison

Refer to the Introduction for an explanation of the symbols.

Diquat

Herbicide Group 22 - diquat

Company:
Syngenta Canada (*Reglone*, *Reglone Ion*, *Desica*)
ADAMA Canada (*Armory 240, Armory All In*)
Advantage Crop Protection (*Advantage Diquat 240*)
AgraCity (*Clone*)
Sharda Cropchem Canada (*Dessicash Desiccant*)
Federated Cooperatives (*CO-OP Bolster II*)
Interprovincial Cooperative Limited (*IPCO Bolster II*)
Loveland Products Canada (*Stage*)
Nufarm Agriculture (*Drifast*)
WinField United Canada (*Craven*)*
Viking (*Viking Diquat*)
Innovis Crop Protection Limited (*Innovis Diquat 240 Harvest Aide*)

***Note:** This product is no longer manufactured but inventories still remain in distribution. This product may be removed from future editions.*

Formulation:
***Diquat 240* formulations = *Armory 240* (PCP#32726); *Advantage Diquat 240* (PCP#33731); *IPCO Bolster II* (PCP #33743); *Clone* (PCP#32997); *Co-op Bolster II* (PCP#33744); *Craven* (PCP#32231); *Desica* (PCP#30488); *Dessicash Desiccant* (PCP#31406); *Drifast* (PCP#32648); *Stage* (PCP#31597); *Reglone* (PCP#26396), *Viking Diquat* (PCP#34790), *Innovis Diquat 240 Harvest Aide*: (PCP# 34905)**
240 g/L diquat ion (present as dibromide) formulated as a solution.

- Container sizes - Various from 2 x 10 L to 1000 L

***Reglone Ion* (PCP#31058), *Armory All In* (PCP#35143):** 200 g/L diquat formulated as a solution. Comes with a built-in-adjuvant

- Container sizes - 2 x10 L, 115 L (*Reglone Ion* only), 120 L (*Armory All In* only), 450 L, or 1000L (*Armory All In* only)

Crops and Staging:
Field crops: Diquat is used to dry immature green material at top of indeterminate crops and green weeds to facilitate harvest. Diquat will not speed maturity of green crops. Treatment before the recommended stage can result in reduced yield and quality. Use *Agral 90*, a wetting and spreading agent at a rate of 1 L for each 1000 L of spray mixture unless otherwise stated. For bean or lentils, LI 700 at a rate of 2.5 L for each 1000 L of spray mixture may be used. For all applications of 240 g/L formulations. Refer to product labels for specific recommendations for adjuvant use.

Crop	Stage	Rate (L per acre)			
		240 g/L formulations		200 g/L formulations	
		Ground	Aerial	Ground	Aerial
Canola*†	90% or more of seed has turned brown.	0.50 to 0.69†	0.69 to 0.93	0.61 to 0.83†	0.83 to 1.11†
Dry Beans (red and white kidney)	Crop has lost 80 to 90% of leaves and 80% of pods are yellow.				
Soybeans					
Faba beans††	Most plants are ripe and dry. Pods fully filled, bottom pods are tan or black in colour.				
Flax and Solin (low linolenic acid flax)	75% of bolls brown.				
Lentil	Lowest pods are light brown and rattle when shaken.				
Mustard (condiment type only)	75% of seed has turned brown.				
Peas	Bottom pods are ripe and dry, seeds detached from pods.				
Sunflowers	Backs of sunflower heads and bracts are turning yellow and seed moisture is 20 to 50%.	0.50 to 0.69†	0.69 to 0.93	0.61 to 0.83†	0.83 to 1.11†
Chickpeas†	Plants yellow, pods mature, seeds changed colour and detached from pods.	0.50 to 0.69†	0.69	0.61 to 0.83†	0.83
Potatoes (top growth mature and few weeds)	Two weeks prior to harvest.	0.5	Requires 2 Passes Pass #1: 0.69 to 0.93 L/acre** Pass #2: (4 to 5 days later) at 0.5 L/acre	DO NOT use *200 g/L formulations* on Potatoes	
Potatoes (some top growth and/or some weeds)		0.69 to 0.93**†			
Potatoes (dense crop, heavy weed infestations)		1.42**†			
Alfalfa, bird's-foot trefoil, red clover, alsike clover††† and white clover (for seed production only)***	Pods are ripe but before shattering. Harvest within 7 days.	0.69 to 1.09†	0.69 to 1.09†	0.83 to 1.32†	0.83 to 1.32†

† Use high rates for dense crops and/or heavy weed infestations. Use of high rates for canola and chickpea is recommended.
†† Except *Nufarm Drifast* and *Innovis Diquat 240 Harvest Aide*.
††† *Reglone Ion , Armory All In* only.
*** This use can cause shattering losses in non-shatter resistant canola.**
**** DO NOT use an adjuvant on potatoes except at the 0.5 L per acre ground application rate.**
***** DO NOT use on forage legumes that have been treated with a residual herbicide in the previous 12 months.**

Industrial Vegetation uses in Non-Crop Areas (*Diquat 240* formulations only): Apply 0.93 to 1.86 L per acre to kill topgrowth vegetation on areas to be maintained vegetation free. May be combined with soil active herbicides to maintain vegetation free.

Application Information:

- **Water Volumes:**
  - ***Ground:*** 91 to 222 L per acre. Use 222 to 445 L per acre on potatoes.
  - ***Aerial:*** 18 L per acre.

  Use the highest water volumes when crop canopy is heavy or if weed growth is dense.
- **Nozzles and Pressure:** 20 to 30 psi (150 to 200 kPa) when using conventional Flat fan nozzle tips are recommended for proper coverage. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE medium*** droplets. Rotary atomizer nozzles and other low volume and ultra low volume application equipment are not recommended for use with diquat.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
diquat	POST (foliar)	PS I Inhibitor/Membrane disruptor	Little (Apoplast)	Non-selective	22

Effects of Growing Conditions:

Best results under cloudy conditions or in evening. Shattering losses can increase if heavy winds, rain or hail occur after the crop has dried down.

Tank Mixes:

Herbicides: None registered.
Insecticides: None registered.
Fungicides: Fungicides may be added when applying diquat to potatoes for vine killing.
Fertilizers: None registered.

Restrictions:

- **Rainfall:** Within 15 minutes may reduce effectiveness.
- **Restricted Entry Interval:** Leave 24 hours before entering treated fields.
- **Grazing Restrictions:** Crop residues remaining after harvest may be fed to livestock.
- **Pre-harvest Interval (note these recommended intervals may be for functional or marketability reasons):**
  - ***Faba bean, Lentil:*** Wait 4 to 7 days to harvest.
  - ***Forage Legumes:*** DO NOT exceed 7 days.
  - ***Canola, Mustard:*** Wait 7 to 10 days; maximum 14.
  - ***Sunflowers:*** Wait 15 to 20 days.
  - ***Flax, Peas:*** When sample tests dry.
- **Re-cropping Interval:** No restrictions the year after application.
- **Aerial Application:** May be applied by air in a minimum of 18 L per acre water volume.
- **Storage:** DO NOT freeze.
- **Buffer Zones:**

Application method	Crops	Buffer Zones (metres†) Required for the Protection of:		
		Aquatic Habitats of Depths		Terrestrial habitat
		Less than 1 m	Greater than 1 m	
Ground*	Potatoes and Industrial Vegetation Management uses	10	5	5
	Other crops under "Crops:" section	5	3	3
Winged aircraft	Potatoes	200	100	100
	Beans, legume forage seed	150	80	90
Helicopter	Potatoes	125	65	80
	Beans, legume forage seed	100	55	70

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones for ground applications can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

When finished spraying diquat, rinse the sprayer out with clean water. Run through pump, lines and nozzles. Drain tank by spraying out on an untreated portion of a crop on which the product is registered, or by spraying on uncropped land. Refill sprayer with water and *Agral 90* at 0.6 L per 1000 L spray solution. Run the solution through lines and boom. Spray out, then refill with clean water. Leave equipment standing overnight, then drain water out.
Refer to the general section on sprayer cleaning in the introduction. for additional information.

Hazard Rating:

Warning – Poison
Caution – May Cause Eye Damage
Potential Skin Sensitizer
Refer to the Introduction for an explanation of the symbols.

Distinct

Herbicide Group
4 - dicamba
19 - diflufenzopyr

Company:
BASF Canada (PCP#25811)

Formulation:
20% diflufenzopyr and 50% dicamba, sodium salt formulated as a water dispersible granule.
- Container size - 2 x 2.3 kg

Crops and Staging:
Fallow and Post-Harvest applications
Corn: 2 to 6 leaf stage
Note: The use of this chemical may result in contamination of groundwater, particularly in areas where soils are permeable (e.g. sand, loamy sand and sandy loam soils) and/or the depth to the water table is shallow.

Weeds, Rates and Staging:
Corn:

Distinct *applied post-emergent to weeds below at 115 grams per acre plus a non-ionic surfactant and UAN (liquid 28-0-0) at 1.25 L per 100 L of spray solution will control:*
- Biennial wormwood (2 to 8 leaf)
- Canada thistle*
- Cocklebur (6 leaf)
- Kochia (up to 15 cm)
- Lady's-thumb
- Lamb's-quarters
- Ragweed (common, giant**) (2 to 8 leaf)
- Redroot pigweed
- Sow-thistle, perennial** (2 to 10 leaf)
- Waterhemp
- Velvetleaf
- Volunteer canola (up to 4 leaf)
- Wild buckwheat

Fallow or post-harvest:

It is recommended that *Distinct* be tank-mixed with glyphosate and *Merge* adjuvant (200 mL per acre).

Distinct *at 58 grams per acre, as a tank mix with glyphosate, provides enhanced control of the following weeds:*
- Dandelion*
- Kochia
- Lamb's-quarters
- Narrow-leaved hawk's-beard
- Redroot Pigweed
- Round-leaved mallow
- Sow-thistle, spiny annual
- Wild buckwheat

Distinct *at 115 grams per acre controls:*
- *Weeds listed* at 58 grams per acre plus:
  - Biennial wormwood (2 to 8 leaf)
  - Canada thistle*
  - Cocklebur
  - Lady's-thumb
  - Lamb's-quarters
  - Redroot pigweed
  - Ragweed, common
  - Sow-thistle, perennial**
  - Waterhemp
  - Velvetleaf
  - Volunteer canola (up to 4 leaf)
  - Wild buckwheat

*** Top growth control only.**
**** Suppression only.**

A general guide to mixing can be found in the introduction.

DO NOT exceed a maximum application rate of 115 grams per acre of *Distinct* per season.

Application Information:
- **Water Volume:** 20 to 80 L per acre. High water volumes are required for adequate coverage, particularly when weed densities are high or weed staging is large.
- **Nozzles and Pressure:** Use 40 psi (275 kPa) when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage a of ***ASABE coarse*** droplets.
- **Screens:** Use 50 mesh or coarser on both nozzle and primary plumbing screens.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
dicamba	POST (foliar)	Synthetic Auxin	Throughout the plant (Symplast)	Broadleaf only	4
diflufenzopyr	POST (foliar)	Auxin transport inhibitor	To growth areas of the plant (Symplast)	Broadleaf only	19

Effects of Growing Conditions:

DO NOT spray if temperatures of +5°C or less are forecast within 3 days of application or when temperatures are expected to exceed +27°C on the day of application. Under cool or dry conditions, control of some weeds may be severely reduced.

Tank Mixes:

Herbicides:

- ***Fallow and Post-harvest:***
  - Glyphosate (180 to 360 g ae per acre) - recommended
- ***Corn:***
  - None registered in western Canada.

Insecticides: None registered.

Fungicides: None registered.

Fertilizers: None registered.

Restrictions:

- **Rainfall:** Rain within 4 hours may reduce control.
- **Restricted Entry Interval:** Leave 12 hours before entering treated fields.
- **Grazing Restrictions:** DO NOT graze or cut as feed for 75 days.
- **Pre-harvest Interval:** DO NOT apply within 120 days of harvesting corn.
- **Re-cropping Interval:** A plant back interval of 30 days is required for the planting of rotational crops. If applying between September 1st and 30th at the low rate (58 g per acre), BASF supports plant back to these crops the following spring – canola, lentil, field peas, soybeans, or cereal crops. Please contact BASF Canada for a full list of supported rotational crops.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store in a cool, dry place above 5°C.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground only	15	15	10

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Distinct can cause injury to sensitive crops at very low concentrations. Sprayers used to spray this product should be flushed out immediately after use.

Use 'Method B' in the introduction to clean sprayers after using *Distinct*.

Hazard Rating:

Caution – Poison

Refer to the Introduction for an explanation of the symbols.

Eclipse XC

Herbicide Group
4 - clopyralid
9 - glyphosate

This product is a prepackaged tank mix of clopyralid and glyphosate.
Information listed is restricted to Crop, Weeds and Rates. For other detailed information on the component products see the product pages listed above.

Company:

Corteva Agriscience (*Eclipse XC**)

*** Note:** *This product is no longer manufactured but inventories still remain in distribution. This product may be removed from future editions.*

Formulation:

The *Eclipse XC* package contains the following components:

***Eclipse XC A* (PCP#32883):** 600 g/L clopyralid formulated as a solution.

- Container size - 2.67 L

-plus-

***Eclipse XC B* (PCP#32852):** 480 g/L glyphosate present as an dimethylamine (DMA) salt and formulated as a solution.

- Container sizes - 2 x 7.5 L, 90 L

Crops and Staging:

Glyphosate tolerant canola varieties only in the 2 to 6 leaf stage. Some yellowing may occur when applied at the 4 to 6 leaf stage. This effect is temporary and will not influence crop growth, maturity or yield.

Weeds and Staging:

No staging is specified on the label.

The weeds controlled by glyphosate at 180 g ae per acre plus:

- ***Annual broadleaf weeds:***
  - Chickweed
  - Corn spurry
  - Cow cockle
  - Kochia*
  - Night-flowering catchfly
  - Shepherd's-purse
  - Smartweed
  - Wild tomato
  - Volunteer canola*
- ***Perennial weeds (season long control):***
  - Canada thistle
  - Dandelion less than 15 cm diameter**
  - Dandelion greater than 15 cm diameter***
  - Perennial sow-thistle**
  - Quackgrass

*** Not including glyphosate tolerant/resistant types.**
**** Top growth only.**
***** Suppression only.**

Rates:

Eclipse XC A: 69 mL per acre
Eclipse XC B: 375 mL per acre

To prepare spray solution, add the clopyralid component to the spray tank. Once it is half filled with water, add the glyphosate component as the remaining water is added to the tank.

Application Information:

- **Water Volume:** 40 L per acre.
- **Nozzles and Pressure:** Maximum 30 to 40 psi (200 to 275 kPa) when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage and a minimum of fine droplets that are prone to drift. **DO NOT use with galvanized sprayer tanks since explosive hydrogen gas can be produced.**

Restrictions:

- **Re-cropping Interval:** Wheat, oats, barley, rye (not underseeded to legumes such as alfalfa and clover), forage grasses, flax, canola, mustard and field pea* can be grown the year after application. Manure bedded with straw from treated crops may only be applied prior to the crops listed above with the exception of field pea. Soybean* can be planted the year following *Eclipse XC*.
  *** DO NOT seed to field peas or soybean for at least 10 months following treatment. Very dry soil conditions following application can result in a risk of injury when grown in rotation. If severe drought conditions are experienced during the months of June to August inclusive in the year of application delay seeding these crops an additional 12 months (22 months following application). Contact your local the manufacturer or retailer for more information before seeding these crops following drought conditions in the previous year.**
- **Aerial Application:** DO NOT apply by air.

See component products for more information on restrictions, application details and handling. Unless indicated differently above use the most limiting restrictions across all components for the mix.

Enforcer D

Herbicide Group
4 - fluroxypyr, 2,4-D
6 - bromoxynil

Company:
Nufarm Agriculture (PCP#30690)

Formulation:
80 g/L fluroxypyr, 190 g/L bromoxynil and 240 g/L 2,4-D ester formulated as an emulsifiable concentrate.
- Container sizes - 2 x 10 L, 120 L, 480 L

Crops and Staging:
Spring wheat (including durum) and barley: 4 leaf stage until the flag leaf is fully emerged.
When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

Weeds, Rates and Staging:
Apply to emerged weed seedlings up to the 5 leaf stage unless otherwise indicated.

Weeds controlled at the 0.24 L per acre rate:
- Broadleaf plantain
- Cleavers
- Common groundsel
- Kochia (up to 5 cm tall)
- Hemp-nettle
- Knotweed
- Lady's-thumb
- Lamb's-quarters
- Night-flowering catchfly
- Shepherd's-purse
- Stinkweed
- Stork's-bill
- Volunteer canola
- Wild mustard

Weeds controlled at the 0.48 L per acre rate:
- *Weeds listed above plus:*
  - Canada thistle (suppression)
  - Dandelion
  - Field horsetail
  - Redroot pigweed
  - Round-leaved mallow
  - Russian thistle
  - Volunteer flax
  - Wild buckwheat

Application Information:
- **Water Volume:** Minimum 20 to 40 L per acre. Use the higher volume when there is a heavy crop canopy or weeds are at an advanced stage.
- **Nozzles and Pressure:** Use 40 psi (275 kPa) if applying without drift reduction nozzles. Drift reduction nozzles may require higher pressures for proper performance. Select the nozzle and pressure combination that produces ***ASABE coarse*** droplets while maintaining good coverage of foliage.

How it Works:
Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
fluroxypyr, 2,4-D	POST (foliar)	Synthetic Auxin	Moves throughout the plant (Symplast)	Broadleaf only	4
bromoxynil	POST (foliar)	PSII Inhibitor/Membrane disrupter	Little (Apoplast)	Broadleaf only	6

Effects of Growing Conditions:
Optimum activity is experienced between 12 to 24°C when weeds are actively growing. Weeds may not be actively growing and as a result reduced activity will occur when temperatures are below 8°C or above 27°C. Frost 3 days before or after an application may reduce crop tolerance and weed control efficacy.

Tank Mixes:
Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides:
- ***In spring wheat (including durum) and barley:***
  - Tralkoxydim (*Nufarm Tralkoxydim* and *Liquid Achieve* only)
  - Fenoxaprop (*Puma Advance* only)
  - Thifensulfuron/tribenuron (*Boost* only) - 2.7 grams per acre
- ***In spring wheat (including durum) only:***
  - Clodinafop 240 EC (*Signal* only)
  - *Simplicity OD*
  - *Varro*

Insecticides: None registered.
Fungicides: None registered.
Fertilizers: None registered.
Note: The above mixes are those listed on the *Enforcer D* labels only.
According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product..
Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** No rainfast period is specified on the label; required interval may be up to 8 hours. Contact manufacturer for more information.
- **Restricted Entry Interval:** DO NOT enter treated fields for 24 hours.
- **Grazing Restrictions:** DO NOT graze or cut for livestock feed within 30 days of application. Withdraw meat animals from treated feed 3 days before slaughter.
- **Pre-harvest Interval:** DO NOT harvest within 60 days of application.
- **Re-cropping Interval:** Barley, canola, flax, forage grasses, lentil, mustard, oats, pea, rye and wheat can be seeded the following year or fields can be fallowed.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store in a ventilated room above freezing. If frozen, allow container to warm and shake well before using.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground only*	1	1	1

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

- Spray when winds are under 16 km per hour, but not dead calm.

Sprayer Cleaning:

The manufacturer provides no recommendations on how to clean equipment used to apply this product. As a petroleum based emulsifiable concentrate, 'Method B' in the general section on sprayer cleaning in the introduction may be the most effective.

Hazard Rating:

Caution – Poison

Caution – Skin and Eye Irritant

Refer to the Introduction for an explanation of the symbols.

Enlist 1

Herbicide Group 4 - 2,4-D

Company:

Corteva Agriscience (PCP#33701)

Formulation:

454 g /L 2,4-D present as a choline salt formulated as a solution.

- Container sizes - 2 x 10.2 L, 547 L

Crops and Staging:

- **Enlist E3 soybeans:** no later than R2 (full flowering stage)
- **Enlist corn:** Up to the V8 growth stage or 120 cm (48 in) height
- **Wheat (spring, durum, winter), barley,and fall rye:** full 3-leaf to early flag leaf stage

Weeds and Staging:

Apply when weeds are small and actively growing. Use the lower rate in each group for seedling weeds (2-4 leaves) and growing rapidly; and the higher rate for weeds that are in bud, during dry, cool periods or where heavy infestations exist.

Weeds Controlled with lower rate (295 mL to 445 mL per acre):

- Bluebur
- Burdock (before 4 leaf stage)
- Cocklebur
- Common plantain
- False flax
- Daisy fleabane
- Field horsetail
- Flixweed
- Goat's-beard
- Hoary cress
- Kochia
- Lamb's-quarters
- Mustards (except green tansy)
- Pigweed (redroot, Russian)
- Ragweed (common, giant)
- Russian thistle
- Shepherd's-purse
- Sunflower (annual)
- Sweet clover
- Vetch
- Wild radish

Weeds Controlled with higher rate (525 mL to 725 mL per acre) – Enlist E3 Soybeans and Enlist corn only:

- Biennial wormwood*
- Bindweed (field*, hedge)
- Blue lettuce*
- Buckwheat (wild*, tartary)
- Burdock*
- Canada thistle*
- Chickweed (common, mouse-eared*)
- Common purslane
- Common tansy
- Dandelion
- Dog Mustard
- Field peppergrass
- Hairy galinsoga
- Knotweed (before 4 leaf)
- Leafy spurge*
- Oakleaf goosefoot
- Pineappleweed
- Sow-thistle (annual, perennial*)
- Velvetleaf

*** Top growth control.**

Rate:

Enlist E3 soybeans, E3 corn: Make one to two applications with a minimum of 12 days between applications. Do not apply more than two post emergent applications per use season. Do not apply more than 1.46 L per acre of *Enlist 1* (660 g acid equivalent) per use season.

Wheat (spring, durum, winter), barley,and fall rye: The recommended safe crop rate is 445 mL per acre. Possible crop injury may come from higher rates needed to control certain weed species. Higher volumes of water (40 or more litres of water per acre) may reduce the risk of crop injury. Do not apply more than 1 treatment per year.

Application Information:

- **Water Volume:**
  - ***Ground:*** 20 to 80 L per acre (recommended 40 to 60 L per acre).
- **Nozzles and Pressure:** DO NOT apply during periods of dead calm. Avoid application of this product when winds are gusty. Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ASABE coarse to extremely coarse droplets by ground to significantly reduce the potential for drift. Sprayers without drift reduction nozzles should use between 30 to 40 psi (200 to 275 kPa). Low drift nozzles may require higher pressures for proper performance.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
2,4-D choline salt	POST (foliar)	Synthetic Auxin	Moves throughout the plant (Symplast)	Broadleaf only	4

Effects of Growing Conditions:

Enlist 1 herbicide is selective to Enlist (glyphosate and 2,4-D tolerant) varieties. **Foliar application to non-tolerant varieties will cause serious crop damage and yield loss.** Weeds hardened off by cold weather or drought stress may not be adequately controlled or suppressed and re-growth may occur. In general, increase spray volume as crop canopy, height and weed density increase to obtain adequate spray coverage.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides:

- ***Post-Emergent:*** Enlist Corn, Enlist E3 Soybeans: Glyphosate (360 g ae per acre)
  - Enlist E3 Soybeans: *Liberty 200 SN* (ensure that the glufosinate ammonium herbicide is registered for use on soybeans and refer to label for specific weed species and application rates). Tank-mixing *Enlist 1* with glufosinate ammonium herbicides not labelled for use on Enlist E3 soybeans can cause significant crop injury.

Fungicides: None registered.
Insecticides: None registered.
Fertilizers: None registered.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 2 hours of application may reduce control.
- **Re-entry:** DO NOT re-enter treated fields for 12 hours.
- **Grazing: Enlist Corn, wheat, barley or fall rye:** Lactating livestock may be grazed on treated crops 7 days following application. Withdraw meat animals from treated field at least 3 days prior to slaughter. **Enlist Soybean:** DO NOT graze.
- **Re-cropping:** There are no crop rotational restrictions to fields previously treated with *Enlist 1* after a minimum of 10 months. During the growing season, if replanting is required following application of *Enlist 1* herbicide, observe all planting restrictions for 2,4-D pre-plant applications (i.e., delay planting a crop sensitive to 2,4-D).
- **Storage:** Store this product away from food or feed. This product must be stored away from fertilizers, seeds, insecticides, fungicides or other herbicides intended for use on 2,4-D sensitive crops. If this product is exposed to temperatures below 0°C, it should be warmed to at least 5°C and mixed thoroughly before using.
- Buffer Zones:

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground*	1	0	1
Helicopter			

See the Key to Product Pages for an explanation of the different habitats.
***Buffer zones can be reduced by 70% when using shrouds and by 30% when using cones mounted less than 12 inches from the crop canopy.**
†Distance is measured from the downwind edge of the boom to sensitive areas.

Sprayer Cleaning:

Refer to 'Method B' in the general section on sprayer cleaning in the introduction. Let solution stand for an extended period for better results. Flush sprayer system with water. See the label for product specific cleaning details.

Hazard Rating:

Warning – Poison

Caution – eye and skin irritant, potential skin sensitizer.

Refer to the introduction for an explanation of the symbols used.

Enlist Duo

Herbicide Group
4 - 2,4-D
9 - glyphosate

Company:
Corteva Agriscience (PCP#30958)

Formulation:
194 g/L 2,4-D present as a choline salt and 204 g/L glyphosate present as a dimethylamine salt formulated as a solution.
- Container sizes - 2 x 8.7 L, 556.8 L

Crops, Rates and Staging:
Prior to seeding or post-seeding but pre-emergence: Wheat (spring, durum, winter), barley, rye, field corn
Post-emergence:
- ***Enlist E3 soybeans:*** up to R2 (full flowering stage)
- ***Enlist corn:*** Up to the V8 growth stage or 120 cm (48 in) height

Weeds and Staging:
Apply when weeds are small and actively growing.
Grassy weeds controlled:
- Barnyard grass
- Foxtail (green)
- Proso millet (wild)
- Quackgrass
- Volunteer barley
- Volunteer wheat
- Wild oats
- Yellow nutsedge**

Broadleaf weeds controlled:
- Biennial wormwood*
- Bindweed (field**, hedge)
- Bluebur
- Blue lettuce*
- Buckwheat (wild, tartary)
- Burdock*
- Canada fleabane
- Canada thistle**
- Chickweed (common, mouse-eared*)
- Cleavers
- Cocklebur
- Common plantain
- Common purslane
- Common tansy
- Corn spurry
- Cow cockle
- Daisy fleabane
- Dandelion
- False flax
- Field horsetail
- Field peppergrass
- Flixweed
- Goat's-beard
- Hairy galinsoga
- Hemp-nettle
- Hoary cress
- Kochia
- Lamb's-quarters
- Leafy spurge*
- Milkweed (common**)
- Mustards (except green tansy)
- Narrow-leaved hawk's-beard
- Night-flowering catchfly
- Nightshade (Eastern black)
- Oak-leaf goosefoot
- Pigweed/amaranth (redroot, Russian, smooth, Palmer**, waterhemp)
- Pineappleweed
- Ragweed (common, giant)
- Round-leaved mallow**
- Russian thistle
- Shepherd's-purse
- Smartweed (green, Pennsylvania, lady's-thumb)
- Sow-thistle, (annual, perennial**)
- Stinkweed
- Sweet-clover
- Vetch
- Velvetleaf
- Volunteer canola
- Wild radish
- Wild sunflower (annual)
- Wild tomato
- Yellow nutsedge**

*** Top growth control.**
**** Use 2 applications for best control. The second application should be no later than the V8 stage of corn. Milkweed should be 15 to 60 cm in height and actively growing. Yellow nutsedge should be 5 to15 cm in height and actively growing. Canada thistle and perennial sow-thistle should be from the rosette stage to 50 cm in height and actively growing. The second application should be at least 2 weeks after the first for best control of these perennial weeds.**

Rates:
Apply at 1.74 L per acre. DO NOT apply more than 2 applications (3.48 L per acre total) per season.
Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Application Information:
- **Water Volume:**
  - ***Ground:*** 20 to 80 L per acre. Corteva Agriscience recommends 40 to 60 L per acre.
- **Nozzles and Pressure:** DO NOT apply during periods of dead calm. Avoid application of this product when winds are gusty. Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE coarse to extremely coarse*** droplets by ground to significantly reduce the potential for drift. Sprayers without drift reduction nozzles should use between 30 to 40 psi (200 to 275 kPa). Low drift nozzles may require higher pressures for proper performance.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
2,4-D choline salt	POST (foliar)	Synthetic Auxin	Symplast	Broadleaf only	4
glyphosate	POST (foliar)	EPSP Amino Acid Synthesis Inhibitor	Toward growth areas (Symplast)	Non-selective broadleaf & grass, except HT crops	9

Effects of Growing Conditions:

Enlist Duo herbicide is a systemic herbicide and is intended for control of emerged annual and perennial weeds. *Enlist Duo* herbicide is selective to *Enlist* (glyphosate and 2,4-D tolerant) varieties. Foliar application to non-tolerant varieties will cause serious crop damage and yield loss. Weeds hardened off by cold weather or drought stress may not be adequately controlled or suppressed and re-growth may occur. In general, increase spray volume as crop canopy, height and weed density increase to obtain adequate spray coverage.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.
Herbicides: Glyphosate (480 g/L present as the DMA salt).
Insecticides: None registered.
Fungicides: None registered.
Fertilizers: None registered.
Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** *Enlist Duo* should not be applied when rainfall is expected within 2 hours of completion of the application.
- **Restricted Entry Interval:** DO NOT enter treated fields for 12 hours.
- **Grazing Restrictions:**
  - ***Enlist Corn:*** Lactating livestock may be grazed on treated crops 7 days following application. Withdraw meat animals from treated field at least 3 days prior to slaughter. DO NOT graze *Enlist* soybean.
- **Pre-harvest Interval:** DO NOT harvest within 30 days of application.
- **Re-cropping Interval:** There are no crop rotational restrictions to fields previously treated with *Enlist Duo* after a minimum of 10 months. During the growing season, if replanting is required following application of *Enlist Duo* herbicide, observe all planting restrictions for 2,4-D pre-plant applications (i.e., delay planting a crop sensitive to 2,4-D).
- **Aerial Application:** DO NOT apply by air.
- **Storage:** This product must be stored away from fertilizers, seeds, insecticides, fungicides or other herbicides intended for use on 2,4-D and glyphosate sensitive crops.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground*	1	1	2

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Refer to 'Method B' in the introduction. Let solution stand for an extended period for better results. Flush sprayer system with water. See the label for product specific cleaning details.

Hazard Rating:

Caution – Eye Irritant
Potential Skin Sensitizer
Refer to the Introduction for an explanation of the symbols.

Eptam Liquid EC

Herbicide Group 15 (formerly Group 8) - EPTC

Company:
Gowan Canada (PCP#11284)

Formulation:
800 g/L of EPTC formulated as an emulsifiable concentrate.
- Container sizes - 10 L, 1000 L

Caution: *The level of weed control may be reduced where* Eptam Liquid EC *is used on soils that have been treated with* Eptam Liquid EC *the previous growing season. It is expected that the reduction in control will be greater where* Eptam Liquid EC *have been used repeatedly for 2 or more years.*

Crops, Rates and Staging:
Eptam Liquid EC is applied as a pre-plant incorporated treatment prior to seeding the following crops:

Crop	Rate (L per acre)
Dry beans	1.72 to 2.23
Alfalfa, birdsfoot trefoil, cicer milkvetch**, sweet clover**, sunflowers*	1.72
Potatoes	1.72 to 3.44
Flax*	1.42 to 1.72

*** May also be applied in late fall prior to freeze-up.**
**** Seed production only.**

NOTE: The use of *Eptam Liquid EC* on flax is not recommended in Saskatchewan because of the risk of crop injury.

Where a rate range appears, use the lower rate on light textured soils and the higher rate on heavy textured soils.

DO NOT apply *Eptam Liquid EC* to:
- soils with less than 3 percent organic matter
- soil with more than 15 percent organic matter.

Weeds and Staging:
Must be applied prior to the emergence of the following weeds. Emerged weeds will not be controlled.
- Barnyard grass
- Chickweed*
- Corn spurry*
- Foxtail (green, yellow)
- Hairy nightshade*
- Henbit *
- Lamb's-quarters*
- Nettleleaf goosefoot*
- Pigweed (prostrate, redroot, tumble)*
- Purslane*
- Quackgrass (suppression)**
- Volunteer cereals (wheat, barley, oats)
- Wild oats
- Yellow nutsedge**

*** Will be controlled only if treatment is made when conditions are favourable for germination and growth.**
**** Roots of perennial weeds must be thoroughly chopped prior to application.**

Application Information:
- **Water Volume:** Minimum of 40 L per acre of water. May be mixed with liquid fertilizer in place of water (see label for liquid fertilizer compatibility).
- **Pressure:** 30 to 40 psi (200 to 275 kPa).
- **Equipment and Nozzles:** Since *Eptam Liquid EC* is highly volatile, the product must be incorporated immediately. This is best accomplished by mounting spraying equipment directly onto the incorporation equipment (tandem disks, field cultivators on light soil). May also be applied to cleanly cultivated soil for potatoes, by metering into the irrigation water to achieve the recommended rate per acre ("herbigation" or "chemigation"). See label for detailed instructions.
- **Incorporation:** All growth and stubble should be thoroughly worked into the soil before treatment. Apply to a dry soil surface. Incorporate immediately after application preferably during the spraying operation as *Eptam Liquid EC* is volatile. Set disc and cultivator implements to cut to a depth of 4 to 6 inches (10 to 15 cm). A second operation at a right angle to the first is required. The disc or cultivator must be followed with a harrow or other levelling device that extends beyond the width of the implement. Speeds in excess of 8 km per hour (5 miles per hour) will result in excessive pulverization and crop residue destruction leaving the field susceptible to erosion. The maximum recommended tillage depth is 4 inches (10 cm).

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
EPTC	PPI (soil active)	Lipid Synthesis Inhibitor (Non-ACCase)	Little movement in plant (Apoplast)	Broadleaf & Grass	15 (formerly Group 8)

Effects of Growing Conditions:

Crop injury can occur if stressful environmental conditions (cold, wet soils, drought or excessive heat) occur after seeding. To minimize crop injury, delay seeding 10 days if these conditions occur at the time of application, or select an alternative product. Very cold or dry soil conditions during weed emergence will reduce control.

Tank Mixes:

Herbicides:

- ***Dry beans (navy and red kidney only):*** Liquid formulations of *Treflan* and *Rival*.

Insecticides: DO NOT tank mix with insecticides.

Fungicides: None registered.

Fertilizers: May be mixed with liquid fertilizer.

- Compatibility test should be conducted according to instructions on the herbicide label.
- Dry bulk fertilizers, except nitrate fertilizers, may be impregnated or coated with *Eptam Liquid EC*. The impregnated fertilizer should be spread uniformly onto the field using a double overlap pattern immediately after impregnation. The impregnated fertilizer must be applied to the field when the soil surface is dry to at least 0.5 inch (1.5 cm) depth. The first incorporation must be done immediately after application.

According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** No effect once incorporated. DO NOT apply prior to irrigation.
- **Restricted Entry Interval:** DO NOT enter treated fields for 24 hours.
- **Grazing Restrictions:** DO NOT graze or feed treated crops to livestock in the year of application.
- **Re-cropping Interval:** Will not injure crops the year after spring application.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** May be frozen.
- **Buffer Zones:** DO NOT apply within 15 m of fish bearing waters or wildlife habitat.

Sprayer Cleaning:

No detailed cleaning procedures are indicated on the label. Use a commercial all purpose spray sprayer cleaning product for adequate cleaning. Contact the manufacturer for more information.

Hazard Rating:

Caution – Poison

Refer to the Introduction for an explanation of the symbols.

Escort

Herbicide Group 2 - metsulfuron

Company:
Envu Canada (PCP#23005)

Formulation:
60% metsulfuron-methyl formulated as a water dispersible granule.
- Container size - 0.25 kg

Crops and Staging:
Pasture, rough turf, and rangeland: No stage restrictions.

Weeds, Rates and Staging:
For seedling weeds apply to young plants up to 4 inches (10 cm) tall or wide. For established non-woody plants (biennial or perennial) apply up to the early bud stage. For western snowberry, wild rose and other woody species, apply between mid-June and mid-August after the brush has leafed out, but before the leaves begin to turn their fall colours.

Rate	Weeds Controlled	
8 g/acre	Canada thistle* Dandelion* Russian thistle Sow-thistle*	Common tansy Scentless chamomile Sweet clover
10 g/acre	*Above weeds plus:* Western snowberry	
12 g/acre	*Above weeds plus:* Wild rose	Dandelion
40 g/acre**	Balsam poplar	Willow
60 g/acre**	Cherry	Trembling aspen

At all rates add *Agral 90, Agsurf II*, or *Citowett* at 0.2 L per 100 L of spray solution.
*** Suppression only.**
**** Rangeland only. See label for detailed application instructions.**
Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Application Information
- **Water Volume:** 40 to 91 L per acre for weedy growth and up to 809 L per acre applied to the point of run-off for woody species. See the label for details.
- **Nozzles and Pressure:** 30 to 40 psi (200 to 275 kPa) when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE coarse*** droplets.

How it Works:
Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
metsulfuron-methyl	POST (foliar) also has soil activity	ALS Amino Acid Inhibitor	Toward growth areas of plant (Symplast)	Broadleaf only	2

Effects of Growing Conditions:
DO NOT apply during periods of intense rainfall or to soil saturated with water. Warm, moist conditions following treatment enhance the activity of *Escort*, while cold, dry conditions may reduce or delay activity. Brush hardened off by cold weather and drought stress may not be controlled.

Tank Mixes:

Herbicides: 2,4-D amine or ester (371 g ae per acre) plus surfactant.
Insecticides: None registered.
Fungicides: None registered.
Fertilizers: None registered.
Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** No rainfast period is specified on the label; required interval may be up to 8 hours. Contact manufacturer for more information.
- **Restricted Entry Interval:** DO NOT re-enter treated fields for 12 hours.
- **Grazing Restrictions:** May be grazed by cattle on the day of treatment.
- **Storage:** Store in a cool, dry place. May be frozen.
- **Buffer Zones:**
  Buffers are not required for hand-held and backpack applications.

Rate (g per acre)	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat**
	Less than 1 m	Greater than 1 m	
8 to 12	1	1	10
40	2	1	35
60	3	1	45

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
**** Terrestrial buffers are not required for transport and utility rights-of-way**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Escort can cause severe injury to sensitive crops at very low concentrations. Use 'Method A' in the introduction to clean sprayers immediately after using *Escort*.

Hazard Rating:

Caution – Eye Irritant
Refer to the Introduction for an explanation of the symbols.

Esplanade SC

Herbicide Group 29 - indaziflam

Company:
Envu Canada (PCP#31333)

Formulation:
200 g/L of indaziflam formulated as a suspension concentrate.
- Container sizes - 4 x 1 L, 2 x 10 L

Crops and Staging:
Non-crop areas where bare ground is desired (i.e., rights-of-way, roadsides, industrial sites, fence lines and other non-crop areas). DO NOT use in residential or recreational areas, where bystanders could be exposed during or after application. DO NOT apply to cropland.

Weeds and Staging:
Soil active, residual control of the emergence of the following weeds. Apply to target surface as a uniform broadcast or band application before weeds germinate.

Broadleaf weeds controlled:
- Bittercress
- Black medick
- Carpetweed
- Chickweed (mouse-eared)
- Common groundsel
- Cudweed
- Curled dock
- Field bindweed
- Fleabane (hairy)
- Hawk's-beard (smooth, green)
- Henbit
- Kochia*
- Lamb's-quarters
- London rocket*
- Mustard (black, wild)
- Nightshade (American black, hairy)
- Pigweed (prostrate, redroot*)
- Plantain (buckthorn)
- Prickly lettuce*
- Prostrate knotweed
- Purple vetch
- Purslane
- Round-leaved mallow
- Shepherd's-purse
- Sow-thistle (annual)
- Spotted spurge
- St-John's wort
- Stork's-bill
- Sunflower (wild, annual)
- White clover*
- White sweetclover
- Yellow star-thistle
- Yellow woodsorrel

Grassy weeds controlled:
- Annual bluegrass
- Annual brome (downy, Japanese)
- Barnyard grass
- Crabgrass (large, smooth)
- Foxtail (green, yellow)
- Medusa head
- Ryegrass (annual, Italian, perennial)
- Stinkgrass
- Tufted lovegrass
- Volunteer common rye
- Wild oats
- Wild proso millet
- Witchgrass

*** Suppression only.**

Rates:
152 mL per acre

Note: Excessive plant debris present on the soil surface at time of application may prevent uniform product distribution reaching the soil and reduce weed control. Performance may be improved by removing excessive debris prior to product application.

Apply ONE APPLICATION of this product or other products containing indaziflam per year.

Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Application Information:
- **Water Volume:** Minimum 40 to 380 L per acre. Use adequate volumes to provide complete even soil coverage.
- **Nozzles and Pressure:** Use a combination of nozzles and pressure designed to deliver thorough, even coverage of ***ASABE S572.1 coarse droplets*** or coarser. DO NOT apply with hollow cone nozzles or other application equipment that does not provide uniform coverage.

How it Works:
Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
Indaziflam	Pre-emergent	Inhibitor of cell wall synthesis site C	No appreciable movement	Broadleaf and Grassy Weeds	29

Effects of Growing Conditions:

Esplanade SC is a persistent soil active herbicide. As a soil active herbicide, this product relies on rainfall to move it into the germination zone of weedy species. *Esplanade SC* is broken down by soil microbes; therefore, persistence can vary based on availability of rainfall. Low rainfall will allow this product to persist for longer and moist conditions will cause the product to persist for a shorter period. Very heavy rain may leach the product out of the germination zone and reduce control.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides:

- Glyphosate† (360 to 1750 g ae per acre)
- *Milestone* (0.1 to 0.2 L per acre)
- Glyphosate† + *Milestone* (rates above)
- *Payload* + Glyphosate† (rates above)
- *Navius Flex* plus a non-ionic adjuvant, *Merge* adjuvant, or *Crop Oil Concentrate*

Insecticides: None registered.
Fungicides: None registered.
Fertilizers: None registered.

† **Note: The manufacturer may not support all brands of these products. See the label or contact Bayer for more information.**

Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Treatments are most effective in controlling weeds when adequate moisture is present and the application is followed by rain prior to weed seed germination.
- **Restricted Entry Interval:** DO NOT enter treated areas until sprays have dried.
- **Grazing Restrictions:** There are no grazing or haying restrictions (including cattle, horses, sheep and goats) when used alone.
- **Re-cropping Interval:** DO NOT apply to cropland.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** CANNOT be stored below freezing. Keep in original container during storage.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground*	1	0	15**

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
**** Buffer zones for protection of terrestrial habitats are not required for applications to rights-of-way, including railroad ballasts, rail and hydro rights-of-way, utility easements and roads and training grounds on military bases.**
† **Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.**
Note: Avoid application of this product when winds are gusty.

Sprayer Cleaning:

Refer to 'Method C' in the introduction. Let solution stand for an extended period for better results. Flush sprayer system with water. See the label for product specific cleaning details.

Hazard Rating:

Causes Moderate Eye Irritation

Refer to the Introduction for an explanation of the symbols.

Ethalfluralin

Herbicide Group 3 - ethalfluralin

Company:
Gowan Canada (*Edge MicroActiv* - PCP#32904)
Rath Holdco Inc. (*Yieldshield Resflura Soilsorb* - PCP#34586)

Formulation:
10% ethalfluralin formulated as a granular.
- Container size - 454 kg

Crops and Staging:
Ethalfluralin can be applied prior to seeding the following crops:
- Alfalfa establishment
- Camelina*
- Canola
- Caraway
- Chickpeas*
- Coriander
- Dry beans**
- Industrial hemp*
- Faba beans
- Lentils†
- Mustard (yellow only)
- Field peas
- Safflower
- Soybeans
- Sunflowers

† *Yieldshield Resflura Soilsorb* is registered for fall application only, where one incorporation is completed in the fall. *Edge MicroActiv* may be applied spring or fall. Fall application may be for both conventional tillage and direct seeding systems. Spring application of *Edge MicroActiv* is for use with direct seeding systems only. Seeding depth is critical – DO NOT seed more than 1.5 inches (4 cm) deep. Avoid loose seedbeds and planting into cold soils.
*** Since this use is registered under the User Requested Minor Use Label Expansion program, the manufacturers assume no responsibility for herbicide performance. Application to camelina, chickpeas and industrial hemp is at the risk of the user.**
**** *Yieldshield Resflura Soilsorb10%* for navy and kidney only. *Edge MicroActiv* is registered for all dry common bean (*Phaseolus spp.*) but tolerance may vary across varieties. Apply to a small area initially to determine tolerance before adopting over a larger area.**

Weeds and Staging:
For pre-emergent control of the following weeds:

Grassy Weeds:
- Barnyard grass
- Foxtail (green**, yellow)
- Volunteer barley*
- Volunteer spring wheat*
- Wild oats*
- Witch grass

Broadleaf Weeds:
- Cleavers*
- Chickweed
- Corn spurry
- Cow cockle
- Hemp-nettle*
- Kochia
- Lady's-thumb*
- Lamb's-quarters
- Nightshade*
- Pigweed (prostrate, redroot)
- Purslane
- Russian thistle*
- Wild buckwheat

*** Suppression only.**
**** Not including group 3 herbicide resistant biotypes.**

Rates:
Note: Successful use of this product requires proper field preparation and product incorporation. For instructions on proper application under various situations see 'Application Information' below.

	Rate (kg per acre)				
	Light Textured Soils		Medium to Heavy Textured Soils		
	2 to 6 percent Organic Matter Dark Brown-Black	6 to 15 percent Organic Matter Deep Black	2 to 4 percent Organic Matter Dark Brown	4 to 6 percent Organic Matter Black	6 to 15 percent Organic Matter Deep Black
Spring	3.4	4.5	3.4	4.5	4.9 to 5.7
Fall	4.5	5.7	4.5	5.7	5.7

DO NOT apply to:
- soils containing less than 2 percent organic matter (including eroded knolls)
- soils containing greater than 15 percent organic matter.
- fields that received applications of manure within the last 12 months. After this period, manure must be thoroughly incorporated to a depth of 10 to 15 cm.

To reduce the possibility of injury to the treated crop, use good quality certified seed. Seed shallow into a warm, moist, firm seedbed using recommended agronomic practices that will promote rapid and even crop germination and emergence.

Application Information:

Apply uniformly with a properly calibrated granular herbicide applicator. Avoid concentration of the herbicide in narrow bands. Calibrate the applicator according to manufacturer's directions and check frequently during application to be sure equipment is operating correctly.

Direct Seeding Systems (minimum tillage systems):

- ***General:***
  - Direct-seeding is defined as seed placement into standing stubble (including chemical fallow) with minimum soil disturbance (<30 percent) and maximum surface residue retention. *Edge MicroActiv* may be used on fields that have been in direct-seeding systems for at least two consecutive years. When seeding, a one pass, direct-seeding operation is recommended.
  - Application to the soil surface provides residual control of susceptible weeds within the top 2.5 cm of the soil surface but will not control weeds that germinate from deeper (>2.5 cm).
- ***Land Preparation:***
  - *Crop Residue Management:* Chopping, spreading and even distribution of straw and chaff residues will prevent plugging or hairpinning during the seeding operation. Poor and uneven crop emergence, cold wet soils, soil nutrient tie-up and delayed and uneven maturity may also be a result of inadequate residue management.
  - *Pre-seeding (Burn Off) Weed Control: Edge MicroActiv* will not control emerged weeds. A pre-seeding burn-off herbicide treatment is required to eliminate weed competition prior to crop emergence.
- ***Instructions:***
  - Use of a single harrow operation assists in managing straw residue to ensure good herbicide soil contact. Avoid excessive soil disturbance.
  - *Seeding Instructions:* Use direct-seeding equipment with seed placement at a uniform depth to ensure seed-soil contact and rapid crop emergence. Minimum soil disturbance ensures a uniform herbicide layer at the soil surface.
  - *Fall Application: Edge MicroActiv* in direct-seeding systems may be applied in the fall between October 1 and prior to soil freeze-up for weed control the following year. Apply at the fall rates in the 'Rates' section using a harrow operation to manage crop residue and ensure herbicide soil contact. DO NOT apply to snow or frozen soil.
  - *Spring Application: Edge MicroActiv* in direct-seeding systems may be applied in the spring as early as field conditions permit and at least 10 days prior to seeding. Apply at the spring rates in the 'Rates' section and use a shallow harrow incorporation within 24 hours of application.

Conventional Tillage Systems:

- ***General:***
  - *Ethalfluralin* for weed control in conventional tillage systems is intended for use on soils which have been conventionally tilled with > 30 percent soil disturbance within the previous two consecutive years or more.
- ***Land Preparation:***
  - *Pre-seeding Weed Control: Ethalfluralin* will not control emerged weeds. If existing weed growth is too heavy to allow uniform application and incorporation, destroy established weeds by cultivation or a foliar herbicide application before application.
- ***Application Instructions*:**
  - Incorporate with a tandem disc, discer or field cultivator (Vibrashank type). Cultivators should have 3 to 4 rows of sweeps spaced 8 inches apart and staggered so that no soil is left unturned. Set equipment to work at a depth of 3 to 4 inches (8 to 10 cm). Operate disc implements at 7 to 10 km per hour (4 to 6 miles per hour), and cultivators at 10 to 13 km per hour (6 to 8 miles per hour).
  - *Fall and Spring Application:* In conventional tillage systems, *Ethalfluralin* can be applied in the fall between September 1 and prior to freeze-up for weed control the following year, or it may be applied in the spring any time up to seeding. DO NOT apply to snow or frozen soil.
  - Apply to a soil surface free of large clods and incorporate in the same operation if possible.
  - Two incorporations are required at right angles for thorough mixing. *The first incorporation must be completed within 24 hours of application*. Delay the second incorporation for at least three days after the first. When applying in the fall, it is preferred that both incorporations be done in the fall. The second incorporation may be delayed until spring to conserve crop residues; however, both incorporations must be done to the same depth.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
ethalfluralin	PPI (Soil active)	Mitosis Inhibitor/cell division	Little movement in plant (Apoplast)	Broadleaf & grass	3

Effects of Growing Conditions:

Crops stressed by cold weather, excessive moisture or drought may be injured by *Ethalfluralin*. Dry soil conditions between application and emergence may result in decreased weed control.

Tank Mixes:
Not applicable.

Restrictions:
- **Rainfall:** No effect once incorporated.
- **Grazing Restrictions:** DO NOT graze or cut treated crops for livestock feed.
- **Re-cropping Interval:** DO NOT grow sugar beets, oats, and small-seeded annual grasses such as timothy, canaryseed and creeping red fescue in rotation following a crop treated with *Ethalfluralin*. DO NOT seed wheat as a rotational crop onto land that has been treated with trifluralin and/or *Ethalfluralin* at oilseed/special crop/barley rates for two consecutive crop years. Thinning of crop may occur in areas that have received abnormally low amounts of precipitation or in crops that are emerging slowly.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store in a cool, dry place. May be frozen. DO NOT expose to prolonged sunlight or heat.
- **Buffer Zones:** Toxic to fish and other aquatic organisms. DO NOT contaminate water bodies or wetland areas.

Sprayer Cleaning:
Not applicable.

Hazard Rating:
Warning – Eye and Skin irritant.
Refer to the Introduction for an explanation of the symbols.

Erebus Xtreme

Herbicide Group
2 - pyroxsulam
4 - fluroxypyr

Company:
Syngenta Canada

Formulation:
The *Erebus Xtreme* package contains two components:
***Erebus Xtreme* (PCP#34353):** 12.8 g/L pyroxsulam and 113.5 g/L fluroxypyr formulated as a suspension .
- Container size -2 x 9.46 L

-plus-
Erebus Xtreme B Utility Modifier:
- Container size - 3.88 L

Crops and Staging:
Spring wheat (including durum) and winter wheat – 3 leaf up to and including stem elongation.

Weeds, Rates and Staging:
Add *Erebus Xtreme B Utility Modifier* at 95 mL per acre.
***Erebus Xtreme* at 356 mL per acre:**
- ***Grasses:***
  - Japanese brome (1 to 4 leaf)
  - Wild oats (less than 75 plants/m^2, up to 4 leaf, 2 tiller)
- ***Broadleaves:***
  - Cleavers (1 to 8 whorls)
  - Flax, volunteer (1 to 12cm)
  - Kochia* (2 to 8 leaf)
  - Stork's-bill* (1 to 8 leaf)
  - Wild buckwheat (1 to 4 leaf)

***Erebus Xtreme* at 473 mL per acre:**
The weeds controlled above plus those listed below.
- ***Grasses:***

Weed	Stage
Wild oats	up to the 4 leaf, 2 tillers
Barnyard grass, yellow foxtail, green foxtail*	1 to 5 leaf
Japanese brome	1 to 6 leaf
Downy brome*	2 to 6 leaf, up to 4 tillers

- ***Broadleaves:***
  - Canada thistle* (up to 30 cm, before budding)
  - Cow cockle (up to 8 leaf)
  - Common chickweed (up to 10 cm)
  - Corn spurry (up to 2 whorl or <10 cm)
  - Dandelion* (rosettes <20 cm diameter)
  - Flixweed (up to 10 cm)
  - Hemp-nettle (1 to 8 leaf)
  - Kochia (2 to 8 leaf)
  - Redroot pigweed (1 to 8 leaf)
  - Round-leaved mallow (up to 6 leaf or 10 cm)
  - Russian thistle* (up to 10 cm)
  - Shepherd's-purse (up to 30 cm)
  - Smartweed (1 to 5 leaf)
  - Stinkweed (up to 30 cm)
  - Volunteer canola (1 to 6 leaf)**

  *** Suppression only.**
  **** Not CLEARFIELD varieties.**
  Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Application Information:

- **Water Volume:**
  - ***Ground:*** Minimum 20 L per acre.
  - ***Aerial:*** 12 to 20 L per acre.
- **Nozzles and Pressure:** DO NOT apply with spray droplets smaller than the American Society of Agricultural Engineers (ASAE S572.1) coarse classification. Boom height must be 60 cm or less above the crop or ground. Use low pressures (200 to 275 kPa).

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
pyroxsulam	POST (foliar)	ALS Amino Acid Inhibitor	Toward area of growth (Symplast)	Broadleaf and grass	2
fluroxypyr	POST (foliar)	Synthetic Auxin	Throughout the plant (Symplast)	Broadleaf	4

Effects of Growing Conditions:

Erebus Xtreme Herbicide activity is influenced by weather conditions. Optimum activity requires active crop and weed growth. The temperature range for optimum activity is 12˚ C to 24˚ C. Reduced activity will occur when temperatures are below 8˚ C or above 27˚ C. Frost before application (3 days) or shortly after (3 days) may reduce weed control and crop tolerance. Weed control may be reduced during stress conditions, e.g. drought, heat or cold stress, or if weeds have initiated flowering, or if heavy infestations exist.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides:

- 2,4-D Ester 700 (214 to 243 mL per acre)

Fungicides: None registered.
Insecticides: None registered.
Fertilizers: None registered.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 1 hour of application may reduce control. Avoid application when heavy rain is forecast.
- **Re-entry:** DO NOT re-enter treated fields for 12 hours.
- **Preharvest Interval:** DO NOT harvest the treated crop within 60 days after application.
- **Grazing:** MUST NOT be grazed or fed to livestock for 7 days after treatment.
- **Re-cropping:** Fields treated can be seeded the following year to barley, canola, corn, dry beans (of the species *Phaseolus vulgaris*), flax, lentils, yellow and brown mustard, oats, peas, potatoes, soybeans, sunflower, or spring wheat; or fields can be summerfallowed.
- **Aerial Application:** May be applied by aircraft.
- **Storage:** Store in original container in a secure, dry, heated storage.

- **Buffer Zones:**

Application method		Buffer Zones (metres†) Required for the Protection of:		
		Freshwater Habitats of Depths		Terrestrial habitat
		Less than 1 m	Greater than 1 m	
Ground*		1	1	5
Aerial	Fixed Wing	4	0	70
	Helicopter	1	0	55

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70% when using shrouds and by 30% when using cones mounted less than 12 inches from the crop canopy.**
† Distance is measured from the downwind edge of the boom to sensitive areas.

Sprayer Cleaning:
Refer to 'Method B' in the general section on sprayer cleaning in the introduction. Let solution stand for an extended period for better results. Flush sprayer system with water. See the label for product specific cleaning details.

Hazard Rating:
Caution - Eye and Skin Irritant
Potential Skin Sensitizer

Exhilarate

Herbicide Group
2 - florasulam
4 - halauxifen, MCPA

Company:
Corteva Agriscience (*Exhilarate*)
Interprovincial Cooperative Ltd (*CO-OP Exhilarate, IPCO Exhilarate*)

Formulation:
All *Exhilarate* packages contains the following components:
***Exhilarate A* (PCP#33803):** 20% halauxifen and 20% florasulam formulated as a water dispersible granule.
- Container size - 800 g jug

-plus-
***Plus M Ester 600* (PCP#29622 – *Exhilarate*), *IPCO MCPA Ester 600* (PCP#27802 – *IPCO Exhilarate*),**
***CO-OP MCPA Ester 600* (PCP#29001 – *CO-OP Exhilarate*):** MCPA Ester 600 g ae/L formulated as an emulsifiable concentrate.
- Container size - 2 x 7.56 L jugs

Crops and Staging:
Wheat (winter, spring and durum) and barley: 3 leaf stage to just prior to the emergence of the flag leaf emergence.

Weeds and Staging:
Weeds controlled at the 1 to 8 leaf stage unless otherwise specified to control the following weeds:
- American dragonhead (up to bud stage and 15 cm in height)
- Barnyard grass (up to 5 leaf, 2 tiller)
- Canada fleabane (up to 15 cm)
- Canada thistle (up to 30 cm)*
- Chickweed
- Cleavers (up to 9 whorls)
- Common ragweed (up to 6 leaf)
- Cow cockle
- Dandelion (seedlings and overwintered rosettes up to 30 cm diameter)
- Flixweed (up to 8 leaf and 8 cm tall)
- Hemp-nettle
- Henbit (up to bud stage and 15 cm in height)
- Kochia*
- Lamb's-quarters
- Narrow-leaved hawk's-beard (up to 30 cm tall)
- Night-flowering catchfly (up to 15 cm)*
- Redroot pigweed
- Round-leaved mallow (up to 6 leaf)
- Scentless chamomile (up to bud stage)*
- Shepherd's-purse (up to 20 cm)
- Smartweed (lady's-thumb, green)
- Sow-thistle, annual (up to 4 leaf)
- Sow-thistle, perennial (up to 6 leaf)*
- Stinkweed (up to 4 leaf)
- Stork's-bill
- Velvetleaf (up to 5 leaf)
- Volunteer alfalfa (up to 25 cm tall)
- Volunteer canola
- Volunteer flax (up to 15 cm)
- White cockle (seedlings and overwintered rosettes up to the bud stage)*
- Wild buckwheat
- Wild mustard (1 to 4 leaf)

*** Suppression.**

Rates:

Exhilarate A: 10 g per acre
Plus M Ester 600, IPCO MCPA Ester 600, COOP MCPA Ester 600: 189 mL per acre
Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Application Information:

- **Water Volume:**
  - ***Ground:*** 20 to 40 L per acre
- **Nozzles and Pressure:** Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE coarse*** droplets by ground. Sprayers without drift reduction nozzles should use between 30 to 40 psi (200 to 275 kPa). Low drift nozzles may require higher pressures for proper performance.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
florasulam	POST (foliar)	ALS Amino Acid Inhibitor	Toward areas of growth (Symplast)	Broadleaf only	2
halauxifen	POST (foliar)	Synthetic Auxin	Throughout the plant (Symplast)	Broadleaf only	4
MCPA	POST (foliar)	Synthetic Auxin	Symplast	Broadleaf only	4

Effects of Growing Conditions:

Control is best with actively growing weeds. Weeds hardened off by cold weather or drought stress may not be adequately controlled or suppressed and re-growth may occur. For best results, ensure thorough spray coverage of target weeds.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides:

Spring wheat (including durum) and winter wheat:
- *Simplicity* (200 mL per acre)
- *Simplicity GoDRI* (28 g per acre) plus *Agral 90* (0.25 L per 100 L spray solution) or *Bindem Utility Modifier* (60 mL per acre)

Spring wheat (including durum):
- *Tandem*

Spring wheat and barley:
- *Axial*

Consult label for specific surfactant requirements.

Insecticides: None registered.

Fungicides: None registered.

Fertilizers: None registered.

According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 1 hour of application may reduce control.
- **Restricted Entry Interval:** DO NOT re-enter treated fields for 12 hours.
- **Preharvest Interval:** DO NOT harvest the treated crop within 60 days after application.
- **Grazing Restrictions:** Livestock may be grazed on treated crops 7 days following application. DO NOT cut the treated crop for hay or silage within 21 days after application.
- **Re-cropping Interval:** Alfalfa, spring wheat, barley, canola (including oilseed quality *B. juncea*), dry bean (*Phaseolus vulgaris* species including pinto, kidney and white types), faba beans, flax, field peas, potatoes (except seed potatoes), mustard (oriental, brown and yellow), soybeans, oats, or sunflower may be seeded 10 months after application. Lentils can be planted 22 months after application.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store in original containers in a secure, dry heated storage.

- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground only*	1	1	2

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:
Use a combination of 'Method A' and 'Method B' refer to the general section on sprayer cleaning in the introduction. Let solution stand for an extended period for better results. Flush sprayer system with water. See the label for product specific cleaning details.

Hazard Rating:
Exhilarate A: Potential Skin Sensitizer
Plus M Ester 600:
Warning – Poison
Refer to the Introduction for an explanation of the symbols.

Express FX

Herbicide Group
2 - tribenuron
4 - dicamba

Company:
FMC Corporation

Formulation:
***Express FX* (PCP#33039):** 60.87% dicamba and 6.52% tribenuron-methyl formulated as a water dispersible granule.
- Container size - 1.86 kg

Express FX is purchased alone, but it must be mixed with glyphosate before use.

Crops and Staging:
For application to fallow, post-harvest and 1 day prior to seeding the following crops:
- Barley
- Wheat (spring, durum and winter)
- Oats

Weeds and Staging:
Unless otherwise noted below, apply to young and actively growing weeds that are less than 15 cm (6 inches) in height or width. Weeds controlled or suppressed by the tank mix of *Express FX* + glyphosate (182 gae per acre):
- Annual smartweed (green, lady's-thumb)
- Canada fleabane (up to 8 cm)
- Canada thistle (rosette)*
- Cleavers
- Common chickweed (up to 8 leaf)
- Common ragweed (up to 8 cm)
- Cow cockle (up to 3 leaf)
- Dandelion
- Flixweed
- Hemp-nettle
- Kochia** (up to 8 cm)
- Lamb's-quarters
- Narrow-leaved hawk's-beard (up to 8 cm)
- Redroot pigweed
- Russian thistle
- Scentless chamomile (up to 8 cm)*
- Stinkweed
- Tufted vetch*
- Volunteer canola
- White cockle (rosette)*
- Wild buckwheat (up to 8 leaf)
- Wild mustard
- Volunteer flax

*** Suppression only**
**** Except biotypes multiple resistant to glyphosate, Group 2 and dicamba**

Rates:
46.5 g per acre. DO NOT apply more than 46.5 g per acre per year.
Must be tank mixed with glyphosate.
Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Application Information:

- **Water Volume:** Minimum 22 L per acre.
- **Nozzles and Pressure:** DO NOT apply with spray droplets smaller than ***ASABE coarse*** classification. Boom height must be 60 cm or less above the crop or ground.
- **Screens:** Use a 50 mesh or coarser screen and filter system.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
tribenuron	POST (foliar)	ALS Amino Acid Inhibitor	Toward growth areas of plant (Symplast)	Broadleaf only	2
dicamba	POST (foliar) with slight soil activity	Synthetic Auxin	Moves throughout the plant (Symplast)	Broadleaf only	4

Effects of Growing Conditions:

Apply *Express FX* when air temperature is between 10 and 25°C. DO NOT apply when there is a risk of severe drop in night temperatures. Control of weeds growing in wheel tracks may be reduced if *Express FX* is applied under dry, dusty conditions.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides:

- Glyphosate

According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Restrictions:

- **Rainfall:** If rain occurs soon after application, control may be reduced.
- **Restricted Entry Interval:** DO NOT re-enter treated fields for 12 hours.
- **Grazing Restrictions:** MUST NOT be grazed or fed to livestock for 7 days after treatment.
- **Re-cropping:** Fields treated with *Express FX* may be seeded to wheat (spring, durum or winter), spring barley or oats a minimum of 24 hours after application. Fields treated with a chemfallow application can be seeded to any crop the following season. Fields treated with a post-harvest application in the fall may be seeded in spring to canola, corn, lentils, oats, spring barley, soybeans, wheat (spring or durum) or white beans (contact manufacturer for timing limitations for canola, lentil, and field corn when seeding in the spring following fall application).
- **Aerial Application:** DO NOT apply by aircraft.
- **Storage:** Store in original container only, away from fertilizer, seeds, food or feed. Not for use or storage in or around the home. Keep container closed.
- **Buffer Zones:**
  Buffers are not required for hand-held and backpack applications.

Rate (g per acre)	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground*	1	1	5

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
**** Terrestrial buffers are not required for transport and utility rights-of-way**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Refer to 'Method A' found in the general section on sprayer cleaning in the introduction.

Hazard Rating:

Caution – Poison

Warning – Eye Irritant

Potential Skin Sensitizer

Refer to the Introduction for an explanation of the symbols.

Express Pro

Herbicide Group
2 - tribenuron, metsulfuron

Company:
FMC Corporation (PCP#29212)

Formulation:
42.9% tribenuron methyl and 8.6 % metsulfuron methyl formulated as a water soluble granule.
- Container size - 560 g container

Express Pro is purchased alone but must be mixed with glyphosate before use.

Crops and Staging:
For application to fallow, post-harvest and prior to seeding of the following crops:
- Spring wheat
- Durum wheat
- Winter wheat
- Barley
- Oats

Allow at least one day (24 hours) between application and seeding.

Fallow and Post-harvest* application:
Allow 10 days between fallow or post-harvest* treatment and tillage.

DO NOT use *Express Pro* on highly variable soils that have large gravely or sandy areas, eroded knolls or calcium deposits.

Weeds, Rates and Staging:
***Express Pro* at 7 grams per acre plus glyphosate at a rate equivalent to 180 g ae per acre (see glyphosate):**
- Weeds controlled by glyphosate products at these rates plus the weeds below up to 3 inches (8 cm) unless otherwise indicated:
  - Canada thistle (rosettes)*
  - Cleavers†
  - Cow cockle (up to 3 leaf)
  - Dandelion (up to 6 inches)†
  - Narrow-leaved hawk's-beard†
  - Night-flowering catchfly*
  - Scentless chamomile
  - Tufted vetch (up to 15 cm)*
  - White cockle (rosettes)
  - Wild carrot (up to 10 cm)*
  - Volunteer canola (including glyphosate tolerant varieties – up to six inches)***†

  † Up to 15 days of extended control.
  *** Suppression only.**

Express Pro may degrade if left in the sprayer for an extended period. Apply within 24 hours of mixing.

If using other herbicides containing the active ingredient metsulfuron methyl, restrict total use of metsulfuron methyl to 0.61 grams active ingredient per acre per year.

Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Application Information:
- **Water Volume:** 22 to 45 L per acre.
- **Nozzles and Pressure:** Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE medium*** droplets. Low drift nozzles may require higher pressures for proper performance.
- **Screens:** Use 50 mesh or larger screens in both nozzles and in-line filters.

How it Works:
Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
metsulfuron, tribenuron	POST (foliar)	ALS Amino Acid synthesis Inhibitor	Toward growth areas (Symplast)	Broadleaf only	2

Effects of Growing Conditions:
Registered crops seeded following *Express Pro* application become stressed by drought, low fertility, saline soils, waterlogged soils (soils at or near field capacity), disease or insect damage may be injured. This injury may be worse on light or low organic matter soils. Weeds hardened off by environmental stress such as those above may not be adequately controlled.

Tank Mixes:

Herbicides:

- Must be mixed with glyphosate.
  - *Aim EC*

Fungicides: None registered.
Fertilizers: None registered.
Insecticides: None registered.
Note: The above mixes are those listed on the *Express Pro* labels only.

According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Adding ingredients in the correct order is critical for optimum performance. Check product labels for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** No rainfast period is specified on the label; required interval may be up to 8 hours. Heavy rainfall immediately after application may reduce effectiveness. DO NOT apply if rain is forecast for the time of application. Contact manufacturers for more information.
- **Restricted Entry Interval:** Wait 12 hours before re-entering treated fields.
- **Re-cropping Interval:** Barley, oats and wheat (spring, winter and durum) may be seeded a minimum of 24 hours after application. Canola, dry beans, faba beans, field corn, flax, lentils, peas and soybeans may be planted 10 months following application. Following fall applications, barley, oats, or wheat (spring or durum), may be seeded or fields may be summerfallowed.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store in a cool, dry place. May be frozen.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat*
	Less than 1 m	Greater than 1 m	
Ground only*	1	1	4

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Express Pro can cause severe injury to sensitive crops at very low concentrations. Sprayers used to spray this product should be flushed out immediately after use. Refer to 'Method A' found in the general sprayer cleaning section in the introduction. Check the label or contact the manufacturer for more specific sprayer cleaning information.

Hazard Rating:

Caution – Poison

Warning – Eye Irritant

Potential Skin Sensitizer

Contains the Allergens Sulphites and Milk

Refer to the Introduction for an explanation of the symbols.

Extinguish XL

Herbicide Group
2 - florasulam
4 - halauxifen, 2,4-D

Company:
Corteva Agriscience (PCP#35112)

Formulation:
6 g/L halauxifen, 6 g/L florasulam, and 300 g/L 2,4-D ester formulated as an emulsifiable concentrate.
- Container size - 2 x 6.74 L, 80.9 L

Crops and Staging:
Wheat (winter, spring and durum) and barley: 2 leaf stage to just prior to the emergence of the flag leaf emergence.

Weeds and Staging:
Weeds controlled at the 1 to 8 leaf stage unless otherwise specified to control the following weeds:
- Barnyard grass (up to 5 leaf, 2 tiller)
- Canada fleabane (up to 15 cm)
- Canada thistle (up to bolting, 30 cm in height)*
- Chickweed◊
- Cleavers (up to 9 whorls)◊
- Common ragweed (up to 6 leaf)◊◊◊
- Cow cockle
- Dandelion (seedlings & overwintered rosettes up to 30 cm in diameter)
- Flixweed (up to 8 leaf and 8 cm tall)
- Hemp-nettle*◊
- Kochia*◊◊◊
- Lamb's-quarters◊
- Narrow-leaved hawk's-beard (up to bolting & 30 cm tall)
- Night-flowering catchfly (up to bolting stage, 15 cm tall)*
- Redroot pigweed
- Round-leaved mallow (up to 6 leaf)
- Scentless chamomile (up to bud stage)*
- Shepherd's-purse (up to bolting & 20 cm tall)
- Smartweed (lady's-thumb, green)
- Sow-thistle, annual (up to 4 leaf)
- Sow-thistle, perennial (up to 6 leaf)*
- Stinkweed
- Stork's-bill
- Velvetleaf (up to 5 leaf)
- Volunteer alfalfa (up to 25 cm tall)
- Volunteer canola◊◊
- Volunteer flax (up to 15 cm)
- White cockle (seedlings and overwintered rosettes up to the bud stage)*
- Wild buckwheat
- Wild mustard

*** Suppression only.**
◊ Including Group 2 resistant biotypes
◊◊ Including all herbicide-resistant biotypes
◊◊◊ Including Group 2 and 9 resistant biotypes

Rate:
337 mL per acre.
Add a non-ionic surfactant (NIS) at 0.25 L per 100 L of spray solution for control of weeds that are under severe environmental stress, or when applying to weeds at more advanced growth stages, or for heavy weed infestations.

Application Information:
- **Water Volume:**
  - ***Ground:*** 20 to 40 L per acre.
- **Nozzles and Pressure:** Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ASABE coarse droplets by ground. Sprayers without drift reduction nozzles should use between 30 to 40 psi (200 to 275 kPa).). Low drift nozzles may require higher pressures for proper performance.

How it Works:
Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
florasulam	POST (foliar)	ALS Amino Acid Inhibitor	Toward regions of growth (Symplast)	Broadleaf only	2
halauxifen	POST (foliar)	Synthetic Auxin	Throughout the plant (Symplast)	Broadleaf only	4
2,4-D	POST (foliar)	Synthetic Auxin	Throughout the plant (Symplast)	Broadleaf only	4

Effects of Growing Conditions:

Control is best with actively growing weeds. Weeds hardened off by cold weather or drought stress may not be adequately controlled or suppressed and re-growth may occur. For best results, ensure thorough spray coverage of target weeds.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides:

- *Spring wheat (including durum) and winter wheat:*
  - *Simplicity* (200 mL per acre)
  - *Simplicity GoDR*I (28 g per acre) plus *Agral 90* (0.25 L per 100 L solution)
  - *Everest 3.0 AG*
  - *Varro*
  - *Traxos*
- *Spring wheat (including durum):*
  - *Tandem*
- *Spring wheat and barley:*
  - *Axial*

Fungicides: None registered.
Insecticides: None registered.
Fertilizers: None registered.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 1 hour of application may reduce control.
- **Re-entry:** DO NOT re-enter treated fields for 12 hours.
- **Preharvest Interval:** DO NOT harvest the treated crop within 60 days after application.
- **Grazing:** Livestock may be grazed on treated crops 7 days following application. DO NOT cut the treated crop for hay or silage within 30 days after application. Withdraw meat animals from treated fields at least 3 days before slaughter.
- **Re-cropping:** Alfalfa, spring wheat, barley, canola (including oilseed quality *B. juncea*), dry bean (*Phaseolus vulgaris* species including pinto, kidney and white types), faba beans, flax, field peas, potatoes (except seed potatoes), mustard (Oriental, brown and yellow), soybeans, oats, or sunflower may be seeded 10 months after application. Lentils can be planted 22 months after application.
- **Aerial Application:** DO NOT apply by air.
- **Storage Store in original containers in a secure, dry heated storage.**
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground*	1	**1**	2

See the Key to Product pages in the introduction for an explanation of the different habitats.
***Buffer zones can be reduced by 70% when using shrouds and by 30% when using cones mounted less than 12 inches from the crop canopy.**
†Distance is measured from the downwind edge of the boom to sensitive areas.

Sprayer Cleaning:

Use a combination of 'Method A' and 'Method B' in the general section on sprayer cleaning in the introduction. Let solution stand for an extended period for better results. Flush sprayer system with water. If mixed with another pesticide additional clean-out measures may be necessary. See the label for product specific cleaning details.

Hazard Rating:

Danger – Corrosive to eyes
Potential skin sensitizer.
Refer to the introduction for an explanation of the symbols used here.

Fenoxaprop

Herbicide Group 1 - fenoxaprop

Company:

Bayer (*Puma Advance*)
AgraCity (*HellCat*)
Interprovincial Cooperative Limited (*Vigil WB*)
Viking (*Viking Fenoxaprop*)

Formulation:

***HellCat* (PCP#30055), *Vigil WB* (PCP#30844), *Viking Fenoxaprop* (PCP#34817):** 120 g/L fenoxaprop-p-ethyl formulated as an emulsifiable concentrate.

- Container sizes* - 6.2 L, 12.4 L, 18.6 L, 99.3 L, 297.6 L, 312 L, 500 L

***Puma Advance* (PCP#29615):** 90 g/L fenoxaprop-p-ethyl formulated as an emulsifiable concentrate.

- Container sizes - 8.25 L, 123.75 L, 412.5 L

*** Check with individual suppliers for the container sizes they have available.**

Crops and Staging:

Application beyond the maximum rates provided below may result in crop injury.

Crop	Stage
Spring wheat (including durum), barley†	1 to 6 leaves on the main stem plus 3 tillers
Barley††	1 to 5 leaves on the main stem plus 2 tillers
Perennial ryegrass for seed production only* (seedling or established†)	2 to 4 leaves
Meadow bromegrass (seedling or established) (forage or seed production)**	
Tall fescue (seedling or established) (forage or seed production)†	Seedling tall fescue - 2 to 6 leaves Established tall fescue - prior to the shot blade stage.

† *Puma Advance* only. Late application of other products could result in injury to barley.
†† *HellCat, Vigil WB* or *Viking Fenoxaprop* only. Apply to barley only when tank mixed with a registered broadleaf product.
NOTE: Application of other fenoxaprop products to barley can result in crop injury.
*** Perennial ryegrass with *Vigil WB* by ground only.**
**** Meadow bromegrass with *Puma Advance* by ground only.**

NOTE: Since the uses on forage grasses were registered under the User Requested Minor Use Label Expansion (URMULE) program, the manufacturer assumes no responsibility for herbicide performance. Those who apply this use do so at their own risk.

Durum wheat, forage grasses and barley may experience some initial, temporary stunting and yellowing that rarely results in yield loss. Injury is more likely under stress conditions (see "Effect of Growing Conditions" section).

Treatment at the 3 to 4 leaf stage of cereal crops and weeds will maximize crop tolerance and weed control. Temporary crop injury such as shortening or discolouration may be observed after application. Such injury is more likely to occur in barley and also when fenoxaprop is applied outside recommended stages.

Weeds, Rates and Staging:

Apply from the 1 to 6 leaf stage up to emergence of 3rd tiller of the weeds below. Apply at the 3 to 4 leaf stage for optimum control. Optimum weed control and yield response occurs when weeds are removed before tillering.

DO NOT apply fenoxaprop or products containing fenoxaprop to a crop more than once per year.

Weeds	Rate (mL per acre)	
	Puma Advance	120 g/L forms
Green foxtail only	206	156
Low wild oats infestations*	360	271
Moderate-heavy wild oats infestations, barnyard grass, green and yellow foxtail	413	312

*** Low wild oats rate for use on WHEAT AND DURUM ONLY, and when applied alone and NOT in a tank-mix. NOT for use with perennial ryegrass or meadow bromegrass.**

Application Information:

- **Water Volume:**
  - ***Ground:*** 23 to 45 L per acre. Use higher water volumes for dense canopies.
  - ***Aerial:*** A minimum of 14 L per acre.
- **Nozzles and Pressure:** Use 40 psi (275 kPa) when using conventional 80° or 110° flat fan nozzles. Angle nozzles forward at 45° to improve contact with vertical leaf surfaces. Low drift nozzles may require higher pressures for proper performance. Use nozzles and pressure designed to deliver proper coverage with ***ASABE medium*** droplets or larger.
  - DO NOT use flood jet nozzles, controlled droplet application equipment or Spra-foil equipment.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
fenoxaprop-p ethyl	POST (foliar)	ACCase Lipid synthesis inhibitor	Toward regions of growth (Symplast)	Grasses only	1

Effects of Growing Conditions:

DO NOT apply fenoxaprop 2 to 3 days prior to, or following, temperatures of 3°C or lower as crop injury may occur. Under stressful conditions (hot/dry, water logging, disease or insect damage) or heavy crop canopy, early application will improve weed control.

DO NOT apply by air when both the temperature is greater than 25°C and the relative humidity is less than 30 percent.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides:

DO NOT apply *Vigil WB* in barley without a broadleaf herbicide mix. ALWAYS tank mix with a registered broadleaf herbicide.

2,4-D Ester (170 g ae per acre† - see 2,4-D page for product rates)
Ally (2 to 3 grams per acre)†
Attain XC ††
Bromoxynil/2,4-D ester[Δ]
Bromoxynil/MCPA Ester[Δ]
Curtail M
Dichlorprop/2,4-D[Δ]
Infinity (0.33 L per acre)††
MCPA Amine or Ester (0.28 L per acre) (600 g ai/L formulation)
Mecoprop-p***[Δ]*
Prestige XC††
Refine SG††
Refine SG + MCPA (rates above)††
Refine SG (4 grams per acre)+ *Buctril M* (0.4 L per acre)††
*Trophy**††

† All products except *HellCat*.
†† *Puma Advance only*.
[Δ] Manufacturers may only support mixes with specific brands. Contact the manufacturers for more information.
*** Use only at the high rate of fenoxaprop.**
**** Use only at the green foxtail rate of fenoxaprop.**
***** Use in wheat only**

Insecticides: None registered.

Fungicides: None registered.

Fertilizers: None registered.

Note: The above mixes are those listed on the fenoxaprop labels only.

According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Leave an interval of 7 days prior to application or 4 days after application of fenoxaprop, when applying any pesticide that is not registered as a tank mix.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 1 hour may reduce control.
- **Restricted Entry Interval:** DO NOT re-enter treated fields for 12 hours.
- **Grazing Restrictions:** DO NOT graze or cut cereal crops or meadow bromegrass for hay, within 25 days of application. DO NOT graze or cut perennial ryegrass crop for hay within 65 days of application.
- **Pre-harvest Interval:** DO NOT harvest within 65 days of application.
- **Re-cropping Interval:** No restrictions in the year after application. Only ONE APPLICATION may be made per year.
- **Aerial Application:** May be applied by air.
- **Storage:** DO NOT freeze.

- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:	
	Aquatic Habitats	Terrestrial habitat
Ground*	3	10
Aerial	3	33

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** These distances can be reduced by 30 percent using cones on individual nozzles and by 70 percent using a full shield (shroud, curtain) that extends to the crop canopy.**
† Distance is measured from the downwind edge of the boom to sensitive areas.

Sprayer Cleaning:
Refer to 'Method B' in the general section on sprayer cleaning in the introduction.

Hazard Rating:
All:
Caution – Poison
Warning – Contains the Allergen Soy
HellCat, Viking Fenoxaprop:
Warning – Eye and Skin Irritant
Puma Advanced:
Danger – Eye and Skin Irritant
Refer to the Introduction for an explanation of the symbols.

Fierce Brands / Torpedo Brands

Herbicide Group
14 - flumioxazin
15 - pyroxasulfone

Company:
Valent Canada, Inc. Distributed by Nufarm Agriculture

Formulation:
***Fierce EZ* (PCP#33869), *Torpedo EZ* (PCP#33872):** 160 g/L flumioxazin and 203 g/L pyroxasulfone formulated as a suspension concentrate.
- Container size - 2 x 7.16 L

Crops, Rates and Staging:
Note: The use of this chemical may result in contamination of groundwater particularly in areas where soils are permeable (e.g. sandy soil) and/or the depth to the water table is shallow.

DO NOT make more than ONE APPLICATION per season.

***Fierce* Spring Applications**

Crop	Stage	Rates
		Fierce EZ **(mL per acre)**
Soybeans*, chickpea, field pea	Pre-seed to pre-emergent. Crop should be seeded prior to or within 3 days of application.	178
Spring wheat (not including durum)** and field corn	Pre-seed only. Apply a minimum of 7 days before seeding wheat and apply between 7 and 30 days prior to seeding field corn. Apply on minimum to no-till soils only.	178

*** Seed at least 1.5 inches (4 cm) deep. Apply up to 3 days after seeding and prior to emergence.**
**** Seed wheat at least 1 inch (2.5 cm) deep. Apply a minimum of 7 days prior to seeding spring or winter wheat.**

***Fierce* Fall Applications**

Crop	Stage	Rates
		Fierce EZ **(mL** per **acre)**
Soybeans*, lentils (small reds and large green varieties), chickpea, field pea	Application should be made prior to soil freeze. DO NOT apply on top of snow cover. Higher rates for season long control in medium to fine soils only.	178 to 267
Spring wheat** (not including durum) and field corn	Application should be made prior to soil freeze. DO NOT apply on top of snow cover. **Apply to minimum to no-till soils only.**	178
Winter wheat**	**Apply to minimum to no-till soils only.**	178

Torpedo Brands

Crop	Stage	Rates
		Torpedo EZ **(mL** per **acre)**
For the maintenance of bare ground on industrial sites***	Application should be made prior to soil freeze. DO NOT apply on top of snow cover. Higher rates for medium to fine soils only.	356 to 492

*** Seed at least 1.5 inches (4 cm) deep. Apply up to 3 days after seeding and prior to emergence.**
**** Seed lentils and wheat at least 1 inch (2.5 cm) deep. Apply a minimum of 7 days prior to seeding spring or winter wheat.**
***** *Torpedo* will cause crop injury. DO NOT apply to farm alleys or roads where traffic may result in treated dust settling onto crops or other desirable vegetation.**

Weeds and Staging:

Spray within 6 hours of mixing. *Fierce/Torpedo* will break down in the spray tank left to sit in the sprayer for an extended period.

Apply prior to crop and weed emergence. *Fierce/Torpedo* will not control emerged weeds. If weeds are emerged, apply in a mix with a foliar herbicide (see tank mix section).

***Fierce/Torpedo* will provide control or suppression of the following weeds:**

- Annual sow-thistle
- Barnyard grass
- Brome (downy, Japanese)*
- Canada fleabane
- Chickweed (common)†
- Cleavers
- Crabgrass (large)
- Dandelion (seedlings only)
- Foxtail (green)
- Foxtail barley*
- Kochia
- Lamb's-quarters
- Nightshade (Eastern black, hairy)
- Pigweed (green, redroot, Palmer amaranth, waterhemp)
- Ragweed (common)
- Russian thistle*
- Smartweed (Pennsylvania)
- Velvetleaf
- Volunteer canola (all varieties)*†
- Wild buckwheat
- Wild mustard
- Wild oats*
- Witchgrass

† *Fierce Brands* only.
*** Suppression only.**

Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction. When applying *Fierce EZ/Torpedo EZ* by itself, a surfactant is not required.

Application Information:

- **Water Volume:** 40 L to 120 L per acre.
- **Nozzles and Pressure:** Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE medium*** droplets.
- **Screens:** The use of 50 mesh screens is recommended.

DO NOT perform any tillage operations after application otherwise weed control will be reduced. When applied prior to seeding crops must be direct seeded with minimum disturbance systems.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
flumioxazin	PRE (surface) with soil activity	PPO Inhibitor/ Membrane disruptor	Upward to leaves. Little downward movement due to rapid cell leakage (Apoplast)	Selective Broadleaf	14
pyroxasulfone	PRE (surface) with residual soil activity	Long-chain Fatty Acid Inhibitor	Little movement (Symplast)	Broadleaf & grass	15

Effects of Growing Conditions:

Rainfall is required to activate *Fierce/Torpedo* in the soil. Dry weather following applications of *Fierce/Torpedo* may reduce effectiveness. However, when adequate moisture is received after dry conditions, *Fierce/Torpedo* will control susceptible germinating weeds listed on the label. Crop injury may occur when soils are wet and cool following application or soils are poorly drained. Severe injury may occur with flooded soils. Newly emerging foliage can be temporarily injured by heavy rain splashing treated soil on leaves. Heavy crop residues may reduce weed control. Tillage following application can reduce effectiveness – DO NOT till after application.

Irrigation: If rainfall is not received after application, 1.5 to 2.5 cm of irrigation may be applied to improve weed control activity. DO NOT apply irrigation to wheat between emergence and heading.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides:

Prior to All Crops:

- **Soybean:**
  - Glyphosate (IPA or K salts) 180 to 486 g ae per acre
  - *Pursuit*

  DO NOT apply with *Dual II Magnum* or *Frontier* or injury may occur.
- **Fallow land:**
  - Glyphosate
- **Wheat:**
  - Glyphosate (IPA or K salts) 180 to 486 g ae per acre
- **Bare ground on non-crop areas (*Torpedo* only):**
  - Glyphosate, 2,4-D Ester, *Arsenal*, dicamba, *Hyvar XL, Karmex, Krovar, Telar, Tordon 22K* or *Velpar*.

Fungicides: None registered.

Insecticides: None registered.

Fertilizers: None registered.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Rain or irrigation shortly after application is required for activation. If rainfall does not occur, irrigation with at least 1.5 cm of water is recommended before ground crack occurs. Avoid application if heavy rain is forecast.
- **Restricted Entry Interval:** DO NOT re-enter treated fields for 12 hours.
- **Grazing Restrictions:**
  - ***Field corn:*** DO NOT permit livestock to graze field or harvest as green feed or silage within 93 days after application.
  - ***Soybeans:*** DO NOT harvest as green feed or permit livestock to graze fields within 21 days after application. DO NOT cut hay/fodder within 50 days after application.
  - ***Wheat (spring and winter):*** DO NOT harvest as green feed or permit livestock to graze fields within 42 days after application. DO NOT cut hay/fodder within 52 days after application.
  - ***All other crops:*** DO NOT graze, cut or feed treated crops to livestock.
- **Re-cropping Interval:**
  - ***Soybean, chickpea, field pea:*** Immediately
  - ***Field corn, wheat (spring, winter):*** 7 days. Wheat may also be seeded any time in the spring following a fall application of up to the highest labelled rate.
  - ***Lentils:*** 6 months or any time in the spring following a fall application of the highest labeled rate.
  - ***Barley, durum wheat, oats, alfalfa:*** 11 months
  - ***Canola, mustard seed:*** 12 months
  - ***Crops not listed:*** A successful soil bio-assay must be performed prior to planting.
- **Aerial Application:** DO NOT apply by aircraft.
- **Storage:** Store in a cool, dry place. May be frozen
- **Buffer Zones:** (Liquid formulations only)

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Soybeans, spring wheat and fallow land	4	2	10
Bare gound on non-crop areas (*Torpedo*)	5	3	20

See the Key to Product Pages in the introduction for an explanation of the different habitats.

*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**

† Distance is measured from the downwind edge of the boom to sensitive areas.

Sprayer Cleaning:
Refer to 'Method A' in the general section on sprayer cleaning in the introduction. See product label for further information.

Hazard Rating:
Warning – Skin and Eye Irritant

Applicators and mixers should only handle a maximum of 58 kg (680 acres at the low rate) of 345 L (~1937 acres at the low rate) of *Fierce EZ* per day with proper personal protective equipment.

Refer to the Introduction for an explanation of the symbols.

Flexstar GT*

** For use only in the Red River Valley of Manitoba*

Herbicide Group
9 - glyphosate
14 - fomesafen

Company:
Syngenta Canada (PCP#30412)

Formulation:
67 g/L fomesafen and 271 g/L glyphosate formulated as a solution.
- Container sizes - 2x10 L, 450 L

Crops and Staging:
Flexstar GT may be applied as a pre-seed burn down or as pre-emergent to the crop of soybeans or as early post-emergent on 1 to 2 trifoliate leaf stage of glyphosate tolerant soybeans only.

For use in the Red River Valley of Manitoba only.

Maximum ONE APPLICATION EVERY TWO CONSECUTIVE YEARS of *Flexstar GT* or other products containing the active ingredient fomesafen.

Weeds, Rates and Staging:
Flexstar applied at 840 mL per acre control of the following weeds at the cotyledon to 3 or 4 true leaf stage. Add *Turbocharge* adjuvant at 0.25 L per 100 L spray solution only when weeds are under stress conditions and for larger weeds.

Grass Weeds:
- Barnyard grass
- Bromegrass (smooth)
- Cattail (common)
- Downy brome
- Foxtail barley
- Foxtail (green, yellow)
- Persian darnel
- Proso millet
- Quackgrass
- Rye, tame
- Volunteer barley
- Volunteer corn (except glyphosate tolerant varieties)
- Volunteer wheat
- Wild oats
- Yellow nutsedge

Broadleaf Weeds:
- Absinthe
- Canada thistle
- Chickweed, common
- Cleavers
- Clover (white)
- Cocklebur
- Cow cockle
- Curled dock
- Dandelion
- Field bindweed
- Fleabane (Canada)
- Flixweed
- Hemp-nettle
- Horsetail
- Knotweed (Japanese, prostrate)
- Lamb's-quarters
- Milkweed (common)
- Narrow-leaved hawk's-beard
- Night-flowering catchfly
- Nightshade (Eastern black)
- Pigweed (redroot, smooth)
- Prickly lettuce
- Ragweed (common)
- Round-leaved mallow
- Russian thistle
- Shepherd's-purse
- Smartweed (green, lady's-thumb)
- Sow-thistle (annual, perennial)
- Stinkweed
- Stork's-bill
- Volunteer alfalfa
- Volunteer canola (all varieties)
- Volunteer flax
- Wild buckwheat
- Wild mustard
- Wild tomato

A general guide to mixing can be found in the introduction.

Application Information:
- **Water Volume:** Minimum of 60 to 80 L clean, clear water per acre. Higher spray volume is required for dense weed stands.
- **Pressure:** 30 psi (210 kPa). Increase pressure to 60 psi (420 kPa) for fields with heavy weed densities or with weeds at the upper limit of their recommended stage.
- **Nozzles:** Use nozzles capable of delivering appropriate pressures and volumes. DO NOT apply with spray droplets smaller than the ***ASABE coarse*** classification.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
fomesafen	POST (foliar) with little soil activity	PPO Inhibitor/ Membrane disruptor	Little movement due to rapid cell leakage(Symplast)	Non-selective Broadleaf	14
glyphosate	POST (foliar)	EPSP Amino Acid Synthesis Inhibitor	Toward growth areas (Symplast)	Broadleaf & grass	9

Effects of Growing Conditions:

Extremes in environmental conditions such as temperature, moisture, soil conditions, and cultural practices may affect activity.

Tank Mixes:

None registered.

Restrictions:

- **Rainfall:** Within 4 hours may reduce control.
- **Restricted Entry Interval:** DO NOT re-enter treated fields for 12 hours.
- **Pre-harvest Interval:** Leave at least 90 days from application to harvest.
- **Grazing Restrictions:** DO NOT graze treated crop or cut for hay.
- **Re-cropping Interval:** Winter wheat may be sown 4 months after application. Spring wheat, dry beans, soybeans and field corn may be grown the year following an application. These re-cropping restrictions refer only to the Red River Valley of Manitoba. Use outside this is region is not registered as re-cropping options have not been determined.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store above -10°C, in a dry place in original container, away from food or feed.
- **Buffer Zones:** Leave a buffer zone of at least 15 m between the last spray swath and the edge of sensitive terrestrial areas such as shelterbelts, hedgerows and shrublands as well as aquatic areas such as ponds, streams, rivers, prairie potholes and sloughs. DO NOT apply when winds are greater than 15 km per hour.

Sprayer Cleaning:

Refer to 'Method B' in the general section on sprayer cleaning in the introduction.

Hazard Rating:

Warning – Eye Irritant

Refer to the Introduction for an explanation of the symbols.

Florasulam

Herbicide Group 2 - florasulam

Company:

Corteva Agriscience (*PrePass Flex*)
AgraCity (*Battlefront*)
Loveland Products Canada (*Blitz* , *Bombard 50SC*)
Adama Canada (*Priority*)
Sharda Cropchem (*Flora, Start 25 WDG*)
Advantage Crop Protection (*Advantage Florasulam 50 SC*)
Albaugh (*Clorvante*)
Viking (*Viking Florasulam*)

Formulation:

***PrePass Flex* (PCP#31259)*, *Start 25 WDG* (PCP#34969)*:** 25% florasulam formulated as a water dispersible granule.

- Container size - 8 x 648 g case

***Priority* (PCP#30831)*, *Blitz* (PCP#31687)*, *Battlefront* (PCP#33003)*, *Flora* (PCP#33610)*, *Advantage Florasulam 50 SC* (PCP#34336)*, *Clorvante* (PCP#34431)*, *Bombard 50 SC* (PCP#35006)*, *Viking Florasulam* (PCP#34752):**
50 g/L florasulam formulated as a suspension concentrate.

- Container sizes:
  - *Priority, Battlefront, Advantage Florasulam 50 SC, Bombard 50 SC, Viking Florasulam* - 2 x 6.4 L
  - *Flora* - 2 x 6.4 L
  - *Blitz* - 4 x 3.2 L

* ***NOTE:*** PrePass Flex, Priority, Blitz , Battlefront, Flora, Advantage Florasulam 50 SC, Clorvante, Bombard 50 SC and Start 25 WDG *are intended to be applied with glyphosate only. Best practice is to mix florasulam products with herbicides from other resistance groups to prevent the development of resistant weed biotypes.*

Crops and Staging:

All Products:

- ***Preseed burndown, fallow or post harvest:*** Florasulam + glyphosate can be applied either in the fall or in the spring prior to seeding spring wheat (including durum), barley or oats or as an initial fallow treatment. *PrePass Flex* and *Start 25 WDG* may be applied in fall prior to seeding winter wheat.

***Battlefront, Advantage Florasulam 50 SC, Clorvante, Bombard 50 SC, Flora* and *Viking Florasulam* only:**

- ***Wheat (spring, durum, winter††), barley:*** 2 to 6 leaf stage.
  †† ***Flora* and *Viking Florasulam* only.**

***PrePass Flex* only:**

- ***Established alfalfa for forage and hay*:*** apply to dormant or semi-dormant alfalfa (not actively growing) in late fall or early spring. See label for details
  *** Note:** Since applications to established alfalfa for forage and hay has been registered under the User Requested Minor Use program, the manufacturer assumes no responsibility for herbicide performance. **Application to established alfalfa for forage and hay is at the risk of the user.**

When mixing, always check the tank mix partner recommendations for additional staging restrictions.

Weeds and Staging:

Broadleaf weeds controlled at the 2 to 4 leaf stage:

- Chickweed
- Cleavers
- Cow cockle**
- Shepherd's-purse
- Smartweed (including lady's-thumb)
- Stinkweed
- Volunteer canola†
- Wild buckwheat
- Wild mustard

Broadleaf weeds suppressed:

- Annual sow-thistle
- Hemp-nettle
- Narrow-leaved hawk's-beard
- Perennial sow-thistle (top growth control only)
- Redroot pigweed

*** Seedlings and overwintered rosettes.**
**** All products except *Advantage Florasulam 50 SC* and *Bombard 50 SC*.**
† Not Including CLEARFIELD canola varieties.

Rates:

PrePass Flex, Start 25 WDG: 8.1 grams per acre
Priority, Blitz, Battlefront, Viking Florasulam, Flora, Advantage Florasulam 50 SC, Clorvante* and *Bombard 50 SC: 40 mL per acre
Refer to the product label for complete mixing instructions for this product and its mixes. A general mixing guide can be found in the introduction.

Application Information:

- **Water Volume:** 40 L per acre.
- **Nozzles and Pressure:** Maximum 30 to 40 psi (200 to 275 kPa) with conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use nozzles and pressure designed to deliver thorough, even coverage with ***ASABE coarse*** droplets.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
florasulam	POST (foliar) with little soil activity	ALS Amino Acid synthesis inhibitor	Toward regions of growth (Symplast)	Broadleaf only	2

Effects of Growing Conditions:

Warm, moist growing conditions promote active weed growth and enhance activity of florasulam. Weeds hardened off by cold weather or drought stress may not be adequately controlled or suppressed and re-growth may occur. Under conditions of low crop and high weed density, control may be reduced. Extreme growing conditions such as drought or near freezing temperature prior to, at, or following time of application may reduce weed control and increase the risk of crop injury at all stages of growth.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Preseed Burndown, Fallow or Post-harvest:

- Glyphosate (180 to 360 g ae per acre)

In spring wheat (including durum):

- Bromoxynil

Insecticides: None registered.
Fungicides: None registered.
Fertilizers: None registered.
Note: The above mixes are those listed on the florasulam labels only.
According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.
Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Rainfall within 30 minutes application of *Prepass Flex* may reduce effectiveness. No rainfast period is specified on other labels; required interval may be up to 8 hours. Contact manufacturer for more information. DO NOT apply excessive irrigation following application as product may leach.
- **Restricted Entry Interval:** DO NOT enter or allow worker entry into treated areas for at least 12 hours.
- **Grazing Restrictions:** DO NOT graze or cut treated areas for feed or hay within 7 days of application. Withdraw meat animals from treated fields at least 3 days before slaughter. When *PrePass Flex* is applied to established alfalfa for forage and hay DO NOT cut for hay or graze within 21 days of application.
- **Pre-harvest Interval:** Leave 60 days between application and harvesting mature crop.
- **Re-cropping Interval:** Wheat, barley, canola, chickpea*, corn*, dry beans*, flax*, lentil*, mustard* (brown, oriental, yellow, and oilseed quality *B. juncea* types), oats**, peas, potato* (except seed potato), soybean* or sunflower* may be grown the year following an application.
  *** *PrePass Flex, Flora, Battlefront* only.**
  **** All products except *Advantage Florasulam 50 SC* and *Clorvante*.**
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store in dry, heated area. If frozen, bring to room temperature and agitate before use.

- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground only*	1	0	3

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Refer to 'Method A' in the general section on sprayer cleaning in the introduction. Check the cleanout requirements of pesticides mixed with this product. Additional cleanout measures may need to be integrated into those provided here.

Hazard Rating:

PrePass Flex:

Warning – Eye Irritant

Other Products:

Caution – Poison

May Cause Skin and Eye Irritation

Refer to the Introduction for an explanation of the symbols.

Florasulam + Fluroxypyr + MCPA

Herbicide Group
2 - florasulam
4 - fluroxypyr, MCPA

These products are a prepackaged tank mix of florasulam, fluroxypyr and MCPA Ester. Information listed is restricted to Crops, Weeds, Rates and Tank mixes. For other detailed restrictions and other general information on the component products see the product pages listed above.

Company:
AgraCity (*Deathstar*)
Viking (*Viking Askim*)

Formulation:
The florasulam + fluroxypyr package contains the following components:
***Battlefront* (PCP#33003 - Deathstar), Viking Florasulam (PCP#34752 - Viking Askim):** 50 g/L florasulam formulated as a suspension concentrate.
- Container sizes - 3.2 L, 9 x 3.2L

-plus-
***Foxxy* (PCP#32952 - Deathstar), Viking Fluroxypyr (PCP# 34778 - Viking Askim):** 180 g/L fluroxypyr formulated as an emulsifiable concentrate.
- Container sizes:
  - 2 x 12.8 L, 230 L

Crops and Staging:
Spring wheat, durum wheat, barley: Apply from the 3 to 6 leaf stage, prior to flag leaf.

Weeds and Staging:
Apply when weeds are at the 2 to 4 leaf stage unless otherwise indicated.
***Battlefront* at 40 mL per acre plus *Foxxy* at 320 mL per acre plus MCPA Ester 600 at 300 mL per acre (sold separately) or *Viking Florasulam* at 40 mL per acre plus Viking Fluroxypyr at 320 mL per acre plus MCPA Ester at 300 ML per acre (sold separately) will control:**
- Annual sow-thistle*
- Annual sunflower†§
- Ball mustard§
- Burdock†§
- Canada thistle*§
- Chickweed
- Cleavers (1 to 4 whorls)§
- Cocklebur§
- Common ragweed§
- Cow cockle
- Dandelion*
- Flixweed§ (spring rosettes only)
- Hemp-nettle §
- Kochia
- Lamb's-quarters§
- Narrow-leaved hawk's-beard*
- Perennial sow-thistle*
- Plantain*
- Prickly lettuce†§
- Redroot pigweed§
- Round-leaved mallow (1-6 leaf)
- Russian pigweed†§
- Shepherd's-purse
- Smartweed
- Stinkweed
- Stork's-bill*§
- Vetch§
- Volunteer canola (all varieties)
- Volunteer flax (1 to 12 cm)
- Wild buckwheat
- Wild mustard
- Wild radish§

*** Suppression only.**
† Up to 4 leaf stage.
§ Requires additional 47 mL per acre of MCPA 600 Ester for control.

Tank Mixes:
None registered.

According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found in the introduction.

See component products for more information on restrictions, application details and handling. Unless indicated differently above use the most limiting restrictions across all components for the mix.

Florasulam + glyphosate

Herbicide Group
2 - florasulam
9 - glyphosate

This product is a prepackaged tank mix of Florasulam and glyphosate. Information listed is restricted to Crop, Weeds, Rates and Tank mixes. For other detailed restrictions and other general information on the component products see the product pages listed above.

Company:

Corteva Agriscience (*PrePass XC, PrePass Flex*)
ADAMA Canada (*Priority*)
Loveland Products Canada (*Blitz*)

Formulation:

The *PrePass XC* package contains the following components:

***PrePass XC A* (PCP#29651):** 50 g/L florasulam formulated as a suspension concentrate.

- Container sizes - 1.6 L, 4 x 12 L

***PrePass XC B* (PCP#29652):** 480 g/L glyphosate DMA salt formulated as a solution.

- Container sizes - 2 x 7.5 L, 450 L

-or-

***PrePass Flex** (PCP#31259):** 25% florasulam formulated as a water dispersible granule.

- Container size - 8 x 648 g

-or-

***Priority** (PCP#30831), *Blitz** (PCP#31687):** 50 g/L florasulam formulated as a suspension concentrate.

- Container size - 2 x 6.4 L

*** *PrePass Flex, Priority* and *Blitz* DO NOT come packaged with glyphosate. Glyphosate must be purchased separately.**

Crops and Staging:

Florasulam + glyphosate can be applied either in the fall or in the spring prior to seeding spring wheat (including durum), barley or oats or as an initial fallow treatment.

PrePass XC or *PrePass Flex* may be applied in fall prior to seeding winter wheat.

Weeds and Staging:

Florasulam + glyphosate will control the following weeds:

Weeds controlled by glyphosate at the 180 g ae per acre rate plus enhanced control of the following weeds:

- ***Broadleaf weeds controlled at the 2 to 4 leaf stage:***
  - Canada fleabane (up to 8 cm)†
  - Common chickweed
  - Cleavers
  - Cow cockle
  - Dandelion (up to 30 cm across)
  - Flixweed†
  - Hemp-nettle
  - Kochia*
  - Lamb's-quarters
  - Narrow-leaved hawk's-beard (up to 8 cm)
  - Ragweed, common (up to 8 cm)†
  - Redroot pigweed
  - Russian thistle†
  - Scentless chamomile†
  - Shepherd's-purse
  - Smartweed (including lady's-thumb)
  - Stinkweed
  - Volunteer canola (all varieties)
  - Volunteer flax
  - Wild buckwheat (up to 5 leaf)
  - Wild mustard
- ***Broadleaf weeds suppressed:***
  - Annual sow-thistle
  - Perennial sow-thistle***

*** Note: Florasulam + glyphosate will not control glyphosate resistant kochia.**
**** Earlier applications provide better results.**
***** Applications made at advance stages will reduce effectiveness.**
† *PrePass XC* and *PrePass Flex* only.

Rates:

For *PrePass* XC:

***PrePass XC A*:** 40 mL per acre
-plus-
***PrePass XC B*:** 375 mL per acre
-or-

***Prepass Flex*:** 8.1 grams per acre
-plus-
Glyphosate (purchased separately): At least 180 g ae per acre (see glyphosate for product rates)
-or-
***Priority, Blitz*:** 40 mL per acre
-plus-
Glyphosate (purchased separately): 180 g ae per acre (see glyphosate for product rates)

Tank Mixes:

Herbicides

- ***PrePass XC:*** *Vantage Plus Max II***.
- ***PrePass Flex:*** glyphosate IPA, DMA or K+ salt at 180 to 1020 g ae per acre.
- ***Priority* or *Blitz*:** must be mixed with glyphosate IPA or DMA salt at 180 g ae per acre.

**** NOTE: Corteva Agriscience does not support the topping up of *PrePass XC* with other salts of glyphosate as they may have a negative reaction with the florasulam component. *PrePass Flex* may be topped up with any formulation of glyphosate, as indicated above.**

Note: The above mixes are those listed on the florasulam + glyphosate labels only.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Re-cropping Interval:**
  - Applications after August 1: Spring wheat (including durum), barley and oats, may be seeded the following year, or the field may be fallowed.
  - Applications **before August 1**: Barley, canola, chickpeas*, dry beans*, field peas, flax*, lentils*, mustard* (brown, oriental, yellow and oilseed quality *B. juncea*) oats, soybeans*, sunflower* and wheat, may be grown the following year.
    * *PrePass XC, PrePass Flex*, and *Priority* only.

See component products for more information on restrictions, application details and handling. Unless indicated differently above use the most limiting restrictions across all components for the mix.

Florasulam / fluroxypyr + MCPA Ester

Herbicide Group
2 - florasulam
4 - fluroxypyr, MCPA

Company:

ADAMA Canada (*Outshine*)
Agracity (*Battlestar*)
Corteva Agriscience (*Stellar Unpacked, Stellar XL*)
Sharda Crop Chem (*Alloy, Steel**)
Viking (*Viking Bodo*)
Syngenta (*Sabatis*)
*** Note:** *This product is no longer manufactured but inventories still remain in distribution. This product may be removed from future editions.*

Formulation:

***Outshine* (PCP#31646), *Steel* (PCP#33936), *Battlestar* (PCP#34567), *Viking Bodo* (PCP#34799), *Alloy* (PCP#34669), *Stellar Unpacked* (PCP#34516):** 2.5 g/L florasulam and 100 g/L fluroxypyr formulated as a suspension concentrate.

- Container size - 2 x 8 L, 97.1 L (*Stellar Unpacked only*), 128 L (*Steel* only)

***MCPA 2 EH Ester 600* (PCP#31669):** 600 g/L of MCPA Ester formulated as an emulsifiable concentrate.

- Container sizes:
  - *MCPA 2 EH Ester 600* - 1 x 9.33 L
  - *Alloy, Stellar Unpacked, Steel and Viking Bodo* - MCPA sold separately

-or-

***Stellar XL* (PCP #32099), *Sabatis* (PCP#35304):** 2.5 g/L florasulam, 100 g/L fluroxypyr and 350 g/L of MCPA as a co-formulated emulsifiable concentrate.

- Container sizes - 2 x 8.1 L, 97.1 L (*Stellar XL* only), 129.6 L (*Sabatis* only) or 518 L (*Stellar XL* only)

Crops and Staging:

Barley, oats, wheat (spring, durum, winter*): 3 to 6 leaf stage, including staging for *Steel* with MCPA tank mix. DO NOT apply *Alloy* or *Stellar Unpacked* or *Steel* mixed with MCPA on oats. *Alloy, Stellar Unpacked* and *Steel* alone on registered crops starting at the 2 leaf stage.

Seedling and established forage grasses (Group 17) for seed production*†:

- ***Seedlings:*** 4 leaf stage up to the flag leaf stage.
- ***Established:*** no stage restrictions.
  - Bromegrasses
  - Fescues
  - Meadow Foxtail
  - Orchardgrass
  - Redtop
  - Reed canarygrass
  - Ryegrasses
  - Timothy
  - Wheatgrasses

Seedling and established forage grasses for seed, forage and hay production*†:

- Bromegrass (meadow, smooth, hybrid)

When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

* ***Stellar XL and Sabatis* only.**

† ***Note -*** *Since applications to forage grasses have been registered under the User Requested Minor Use program, the manufacturer assumes no responsibility for herbicide performance.* ***Application to timothy is at the risk of the user.***

Weeds and Staging:

Apply when weeds are at the 2 to 4 leaf stage unless otherwise indicated. Weed list includes *Steel* tank mixed with MCPA Ester.

- Burdock†
- Chickweed (common)
- Cleavers†††
- Cocklebur†
- Flixweed
- Hemp-nettle
- Kochia
- Lamb's-quarters
- Plantain†
- Prickly lettuce†
- Ragweed
- Pigweed (redroot, Russian†)
- Shepherd's-purse
- Smartweed
- Stinkweed†
- Stork's-bill*
- Sunflower (annual)
- Vetch†
- Volunteer canola
- Volunteer flax
- Wild buckwheat
- Wild mustard
- Wild radish†

*** Suppression only.**
† Weeds listed on MCPA component of *Outshine/Steel/Battlestar* mix only. All weeds controlled with *Stellar XL and Sabatis*.
†† *Stellar XL* only.
††† 1 to 8 whorl for *Stellar XL*. No staging given for *Stellar/Outshine/Steel/Battlestar*.

Rates:

***Outshine A/Steel/Battlestar/Viking Bodo/Alloy/Stellar Unpacked/*:** 0.4 L per acre
***Outshine B (MCPA)/*Other MCPA 600 Ester mix with *Steel/Battlestar*:** 0.24 L per acre
-or-
***Stellar XL, Sabatis*:** 405 mL per acre

Application Information:

- **Water Volume:** Minimum 40 L per acre.
- **Nozzles & Pressure:** For conventional flat fan nozzles use a pressure of 30 to 40 PSI (200 to 275 kPa). Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE coarse*** droplets. Low drift nozzles may require higher pressures for proper performance.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
florasulam	POST (foliar)	ALS Amino Acid Synthesis Inhibitor	Toward regions of growth (Symplast)	Broadleaf only	2
fluroxypyr	POST (foliar)	Synthetic Auxin	Throughout the plant (Symplast)	Broadleaf only	4
MCPA	POST (foliar)	Synthetic Auxin	Throughout the plant (Symplast)	Broadleaf only	4

Effects of Growing Conditions:

DO NOT apply to crops or weeds that are stressed (frost, low fertility, drought or flooding, disease or insect damage) as crop injury or reduced weed control may result.

Tank Mixes:

Herbicides:

- ***Spring wheat (including durum) and barley (*Alloy/Stellar Unpacked/Steel/Battlestar/Bodo *only):***
  - MCPA Ester
- ***Barley, spring wheat:***
  - *Axial****
- ***Spring Wheat (including durum) only:***
  - *Simplicity***
  - *Simplicity GoDRI****
  - *Traxos*****

*** All products.**
**** *Stellar, Stellar XL* and *Viking Bodo* only.**
***** *Stellar XL, Sabatis* and *Viking Bodo* only.**
******Sabatis only**

Insecticides: None registered.

Fungicides: None registered.

Fertilizers: None registered.

According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Rainfall within 2 hours of application may reduce efficacy.
- **Restricted Entry Interval:** DO NOT enter treated fields for at least 12 hours.
- **Pre-harvest Interval:** Leave 60 days between treatment and harvest.
- **Grazing Restrictions:** DO NOT graze or harvest for livestock feed within 7 days of treating the crop. ***For Group 17 forage grasses (Stellar XL, Sabatis only):*** DO NOT graze dairy animals within 7 days of application. DO NOT harvest green feed or cut for hay/silage within 7 days of application. Withdraw meat animals from grazing within the 7 day period for 3 days before slaughter.
- **Re-cropping Interval:** The following crops may be grown the season following application: barley, canola, corn*, field beans (*Phaseolus vulgaris*)*, flax*, lentils*, mustard*, oats, peas, potato*†, soybean*, sunflower* or wheat or fields can be summerfallowed. There are no recropping restrictions the second year after application.
  * *Alloy, Stellar Unpacked, Steel, Battlestar, Stellar*, *Stellar XL and Sabatis* only.
  † Except seed potatoes for *Stellar*
- **Aerial Application:** DO NOT apply by air.

- **Storage:** May be frozen. If frozen, bring to room temperature and agitate before use. *Stellar* and *Outshine* only – product is combustible. DO NOT store near heat or open flame.
- **Buffer Zones:**

Product	Buffer Zones (metres†) Required for the Protection of:		
	Freshwater Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Stellar XL, Outshine	1	0	1
Alloy, Stellar Unpacked, Steel, Battlestar	1	0	3

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Use a combination of 'Method A' and 'Method B' utilizing the commercial spray tank cleaner *All-Clear* as the detergent. See the general section on sprayer cleaning in the introduction. If mixed with another pesticide additional clean-out measures may be necessary.

Hazard Rating:

Warning – Poison

Warning – Eye and Skin Irritant

Potential Skin Sensitizer

Refer to the Introduction for an explanation of the symbols.

Flucarbazone

Herbicide Group 2 - flucarbazone

Company:

UPL AgroSolutions Canada (*Everest 3.0 AG*)
Syngenta Canada (*Sierra 3.0 AG*)
AgraCity (*Himalaya*)
Viking (*Viking Flucarbazone*)

Formulation:

***Everest 3.0 AG* (PCP#33258), *Sierra 3.0 AG* (PCP#33538):** 200 g/L flucarbazone-sodium formulated as a suspension concentrate.

- Container size - 3.88 L

***Himalaya* (PCP#33370), *Viking Flucarbazone* (PCP#34739):** 66% flucarbazone-sodium formulated as a water dispersible granule.

- Container size - 567 g

Crops and Staging:

Spring application to wheat (spring, durum, winter): 1 leaf to a maximum of 4 main stem leaves plus 2 tillers (6 total leaves).

Note: Several of the tank mix partners have more limiting staging than flucarbazone alone. When tank mixing use the most restrictive application stage or injury may result.

Weeds, Rates and Staging:

Grass weeds: Maximum of 4 main stem leaves and 2 tillers
Broadleaf weeds: 2 to 6 leaf stage

Weed	Rate	
	3.0 AG **mL per acre**	***Himalaya , Viking Flucarbazone*** **g per acre**
Green foxtail*	29.1	8.7
Weeds listed above plus: Wild oats* (light infestations < 100 plants/m^2), volunteer oats, green smartweed, redroot pigweed*, shepherd's-purse*, volunteer canola*, wild mustard*, stinkweed* (2 to 9 leaf stage)	38.4	11.5
Weeds listed above plus: Wild oats* (heavy populations > 100 plants/m^2), Japanese brome up to 4 leaf stage pre-tillering, both growing under ideal growing conditions **Suppression of:** Wild buckwheat (1 to 4 leaf stage), barnyard grass**, yellow foxtail**	48.2	14.4
Grass weeds listed above growing under poor growing conditions or when mixing with herbicides containing the a.i. dicamba	58.2	17.4

Requires the addition of a non-ionic surfactant (*Agral 90, Agsurf II, Liberate, ProSurf, Super Spreader, LI700*) at 2.5 L per 1000 L of spray solution.

*** Will not control imidazolinone tolerant (CLEARFIELD) canola volunteers or Group 2 resistant weed biotypes.**
**** For control of these weeds, see tank mix section of the product label.**

DO NOT apply more than the equivalent of 11.64 g flucarbazone active ingredient per growing season.
Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Application Information:

- **Water Volume:**
  - ***Ground:*** 22.5 to 45 L per acre.
  - ***Aerial:*** 11 L per acre.
- **Nozzles and Pressure:** Use 30 to 50 psi (200 to 345 kPa) when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE coarse*** droplets. Orienting nozzles at a 45 degree angle forward may improve coverage of vertical leaves (grasses).

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
flucarbazone	POST (foliar) with soil residual activity	ALS Amino Acid Inhibitor	Toward growth areas of plant (Symplast)	Broadleaf & grass	2

Effects of Growing Conditions:

Crop tolerance and weed control may be reduced if applications are made to plants growing under stress. Stress includes saturated or water-logged soil, drought, extreme temperatures, low fertility or visible disease symptoms at application. Adopting practices to increase crop vigour will improve crop tolerance.

Tank Mixes:

Herbicides:

Note:

- All mixes must be applied with a registered surfactant unless otherwise indicated. Only one registered surfactant is required.
- All products below may be mixed at label rates with flucarbazone unless otherwise indicated.
- Flucarbazone at all rates may be mixed with the products listed below unless otherwise indicated.
  - ***In wheat (spring and durum) only:***
    - 2,4-D Amine or Ester (rates up to 227 g ae per acre)*
    - *Akito*
    - *Enforcer D*
    - *Enforcer M*[§]
    - *Pixxaro*
    - Tribenuron (*Inferno WDG*)
  - ***In wheat (spring and winter) only:***
    - 2,4-D Amine or Ester (rates up to 227 g ae per acre)
    - Bromoxynil/MCPA (*Buctril M/Logic M* only)
    - MCPA Amine or Ester at rates up to 0.38 L per acre (600 g/L formulation)
    - Thifensulfuron/tribenuron (*Refine SG* only)[§]
  - ***In spring wheat (NOT including durum) only:***
    - Bromoxynil (*Brotex 240/Pardner* only)
    - Bromoxynil/2,4-D (*Leader/Thumper* only)
    - *Curtail M***
    - Dichlorprop-D
    - *Frontline 2,4-D*
    - Florasulam + MCPA (*Frontline XL* only)*
    - Florasulam/Fluroxypyr+MCPA (*Stellar XL* only)**
    - Fluroxypyr + 2,4-D (*Attain XC* only)**
    - Fluroxypyr+MCPA (*Trophy* only)
    - Metsulfuron (*Ally* only) + 2,4-D Amine or Ester up to rates above**
    - *OcTTain XL**[§]
    - *Optica Trio*[#*†§]
    - *Prestige XC***
    - Thifensulfuron/Tribenuron (*Refine SG* only[§]) plus 2,4-D Amine or Ester at rates above

*** Apply in 40 L per acre of water. In durum max rate is 170 gae per acre in 45 L of water.**
**** Apply in 40 L per acre of water only with 38.4 to 58.3 mL per acre of *Flucarbazone 3.0/3.0 AG*.**
[†] **Wild oats control may be reduced with this mix.**
[#] **Tank mix only with the highest rate of flucarbazone.**
[§] ***Flucarbazone 3.0 AG* only.**

Fertilizers: None registered.

Insecticides: None registered.

Note: The above mixes are those listed on the flucarbazone labels only.

According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Rainfall within 1 hour of application may reduce control.
- **Restricted Entry Interval:** DO NOT re-enter treated area within 12 hours.
- **Grazing Restrictions:** DO NOT graze treated fields. Mature grain or straw may be fed to livestock.
- **Pre-harvest Interval:** Leave at least 80 days from application to harvest

- **Re-cropping Interval:** See the following chart below:

Soil Zones and Rotational Crops			
Grey-Wooded	Black	Dark Brown	Brown
Spring wheat Barley Canola (all varieties) Field pea*	Spring wheat Barley Canola (all varieties) Durum wheat Field pea* Flax Field bean Soybean† Sunflower†	Spring wheat Barley Canola (all varieties) Durum wheat Field pea* Flax Soybean† Sunflower†	Spring wheat

† Not including *Sierra 3.0* at this time.
*** NOTE: Field pea may be grown the year following flucarbazone application in fields where precipitation has been equal to or above the 10-year average during the growing season, and where organic matter content is above 4 percent, and pH is below 7.5. The company suggests a minimum of 100 mm (4 inches) of rain is needed in the 60 days following application for adequate breakdown to take place.**

NOTE: Other rotational crops may also be affected under certain environmental conditions, including prolonged drought and/or cold temperatures within the following cropping season, as well as soils with both low OM (less than 2 per cent) and high pH (greater than 7.5).

- **Aerial Application:** May be applied by aircraft.
- **Storage:** Store in closed original container in a cool, dry area away from fertilizers, food or feed. DO NOT freeze.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:	
	Aquatic Habitat	Terrestrial habitat
Field sprayer*	5	2
Fixed wing aircraft	100	65
Helicopter	85	55

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance is measured from the downwind edge of the boom to sensitive areas.

Sprayer Cleaning:

Refer to 'Method A' in the general section on sprayer cleaning in the introduction. When mixing with other pesticides, combine the method above with cleanout methods for the tank mix partner.

Hazard Rating:

***Flucarbazone 3.0 AG*:**

Danger – Corrosive to Eyes

***Himalaya, Viking Flucarbazone*:**

Warning eye and skin irritant

Potential Skin Sensitizer

Refer to the Introduction for an explanation of the symbols.

Flucarbazone + Tribenuron

Herbicide Group
2 - flucarbazone, tribenuron

Company:
UPL AgroSolutions Canada (*Inferno Duo*)
AgraCity (*Himalaya Extra*)
Viking (*Viking Visby*)

Formulation:
***Inferno Duo* (PCP#30663):** 45% flucarbazone and 3.9% tribenuron formulated as water dispersible granules.
- Container size - 4 x 1018 grams

-or-
The *Himalaya Extra* package contains the following components:
***Himalaya* (PCP#33370):** 66% flucarbazone-sodium formulated as a water dispersible granule.
- Container size - 695 g

-plus-
***MPOWER Extra* (PCP#33143):** 75% tribenuron methyl formulated as a water dispersible granule.
- Container size - 320 g

-or-
The Viking Visby package contains the following components:
***Viking Flucarbazone* (PCP#34739):** 66% flucarbazone-sodium formulated as a water dispersible granule.
- Container size - 965 g

-plus-
***Viking Tribenuron* (PCP#34738):** 75% tribenuron methyl formulated as a dry flowable.
- Container size - 320 g

Crops and Staging:
Spring wheat (NOT including durum) and winter wheat*: Apply to the soil surface from one week before seeding until crop emergence.
*** Winter wheat with *Inferno Duo* only.**

Weeds, Rates and Staging:
Inferno Duo: Apply 12.75 g per acre or
Himalaya Extra: Apply 8.7 g per acre of *Himalaya* plus 4 g per acre of *MPOWER Extra*
Viking Visby: Apply 8.7 g per acre of *Viking Flucarbazone* plus 4 g per acre of *Viking Tribenuron*
All Products: Add 180 g ae per acre of glyphosate IPA or K+ salts (see glyphosate) to control:
- *Weeds controlled by glyphosate at 180 g ae per acre (see glyphosate) plus:*
  - Cow cockle
  - Dandelion†
  - Foxtail barley (up to 10 cm)*
  - Narrow-leaved hawk's-beard
  - Shepherd's-purse§
  - Volunteer canola
  - Wild oats†

Mix with glyphosate at 360 g ae per acre to control:
  - Foxtail barley (greater than 10 cm, heavy infestations or stressed plants)*

*** Apply prior to seed head emergence and the loss of older leaves.**
† Suppression only.
§ *Inferno Duo* only.

NOTE: The entire 254.5 g pouch of Inferno Duo *must be added to the spray tank. DO NOT use part pouches.*
DO NOT apply flucarbazone/tribenuron more than once per season or follow the application of these products with an application of another flucarbazone product.

Application Information:
- **Water Volume:** 40 L per acre.
- **Nozzles and Pressure:** Use 30 to 50 psi (200 to 345 kPa) when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage and a minimum of fine droplets that are prone to drift.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
flucarbazone	POST (foliar – emerged weeds) PRE (soil activity)	ALS Amino Acid inhibitor	Toward Areas of Growth (Symplast)	Broadleaf & grass	2
tribenuron	POST (foliar – emerged weeds)	ALS Amino Acid inhibitor	Toward Areas of Growth (Symplast)	Broadleaf only	2

Effects of Growing Conditions:

Crop tolerance and weed control may be reduced if applications are made to plants growing under stress. Stress includes saturated or water-logged soil, drought, extreme temperatures, low fertility or visible disease symptoms at application.
Adopting practices to increase crop vigor will improve crop tolerance.

Tank Mixes:

Herbicides: Glyphosate IPA or K+ salts only.
Fungicides: None registered.
Insecticides: None registered.
Fertilizers: None registered.
Note: The above mixes are those listed on the *Inferno Duo* label only.
Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** DO NOT apply if rainfall is expected within 1 hour of application.
- **Restricted Entry Interval:** Wait at lest 12 hours before re-entering treated fields.
- **Grazing Restrictions:** DO NOT graze treated fields. Mature grain or straw may be fed to livestock.
- **Pre-harvest Interval:** Leave at least 80 days from application to harvest.
- **Re-cropping Interval:** The following crops may be planted 11 months after application.

Soil Zones and Rotational Crops			
Grey-Wooded	Black	Dark Brown	Brown
Wheat (spring, winter†) Barley Canola (all varieties) Field pea*	Wheat (spring, winter†, durum) Barley Canola (all varieties) Field pea* Flax Field bean Soybean† Sunflower†	Wheat (spring, winter†, durum) Barley Canola (all varieties) Field pea* Flax Soybean† Sunflower†	Wheat (spring, winter†)

† ***Inferno Duo* only.**
*** NOTE: Field peas may be grown the year following application in fields where precipitation has been equal to or above the 10 year average during the growing season, and where organic matter content is above 4 percent, and pH is below 7.5. The company suggests a minimum of 100 mm (4 inches) of rain is needed in the 60 days following application for adequate breakdown to take place.**
  - *NOTE: Other rotational crops may also be affected if rainfall is less than the 10 year average for the area. Soils in the grey wooded, black and dark brown soil zones with a combination of low organic matter (less than 2 percent), light textured soils or high pH (greater than 7.5) (i.e. eroded knolls, sandy soils) may result in delayed growth and development in rotational crops. DO NOT plant crops other than those listed above in the year following application.*

- **Aerial Application:** DO NOT apply by air.
- **Storage:** May be frozen.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:	
	Aquatic Habitats	Terrestrial habitat
Ground only*	35	20

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured is metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Refer to 'Method A' in the general section on sprayer cleaning in the introduction. Let solution stand for an extended period for better results. Flush sprayer system with water. See the label for product specific cleaning details.

Hazard Rating:

Inferno Duo:

Caution – Skin Irritant

Potential Skin Sensitizer

Warning – Contains the Allergen Sulphites

Himalaya Extra, Viking Visby:

- ***Himalaya:***

Warning – Eye and Skin Irritant

- ***MPOWER Extra Viking Tribenuron:***

Warning – Eye Irritant

Refer to the Introduction for an explanation of the symbols.

Fluroxypyr

Herbicide Group 4 - fluroxypyr

Company:

Great Northern Growers and UAP (*Ikwin*)
FMC Corporation (*Perimeter II*)
Albaugh (*Fluro Star, Fluro Star Max*)
WinField United (*Cavalier 180*, Cavalier 333)*
Advantage (*Advantage Fluroxypyr 333 EC*)

** **Note:** This product is no longer manufactured but inventories still remain in distribution. This product may be removed from future editions.*

Formulation:

***Ikwin* (PCP#33047), *Fluro Star* (PCP#33280), *Cavalier 180* (PCP#34344):** 180 g ae/L fluroxypyr formulated as an emulsifiable concentrae.

- Container sizes - 9.68 L (*Ikwin*), 9.3 L or 115 L (*Fluro Star*)

***Perimeter II* (PCP#30094)*, *Cavalier 333* (PCP#33933), *Fluro Star Max* (PCP#33281), *Advantage Fluroxypyr 333 EC* (PCP#35273):** 333 g ae/L fluroxypyr formulated as an emulsifiable concentrate.

- Container sizes - 3.4 L (*Perimeter II, Cavalier*) or 2 x 10 L (*Fluro Star Max*)

*** *Perimeter II* is only available as a component of co-packaged products or tank mixes with FMC products.**

Crops and Staging:

Spring wheat (including durum), barley, oats*: 2 leaf up to the initiation of stem elongation (nodes can be felt at the base of the stem).
Winter wheat*: Apply to winter wheat in the spring from the 3 tiller stage to just before the flag leaf stage.
Rangeland, permanent pasture, rights-of-way, industrial and other non crop areas - *Advantage Fluroxypyr 333 EC, Cavalier 333* and *Fluro Star Max* only.
*** *Cavalier 333 Fluro Star Max, Advantage Fluroxypyr 333 EC* and *Perimeter II* only.**
When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

Weeds, Rates and Staging:

Weeds Controlled	180 g/L		333 g/L	
	Rate (mL per acre)	Stage	Rate (mL per acre)	Stage
Cleavers	162	1 to 4 whorls	85	1 to 6 whorls
Cleavers	-	-	125	1 to 8 whorls
Kochia*	243	2 to 8 leaf	125	2 to 8 leaf
Round-leaved mallow	324	1 to 6 leaf	162	1 to 6 leaf
Volunteer flax	243	1 to 12 cm	125	1 to 12 cm
Chickweed††	324	up to 8 cm	162	up to 8 cm

Weeds Controlled	180 g/L		333 g/L	
	Rate (mL per acre)	Stage	Rate (mL per acre)	Stage
Hemp-nettle†	324	2 to 6 leaf	162	2 to 6 leaf
Stork's-bill†	243	1 to 8 leaf	125	1 to 8 leaf
Wild buckwheat†	324	1 to 4 leaf	85	1 to 8 leaf

***170 to 340 mL per acre in rangeland, permanent pasture, rights-of-way, industrial and other non-crop areas. For spot applications mix 17 to 34 mL per 100 L spray solution**
† Suppression only.
†† Suppression only with 180 g/L formulations, control with 333 g/L formulations.
Make only ONE APPLICATION per year of any of these products or other products containing fluroxypyr. Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Application Information:

- **Water Volume:**
  - ***Ground:*** 20 to 40 L per acre. All other uses minimum 40 L per acre.
  - ***Aerial:*** *Perimeter II* only – 12 to 20 L per acre.
- **Nozzles and Pressure:** Maximum 30 to 40 psi (200 to 275 kPa) when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage of ***ASABE coarse*** droplets.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
fluroxypyr	POST (foliar)	Synthetic Auxin	Throughout the plant (Symplast)	Broadleaf only	4

Effects of Growing Conditions:

The activity these products are influenced by weather conditions. The temperature range for optimum activity is 12°C to 24°C. Reduced activity will occur when temperatures are below 8°C or above 27°C. Frost 3 days before or after application may reduce weed control and crop tolerance. Weed control may be reduced during stress conditions (drought, heat or cold stress) or if extremely heavy infestations exist.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides:

The following mixes may be used with each of the products above unless noted otherwise.

- ***In all labelled crops:***
  - MCPA Ester (up to 560 g ae per acre)
  - *Curtail M* (0.61†† to 0.81 L per acre)
- ***In all labelled crops - except oats:***
  - 2,4-D ester (up to 560 g ae per acre)

The following mixes may be used with fluroxypyr alone or in combination with the broadleaf tank mix partners above unless otherwise indicated.

- ***In spring wheat (including durum) and barley:***
  - *Refine SG*
  - Tralkoxydim†*
- ***In spring wheat (including durum) only:***
  - Clodinafop 240 EC† (93 mL per acre)
  - Fenoxaprop†
  - *Simplicity OD*††Δ
- ***In rangeland, permanent pasture, rights-of way, industrial and other non-crop areas:****
  - Milestone

Insecticides: None registered.
Fungicides: None registered.
Fertilizer: None registered.
*** Temporary crop injury or reduced wild oats control may occur with this tank mix.**
*******Advantage Fluroxypyr 333 EC, Cavalier 333* and *Fluro Star Max* only**
† See product labels for specific brands registered.
†† *Perimeter II* only.
Δ Only with tank mix with 2,4-D ester.

According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product..
Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 1 hour will reduce control.
- **Restricted Entry Interval:** DO NOT re-enter treated area within 12 hours.
- **Grazing Restrictions:** Livestock may be grazed 3 days after application. DO NOT feed or cut forage grasses for hay.
- **Pre-harvest Interval:** Leave 60 days between application and harvest.
- **Re-cropping Interval:**
  - ***All Products:*** Barley, canola, flax, forage grasses, lentils, mustard, oats, peas, rye, and wheat, may be grown the year after application. There are no re-cropping restrictions the second year after application.
  - **Perimeter II *only:*** Alfalfa, corn, dry beans, faba beans, potatoes, soybeans and sunflowers may also be seeded the year following.
- **Aerial Application:** *Perimeter II, Fluro Star Max* only may be applied by air.
- **Storage:** Avoid freezing. If frozen, bring to room temperature and agitate before use. These products are combustible. DO NOT store near heat or open flame.
- **Buffer Zones:**
  - ***Ikwin:*** Leave a buffer of 15 metres from water bodies, wetland areas and plants that may be injured.
  - ***Perimeter II, Cavalier 180, Fluro Star, Fluro Star Max:***

Application method	Product	Buffer Zones (metres†) Required for the Protection of:		
		Aquatic Habitats of Depths		Terrestrial habitat
		Less than 1 m	Greater than 1 m	
Ground only*	*Cavalier 180, Fluro Star Max*	1	0	1
	Cavalier 333 and *Perimeter II*	1	0	3
Fixed wing aircraft	*Cavalier 333* and *Perimeter II* only	5	0	95
Helicopter	*Cavalier 333* and *Perimeter II* only	3	0	80

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance is measured from the downwind edge of the boom to sensitive areas.

Sprayer Cleaning:

Refer to 'Method A' in the general section on sprayer cleaning in the introduction.

Hazard Rating:

Ikwin, Fluro Star Max, Cavalier 180, Cavalier 333: Danger – Poison

All products:

Warning – Eye Irritant

Caution – Skin Irritant

Refer to the Introduction for an explanation of the symbols.

Fluroxypyr + 2,4-D

Herbicide Group
4 - fluroxypyr, 2,4-D

This product is a prepackaged tank mix of fluroxypyr and 2,4-D ester. Information listed is restricted to Crops, Weeds, Rates and Tank mixes. For other detailed restrictions and other general information on the component products see the product pages listed above.

Company:

AgraCity (*Foxxy Pro, Foxxy Extreme*)
Corteva Agriscience (*Attain XC**)
Nufarm Agriculture (*Flurox-24*)
ADAMA Canada (*Rush 24*, *Rush 24 All In*)
Viking (*Viking Kalmar*)
* ***Note:*** *This product is no longer manufactured but inventories still remain in distribution. This product may be removed from future editions.*

Formulation:

The *Attain XC* package has the following components:

***Attain XC A* (PCP#29973):** 333 g/L fluroxypyr formulated as an emusifiable concentrate.

- Container size - 5 L

***Attain XC B* (PCP#29972):** 660 g/L 2,4-D ester formulated as an emusifiable concentrate.

- Container size - 2 x 6.8 L

-or-

The packages for *Flurox-24, Rush 24* or *Viking Fluroxypyr* or *Foxxy Pro* have the following components:

***Nufarm Fluroxypyr* (PCP#30194), *Fluroxypyr 180 EC* (PCP#30815), *Foxxy* (PCP#32952), *Viking Fluroxypyr* (PCP#34778):** 180 g/L fluroxypyr formulated as an emusifiable concentrate.

- Container sizes:
  - *Nufarm Fluroxypyr* - 7.28 L
  - *Viking Fluroxypyr* - 9.6 L
  - *Fluroxypyr 180 EC*- 9.6 L, 96 L, 980 L
  - *Foxxy - 5.2 L*

2,4-D Ester 700 (PCP#27820), Salvo 2,4-D Ester 700 (PCP#27818), 2,4-D Ester 700 II (PCP#34808), Viking 2,4-D Ester 700 (PCP#34813): 660 g/L 2,4-D ester formulated as an emusifiable concentrate.

- Container sizes:
  - *Flurox-24* package - 10.3 L
  - *Salvo (Rush 24)*, *Viking 2,4-D Ester 700* - 9.8 L[§]
  - *Foxxy Pro* package - 9.8 L[§]
  - *Foxxy Extreme* package - 13.3 L, 326 L

-or-

Rush 24 All In (PCP# 34878): 90 g/L fluroxypyr + 360 g/L 2,4-D ester.

- Container sizes: 2 x 8.9 L, 106.8 L, 427.2 L

[§] NOTE: The amount of 2,4-D 700 ester provided in the *Rush 24, Foxxy Pro* and *Viking Kalmar* packages is roughly 75% of the 2,4-D ester required to achieve the rates listed below. Additional 2,4-D ester will need to be purchased to achieve labelled use rates.

Crops and Staging:

Spring wheat (including durum), barley: 4 leaf up to the emergence of the flag leaf.

Winter wheat: Apply to winter wheat in the spring from the 3 tiller stage to just before the flag leaf stage (*Attain XC* only).

Forage Grasses for seed production only*:

- Seedling and established grasses at the 4 leaf up to the emergence of the flag leaf.
  - Bromegrass (meadow, smooth)
  - Fescue (creeping red, tall)
  - Timothy
  - Wheatgrass (crested, intermediate)

  * ***NOTE: Since these uses are registered under the User Requested Minor Use Label Expansion (URMULE) program, the manufacturer assumes no responsibility for herbicide performance. Those who apply these uses do so at their own risk.***

When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

Weeds, Rates and Staging:

The following weeds are controlled at the 2 to 4 leaf stage, unless otherwise specified:

[§] NOTE: The amount of 2,4-D 700 ester provided in the *Rush 24*, *Foxxy Pro* and *Viking Kalmar* packages is roughly 75 percent of the 2,4-D ester required to achieve the rates listed below. Additional 2,4-D ester will need to be purchased to achieve labelled use rates.

- ***Attain XC A* at 95 mL per acre plus *Attain XC B* at 260 mL per acre or;**
  ***Nufarm* or *ADAMA Fluroxypyr 180* or *Foxxy* or *Viking Fluroxypyr* at 180 mL per acre plus 2,4-D ester 700 component[§] at 260 mL per acre controls the weeds controlled by 2,4-D ester at 170 g ae per acre (see 2,4-D) plus the following weeds:**
  - Annual sunflower
  - Cleavers*
  - Field horsetail (top growth)
  - Hoary cress (top growth[Δ])
  - Kochia
  - Vetch
  - Wild buckwheat**

  *** 1 to 4 whorls with *Flurox-24, Rush 24, Foxxy Extreme, Foxxy Pro* and *Viking Fluroxypyr*; 1 to 6 whorls with *Attain XC* only.**
  **** 1 to 4 leaf with *Flurox-24*, *Foxxy Extreme, Foxxy Pro* and *Viking Kalmar*; 1 to 6 leaf with *Attain XC* and *Rush 24* only.**
- ***Attain XC A* at 125 mL per acre plus *Attain XC B* at 340 mL per acre or;**
  ***Nufarm* or *ADAMA Fluroxypyr 180* or *Foxxy or Viking Fluroxypyr* at 240 mL per acre plus 2,4-D ester 700 component[§] at 340 mL per acre controls the weeds controlled by 2,4-D ester at 227 g ae per acre (see 2,4-D) plus the following weeds:**
  - *All weeds listed above plus:*
    - Cleavers (1 to 8 whorls)[Δ]
    - Docks
    - Dog mustard
    - Field bindweed (top growth)
    - Gumweed
    - Hairy galinsoga
    - Hedge bindweed
    - Hemp-nettle (2 to 6 leaf stage)[†]
    - Kochia (2 to 8 leaf)
    - Round-leaved mallow (1to 6 leaf)
    - Smartweed
    - Stork's bill (1 to 8 leaf)
    - Volunteer flax (1 to 12 cm)
    - Wild buckwheat***

  ***** 1 to 4 leaf with *Flurox 24*, *Foxxy Pro, Foxxy Extreme* and *Viking Kalmar*; 1 to 8 leaf with *Attain XC* and *Rush 24* only.**
  [Δ] *Attain XC* and *Flurox-24* only.
  [†] Suppression only.

Make only ONE APPLICATION per year of any of these products or other products containing the same active ingredients. Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Application Information:

- **Water Volume:**
  - ***Ground:*** *Attain XC* use 20 to 40 L per acre. All other products minimum 40 L per acre.
  - ***Aerial:*** *Attain XC* only use 12 to 20 L per acre.
- **Nozzles and Pressure:** Maximum 30 to 40 psi (200 to 275 kPa) when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage of ***ASABE coarse*** droplets.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides:

The following mixes may be used with each of the combinations above unless noted otherwise.

- ***In spring wheat (including durum) and barley:***
  - Tralkoxydim[†]*
- ***In spring wheat (including durum) only:***
  - Clodinafop 240 EC[†] (93 mL per acre)
  - Fenoxaprop[†]
  - *Simplicity OD*[††]
  - *Simplicity GoDRI*[††]

Insecticides: None registered.

Fungicides: None registered.

Fertilizer: None registered.

*** Temporary crop injury or reduced wild oat control may occur with this tank mix.**
[†] See product labels for specific brands registered.
[††] Low rate of *Attain XC* only.

According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 1 hour may reduce effectiveness.
  Grazing Restrictions: DO NOT permit lactating dairy animals to graze cereal fields within 7 days of application. DO NOT harvest cereal crops for forage or cut hay within 30 days of application. Withdraw meat animals from treated fields at least 3 days before slaughter. DO NOT feed or cut forage grasses for hay.
- **Re-cropping Interval:**
  - ***All products:*** Barley, canola, flax, forage grasses, lentils, mustard, oats, peas, rye, and wheat, may be grown the year after application. There are no re-cropping restrictions the second year after application.
  - **Attain XC *only:*** Alfalfa, corn, dry beans, potatoes, soybeans, and sunflowers may also be seeded the year following.
- **Aerial Application:** *Attain XC* may be applied by air.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground only*	1	0	1
Fixed wing aircraft (*Attain XC* only)	5	0	95
Helicopter (*Attain XC* only)	3	0	80

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance is measured from the downwind edge of the boom to sensitive areas.

See component products for more information on restrictions, application details and handling. Unless indicated differently above use the most limiting restrictions across all components for the mix.

Fluroxypyr + MCPA

Herbicide Group
4 - fluroxypyr, MCPA

This product is a prepackaged tank mix of Fluroxypyr (see Fluroxypyr) and MCPA Ester.
Information listed is restricted to Crops, Weeds, Rates and Tank mixes.
For other detailed restrictions and other general information on the component products see the product pages listed above.

Company:

AgraCity (*Foxxy M*)
Nufarm Agriculture (*Trophy*)
Viking (*Lidingo*)

Formulation:

The Fluroxypyr + MCPA package has the following components:
***Nufarm Fluroxypyr* (PCP#30194), *Foxxy* (PCP#32952), *ADAMA Fluroxypyr 180 EC* (PCP#30815) or *Viking Fluroxypyr* (PCP# 34778):**
180 g/L fluroxypyr.

- Container sizes:
  - *Nufarm Fluroxypyr, ADAMA Fluroxypyr 180 EC* - 4.8 L
  - *Foxxy* - 9.6 L, 230 L
  - *Viking Fluroxypyr* - 9.6 L

***NuFarm MCPA Ester 600* (PCP#27803), *MCPA Ester 600* (PCP#34156), *ADAMA MCPA 2 EH Ester 600* (PCP#31669) or *Viking MCPA Ester 600* (PCP # 34805):**
600 g/L MCPA Ester.

- Container sizes:
  - *NuFarm MCPA Ester 600, ADAMA MCPA 2 EH Ester 600* - 7.5 L
  - *MCPA Ester 600* - 10 L, 230 L
  - *Viking MCPA Ester 600* - 10 L

All components above are formulated as emulsifiable concentrates.

Crops and Staging:

Spring wheat (including durum), canaryseed*, barley: 3 leaf up to full emergence of the flag leaf.
*** Trophy** ***only - Since the use of this product on canaryseed is registered under the User Requested Minor Use registration system, the manufacturer assumes no responsibility for herbicide performance. Users of this product on canaryseed do so at their own risk.***
When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

Weeds and Staging:

Weeds controlled at the 2 to 4 leaf stage, unless specified, include weeds controlled by MCPA 600 ester at 380 mL per acre plus:

- Cleavers (1 to 4 whorls)
- Hemp-nettle (2 to 6 leaf)
- Kochia
- Vetch
- Volunteer flax (1 to 12 cm)

Weeds suppressed include:

- Green smartweed
- Stork's-bill (1 to 8 leaf)
- Wild buckwheat (1 to 4 leaf)

Rate:

Fluroxypyr component: 0.24 L per acre
MCPA Ester 600 component: 0.38 L per acre.
Maximum ONE APPLICATION per year of these or other products containing fluroxypyr.

Tank Mixes:

Tank mix partners may be mixed at all label rates and include recommended adjuvants unless otherwise noted.
Herbicides:

- ***In spring wheat (including durum) and barley:***
  - Tralkoxydim†
- ***In Spring wheat (including durum) only:***
  - Clodinafop†
  - Flucarbazone†

† See product labels for specific brands registered and compatibility with each product.

Note: The above mixes are those listed on the Fluroxypyr + MCPA Ester labels only.

According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

See component products for more information on restrictions, application details and handling. Unless indicated differently above use the most limiting restrictions across all components for the mix.

Focus

Herbicide Group
14 - carfentrazone-ethyl
15 - pyroxasulfone

Company:
FMC Corporation

Formulation:
***Focus* (PCP#32292):** 447 g/L pyroxasulfone and 53 g/L carfentrazone-ethyl formulated as a suspension emulsion.
- Container size - 4 x 4.5 L

Crops and Staging:
Note: *Seed soybeans at least 4 cm deep and other crops at least 1 inch (2.5 cm) deep or injury may occur.*
Note: *The use of this chemical may result in contamination of groundwater particularly in areas where soils are permeable (e.g. sandy soil) and/or the depth to the water table is shallow.*
Apply in the fall or in the spring prior to seeding of or up to 3 days after seeding of:
- Corn
- Lentil†
- Field peas†
- Soybean
- Sunflower
- Wheat (spring and winter, NOT durum)

† **Under certain conditions, *Focus* can affect lentil and field pea growth. See details under "Effects of Growing Conditions" below.**
WARNING – application to emerged crops will result in severe damage to the crop.

DO NOT apply *Focus*:
- to soils with 7 percent or more organic matter content.
- to soils with a pH greater than 7.8.
- to sandy soils with less than 1 percent organic matter content.
- in conjunction with products containing saflufenacil (*Heat*), before or after the application of *Focus* as crop injury may occur.

Weeds and Staging:
Control of the following weeds emerging from seed (not controlled if emerged at application):
- Annual bluegrass
- Barnyard grass
- Brome (downy, Japanese)
- Cleavers
- Foxtail (green, yellow)
- Foxtail barley*
- Kochia*
- Lamb's-quarters*
- Mustard (wild*, wormseed)
- Persian darnel*
- Pigweed (green, redroot)
- Ryegrass (Italian)
- Stinkweed*
- Waterhemp
- Wild buckwheat*
- Wild oats*
- Velvetleaf

*** Suppression only.**

The following emerged weeds are controlled by *Focus* up to the 10 cm stage unless otherwise indicated (burn-off):
At the 90 mL per acre rate:
- Lamb's-quarters (up to 7.5 cm tall)
- Nightshade** (black, Eastern black - up to 5 cm tall)
- Pigweed (redroot, waterhemp**)
- Velvetleaf

At the 113 mL per acre rate:
Weeds controlled post-emergent above plus:
- Flixweed
- Lamb's-quarters
- Nightshade (hairy)
- Pennsylvania smartweed (seedlings)
- Pigweed (prostrate, smooth, tumble, waterhemp)
- Purslane
- Round-leaved mallow
- Stinkweed
- Tansy mustard

At the 136 mL per acre rate:
Weeds controlled post-emergent above plus:
- Carpetweed
- Cleavers
- Cocklebur
- Jimsonweed
- Kochia
- Nightshade (black, Eastern black)
- Russian thistle (up to 5 cm tall)
- Shepherd's-purse
- Volunteer canola

Rates:

Treatment	Rate (per acre)	
	Soil Type	
	Coarse to Medium Texture (1 to 3 percent O.M.)*	Medium to Fine Texture (> 3 to 7 percent O.M.)*
Early season control only (spring application only)	90 mL	
Extended residual control (spring or fall application)	113 mL	136 mL

*** O.M. = organic matter content.**

Coarse to Medium soils	Medium-Fine to Fine soils
Sand, loamy sand, sandy loam, loam, silt loam, silt	Sandy clay loam, sandy clay, silty clay loam, silty clay, clay loam, clay

Maximum ONE APPLICATION of *Focus* or other products containing pyroxasulfone within a 12 month period.
Use non-ionic surfactant at 0.25 L per 100 L of spray solution or *Merge* at 1 L per 100 L of spray solution for emerged broadleaf weeds, if using *Focus* without glyphosate.
DO NOT follow a fall application of *Focus* (or any other product containing pyroxasulfone) with a spring application of *Authority 480* (or any other product containing sulfentrazone) to fields where spring wheat will be planted.
Refer to the product label for complete mixing instructions for this product and its mixes. A general guide to mixing can be found in the introduction.

Application Information:

- **Water Volume:** Minimum of 40 L per acre. Higher spray volume is required for dense weed stands. Weed control improves with the amount of coverage.
- **Nozzles & Pressure:** Maximum 35 psi (210 kPa) when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE medium*** droplets.
- Apply to a uniform seedbed which is firm and clod free. DO NOT mechanically incorporate between application and seeding the crop as this can destroy the herbicide barrier and allow weeds to escape. DO NOT apply to frozen soils or existing snow cover as runoff may result.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
carfentrazone-ethyl	POST (foliar)	PPO Inhibitor/ Membrane disruptor	Little movement due to rapid cell leakage (Symplast)	Non-selective Broadleaf	14
pyroxasulfone	PPI, PRE (surface) with residual soil activity	Long-chain Fatty Acid Inhibitor	Little movement (Symplast)	Broadleaf & grass	15

Effects of Growing Conditions:

All Crops: Moisture, a minimum of 15-25mm. shortly after application, is necessary to activate the Pyroxasulfone component in soil for effective weed control. Dry weather following applications may reduce effectiveness. Extremes in environmental conditions such as temperature, moisture, soil conditions, and cultural practices may affect activity. Excessive rainfall, irrigation, or prolonged wet soil conditions after application of *Focus* from seed germination through seedling emergence may increase the risk of seedling injury, especially with shallow seeded crops.
Lentils, Peas: Under certain conditions, *Focus* can affect lentil and pea growth. These conditions include high pH (7.5 and above), cool weather, prolonged and excessive moisture, seedling diseases, and any other conditions, including poor agronomic practices, that are unfavorable to vigorous crop growth. Such effects are often observed as stunting and discoloration. The duration of these effects is somewhat dependent on the duration of the adverse growing conditions. These effects lessen and generally diminish with the return to normal growing conditions.

Tank Mixes:

Herbicides:

- ***Prior to field corn only:***
  - *AAtrex* (0.85 to 1.25 L per acre) (soil activity).
- ***Prior to all crops:***
  - Glyphosate (180 to 360 g ae per acre)
- ***Prior to wheat (spring, winter, NOT durum), soybean*, field pea*:***
  - *Express SG** + glyphosate

  *** Refer to crop specific restrictions of *Express SG* prior to pulse crops.**

According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Heavy rainfall shortly after application may reduce weed control of the carfentrazone component. Moderate rainfall (see 'Effects of Growing Conditions' above for details) within a few days of application is required for proper activity of the pyroxasulfone component.
- **Restricted Entry Interval:** DO NOT re-enter treated fields for 12 hours.
- **Grazing Restrictions:** DO NOT allow livestock to graze or feed on wheat grain, forage, hay or straw within 42 days after application.
- **Pre-harvest Interval:** Not applicable.
- **Re-cropping Interval:** Field corn, field pea, lentils, soybeans, sunflower, wheat (winter and spring, NOT including durum) may be seeded any time following application. Barley, canola, chickpeas, durum, flax, mustard, oats, safflower may be seeded 12 months after application. Sugar beets may be seeded 24 months after application. Conduct a field bioassay to confirm crop safety prior to seeding any other rotational crops.
  Note: If there is a lack of adequate or normal soil moisture due to drought conditions following an application of Focus, the minimum rotational crop interval described above must be extended for one additional year and a representative bioassay of the field must be conducted with the potential rotational crop and adequate soil moisture to determine the crop sensitivity to Focus.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** STORE ABOVE 5°C TO KEEP PRODUCT FROM FREEZING. If frozen, thaw before use. If solid crystals are observed, warm material to above 15°C by placing container in warm location. Shake or roll container periodically to redissolve solids.
- **Buffer Zones:**

Application Method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground *	5	3	5

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Refer to 'Method A' in the general section on sprayer cleaning in the introduction.

Hazard Rating:

No specific hazards.

Foxxy MR

This product is a prepackage tank mix of thifensulfuron/tribenuron (2:1), MCPA Ester and fluroxypyr. Information listed is restricted to Crops, Weeds, Rates and Tank Mixes. For other detailed restrictions and other general information on the component products see the product pages listed above.

Herbicide Group
4 - fluroxypyr, MCPA
2 - thifensulfuron, tribenuron

Company:
AgraCity

Formulation:
The *Foxxy MR* package contains the following components:
***Foxxy* (PCP#32952):** 180 g/L fluroxypyr formulated as an emulsifiable concentrate.
- Container sizes - 9.6 L, 230 L

-plus-
***MCPA Ester 600* (PCP#34156):** 600 g a.e./L MCPA Ester formulated as an emulsifiable concentrate.
- Container sizes - 9.6 L, 230 L

-plus-
***MPOWER RX* (PCP#33520):** 50% Thifensulfuron-methyl + 25% tribenuron-methyl formulated as water dispersible granules.
- Container sizes - 320 g, 24 x 320 g

Crops and Staging:
Spring wheat, durum wheat, barley: 3-leaf to early flag leaf stage.

Weeds and Staging:
Weeds controlled by Thifensulfuron/Tribenuron (2:1) plus the weeds controlled by MCPA Ester at 240 mL per acre plus:
- Cleavers (1 to 4 whorls)
- Kochia (2 to 8 leaf)
- Volunteer flax (1 to 12 cm)
- Stork's-bill (1 to 8 leaf)*

*** Suppression only.**

Rates:
Note: Maximum ONE APPLICATION of this or other products containing fluroxypyr or thifensulfuron per year.
***Foxxy*:** 240 mL per acre
-plus-
MCPA Ester 600: 240 mL per acre
-plus-
***MPOWER RX*:** 8 g per acre
Add *Agral 90, Agsurf II* or *Citowett Plus* at 0.2 L per 100 L of spray solution if applied without a wild oat herbicide.
MPOWER RX may degrade if left in the sprayer for an extended period. Apply within 24 hours of mixing.
Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Tank Mixes:
None registered.

According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product..

See component products for more information on restrictions, application details and handling. Unless indicated differently above use the most limiting restrictions across all components for the mix.

Frontier Max

Herbicide Group
15 - dimethanamid

Company:
BASF Canada (PCP#29194)

Formulation:
720 g/L dimethanamid-P formulated as an emulsifiable concentrate.
- Container sizes - 3 L to 1000 L

Crops and Staging:
Pre-plant incorporated:
- Corn (NOT sweet corn, popcorn, or corn grown for seed).

Pre-emergence surface:
- Dry beans (navy and kidney beans only).
- Potatoes – after planting or after hilling, but before emergence of the crop or weeds.

Weeds and Staging:
Pre-emergent control of green foxtail.

Rates:
Pre-plant incorporated treatments:
- Apply at 0.35 to 0.39 L per acre. Apply at the higher rate on fine-textured or high organic soils and for heavier anticipated weed problems.

Pre-emergence surface treatments:

Soil Type (Texture)	Rate (L per Acre)		
	Less than 3 percent Organic Matter	3 to 6 percent Organic Matter	7 to 10 percent Organic Matter
Coarse	0.31	0.31	0.35
Medium and Fine	0.31	0.35	0.39

Application Information:
- **Water Volume:** A minimum of 40 L per acre.
- **Pressure:** 30 to 43 psi (200 to 300 kPa).
- **Nozzles:** Flat fan or flood-jet. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage of ***ASABE medium*** droplets.
- **Screens:** Use 16 mesh suction screen, 50 mesh elsewhere on sprayer.
- **Incorporation:** For pre-plant incorporated treatments, apply *Frontier Max* as a broadcast treatment and incorporate using a harrow, rolling cultivator or other implement capable of giving uniform, shallow incorporation into the top 5 cm (2 inches) of soil within 7 days of planting. Avoid deeper incorporation or reduced weed control and/or crop injury may result. Immediate incorporation after application is not necessary.
  - Beans must be planted at least 4 cm (1.5 inches) deep or crop injury may occur.

How it Works:
Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
dimethanamid-P	PPI, PRE (suface) with residual soil activity	Long-chain Fatty Acid Inhibitor	Little movement (Symplast)	Broadleaf & grass	15

Effects of Growing Conditions:
Rainfall is required within 7 to 10 days of application to activate and move *Frontier Max* into the soil zone. If dry conditions persist, a shallow cultivation or the use of a rotary hoe is necessary to move the herbicide into moist soil and control weed escapes. Shallow tillage is important to minimize dilution of the herbicide. If drought conditions persist after pre-plant incorporated or pre-emergence applications, weed control may not be adequate.

Tank Mixes:

Herbicides: None registered.

Fertilizers: May be applied with a liquid fertilizer carrier. Test compatibility with liquid fertilizer by mixing a small amount of herbicide with a proportional quantity of liquid fertilizer in a jar. May also be impregnated on dry bulk fertilizers for pre-plant incorporated treatments. A minimum of 90 kg per acre of dry bulk fertilizer should be applied. DO NOT impregnate *Frontier Max* on nitrate fertilizers, superphosphates or limestone.

Insecticides: None registered.

Note: The above mixes are those listed on the *Frontier Max* label only.

Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Rainfall after application is important for good weed control.
- **Restricted Entry Interval:** DO NOT enter treated fields for 24 hours.
- **Grazing Restrictions:** DO NOT graze or feed the treated corn crop within 40 days of application. DO NOT graze the treated bean crop or feed bean forage, hay or straw to livestock.
- **Re-cropping Interval:** DO NOT plant winter wheat within 120 days of application.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** DO NOT freeze. Must be stored under heated warehouse conditions.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground only*	1	1	3

See the Key to Product Pages in the introduction for an explanation of the different habitats.

*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**

† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Refer to 'Method A' in the general section on sprayer cleaning in the introduction. When mixing with other pesticides, combine the method above with the method recommended for the tank mix partner if different from above for thorough cleaning.

Hazard Rating:

Caution – Poison

Warning – Eye Irritant and Potential Skin Sensitizer

Refer to the Introduction for an explanation of the symbols.

Glufosinate 150 SN

Herbicide Group 10 - glufosinate

Company:

BASF Canada (*Liberty 150SN*)
AgraCity (*MPOWER Vigor*)
UPL AgroSolutions Canada (*Interline*)
Advantage Crop Protection (*Advantage Glufosinate-ammonium 150SN*)
WinField United (*Justice*)*
Sharda CropChem (*Opportunity 15SL*)
Viking (*Viking Glufosinate 150)*
NuFarm Agriculture (*Granata)*
Innovis Crop Protection Limited *(Innovis Glufosinate-ammonium 150 SN, SyntheSIZE 280 HE*)
ADAMA Canada (*ADAMA Glufosinate 150 SL*)
Advantage Crop Protection (*Advantage Glufosinate 150*)
Rath Holdco Inc. (*RHI Glufosinate Ammonium 150, RHI Glufosinate 280)*
Interprovincial Cooperative Ltd. (*IPCO Glufosinate 150*)

*** Note:** *This product is no longer manufactured but inventories still remain in distribution. This product may be removed from future editions.*

Formulation:

***Liberty 150 SN* (PCP#28837), *MPOWER Vigor* (PCP#33267), *Interline* (PCP#32860), *Innovis Glufosinate ammonium 150 SN* (PCP#33472), *Justice* (PCP#33615), *Opportunity 15SL* (PCP#34332), *Granata* (PCP#34807), *ADAMA Glufosinate 150 SL* (PCP#34833), *Viking Glufosinate* 150 (PCP#34726), *IPCO Glufosinate* 150 (PCP#35053), *RHI Glufosinate Ammonium 150* (PCP# 35001), *Advantage Glufosinate 150* (PCP# 34827):**
150 g/L glufosinate ammonium formulated as a solution.

- Container sizes:
  - *Liberty 150SN, Interline* - 13.5 L, 108 L, 432 L, 864
  - *MPOWER Vigor, Viking Glufosinate* - 2 x 13.5 L, 108 L, 500 L, 1000 L
  - *Justice* - 108 L, 500 L
  - *Innovis Glufosinate-ammonium 150SN* - 10 L, 120 L, 500 L, 1000 L
  - *Granata* - 500 L
  - *ADAMA Glufosinate 150 SL* - 2 x 13.5 L, 108 L, 432 L

***RHI Glufosinate 280* (PCP#34902), *SyntheSIZE 280 HE* PCP#35033):** 280 g/L glufosinate ammonium formulated as a solution.

- Container sizes: 2 x 10 L, 120 L, 500 L, 1000 L

Crops, Rates and Staging:

Liberty Link Canola – cotyledon to early bolting stage. Temporary crop discolouration (bronzing, speckling) may be observed after application.
Note: A valid Liberty and Trait Agreement is required to purchase Liberty 150SN only.

Repeat Applications:

Liberty 150SN only: Up to 3 applications per year to LibertyLink canola at rates up to 1.62 L per acre for each of the three applications (if required) up to early bolting stage of canola. Apply when new weed growth is in the correct leaf stage. DO NOT apply more than 4.86 L per acre per year.
Other Glufosinate 150 SN brands: A second application of up to 1.35 L per acre may be made to fields to a maximum total combined rate of 2.97 L per acre (i.e. 1.62 L plus 1.35 L). DO NOT apply more than 2.97 L per acre in one season.
RHI Glufosinate 280 and SyntheSIZE 280 HE: a second application of up to 0.72 L per acre may be made to fields to a maximum total combined rates of 1.59 L per acre (i.e. 0.87 L plus 0.72 L). DO NOT apply more than 1.59 L in one season.
Glufosinate tolerant Soybean (*Opportunity 15SL, Granata* and *ADAMA Glufosinate 150 SL* only): Up to two applications of up to 1.35 L per acre from the cotyledon to flowering stage. Maximum 2.7 L per acre per season.
When tank mixing, always check the tank mix partner recommendations for additional staging restrictions. **DO NOT tankmix *Liberty 150SN* with *Interline* or *ADAMA Glufosinate 150 SL*.**

Harvest Aid Treatment:
Note: As of January 1, 2025 www.keepitclean.ca indicates that the use of this product on certain crop types may have market access concerns. Please see introduction for more information AND consult potential grain buyers before using this product.

Crop	Rate (L per acre)	Stage
Alfalfa (seed production only)***	1.09	50 to 75% pod turn (brown)
Canola† * (only Roundup Ready canola with pod shatter reduction trait)	0.81 to 1.09 ††	30 to 40% seed colour change (green to brown)
Lentil† **	0.81 to 1.09 ††	40 to 60% pod turn (yellow to brown)
Potato† **	1.21	14 to 21 days prior to harvest

† Not for crops grown for seed.
†† Use the higher rate when crop canopies or weed densities are heavy.
*** *Innovis Glufosinate-ammonium 150SN* and *RHI Glufosinate Ammonium 150* only.**
**** *Innovis Glufosinate-ammonium 150SN, MPOWER Vigor, Viking Glufosinate and RHI Ammonium Glufosinate 150* only.**
***** *Innovis Glufosinate-ammonium 150SN, MPOWER Vigor, Interline, Opportunity 15SL, Justice, Viking Glufosinate , RHI Glufosinate Ammonium 150 and Advantage Glufosinate 150* only.**

RHI Glufosinate 280 and SyntheSIZE 280 HE

Crop	Rate (L per acre)	Stage
Canola†** (only Roundup Ready canola with pod shatter reduction trait)	0.43 - 0.59††	30 to 40 % seed color change (green to brown)

†Not for crops grown for seed.
†† Use the higher rate when crop canopies or weed densities are heavy.
****DO NOT harvest treated crop within 5 days after application.**

Weeds, Rates and Staging:

Weed	Weed Stage (from emergence to stage)	All 150 formulations Rate (L per acre)	All 280 formulations Rate (L per acre)
Cow cockle	4 leaf	0.54	0.29
Green foxtail	6 leaf (max. 3 tillers)		
Barnyard grass	4 leaf	0.81	0.43
Wild mustard	5 leaf		
Lamb's-quarters, smartweed (lady's-thumb)	6 leaf		
Stinkweed	8 leaf		
Smartweed	6 leaf		
Volunteer flax	2.5 inches (6 cm)		
Russian thistle	3 inches (8 cm)		
Wild buckwheat	3 leaf	1.08	0.58
Redroot pigweed, round-leaved mallow, quackgrass*	4 leaf		
Light to moderate infestations† of volunteer wheat, volunteer barley*	4 leaf (max. 2 tillers)		
Hemp-nettle (1 to 3 leaf pairs), shepherd's-purse	6 leaf		
Common chickweed (max. 4 leaf pairs), sow-thistle	8 leaf		
Kochia	3 inches (8 cm)		
Canada thistle*, scentless chamomile	4 inches (10 cm)		

Weed	Weed Stage (from emergence to stage)	All 150 formulations Rate (L per acre)	All 280 formulations Rate (L per acre)
Cleavers	2 whorls (nodes)	1.35	0.72
Stork's-bill and heavy populations of wild buckwheat	3 leaf		
Quackgrass (light to moderate** or heavy infestations*)†, wild oats	4 leaf (max. 2 tillers except quack-grass)		
Heavy infestations† volunteer wheat, volunteer barley*	4 leaf (max. 2 tillers)		
Hemp-nettle	8 leaf (1 to 4 leaf pairs)		
Dandelion rosettes	6 inches (15 cm) across		
Flixweed, Canada thistle*	4 inches (10 cm)		
Jimsonweed††	1 to 6 leaf		
Quackgrass***	4 leaf	1.6	0.87
Canada thistle**	4 inches (10 cm)		
Japanese, Downy brome (spring germinated)	6 leaf (up to emergence of 1st tiller)	1.6†††	N/A

*** Top growth suppression. Plants may return from surviving growing points.**
**** Extended top growth suppression.**
***** Season long control.**
† The company does not provide guidelines for weed densities. When in doubt as to the infestation level, use the high rate or contact the manufacturer.
†† *Liberty150SN* and *Granata* only
††† *Liberty 150 SN, Interline, Opportunity 15SL, IPCO Glufosinate 150* and *Advantage Glufosinate 150* only

Application Information:

- **Water Volume:**
  - ***Ground:*** Minimum 45 L per acre. When crop canopy and weed densities are heavy, apply in 69 to 89 L per acre of water.
  - ***Aerial:*** 13 to 22 L per acre.
- **Nozzles and Pressure:**
  - ***Ground:*** Use 40 psi (275 kPa) when using conventional 80° or 110° flat fan nozzles; 45 psi (310 kPA) when using check valves. Angle nozzles forward at 45° to improve coverage of vertical leaf surfaces. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE medium*** or larger droplets.
  - ***Aerial:*** DO NOT use raindrop nozzles. Use a combination of nozzles and pressure to provide ***ASABE coarse*** or larger droplet size distribution.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
glufosinate	POST (foliar)	Glutamine Synthase Inhibitor/ Membrane disruptor	Little movement due to rapid cell leakage (Symplast)	Broadleaf & grass	10

Effects of Growing Conditions:

Glufosinate 150SN activity is influenced by environmental conditions. Cool temperatures (less than 10°C), drought, and low humidity conditions slow weed growth. Applications made under these stressed conditions may result in reduced weed control.

Tank Mixes:

Herbicides:

Note: Avoid mixing different glufosinate products in the same tank as incompatibilities have been reported.

- Clethodim (*Select 1EC or Shadow XL* **ONLY**) 51 mL to 153 mL$^{\Delta}$ per acre. For *Select 1EC* or *Shadow XL* tank mixes add *Glufosinate 150SN* and then the *Select 1EC* or *Shadow XL*. Consult label for specific mixing instructions.
- Clethodim (*Centurion ADV* **ONLY**) 51 mL to 153 mL$^{\Delta\Delta}$ per acre. For tank mixes add *Glufosinate 150SN* and then the *Centurion ADV*. Consult label for specific mixing instructions.
- Clethodim (*Centurion* or *Select* only) 25 mL to 77* mL per acre plus *Amigo*. For *Centurion* or *Select* tank mixes add *Amigo* to the tank first followed by *Glufosinate 150SN* and then *Centurion* or *Select*. Consult label for specific mixing instructions.
- Clethodim (*Centurion or Select* only) 25** mL per acre plus *Amigo*. For *Centurion* or *Select* tank mixes add Amigo to the tank first followed by *Glufosinate 150SN* and then *Centurion or Select*. Consult label for specific mixing instructions.

- *Facet* (quinclorac)*** (113 mL per acre) plus *Merge* or *Amigo* 0.2 L per acre adjuvant (0.2 to 0.4 L per acre)
- *Facet* (quinclorac)**** (113 - 227 mL per acre) plus *Merge or Amigo adjuvant* (0.2-0.4 L per acre).
- Clethodim (*Centurion* only) 25 to 77mL per acre + *Facet* 113 to 227 mL per acre plus *Merge or Amigo* adjuvant (rates above)*****
- *Clever* (quinclorac) 25 g per acre †
- *Clever* or *Ingenious* (quinclorac) 25 g per acre††
  ΔLiberty 150SN and Interline only
  ΔΔLiberty 150SN only
  **** Liberty 150SN, Interline, Opportunity 15SL, Advantage Glufosinate 150 only.**
  *****MPOWER Vigor, Viking Glufosinate 150, RHI Glufosinate Ammonium 150, Innovis Glufosinate-ammonium 150 SN only.**
  ******Interline, Justice, Opportunity 15SL, Granata, ADAMA Glufosinate 150 SL only.**
  *******Liberty 150 SN only.**
  ********Liberty 150SN and Advantage Glufosinate 150 only.**
  †Advantage Glufosinate 150 only.
  ††RHI Glufosinate Ammonium 150, Innovis Glufosinate-ammonium 150 SN only.
- ***RHI Glufosinate 280* and *SyntheSIZE 280 HE*:**
  Clethodim (*Centurion* or *Select* only) 25 mL per ace plus *Amigo*. For *Centurion* or *Select* tank mixes add *Amigo* to the tank first followed by *RHI Glufosinate 280* and then *Centurion or Select*. Consult labe for specific mixing instructions.
- *Ingenious* (quinclorac) (25 g per acre) plus adjuvant
- *Advantage Clethodim* 25 ml per acre plus adjuvant.

Insecticides: None registered.
Fungicides: None registered.
Fertilizers: None registered.

According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 4 hours may reduce control.
- **Restricted Entry Interval:** DO NOT re-enter treated areas for 24 hours after application.
- **Grazing Restrictions:** DO NOT graze the treated crop or cut for feed.
- **Preharvest Interval:** DO NOT apply within 60 days of harvest when tankmixed with quinclorac and/or clethodim. For Harvest Aid uses, leave 9 days between application and harvest of lentil and potato.
- **Re-cropping Interval:** No restrictions for field corn, canola and soybeans.. Following *Liberty 150SN* or *MPOWER Vigor* or *RHI Glufosinate 280* there are no restrictions for dry common beans (not grown for seed), alfalfa, carrot, lettuce, onion and potato. 70 days for buckwheat, barley, millet, oats, rye, sorghum, triticale and wheat. Minimum 120 days for all other crops.
- **Aerial Application:** May be applied by air.
- **Storage:** DO NOT freeze.
- **Buffer Zones:**
  - ***Advantage Glufosinate-ammonium 150SN:*** Leave 15 meters by ground and 30 meters by air to sensitive aquatic and terrestrial habitats.
  - ***Liberty 150SN, MPOWER Vigor, Interline, Justice, Viking Glufosinate, RHI Glufosinate 280, SyntheSIZE 280 HE:***

Application method	Crop	Buffer Zones (metres†) Required for the Protection of:		
		Aquatic Habitats of Depths		Terrestrial habitat
		Less than 1 m	Greater than 1 m	
Ground *	All uses	1	0	1
Fixed wing airplane or helicopter	Harvest-Aid uses	1	0	30
	Canola	1	0	30

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

  - DO NOT apply when dead calm or when winds exceed 16 km per hour when using unprotected booms or applying by air, or exceeding 25 km per hour when using shrouded booms.

Sprayer Cleaning:
Refer to 'Method B' in the general section on sprayer cleaning in the introduction.

Hazard Rating:
Warning – Poison

Caution – Skin Irritant

Warning – Eye Irritant

Refer to the Introduction for an explanation of the symbols.

Glufosinate 200 SN

Herbicide Group 10 - glufosinate

Company:
BASF Canada (*Liberty 200 SN* – PCP#25337)
Innovis Crop Protecton Limited (*Innovis Glufosinate 200 SN* – PCP#32823)
AgraCity (*MPOWER Vigor 200 SN* – PCP#33613)

Formulation:
200 g/L of glufosinate ammonium formulated as a solution.
- Container size - 10 L

Crops and Staging:
Glufosinate ammonium tolerant corn only: 1 to 8 leaf stage. Refer to product label for appropriate method of determining crop leaf stage.
Glufosinate ammonium tolerant soybean varieties only: up to the start of flowering and prior to canopy closure.

Weeds Rates and Staging:
Weeds controlled with 0.61 L per acre rate

Weed	Weed Stage (from emergence to stage)
Cocklebur	4 leaf
Green foxtail, proso millet, ragweed	5 leaf
Redroot pigweed, shepherd's-purse	6 leaf
Chickweed	8 leaf

Weeds controlled with 0.81 L per acre rate

Weed	Weed Stage (from emergence to stage)
Perennial sow-thistle, wild buckwheat, wild mustard, wild oats, yellow foxtail	4 leaf
Barnyard grass, eastern black nightshade	5 leaf
Canada thistle*, field bindweed*, lady's-thumb, lamb's-quarters, wormseed mustard	6 leaf
Ragweed	7 leaf
Stinkweed	8 leaf

*** Season long suppression.**

Weeds controlled with 1.0 L per acre rate

Weed	Weed Stage
Quackgrass**	1 to 4 leaf
Jimsonweed	1 to 6 leaf stage

**** Season long suppression, apply with ammonium sulphate, 2.4 L per acre (49 percent solution) or 1.2 kg per acre (99 percent).**

Second Application:

- A second application may be made to fields treated initially with up to 1 L per acre, if weeds and crop are at the correct leaf staging. DO NOT apply more than 2 L per acre *Glufosinate 200 SN* to a crop in a single season.

Split Application Program:

- For season long control of the weeds above a split application of *Glufosinate 200 SN* may be employed. The first application must be a minimum of 0.81 L per acre made at the correct weed staging. For the second application of a 0.51 L per acre rate may be used. The second application timing must be made as soon as the second flush of weeds occurs and before the maximum leaf stage for the crop.

Application Information:

- **Water Volume:** A minimum of 45 L per acre.
- **Nozzles and Pressure:** Use 25 to 40 psi (175 to 275 kPa) when using conventional 80° or 110° flat fan nozzles. Angle nozzles forward at 45° to improve coverage of vertical leaf surfaces. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE medium*** droplets.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
glufosinate	POST (foliar)	Glutamine Synthase Inhibitor/ Membrane disruptor	Little movement due to rapid cell leakage (Symplast)	Broadleaf & grass	10

Effects of Growing Conditions:

Glufosinate 200 SN activity is influenced by environmental conditions. Cool temperatures (less than 10°C), drought and low humidity conditions slow weed growth. Applications made under these stress conditions may result in reduced weed control. Weed control may also be reduced when heavy dew, fog, or mist are present at the time of application.

Tank Mixes:

None registered.

Restrictions:

- **Rainfall:** Within 4 hours of application may reduce control.
- **Restricted Entry Interval:** DO NOT re-enter treated areas for 24 hours after application, without protective clothing as for spraying.
- **Grazing Restrictions:** DO NOT graze treated fields within 20 days of application.
- **Pre-harvest Interval:** Leave 86 days between application and corn harvest, and 70 days for soybean.
- **Re-cropping Interval:** No re-cropping restrictions the year after treatment.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** DO NOT freeze.
- **Buffer Zones:**
  - Hand-held or backpack sprayers, inter-row hooded sprayers and spot treatments are exempt from buffer zone requirements.

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground *	1	0	1

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Refer to 'Method C' in the general section on sprayer cleaning in the introduction.

Hazard Rating:

Caution – Poison

Caution – Skin Irritant

Warning – Eye Irritant

Refer to the Introduction for an explanation of the symbols.

Glyphosate

Herbicide Group 9 - glyphosate

Product Names, Company, Formulation and Package Sizes:

All products are formulated as solutions.
Container sizes available: Various

Product Name	Company	Salt type*	Active** content (g ae per L)
Advantage Glyphosate 360 (PCP#33694)	Advantage Crop Protection	IPA	360
Advantage Glyphosate 540 (PCP#33764)	Advantage Crop Protection	K+	540
Credit 45 (PCP#29124)†	Nufarm Agriculture	IPA	450
Credit Xtreme (PCP#29888)	Nufarm Agriculture	IPA/K+	540
Crush'R Plus (PCP#29995)	Albaugh	IPA	360
Crush'R 540 (PCP#31655)	Albaugh	K+	540
Destroyer 540 (PCP#32945)	Agracity	K+	540
Disruptor 540 (PCP#32817)	AgraCity	K+	540
Factor 540 (PCP#27988)	Interprovincial Cooperative Limited	K+	540
Gallop (PCP#34489)	Sharda CropChem Canada	IPA/K+	540
Glycere 540 (PCP#35218)	Vincere Agri Solutions Ltd.	K+	540
Glyforce WDG (PCP#33400)	Sharda CropChem Canada	MA	68.77%
J-Maxx 540 (PCP#35219)	Vincere Agri Solutions Ltd.	K+	540
Matrix (PCP#29775)	Interprovincial Cooperative Limited	DMA	480
Roundup Transorb HC (PCP#28198)	Bayer	K+	540
Roundup WeatherMax (PCP#27487)	Bayer	K+	540
R/T 540 (PCP#28487)	Bayer	K+	540
Smoke (PCP#31063)	Farmers Business Network Canada	IPA	360
Sharda Glyphosate (PCP#31493)	Sharda CropChem Canada	IPA	360
Shotgun 540 (PCP#33675)	Albaugh	K+	540
Shotgun 360 (PCP#33671)	Albaugh	IPA	360
StartUp (PCP#29498)	Loveland Products Canada	K+	540
Stonewall 540 (PCP#33379)	WinField United Canada	K+	540
Vector 540 (PCP#31598)	Federated Cooperatives	K+	540
Viking 540 Glyphosate (PCP# 34787)	Viking Crop Production Partners Inc.	K+	540

*** Salt type: IPA = Isopropylamine, MA = Monoammonium, DA = Diammonium, DMA = dimethylamine, K+ = Potassium**
**** Formulation concentration is expressed as "grams of acid equivalent per litre of product (g ae/L)" with the exception of *Glyforce WDG*. Glyphosate acid is the herbicidally active component of the formulation and is proportional to the activity of the formulation.**
Note: **Some products may be more effective due to formulation differences (not related to higher glyphosate content) under adverse conditions, but that benefit is reduced when applications are made under optimal conditions for activity (i.e. rapid weed growth, clean leaf surfaces). When selecting a glyphosate product, consult the product labels.**
† *Note: This product is no longer manufactured but inventories still remain in distribution. This product may be removed from future editions.*

Rate (g ae per acre)	Glyphosate formulation concentration (g ae per L)					
	356/360	450	480	500	540	68.77% WDG
36.5	100 mL	81 mL	76 mL	73 mL	67 mL	-
73	200 mL	162 mL	152 mL	146 mL	134 mL	-
110	0.3 L	0.24 L	0.23 L	0.2 L	0.2 L	142 g
120	0.33 L	0.27 L	0.25 L	0.24 L	0.22 L	-

Rate (g ae per acre)	Glyphosate formulation concentration (g ae per L)					
	356/360	450	480	500	540	68.77% WDG
136	0.38 L	0.30 L	0.28 L	0.27 L	0.25 L	-
145	0.4 L	0.32 L	0.3 L	0.28 L	0.27 L	190.2 g
180	0.5 L	0.4 L	0.38 L	0.36 L	0.33 L	242.8 g
275	0.77 L	0.61 L	0.57 L	0.54 L	0.51 L	364.2 g
325	0.91 L	0.73 L	0.68 L	0.65 L	0.61 L	433 g
360	1.0 L	0.81 L	0.76 L	0.73 L	0.67 L	481.6 g
510	1.42 L	1.13 L	1.1 L	1.0 L	0.94 L	671.8 g
540	1.5 L	1.21 L	1.13 L	1.09 L	1.0 L	720.3 g
690	1.9 L	1.54 L	1.44 L	1.38 L	1.28 L	910.5 g
720	2.0 L	1.62 L	1.5 L	1.46 L	1.34 L	959.1 g
1020	2.8 L	2.27 L	2.13 L	2.02 L	1.89 L	1351.7 g
1750	4.9 L	3.88 L	3.6 L	3.48 L	3.24 L	2302.7 g

Crops and Uses:

1. Annual weed control prior to crop emergence or in fallow.
2. Quackgrass control prior to seeding or after harvest.
3. Dandelion control (other than Preharvest).
4. Canada thistle control in fallow, shelterbelts and post-harvest.
5. Alfalfa control (other than Preharvest).
6. Other perennial weeds control in fallow, shelterbelts and post-harvest.
7. Patch treatments of perennial weeds in cereals, corn, soybean and forages.
8. Preharvest perennial weed control.
9. For use in Glyphosate tolerant crops.
10. Tank Mixes.

1. Annual weed control prior to crop emergence or in fallow:

Weeds listed may not occur on all product labels. Check individual product labels for a specific list of weeds controlled.

Rate (g ae per acre)	Surfactant*	Weeds Controlled	Weed Stage
110	0.14 L/acre	**Grasses:** Green foxtail, volunteer cereals, wild oats (light infestations) **Broadleaves:** lady's-thumb, stinkweed, volunteer canola (NOT including glyphosate tolerant varieties), wild mustard.	Less than 3 inches (8 cm) high. Apply at the 1 to 3 leaf stage of wild oats.
145	0.14 L/acre	*Above weeds plus*: **Grasses:** heavy infestations of wild oats **Broadleaves:** suppression of flixweed, kochia.	1 to 3 leaves for wild oats Weeds 3 to 6 inches (8 to 15 cm).
180 to 275	Not required	*Above weeds plus:* **Grasses:** downy brome, Persian darnel. **Broadleaves:** Canada fleabane, cleavers, common ragweed, flixweed, hemp-nettle, lamb's-quarters, narrow-leaved hawk's-beard, redroot pigweed, Russian thistle, volunteer flax, wild buckwheat.	Canada fleabane, common ragweed, less than 3 inches (8 cm) high. Other weeds less than 6 inches (15 cm). Use high rate for narrow-leaved hawk's- beard 3 to 6 inches (8 to 15 cm) or wild buckwheat at the 3 to 4 leaf stage.
325	Not required	*Above weeds plus:* **Grasses:** annual blue grass. **Broadleaves:** annual sow-thistle, kochia, prickly lettuce, shepherd's-purse, narrow-leaved vetch**.	Less than 6 inches (15 cm) high
510	Not required	Above weeds.	Greater than 6 inches (15 cm) high

*** Unless otherwise specified on the product label, use one of the following surfactants: *Agral 90, Agsurf II, Companion* or *LI700*.**

**** Note: Narrow-leaved vetch is an annual species. Established perennial vetches, such as American vetch, may not be controlled at this rate.**

2. Quackgrass control prior to seeding or after harvest:

Rate (g ae per acre)	Quack Grass Stage
360	Season long control of light to moderate infestations. Apply when quack grass is 8 inches (20 cm) tall and has 3 to 4 actively growing leaves. Apply spring or fall.
360 to 1020	Apply when quack grass has 3 to 4 new leaves for long term control of heavy infestations. Use high rate for sod-bound quack grass (left undisturbed for at least 2 years).

DO NOT apply fall treatments if a hard frost has occurred (-5°C) or if plants are drought stressed. Spread straw to allow regrowth and good spray coverage.

Cultivation prior to application will result in reduced control. DO NOT cultivate between harvest and treatment when using fall applications. If using spring applications on fields which have been fall-tilled, delay application until the quack grass has reached the 4 to 5 leaf stage. (This will occur 1 to 4 weeks later on fall-tilled fields than in undisturbed fields).

Cultivation after application usually will improve control of quack grass. Wait a minimum of 3 days after application before cultivating. If growing conditions are poor (cold or dry), particularly in the fall, waiting longer than 5 days may improve control.

3. Dandelion control (other than Preharvest):

Apply up to and including dandelion bloom for best results.

Rate (g ae per acre)	Dandelion Growth Stage
360	Less than 6 inches (15 cm) diameter. Allow 3 or more days after treatment before tillage.
540 to 720	Greater than 6 inches (15 cm) diameter. Use higher rate when infestations are heavy.

4. Canada thistle control in fallow, shelterbelts and post-harvest:

Rate (g ae per acre)	Weed Staging
360	Rosettes at least 6 inches (15 cm) in diameter, treated in late summer, following tillage in spring and early summer (up to August 1). Allow thistles to regrow for 5 weeks following last tillage. Wait a minimum of 10 days after application before tillage. Treatment after a mild frost is possible if leaves are green and pliable and plants are actively growing.
690 to 1020	Bud stage or beyond. Allow at least 5 days after application before tillage. -or- Post-harvest treatment. Allow 8 to 10 inches (20 to 25 cm) of new growth before application. Must be sprayed at least 2 weeks prior to killing frost. Straw should be removed or evenly spread to allow for proper regrowth and spray coverage.

5. Alfalfa Control (other than Preharvest):

Rate (g ae per acre)	Weed Staging
540 to 720	Fall control of alfalfa in early bud to full bloom stage. Use high rate when alfalfa populations are high or when perennial grasses are present. Allow at least 5 days before tillage. See tank mix section for minimum tillage or spring applications. Apply with 23 to 135 L per acre water.

6. Other perennial weed control in fallow, shelterbelts and post-harvest:

(Refer to individual product labels for detailed application information.)

Foxtail Barley:

- Control from seedling to heading (all products) at 360 to 720 g ae per acre. Late fall applications may provide better control of established foxtail barley plants than spring applications.

Yellow toadflax: 360 g ae per acre.

Other Perennial weeds*: 1020 to 1750 g ae per acre

*** Perennial weeds such as absinthe, blue grass spp., smooth brome grass, cattail, curled dock, field bindweed (bloom stage or beyond), hemp dogbane, hoary cress, poison ivy, purple loosestrife, perennial sow-thistle, and yellow nutsedge applied at the early heading to early bud stage.**

7. Patch treatments of perennial weeds in wheat, oats, barley, corn, soybean, forage legumes and forage grasses:

(Refer to individual product labels for detailed application instructions)

Rate (g ae per acre)	Weed
360 to 1020	Quack grass 8 in (20 cm) tall
690 to 1020	Canada thistle bud or beyond
1750	Milkweed bud to bloom
1020 to 1750	Other perennial weeds*
36.5 to 73	Spot treatment rates for hand held equipment (per 10 L water**)

*** Perennial weeds such as absinthe, blue grass spp., smooth brome grass, cattail, curled dock, field bindweed (bloom stage or beyond), hemp dogbane, hoary cress, poison ivy, purple loosestrife, perennial sow-thistle, and yellow nutsedge applied at the early heading to early bud stage.**
**** Use the low rate for quack grass and the high rate for all other perennials.**

8. Preharvest perennial weed control:

DO NOT apply to any crops grown for seed.

Note: As of JJanuary 1, 2025 www.keepitclean.ca indicates that the use of this product on certain crop types may have market access concerns. Please see introduction for more information AND *consult potential grain buyers before using this product.*

Not all glyphosate products are registered for Preharvest applications on all crop species listed below. Refer to specific glyphosate labels for a list of registered uses and crop species.

RATES:

- **Prior to the harvest of annual grains (see staging chart below for specific crops):** 360 g ae per acre.
- **Prior to the final cut of forages to be removed from production:** 360 to 720 g ae per acre.
- **Weeds controlled with preharvest applications:**

Quack grass 4-5 green leaves	Canada thistle and perennial sow-thistle at bud stage or beyond	Common milkweed at bud to bloom stage	Toadflax at bud to full bloom stage	Dandelion from rosette to full bloom stage
X	X	X	X	X

- **Crop Staging for Preharvest applications:**
  - Apply to crops (except forage) when grain moisture is less than 30 percent. The following chart lists visual symptoms that can be used as guidelines to when 30 percent grain moisture has been reached.

Crop*	Visual Guide to Proper Application Stage
Wheat, barley*, oats*, canaryseed***†	Hard dough stage – a thumbnail impression remains on seed.
Canola, mustard‡***†	Pods are green to yellow and most seeds are yellow to brown.
Flax (and solin - low linolenic acid flax)	Majority (75 to 80% of bolls) are brown.
Lentil	Lowermost pods (bottom 15%) are brown and rattle when shaken.
Pea	Majority (75 to 80%) of pods are brown.
Chickpea**†, lupin**†, faba bean**†, dry bean	Stems are green to brown in colour; pods are mature (yellow to brown in colour); 80% to 90% leaf drop (original leaves).
Camelina***†	When 95% of pods have changed colour, seed is firm and less than 40% of seed is green.
Soybean	Stems are green to brown in colour and pod tissue is brown and dry in appearance (80 to 90% leaf drop).
Forage	3 to 7 days prior to the last cut before rotation or forage renovation. DO NOT apply to forage stands that are to be maintained.

*** Registered for application to barley grown for malt and tame oats grown for milling; however, many millers and malsters are not accepting glyphosate treated oats or malt barley. Contact malt barley or milling oats buyers prior to application to confirm acceptance of glyphosate-treated grain.**
**** Preharvest applications on these crops are registered with *Roundup Transorb HC, Roundup WeatherMax, R/T 540, Advantage Glyphosate 540, Stonewall 540, Viking 540 Glyphosate* and *StartUp* only.**
***** Preharvest applications on these crops are registered with *RoundUp Weather Max* only.**
‡ Yellow/white, brown, oriental mustard only.
† *NOTE: Since these uses are registered under the User Requested Minor Use Label Expansion (URMULE) program, the manufacturer assumes no responsibility for herbicide performance. Those who apply glyphosate to chickpea, lupin, faba bean, canaryseed, camelina or mustard do so at their own risk.*

9. For use in glyphosate tolerant canola:

Weeds, Staging and Rates:

***Genuity* (original) glyphosate tolerant canola:**

All applications must be made within the cotyledon to 6 leaf stage. Temporary yellowing may occur if applied at the 4 to 6 leaf stage of the crop.

Not all glyphosate products are registered for use on glyphosate tolerant canola at all rates listed. Refer to individual product labels for specific uses and rates.

Single application of 120 g ae per acre:

- ***Weeds controlled at all stages unless indicated otherwise:***
  - *Annual grasses:* barnyard grass, green foxtail, volunteer cereals, wild oats.
  - *Annual broadleaves:* annual smartweed spp.**, chickweed, corn spurry, cow cockle*, hemp-nettle, kochia, lamb's-quarters, night-flowering catchfly*, redroot pigweed, Russian thistle, shepherd's-purse*, stinkweed, volunteer canola (except glyphosate tolerant varieties), wild mustard, wild tomato.

Single application of 180 g ae per acre:

- ***All stages of the weeds listed above plus:***
  - *Annual broadleaves:* cleavers, flixweed, wild buckwheat, stork's-bill, narrow-leaved hawk's-beard.
  - *Perennial weeds suppressed:* Canada thistle, dandelion, perennial sow-thistle, and season long quack grass control.

Split application of 180 g ae per acre plus 180 g ae per acre:

- ***Additional flushes of the weeds listed above plus:***
  - *Annual broadleaves:* round-leaved mallow
  - *Season long control of following perennials:* Canada thistle, foxtail barley, and perennial sow-thistle.

Single application of 270 g ae per acre:

- ***All weeds in single applications above plus:***
  - *Season long control of following perennials:* Canada thistle and perennial sow-thistle.

*** Low rates can be used only up to the 3 leaf stage of the crop otherwise use the high rate.**
**** Low rates can be used only when annual smartweed is in the 4 to 6 leaf stage.**
NOTE: A maximum of 360 g ae per acre per season is allowed in glyphosate tolerant canola

Second Generation Glyphosate Tolerant (*TruFlex* and *Optimum GLY*) canola varieties only:
TruFlex Canola: *Roundup* brands, *R/T 540*, *Matrix*, and *Startup* only.
Optimum GLY canola: *Credit 45*, *Credit Xtreme*, *Crush'r 540*, *Matrix*, *Shotgun 540*, and *Stonewall* only.
Apply from emergence to first flower stage (50 percent of plants in field have no more than 1 flower) for rates up to one or two applications of the 360 g ae per acre rate. The maximum timing at the 720 g ae per acre rate is the 6 leaf stage.

Single application of 120 to 180 g ae per acre:

- ***Weeds controlled at all stages unless indicated otherwise:***
  - *Annual grasses:* barnyard grass, green foxtail, volunteer cereals, wild oats.
  - *Annual broadleaves:* annual smartweed (incl. lady's-thumb)**, chickweed, cleavers, corn spurry, cow cockle*, flixweed, hemp-nettle, kochia, lamb's-quarters, narrow-leaved hawk's-beard, night-flowering catchfly*, pigweed (redroot), Russian thistle, shepherd's-purse*, stinkweed, stork's-bill, volunteer canola (except glyphosate tolerant varieties), wild buckwheat, wild mustard, wild tomato.
  - *Perennial weeds suppressed:* Canada thistle, dandelion, perennial sow-thistle, and season long quack grass control.

Split application of 180 g ae per acre plus 180 g ae per acre:

- ***Additional flushes of the weeds listed above plus:***
  - *Annual broadleaves:* round-leaved mallow
  - *Season long control of following perennials:* Canada thistle, foxtail barley, and perennial sow-thistle.

Single application of 270 g ae per acre:

- ***All stages of the weeds listed above plus:***
  - *Season long control of following perennials:* Canada thistle and perennial sow-thistle.

Single application of 360 g ae per acre:

- ***All weeds above plus:***
  - *Grasses:* foxtail barley, yellow foxtail, wild proso millet.
  - *Broadleaves:* biennial wormwood (2 to 8 leaf), cocklebur, common milkweed†, nightshade (eastern black), pigweed (smooth), ragweed (common), smartweed (Pennsylvania).

Split application of 360 g ae per acre plus 360 g ae per acre at least 2 weeks apart and prior to 50 percent bloom:

- ***Additional flushes of the weeds listed above plus:***
  - *Season long control of following:* Dandelion, common milkweed (15 to 60 cm), field bindweed, waterhemp (up to 18 leaf stage).

Single application of 720 g ae per acre (maximum 6 leaf stage of *TruFlex* canola):

- ***All weeds above.***

† Supression only.
*** Low rates can be used only up to the 3 leaf stage of the crop otherwise use the high rate.**
**** Low rates can be used only when annual smartweed is in the 4 to 6 leaf stage.**
NOTE: A maximum of 720 g ae per acre per season is allowed in* TruFlex *glyphosate tolerant canola.

10. For use in glyphosate tolerant corn and soybean:

Weeds, Staging and Rates:

All applications must be made within the following crop growth stages.

- ***Corn:*** up to and including 8 leaf stage
- ***Soybean:*** first trifoliate leaf through flowering.

Not all glyphosate products are registered for use on glyphosate tolerant corn and soybeans at all rates listed. Refer to individual product labels for specific uses and rates.

- **Single application of 360 g ae per acre controls the following weeds:**
  - Barnyard grass
  - Foxtail (green, yellow)
  - Proso millet
  - Quack grass
  - Volunteer barley and wheat
  - Wild oats
- ***Broadleaves:***
  - Biennial wormwood
  - Canada thistle
  - Chickweed
  - Cleavers
  - Corn Spurry
  - Cocklebur
  - Common milkweed (suppression only)
  - Common ragweed
  - Flixweed
  - Kochia
  - Lamb's-quarters
  - Narrow-leaved hawk's-beard
  - Night-flowering catchfly
  - Nightshade (Eastern black)
  - Perennial sow-thistle
  - Pigweed (smooth, redroot)
  - Round-leaved mallow
  - Russian thistle
  - Shepherd's-purse
  - Smartweed spp.
  - Stinkweed (suppression only)
  - Stork's-bill
  - Velvetleaf
  - Volunteer canola (except glyphosaste tolerant varieties)
  - Wild mustard
  - Wild buckwheat
  - Wild tomato

  *** Registered for control in glyphosate tolerant soybean only with Roundup products and R/T 540 only.**
- ***Second applications of 360 g ae per acre controls the following weeds:***
  - ***Late flushes of heavy infestations of the above weeds plus control of:***
    - Common milkweed
    - Field bindweed
    - Round-leaved mallow
    - Yellow nutsedge
- **Single application of 720 g ae per acre in glyphosate tolerant soybean from the first trifoliate to flowering stage and corn up to and including 6 leaf stage:**
  - ***Heavy infestations of the annual weeds listed above plus control of:***
    - Field bindweed
    - Common milkweed
    - Canada thistle
    - Perennial sow-thistle
    - Yellow nutsedge
- **Single application of 1020 g ae per acre in glyphosate tolerant soybean (*Roundup Ready 2 Yield* soybeans only) from the first trifoliate to flowering stage**
  - ***Weeds listed above plus control of:***
    - Volunteer alfalfa
    - Smooth bromegrass

    **** The single application rate in glyphosate tolerant corn and soybean is not labeled for all glyphosate products. Refer to individual glyphosate labels for the registration status of this rate usage in glyphosate tolerant soybean and corn.**

11. Tank Mixes:

Tank mix partners may be mixed at all label rates and include recommended adjuvants unless otherwise noted. Not all glyphosate products are registered for all tank mix options below. Refer to individual glyphosate labels for registered tank mixes, glyphosate rates and registered crop species.

	Rate per Acre
Preseeding before all crops†††	*Aim*
Preseeding canola††	Bromoxynil – all bromoxynil products at the highest rate indicated on the Bromoxynil page
Preseeding cereals***	2,4-D (108 to 273 g ae)*
	Bromoxynil - *Pardner* (0.51 L), *Koril* (0.48), *Brotex* (0.6 L)
	MCPA♦ (0.2 to 0.4 L)*
	Bromoxynil/MCPA* - *Buctril M* (0.2 to 0.4 L), *Logic M* (0.25 to 0.5 L)

	Rate per Acre
Preseeding corn (field and sweet), flax	MCPA♦♦ (0.2 to 0.4 L)*♦
	Bromoxynil/MCPA* - *Buctril M* (0.2 to 0.4 L), *Logic M* (0.25 to 0.5 L)
Preseeding field pea, lentil†, chickpea†	MCPA Amine♦♦ (0.2 to 0.28 L)*♦
Preseeding canaryseed & seedling forage grasses♦♦♦	Bromoxynil/MCPA* - *Buctril M* (0.2 to 0.4 L), *Logic M* (0.25 to 0.5 L)
Preseeding or prior to emergent of soybeans (all varieties)	Imazethapyr (*Pursuit*)
Chem fallow	2,4-D (235 g ae)*
	Dicamba (0.12 L)*
	Bromoxynil - *Pardner* (0.51 L), *Brotex*(0.6)
Canada thistle control following harvest or in fallow	Dicamba (240 g acid equivalent per acre)**
Alfalfa control in spring/fall	2,4-D (235 to 470 g ae)*

*** Volunteer glyphosate tolerant canola control: Tank mixes of 2,4-D at 108 to 160 g ae per acre, MCPA and Bromoxynil/ MCPA will control volunteer glyphosate tolerant canola up to the 4 leaf stage and 2,4-D at 212 to 320 g ae per acre will give control up to the 6 leaf stage. Earlier application will result in more consistent control. Dicamba at 0.12 L per acre will not control glyphosate tolerant canola.**
**** See re-cropping restrictions for Dicamba with fall applications.**
***** 2,4-D tank-mixes in cereals are registered for winter wheat, wheat, barley, and rye; Bromoxynil tank-mixes in cereals are registered on wheat, oats and barley; bromoxynil/MCPA and MCPA tank-mixes registered on cereals include wheat, barley oats and rye.**
† Under drought conditions, deep seeding and/or brief rain showers after seeding may cause injury to emerging seedlings in sprayer overlaps. NOT for use with *Credit 45, Disruptor, Viking 540 Glyphosate, Smoke,* or *Sharda Glyphosate*.
†† *Roundup WeatherMax, R/T 540, Roundup Transorb, Disruptor 540, Viking 540 Glyphosate, Startup* only.
††† *Credit 45, Credit Xtreme* only.
♦ Rates based on 500 g/L formulations. All formulation concentrations are registered unless indicated otherwise.
♦♦ Use only amine formulations of MCPA prior to corn, lentil, chickpea and field peas.
♦♦♦ Forage grasses include brome grass, crested wheatgrass, intermediate wheat grass, slender wheatgrass, tall wheatgrass, Russian wildrye, timothy, orchard grass, creeping red fescue, meadow fescue, meadow foxtail, tall fescue, meadow bromegrass, streambank wheatgrass and reed canarygrass.

Tank mixes in glyphosate tolerant crops:

- ***Tank mixes or rates listed may not occur on all product labels. Refer to individual product labels for registered tank-mixes.***
  - ***Soybean:***
    - *Assure II* (101 to 154 mL per acre)
    - *Pursuit* (65 to 85 mL per acre)
  - ***Corn:***
    - *AAtrex* (0.63 to 0.84 L per acre)
    - 2,4-D single application (108 to 212 g ae per acre)*
    - 2,4-D split application (108 g ae per acre followed by 80 to 108 g ae per acre)*
      *** 2,4-D applications to corn may result in serious injury to some corn hybrids. Consult corn seed provider for varietal tolerance to 2,4-D applications. Apply prior to 4 leaf stage of corn.**

Note: The above mixes are those listed on the glyphosate labels only.

According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. See the general guidelines for mixing pesticides for more information.

Application Information:

- **Water Volume:**
  - ***Ground:*** Use 20 to 40 L per acre in most situations; use of the lower volume may improve control when hard water (Ca or Mg) or iron (Fe) ions are present (See Effects of Growing Conditions below). For certain crop situations, perennial weeds and tank mixes may require up to 120 L per acre of clean low ion water.
  - ***Aerial:*** Use 8.1 to 20 L per acre for registered preharvest uses only (see Aerial Application below). Minimum 20 L per acre for preseed, fallow, glyphosate tolerant crops and post-harvest treatments with *Roundup WeatherMax* only.

  Refer to specific weed control situations or labels for more information on water volumes and adjuvants.
- **Nozzles and Pressure:** Use 30 to 40 psi (200 to 275 kPa) when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use nozzles and pressure designed to deliver thorough, even coverage with ***ASABE medium*** droplets for ground applications and ***ASABE coarse*** droplets for aerial applications.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
glyphosate	POST (foliar), Preharvest	EPSP Amino Acid Synthesis Inhibitor	Toward growth areas (Symplast)	Broadleaf & grass	9

Effects of Growing Conditions:

Best results are achieved under relatively warm sunny conditions when weeds are actively growing. Frost which kills more than 40 percent of the above ground tissue will reduce control. Control will also be reduced if foliage is heavily covered with dust. "Hard water" or water containing calcium (Ca), magnesium (Mg) or iron (Fe) ions will reduce the activity of glyphosate products proportional to the level hardness. Reducing application water volume and /or adding ammonium sulphate at 1.2 kg per acre (99 percent dry) or 2.4 L per acre (49 percent solution) will reduce the negative effects of low levels of hard water ions. If water is extremely hard (greater than 700 ppm or 40 grains), another water source should be found. Dirty water or water with suspended soil or organic matter will reduce control.

Restrictions:

- **Rainfall:** DO NOT apply if rainfall is forecast for the time of application, as weed control may be reduced. Consult manufacturer for more information.
- **Restricted Entry Interval:** DO NOT enter treated crop areas for 12 hours after application. DO NOT enter treated non-crop areas until sprays have dried.
- **Grazing Interval:** All portions of forage and crops treated with glyphosate products may be fed to livestock.
- **Re-cropping Interval:** No restrictions.
- **Aerial Application:** DO NOT apply *Credit 45, Crush'R Plus, Glyforce WDG, Matrix, Shotgun 360* brands of glyphosate to cropland by air.
  - All other glyphosate products listed in the "Product names, Company, Formulation and Packaging" chart are registered for aerial application for certain pre-harvest treatments. Not all crop species listed in the pre-harvest section are registered for aerial glyphosate application. Consult manufacturer for current aerial pre-harvest registration status.
  - ONLY *Roundup WeatherMax* may be applied by air when fields are too wet to access by ground sprayer (flooded) for preseed burndown, fallow treatment, or application to glyphosate tolerant crops (canola, corn, soybean).
  - Aerial applicators of *Roundup WeatherMax* for use prior to seeding, in glyphosate tolerant crops and to fallow must have successfully completed a *Roundup* herbicide aerial application training course provided by Bayer.
- **Storage:** May be stored below 0°C.
- **Equipment:** DO NOT mix, store or apply this product in galvanized steel or unlined steel (except stainless steel) containers or spray tanks.
- **Buffer Zones:**

Application method	Uses	Buffer Zones (metres††) Required for the Protection of:	
		Aquatic habitats	Terrestrial habitat
Ground *	Annual crops	1	2
Aerial	Preharvest only**	25	55
	Glyphosate tolerant canola only†	5	40
	Preseed, fallow, glyphosate tolerant crops (corn, soybeans)†	30	70

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
**** *Roundup Transorb HC, Roundup WeatherMax, R/T 540, Disruptor 540, StartUp* only.**
† *Roundup WeatherMax* only when conditions are too wet for access by ground sprayer.
†† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat. Glyphosate is very toxic to non-target plants.

Sprayer Cleaning:

Refer to the general section on sprayer cleaning in the introduction.

Hazard Rating:

Roundup Transorb HC, Roundup WeatherMax, Glyforce WDG, Destroyer 540, Disruptor 540, Stonewall 540, R/T 540, Viking 540 Glyphosate, J-Maxx 540, Glycere 540:

Caution – Poison

***Disruptor 540, Roundup TransorbHC, Roundup WeatherMax, R/T 540, Stonewall 540*, Viking 540 Glyphosate, J-Maxx 540, Glycere 540:**

Warning – Eye and Skin Irritant

All other products:

Caution – Skin and Eye Irritant

Potential Skin Sensitizer

Refer to the Introduction for an explanation of the symbols.

GoldWing

Herbicide Group
4 - MCPA Ester
14 - pyraflufen-ethyl

Company:

Nufarm Agriculture (PCP#32112)

Formulation:

13.5g/L pyraflufen-ethyl and 420g/L MCPA Ester formulated as an emulsifiable concentrate.

- Container sizes - 2 x 10.7 L, 85.5 L

Crops and Staging:

For application from prior to seeding through to 3 days after planting and prior to the emergence of:

- Barley
- Buckwheat
- Canaryseed
- Chickpea
- Corn (field, sweet)
- Dry beans
- Faba bean
- Field pea
- Flax
- Lentils
- Lupins
- Oats
- Proso (crown) or pearl millet
- Rye (spring and winter)
- Triticale
- Wheat (spring, durum, winter)

Weeds, Rates and Staging:

Unless otherwise stated, apply to emerged, young, actively growing weeds that are less than 5 cm tall or across.

***GoldWing* at 133 mL† per acre controls:**

- Annual sow-thistle*
- Canada fleabane*
- Cleavers
- Cow cockle*
- Dandelion*
- Flixweed*
- Kochia
- Lamb's-quarters
- Mallow
- Mustards (except dog and tansy)
- Narrow-leaved hawk's-beard
- Night-flowering catchfly
- Redroot pigweed
- Stinkweed
- Volunteer canola (all varieties)
- Wild buckwheat*
- Wild mustard*

***GoldWing* at 266 mL† per acre provides control or suppression of the weeds above plus control of the following weeds:**

- Canada fleabane
- Cow cockle
- Flixweed
- Goat's-beard*
- Wild buckwheat

*** Suppression only.**

† *GoldWing* applied alone requires the addition of a non-ionic surfactant (*Nufarm Enhance, Agral 90*) at 0.25 L per 100 L of spray solution.

Maximum TWO APPLICATIONS of Goldwing *at the 133 mL per acre rate,* Conquer II *or* Blackhawk *(maximum 3.67 grams per acre of the pyraflufen active) WITHIN A TWO YEAR TIME SPAN.*

Maximum of ONE APPLICATION of Goldwing *at the high (266 mL per acre) rate, and other products with the pyraflufen-ethyl active above (maximum 3.67 grams per acre of the pyraflufen-ethyl active) WITHIN A TWO YEAR TIME SPAN.*

Application Information:

- **Water Volume:** Minimum 20 to 40 L per acre. Higher water volumes may provide better performance.
- **Nozzles & Pressure:** Use 30 to 40 psi (210 to 275 kPa) if applying without drift reduction nozzles. Drift reduction nozzles may require higher pressures for proper performance. Select the nozzle and pressure combination that produces of ***ASABE medium*** droplets while maintaining good coverage of foliage. Keep booms lower than 60 cm from crop canopy.
- **Screens:** Use 50 mesh filter screens or larger.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
MCPA	POST (foliar)	Synthetic Auxin	Moves throughout the plant (Symplast)	Broadleaf only	4
pyraflufen	POST (foliar) with little soil activity	PPO Inhibitor/ Membrane disruptor	Little movement due to rapid cell leakage (Symplast)	Broadleaf only	14

Effects of Growing Conditions:

Extreme growing conditions such as drought or near freezing temperatures prior to, at and following time of application may reduce weed control. Wet foliage at the time of application may result in reduced weed control.

Tank Mixes:

Herbicides:

- Glyphosate (label rates)

Note: The above mixes are those listed on the *GoldWing* label only.

According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** No specific recommendation. May be up to 8 hours. Contact the manufacturer for more information.
- **Restricted Entry Interval:** DO NOT enter treated fields for 12 hours.
- **Grazing Restrictions:** DO NOT graze or feed treated crop to livestock within 7 days of application. DO NOT cut for hay within 30 days of treatment. Withdraw meat animals from treated fields 3 days prior to slaughter and feed untreated feed.
- **Pre-harvest Interval:** N/A when used prior to emergence.
- **Re-cropping Interval:** Any crop may be seeded one month after application.
- **Aerial Application:** Apply by ground equipment only.
- **Storage:** Store in original containers in a cool, secure, dry place. DO NOT freeze.
- **Buffer Zones:**

Crop	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Canary seed	1	1	1
All other labelled crops	1	1	2

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones may be reduced when using drift reduction measures. See the Buffer Zone Calculator on the Pest Management Regulatory Agency website.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Tank Cleaning:

Refer to 'Method A' in the general section on sprayer cleaning in the introduction. The addition of detergent may improve the effectiveness of tank cleanout, especially when tank mixed.

Hazard Rating:

Caution –Skin Irritant
Potential Skin Sensitizer
Contains the Allergen Soy
Refer to the Introduction for an explanation of the symbols.

Grazon XC / Aspect

Herbicide Group
4 - picloram, 2,4-D

Company:
Corteva Agriscience (*Grazon XC* – PCP#31642; *Aspect* – PCP#31641)

Formulation:
97.5 g/L picloram and 360 g ae/L 2,4-D formulated as a solution.
- Container sizes - 2 x 10 L and 110 L

Note: Available only through selected retail outlets.

Crops and Staging:
Grazon XC: Permanent grass pasture and rangeland. Apply in spring or early summer.

Aspect: For use on roadsides and other rights of way.

Note: The use of this chemical may result in contamination of groundwater particularly in areas where soils are permeable (e.g. sandy soil) and/or the depth to the water table is shallow.

Weeds, Rates and Staging:
Note: Maximum ONE APPLICATION of these products or other product containing picloram per year.
Note: DO NOT prolong application for longer than 24 hours after mixing as product may degrade in the tank.
Broadcast (multi-nozzle) application:
- ***Apply* Grazon XC *or* Aspect *at 1.0 L per acre for season long control ONLY:***
  - Canada thistle
  - Common yarrow
  - Dandelion
- ***Apply* Grazon XC *or* Aspect *at 1.9 L per acre: for control of the above weeds and the following weeds:***
  - Burdock
  - Clovers (red, sweet)
  - Dock
  - Fleabane
  - Goldenrod
  - Leafy spurge*†
  - Plantain
  - Ragweed (common)
  - Prickly lettuce
  - Toadflax*†
  - Vetch
  - Wild carrot

  *** For control of leafy spurge and toadflax, use a recommended surfactant (such as any non-ionic surfactant) at the rate of 250 mL per 100 L of water). If maximum rainfastness is desired increase the rate to 375 mL per 100 L of water.**
  † Research has shown that annual applications may be required for up to 4 years to achieve a high level of sustained control of leafy spurge.
- ***Apply* Grazon XC *or* Aspect *at 2.5 L per acre for control of the following woody species:***
  - Aspen
  - Balsam poplar[Δ]
  - Birch
  - Western snowberry[Δ]
  - Wild rose
  - Willow
- ***Apply* Aspect *only at 4.65 L per acre for control of the species above plus the following woody species**:***
  - Alder
  - Cedar
  - Maple
  - Pine
  - Poplar
  - Spruce

Handheld application:**
- ***Single nozzle wand (foliar):*** Apply *Aspect* at 2.7 L per 1000 L of water for application to the fully developed foliage and stems of woody plants prior to the development of fall coloration.
- ***Basal Bark Treatments:*** Mix a dilute solution in a ratio of 1 part *Aspect* to 1.5 parts water (or ethylene glycol under freezing conditions) for use in the following applications.
  - ***Cut Stump Treatment:*** Apply the dilute solution above to the outer edge of the freshly cut surface of a stump.
  - ***Frill or Girdle Treatment:*** Apply the dilute solution to the frills or exposed cambium from a girdling of a tree stem.
  - ***Tree Injection Treatment:*** Apply the dilute solution above by injecting through the bark to the cabium (wood-bark interface at intervals of 7.5 cm.

  [Δ] Suppression
  **** For faster burndown of coniferous species use a recommended surfactant (such as *Gateway Adjuvant*, or *Xiameter OFX-0309 Fluid*, or any non-ionic surfactant) at the rate of 0.25 L per 100 L of water. If maximum rainfastness is desired, increase the rate to 0.375 L per 100 L of water.**

Application Information:
- **Water volume*:**
  - ***Ground:*** 40 to 80 L per acre.
  - ***Aerial:*** 8.1 to 20 L per acre.

  * Use higher water volumes for when foliage is dense. Higher water volumes provide more reliable control.
- **Nozzles and Pressure:** Use nozzles that will deliver coarse droplets in a uniform pattern. Maximum 30 psi (207kPa) by ground or air when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use nozzles and pressure designed to deliver thorough, even coverage with ***ASABE coarse*** droplets.
- Drift of even small amounts of *Grazon XC* or *Aspect* onto sensitive plants or areas where sensitive crops may be grown can cause injury. DO NOT apply under conditions prone to drift (i.e. high winds, dead calm and temperature inversions).

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
picloram	POST (foliar) with residual soil activity	Synthetic Auxin	Throughout the plant (Symplast)	Broadleaf only	4
2,4-D	POST (foliar)	Synthetic Auxin	Throughout the plant (Symplast)	Broadleaf only	4

IMPORTANT: Picloram is a very persistent and water-soluble herbicide. Treated soil should not be moved from the treated area. DO NOT apply to soils that are permeable, have sinkholes, or lie over limestone bedrock. DO NOT apply to soils whose surfaces are composed of fractured rock or unconsolidated gravel. Application to these sites may allow the movement of herbicide to underlying water sources or aquifers. When applying *Grazon XC* over sandy soils ensure that aquifers are not within 1.8 m of the soil surface. If shallow aquifers are present, DO NOT APPLY *Grazon XC*. *Grazon XC* must not be applied on range and pasture acres that are irrigated. DO NOT compost or mulch clippings or manure from grass treated with *Grazon XC* unless being reapplied to the treated area.

Effects of Growing Conditions:

Nothing listed on the *Grazon XC* label. Avoid application when pasture and target weeds are under stress from drought, flooding, extreme heat or cold, as injury to grass or unacceptable control may result. Avoid application when temperatures exceed 28°C.

Tank Mixes:

None registered.

Restrictions:

- **Rainfall:** DO NOT apply if rainfall is forecast. No specific time frame is indicated on the label. Contact manufacturer for more information.
- **Restricted Entry Interval:** DO NOT re-enter pastures within 12 hours of application.
- **Grazing Restrictions:** DO NOT graze areas treated with *Aspect* at a rate of greater than 2.5 L per acre. DO NOT allow lactating dairy animals to graze treated areas within 7 days of application. Withdraw meat animals from treated fields at least 3 days before slaughter. DO NOT harvest forage or cut hay within 30 days of application. Feed livestock untreated forage for 7 days prior to moving onto land that produce broadleaf crops; otherwise, urine or manure may contain picloram. See restrictions in "How it Works" section above.
- **Re-cropping Interval:** Legumes may not be established in a pasture for several years after treatment. If legumes are essential in a pasture, DO NOT use *Grazon XC*. DO NOT break up treated pasture and plant to sensitive broadleaf crops for at least 5 years after application.
- **Aerial Application:** May be applied by air. DO NOT apply during periods of dead calm. DO NOT apply when wind speed is greater than16 km per hour at flying height at the site of application.
- **Storage:** Store product in original containers in a secure, dry, cool area. DO NOT freeze. Combustible – DO NOT store near open flame or heat sources.
- **Buffer Zones:** Handheld or backpack application do not require a buffer zone. Those listed below are for ***ASABE coarse*** droplets only. See the label for nozzles delivering coarser droplets.

Application method	Rate (L per acre)	Buffer Zones (metres†) Required for the Protection of:		
		Aquatic Habitats of Depths		Terrestrial habitat
		Less than 1 m	Greater than 1 m	
Field sprayer	*Aspect* up to 1.0 on ROW	1	1	70**
	Grazon XC and *Aspect* up to 2.5 on R&P and ROW	2	1	
	Aspect only at 4.65 on ROW	4	2	**
Fixed wing aircraft	*Aspect* at 1.0 on ROW	85	50	**
	Grazon XC up to 2.5 on R&P	65	20	500
	Grazon XC up to 2.5 on ROW	225	125	800
	Aspect up to 1.9 on ROW	125	70	**
	Aspect only at 4.65 on ROW	300	150	**

Application method	Rate (L per acre)	Buffer Zones (metres†) Required for the Protection of:		
		Aquatic Habitats of Depths		Terrestrial habitat
		Less than 1 m	Greater than 1 m	
Helicopter	*Aspect* at 1.0 on ROW	40	30	**
	Grazon XC up to 2.5 on R&P	40	15	300
	Grazon XC up to 2.5 on ROW	95	50	700
	Aspect up to 1.9 on ROW	60	35	**
	Aspect only at 4.65 on ROW	125	60	**

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** These distances can be reduced by 30 percent using cones on individual nozzles and by 70 percent using a full shield (shroud, curtain) that extends to the crop canopy.**
**** For applications to rights-of-way using *Aspect*, buffer zones for protection of sensitive terrestrial habitats are not required; however, the best available application strategies that minimize off-site drift should be used.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

- Heavy rains can move this product from its application site down slope toward sensitive areas. DO NOT load or mix near wells, dugouts or other water bodies.

Sprayer Cleaning:

A combination of 'Method A' and 'Method B' found in the introduction, including the use of a commercial tank cleaner or ammonia, is recommended immediately after application is finished. See label for further details.

Hazard Rating:

Warning – Eye Irritant

Refer to the Introduction for an explanation of the symbols.

Heat Brands / Detail (IVM)

Herbicide Group 14 - saflufenacil

Company:

BASF Canada

Formulation:

***Heat WG* (PCP#29368):** 70% saflufenacil formulated as a water soluble granule.

- Container size - 8 x 844 g containers per case

Merge sold separately.

-or-

***Heat LQ* (PCP#31468), *Detail* (PCP#32773):** 342 g/L saflufenacil formulated as a suspension concentrate.

- Container sizes:
  - *Heat LQ* - 1 x 1.73 L plus 2 x 8.1 L *Merge* adjuvant, or tote containing 4 x 10.79 L *Heat LQ* packaged with 1 x 400 L *Merge*
  - *Detail* - 1.38 L

Crops, Rates and Staging:

***Heat Brands* – Prior to the seeding of, or following seeding and prior to the emergence of the following crops, fallow or post-harvest:**
Note: Must be applied as part of a tank mix with glyphosate from 180 to 360 g ae per acre (see glyphosate for specific product rates).

Crop	Rate (per acre)	
	Heat WG (g)	*Heat LQ* (mL)
Barley, canaryseed, chickpea, corn (field and sweet*), field pea, oats, wheat (spring, winter and durum)	10.4 to 28.4	21.4 to 59
Seedling forage grasses grown for seed** (bromegrass, creeping red fescue, timothy)	10.4 to 28.4	21.4 to 59
Faba bean	10.4 to 28.4	21.4 to 59
Lentil†	10.4	21.4

Crop	Rate (per acre)	
	Heat WG (g)	*Heat LQ* (mL)
Soybean†*	10.4 to 14.6	21.4 to 29.5
Fallow and post-harvest	10.4 to 28.4	21.4 to 59

*** Some varieties may be more sensitive to *Heat* and injury may occur**
† DO NOT use rates higher than 10.4 grams per acre of *Heat WG* or 21.4 mL per acre of *Heat LQ* or injury could result.
***** NOTE: Since this use registered under the User Requested Minor Use Label Expansion (URMULE) program, the manufacturer assumes no responsibility of herbicide performance. Application to this crop is at the risk of the user.***
***** NR, not registered.**
Note: Crop injury may occur in lentil when *Heat* is used in conjunction with certain soil applied/soil active herbicides. Consult with the manufacturer for more guidance.

Add either *Merge* or *Amigo* adjuvant or *MSO Concentrate* (sold separately for *Heat WG*) at 0.2 to 0.4 L per acre.

***Heat Brands* – Harvest Aid/Desiccation:**
Apply 14.4 to 28.4 grams per acre of *Heat WG* or 43 mL per acre of *Heat LQ* to speed the rate of dry-down of the following crops and green weedy material. *Merge* adjuvant or *MSO Concentrate* (sold separately for *Heat WG*) must be added spray solutions of both formulations at 0.2 to 0.4 L per acre. Use the high rate of *Heat WG* as well as the high rate of adjuvant for both products when not mixing with glyphosate. The required delay before harvest of each crop is indicated below.
Note: as of January 1, 2025 www.keepitclean.ca indicates that the use of this product on certain crop types may have market access concerns. Please see introduction for more information AND *consult potential grain buyers before using this product.*

Crop	Pre-Harvest Interval (Days after application)	Application Stage
Barley (for feed only)	3	Hard dough stage (Zaddok's growth stage 87) <30% seed moisture
Canola (all types), Mustard†	3	Apply when 65 to 80% of seeds have changed colour.
Chickpea	2	Desi – Apply when most seeds turned yellow/brown Kabuli – Apply when most seeds turned white/tan
Field pea	3	A majority of the pods are brown (70 to 80%)
Faba bean††	2	Apply when 80% of lower pods have turned black, middle pods have turned yellow/tan, and top green pods have firm seed.
Flax	3	Apply when 75% of bolls have turned colour.
Red lentil varieties only*	3	Lower most pods (15%) are brown and rattle when shaken
Dry bean	2	Stems are green to brown, pods are mature (yellow to brown), and 80 to 90% of leaves have dropped
Soybean	3	
Sunflower	7	The backs of flower heads and bracts are turning yellow, and seed moisture is 20 to 30%.
Triticale	3	Hard dough stage (Zaddok's growth stage 87) <30% seed moisture
Wheat	3	Hard dough stage (Zaddok's growth stage 87) <30% seed moisture

*** Glyphosate must be added when applying *Heat* pre-harvest in red lentil varieties. Stand alone applications of *Heat* are not registered on red lentil varieties.**
† All classes including brown, Oriental, canola quality *Brassica juncea*, *Brassica juncea* varieties with the Clearfield trait, and yellow.
†† *Heat LQ* only.

Heat (*WG* or *LQ*) may be tank mixed with glyphosate on barley (feed only), canola (all types), chickpeas, faba beans, flax, field pea, red lentil, dry beans, mustard†, soybeans and wheat for additional pre-harvest weed control. When tank mixing with glyphosate, it is recommended to apply *Heat WG* at 20.4 grams per acre or *Heat LQ* at
42.8 mL per acre. DO NOT tank mix with glyphosate when the harvested grain is to be used for seed.

Maintenance of Bare Ground in Industrial Sites:
Apply *Detail* at rates of 58.7 to 117.4 mL per acre for non-residual broadleaf control and 176 mL per acre for residual control of broadleaf weeds. Add *Merge* adjuvant or *Hasten NT* adjuvant at 0.5 L per 100 L.

DO NOT apply *Detail* to land to be used for cropland as injury may result.

Avoid applying to areas with heavy vehicle traffic and/or fine dusty surfaces that can blow after treatment, since material moving from treated areas may injure neighboring sensitive crops.

Weeds, Rates and Staging:

Heat Brands – Apply up to the 8 leaf stage unless otherwise indicated to control the weeds controlled by glyphosate plus rapid burndown of:

- Canada fleabane†
- Cleavers (4 whorl-stage)**
- Common ragweed†
- Dandelion***
- Kochia (up to 15 cm)
- Lamb's-quarters
- Flixweed
- Narrow-leaved hawk's-beard (up to 8 cm)
- Pigweed (redroot)**†
- Ragweed (common)
- Round-leaved mallow
- Stinkweed**
- Volunteer canola**†
- Wild buckwheat **†
- Wild mustard**

*** All varieties**

**** Applications at the 28.4 grams per acre rate of *Heat WG* or 59 mL per acre rate of *Heat LQ* will also provide suppression of the emergence of these weeds following application.**

***** Top growth burndown of perennial plants, control of spring germinating plants.**

† *Heat LQ* will control indicated weeds when applied for pre-harvest weed management in wheat and barley.

Detail (for bare ground maintenance of industrial sites only): Unless otherwise noted below, apply to young and actively growing weeds that are less than 15 cm in height or width.

- ***Weeds controlled:***
  - Bindweed, field†
  - Canada fleabane*
  - Canada thistle†
  - Chickweed (common*)
  - Cocklebur (common*)
  - Cow cockle
  - Dandelion†
  - Fleabane (hairy)
  - Flixweed
  - Groundsel (common)
  - Henbit (suppression)
  - Knotweed (prostrate)
  - Kochia* (including Group 2 and 9 resistant)
  - Lamb's-quarters*
  - Mustard, (tumble, wild*)
  - Nightshade, (black*, cutleaf/wild tomato, Eastern black, hairy)
  - Pigweed, (redroot*, smooth*, prostrate*)
  - Prickly lettuce††
  - Purslane (common*)
  - Ragweed (common* giant*)
  - Round-leaved mallow
  - Russian thistle*
  - Shepherd's-purse
  - Smartweed (Pennsylvania*, lady's-thumb*)
  - Sow-thistle (annual, spiny annual)
  - Sow-thistle (perennial††)
  - Stinkweed*
  - Sunflower (common*)
  - Velvetleaf*
  - Volunteer canola
  - Wild Buckwheat*

*** Apply *Detail* at 176 mL per acre for both post-emergence and residual control of emerging weeds.**

† Control of seedling stage and suppression of perennial growth stage.

†† Top growth burn down control.

Application Information:

- **Water volume:**
  - ***Preseed, pre-emergent, fallow or post-harvest by ground only (*Heat Brands *only):*** 20 to 40 L per acre.
  - ***Harvest aid/desiccation (*Heat Brands *only):***
    - ***Ground:*** 81 L per acre stand alone or 40 L per acre when tank mixed with glyphosate
    - ***Aerial:*** 20 L per acre.
  - ***Bare ground maintenance (*Detail *only):*** Minimum 80 L per acre for proper coverage.
- Higher volumes are required for dense weed stands. Weed control improves with the amount of coverage.
- **Nozzles and Pressure:** Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE medium*** classification droplets. Low drift nozzles may require higher pressures for proper performance. Higher pressures may be required to penetrate dense plant stands.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
saflufenacil	POST (foliar) with slight soil activity, or Preharvest	PPO Inhibitor/ Membrane disruptor	Little movement due to rapid cell leakage (Symplast)	Non-selective Broadleaf	14

Effects of Growing Conditions:

Rainfall shortly after application can result in slight injury to the crop. See the 'Restrictions' section below for more details. Warm, moist growing conditions promote active weed growth. Weeds hardened off by environmental stress such as cold weather, drought or excessive heat may not be adequately controlled.

Tank Mixes:

Note: Crop injury may occur in lentil when *Heat* is used in conjunction with certain soil applied/soil active herbicides. Consult with the manufacturer for more guidance.

Herbicides:

- ***Preseed, pre-emergent, fallow or post-harvest:*** Glyphosate (180 g to 360 g ae per acre)*
  *** must be mixed with glyphosate.**
- ***Harvest Aid/Desiccation:*** Glyphosate (360 g ae per acre)†
  † NOT for use on crops to be used for seed. Mixes with glyphosate for harvest aid uses are for ground boom application only. DO NOT apply by air.
- ***Bare ground maintenance (*Detail *only):***
  - *Arsenal PowerLine* (1.21 L per acre)
  - Glyphosate (328 to 1750 g ae per acre)

  For both mixes, include adjuvants recommended for *Detail* above.
  (see glyphosate for product concentrations and equivalent application rates)

Fungicides: None registered

Insecticides: None registered

Note: The above mixes are those listed on the *Heat* (*WG* or *LQ*) or *Detail* labels only.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Rainfall shortly after product application can result in slight injury to the crop. Lentils will be more susceptible to injury on coarse textured (sandy or gravely) and low organic matter soils. Injury will appear usually as burning on the outer edges of the leaves. Lentils will grow out of injury symptoms, and yield will not be impacted at recommended rates.
- **Restricted Entry Interval:**
  - ***Heat Brands:*** DO NOT enter treated fields for at least 12 hours.
  - ***Detail:*** DO NOT allow others to enter treated sites until sprays have dried. DO NOT allow military personnel to enter treated sites for 2 days.
- **Pre-harvest Interval (*Heat Brands* only):**
  - ***Preseed and pre-emergent:*** Leave 60 days between application and harvest.
  - ***Harvest Aid/Desiccant:*** Refer to table in 'Crops, Rates and Staging' section.
- **Grazing Interval:**
  - ***Preseed and pre-emergent:*** DO NOT graze or cut cereal crops for feed within 30 days of application or chickpea, corn, field pea, lentil and soybean within 60 days.
  - ***Harvest aid/Desiccant:*** DO NOT graze or feed dry bean, lentil or soybean. Treated field pea may be grazed or used as feed.
- **Re-cropping Interval:**

Crop	Application Rate (per acre) and Timing		
	Spring Application		Fall Application
Heat WG rate	10.4 g	up to 28.4 g	up to 28.4 g
Heat LQ rate	21.4 mL	up to 59 mL	up to 59 mL
Barley	PB	PB	1
Canary seed	PB	PB	1
Canola	1	1	1
Chickpea	PB	PB	1
Corn	PB	PB	1
Dry bean	1	1	2
Flax	1	1	1
Lentil	PB	1	1
Mustard	1	1	2
Oat	PB	PB	1
Field pea	PB	PB	1
Soybean	PB	1	1
Spring wheat (including durum)	PB	PB	1

Crop	Application Rate (per acre) and Timing		
	Spring Application		Fall Application
Heat WG rate	10.4 g	up to 28.4 g	up to 28.4 g
Triticale	1	1	1
Winter wheat	PB	PB	1

PB = May be planted back in the same season
1 = May only be planted the season following application
2 = May only be planted the second season following application

- **Aerial Application:** *Heat Brands* may be applied by aircraft for desiccation use only. DO NOT apply by air for any other use.
- **Storage:** Store in dry, cool storage. May be frozen.
- **Buffer Zones:**
  Hand-held wand or backpack sprayer and spot treatment do not require the buffers below.

Application method	Crop	Buffer Zones (metres†) Required for the Protection of Terrestrial Habitat
Heat Brands – Ground only*	Lentil, soybean	3
	All other crops	10
Detail – Ground only*	Bare ground maintenance (excluding rights-of-way**)	20
Heat Brands –Fixed wing airplane	All desiccation uses	175
Heat Brands –Helicopter	All desiccation uses	150

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
**** Buffer zones for protection of terrestrial habitats are not required for use on rights-of-way, including roadside and railroad ballasts, rail and hydro rights-of-way, utility easements and roads.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

- DO NOT apply in areas where surface water from the treated area can run off to adjacent cropland, streams

Sprayer Cleaning:

Heat and *Detail* can cause injury to sensitive crops at very low concentrations. Sprayers used to apply this product should be flushed out immediately after each day of use.

Refer to 'Method B' in the general section on sprayer cleaning in the introduction.

Hazard Rating:

Caution – Possible Skin Irritant

Refer to the Introduction for an explanation of the symbols.

Heat Complete*

Herbicide Group
14 - saflufenacil
15 - pyroxasulfone

** **Note:** This product is no longer manufactured but inventories still remain in distribution. This product may be removed from future editions.*

Company:
BASF Canada

Formulation:
The *Heat Complete* package contains the following components:
***Heat LQ* (PCP#31468):** 342 g/L saflufenacil formulated as a suspension concentrate.
- Container size - 1 x 1.73 L

-plus-
***Zidua SC* (PCP#32542):** 500 g/L pyroxasulfone formulated as a suspension concentrate.
- Container size - 1 x 3.89 L

-plus-
***Merge adjuvant* (PCP#24702):** Container size - 2 x 8.1 L

Crops, Rates and Staging:
Prior to the seeding of, or following seeding and prior to the emergence of, the following crops:

Crop	Rate (per acre)	
	Heat LQ (mL)	*Zidua SC* (mL)
Corn, field peas, chickpeas	22 to 43	49 to 97
Lentils†	22	49
Soybeans*	22 to 29	49 to 65

† DO NOT use rates higher than 22 mL per acre of *Heat LQ* or 49 mL per acre of *Zidua SC* or injury could result.
***Some varieties may be more sensitive to *Heat Complete* and injury may occur.**
Note: Crop injury may occur in lentils when *Heat Complete* is used in conjunction with certain soil applied/soil active herbicides. Consult with the manufacturer for more guidance.

Add *Merge* adjuvant at 0.2 to 0.4 L per acre.

Weeds, Rates and Staging:
Apply up to the 8 leaf stage unless otherwise indicated to control the weeds controlled by glyphosate plus rapid burndown of:
- Canada fleabane
- Cleavers* (up to 4 whorls)
- Dandelion (up to 15 cm)**
- Flixweed
- Foxtail (green and yellow)ΔΔ
- Kochia†* (up to 15 cm)
- Lamb's-quarters*
- Narrow-leaved hawk's-beard (up to 8 cm)
- Perennial sow-thistle***Δ
- Prickly lettuce***Δ
- Ragweed (common, giant)***
- Redroot pigweed*
- Round-leaved mallow
- Shepherd's-purse***
- Smartweed (lady's-thumb)***
- Stinkweed*
- Volunteer canola (all types)*
- Waterhemp* (prior to emergence)
- Wild buckwheat*
- Wild mustard*
- Wild oatsΔΔ

† Includes Group 2 and glyphosate-resistant biotypes.
*** Residual suppression (may be rate dependent).**
**** Top growth burndown control only of perennial plants; control of spring-germinating plants.**
***** Burndown control is rate-dependent.**
Δ Top growth burndown control only.
ΔΔ Prior to emergence; residual suppression by *Zidua* component only.

Application Information:
- **Water volume:** 20 to 40 L per acre. Higher volumes are required for dense weed stands. Weed control improves with the amount of coverage.
- **Nozzles and Pressure:** Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE medium*** droplets.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
saflufenacil	POST (foliar) with slight soil activity	PPO Inhibitor/ Membrane disruptor	Little movement due to rapid cell leakage (Symplast)	Non-selective Broadleaf	14
pyroxasulfone	PRE (surface) with residual soil activity	Long-chain Fatty Acid Inhibitor	Little movement (Symplast)	Broadleaf & grass	15

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides:

- ***Preseed and pre-emergent:*** Glyphosate (180 g to 360 g ae per acre)*
  *** must be mixed with glyphosate.**

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Rainfall shortly after product application can result in slight injury to the crop. Lentils will be more susceptible to injury on coarse textured (sandy or gravely) and low organic matter soils. Injury will appear usually as burning on the outer edges of the leaves. Lentils will grow out of injury symptoms, and yield will not be impacted at recommended rates.
- **Restricted Entry Interval:** DO NOT enter treated fields for at least 12 hours.
- **Pre-harvest Interval:** Leave 60 days between application and harvest.
- **Grazing Interval:** DO NOT graze or cut labeled crops for feed within 60 days of application.
- **Re-cropping Interval:** All crops 1 year after spring, pre-seed or pre-emergent application.
- **Aerial Application:** DO NOT apply by aircraft.
- **Storage:** Store in a cool, dry place. Avoid freezing. If frozen, bring to room temperature and agitate before use.
- **Buffer Zones:**

Application method	Crop	Buffer Zones (metres†) Required for the Protection of:		
		Aquatic Habitats of Depths		Terrestrial habitat
		Less than 1 m	Greater than 1 m	
Ground*	Lentils	5	3	3
	Soybeans	5	3	4
	Corn, field peas	5	3	10

See the Key to Product Pages in the introduction for an explanation of the different habitats.

† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Heat Complete can cause injury to sensitive crops at very low concentrations. Sprayers used to apply this product should be flushed out immediately after each day of use.

Refer to Method B in the general section on sprayer cleaning in the introduction. Let solution stand for an extended period for better results. Flush sprayer system with water. See the label for product specific cleaning details.

Hazard Rating:

Caution – Possible Skin Irritant

Warning – Contains the Allergen Soy

Refer to the Introduction for an explanation of the symbols.

Hurricane

Herbicide Group
6 - bentazon
14 - acifluorfen

Company:
UPL AgroSolutions Canada (PCP#32662)

Formulation:
320 g/L of bentazon and 160 g/L of acifluorfen formulated as a soluble liquid.
- Container size - 2 x 10 L

Crops and Staging:
Soybean: 1 to 2 trifoliate stage

Weeds and Staging:
Unless otherwise noted below, apply to small, actively growing weeds up to the 6 leaf stage to control.
- **Weeds controlled up to the 6 leaf stage:**
  - Common ragweed
  - Lamb's-quarters*
  - Palmer amaranth
  - Pigweed (redroot, smooth, green)
  - Waterhemp
  - Velvetleaf** (up to 4 leaf stage)

  *** Suppression only.**
  **** Use AMS (or UAN) as the additive when velvetleaf is a target weed.**

Rate:
Apply at 710 mL per acre with one of the following additives: ammonium sulfate (AMS), crop oil concentrate, or UAN (liquid 28-0-0) at the rates specified below:

Additive	Application Rate of Additive (per acre)
AMS Crop oil concentrate UAN solution	1.13 kg 0.5 to 0.95 L 1.9 to 3.8 L
Merge adjuvant	200 to 400 mL per 40 L of water unless stated otherwise on the tank mix partner label
Sure-Mix surfactant	0.5 L per 100 L of spray mixture (0.5% v/v)

NOTE: DO NOT apply more than 0.9 kg of bentazon (from all sources) per acre per calendar year.
NOTE: If the combined temperature and relative humidity exceed 100 (e.g. temperature of 30°C plus 70 percent relative humidity = 100), use the lower additive rates.
Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Application Information:
- **Water Volume:**
  - ***Ground:*** 40 to 80 L per acre.
- **Nozzles and Pressure:** Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE medium*** droplets by ground. Use a minimum of 40 psi (275 kPa) spray pressure.

How it Works:
Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
bentazon	POST (foliar)	PSII Inhibitor/ Membrane Disruptor	Little (Apoplast)	Broadleaf only	6
acifluorfen	POST (foliar)	PPO Inhibitor/ Membrane Disruptor	Little movement due to rapid cell leakage (Symplast)	Broadleaf only	14

Effects of Growing Conditions:
Soybeans may exhibit leaf speckling, yellowing, bronzing or burning, but plants generally outgrow this condition within 10 days. New growth is normal and crop vigor is not reduced.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides:

- *Assure II* with *Merge* or *Sure-Mix*
- *Basagran* (up to 235 mL per acre) with crop oil concentrate, AMS, or UAN
- *Pinnacle* with non-ionic surfactant and AMS or UAN
- *Pursuit* with non-ionic surfactant and AMS or UAN
- Glyphosate products (see label for specific products) (only apply to glyphosate tolerant soybeans)
- *Liberty* with crop oil concentrate (only apply to glufosinate tolerant soybeans)
- *Clethodim* products with *Amigo*

Fungicides: None registered.

Insecticides: None registered.

Fertilizers:

- Ammonium sulfate (AMS)
- UAN (liquid 28-0-0)

NOTE: the above tank mixes are those listed on the *Hurricane* label only.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 4 hours of application may reduce control.
- **Restricted Entry Interval:** DO NOT re-enter treated fields for 48 hours.
- **Pre-harvest Interval:** No specific preharvest interval is indicated on the label.
- **Grazing Restrictions:** DO NOT graze the treated crop or cut for hay.
- **Re-cropping Interval:** The label has no restrictions on crops that may be planted the following season.
- **Aerial Application:** DO NOT apply by aircraft.
- **Storage:** Store in a dry place. DO NOT store below 4°C or above 37°C. This product is a reducing agent and should not be mixed or stored in close proximity to strong oxidizing agents.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of Terrestrial habitat:
	Terrestrial habitat
Ground*	15

See the Key to Product Pages in the introduction for an explanation of the different habitats.

*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**

† Distance is measured from the downwind edge of the boom to sensitive areas.

Sprayer Cleaning:

Refer to 'Method B' in the general section on sprayer cleaning in the introduction. Let solution stand for an extended period for better results. Flush sprayer system with water. See the label for product specific cleaning details.

Hazard Rating:

Caution – Poison

Warning – Skin Irritant

Potential Skin Sensitizer

Refer to the Introduction for an explanation of the symbols.

Huskie PRE

Herbicide Group
6 - bromoxynil
27 - pyrasulfatole

Company:
Bayer

Formulation:
***Huskie PRE* (PCP#35077):** 25 g/L pyrasulfatole + 280 g/L bromoxynil formulated as an emulsifiable concentrate.
- Container Sizes: 8.1L, 129.6 L, 405 L

Crops and Staging:
Pre-seeding or post-seeding but pre-emergent: Wheat (spring, durum, winter), triticale, barley.

Weeds and Staging:
The following weeds are controlled at the 1 to 6 leaf stage unless otherwise specified:
- Annual sow thistle
- Chickweed
- Cleavers (1 to 6 whorls)
- Canada fleabane (up to 10 cm in height/diameter)
- Cow Cockle[1] (1 to 4 leaf stage)
- Dandelion* (up to 10 cm in height / 25 cm diameter)
- Flixweed (up to 10 cm in height)
- Giant ragweed*
- Green smartweed
- Hemp-nettle
- Kochia (up to 10 cm in height)
- Lady's thumb
- Lamb's-quarters (1 to 8 leaf stage)
- Narrow-leaved hawk's beard (up to 10 cm in height/prior to bolting)
- Pale smartweed
- Perennial sow-thistle*
- Redroot pigweed
- Round-leaf mallow
- Russian thistle (up to 10 cm in height)
- Shepherd's purse
- Stinkweed
- Tartary buckwheat (1 to 8 leaf stage)
- Volunteer canola (includes conventional and herbicide tolerant)
- Volunteer soybean (up to the 5th trifoliate leaf stage)
- Wild buckwheat (1 to 8 leaf stage)
- Wild mustard

[1]In normal conditions will be controlled up to the 4-leaf stage. Plants beyond this stage are unlikely to be controlled. The higher rate generally gives better results.
*Suppression only

Rate:
0.4 to 0.5 L per acre

Application Information:
- Water Volume:
  - Ground: Minimum 19 L per acre
  - Aerial: Do NOT apply by air
- Nozzles and Pressure: For best results use flat fan nozzles or comparable nozzles to achieve uniform spray distribution. Do not use flood jet nozzles. DO NOT apply with spray droplets smaller than the American Society of Agricultural Engineers (ASAE S572.1) medium classification. Boom height must be 60 cm or less above the crop or ground.

How it Works:
Refer to How Do Herbicides Work in the Weed Control Introduction section for an explanation of the concepts used in the table below.

Active Ingredient	Timing	Target	Movement	Spectrum	WSSA Group
bromoxynil	Foliar	PSII Inhibitor/ Membrane disruptor	Little (Apoplast)	Broadleaf only	6
pyrasulfatole	Foliar	HPPD pigment inhibitor	Some – both foliar and root (apoplast), somewhat systemic (Has soil residues)	Broadleaf only	27

Effects of Growing Conditions:
For best results, apply to emerged, young, actively growing weeds according to the weed stages listed. Under stressed conditions, early application will result in improved weed control. Weeds growing under adverse environmental conditions such as drought will be less susceptible to herbicide effects.

Tank Mixes:

Herbicides:

- *Pre-seed* and *pre-emergent*
  - *Huskie PRE* must be tank mixed with glyphosate (*Roundup Weathermax, Roundup Transorb HC* or *R/T 540* only at180 to 360 g ae per acre) (no surfactant required).

Note: The above mixes are those listed on the *Huskie PRE* label only.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Restrictions:

- **Rainfall:** Within 1 hour of application may reduce control.
- **Re-entry:** DO NOT re-enter treated fields for 24 hours.
- **Preharvest Interval:** Barley - 45 days, wheat and triticale - 50 days
- **Grazing:** Do not graze or treated crops or cut hay within 25 days of application
- **Re-cropping:** Registered crops may be seeded anytime after treatment. Treated field can be seeded the following year to alfalfa, canaryseed, canola, field corn (Manitoba only), flax, potatoes, soybeans (Manitoba only), sunflower, oats. Field peas may be grown the season following application in the black, grey-wooded and dark brown soil zones. DO NOT plant field peas the season following *Huskie PRE* use in the brown soil zone where soil pH is above 7.5 and precipitation was less than 125 mm from June 1 to September 1 the year of application. Lentils may be seeded 22 months after application.
- **Aerial Application:** Do not apply by aircraft
- **Storage:** Do not store below -20 °C. After storage, warm to room temperature and shake well before use. If stored for one year or longer, shake or mix well before using. Store this product away from food or feed.
- **Buffer Zones:**

Application method	Crop	Buffer Zones (metres†) Required for the Protection of:		
		Aquatic Habitat		Terrestrial Habitat
		Less than 1 m	Greater than 1 m	
Field Sprayer	Wheat (spring, durum, winter), triticale, barley	1	1	5

When tank mixes are permitted, consult the labels of the tank-mix partners and observe the largest (most restrictive) spray buffer zone of the products involved in the tank mixture and apply using the coarsest spray (ASAE) category indicated on the labels for those tank mix partners. The spray buffer zones for this product can be modified based on weather conditions and spray equipment configuration by accessing the Buffer Zone Calculator on the Pesticides portion of the Canada.ca website.

Sprayer Cleaning:

Refer to 'Method A' in the general section on sprayer cleaning on page 15-16. Flush sprayer system with water. See the label for product specific cleaning details.

Hazard Rating:

Contains petroleum distillates – vomiting may cause aspiration pneumonia. Treat symptomatically.

Image

Herbicide Group 2 - imazamox

Company:
Sharda Cropchem (PCP#33914)

Formulation:
120 g/L imazamox formulated as a solution.
- Container sizes - 4 x 5.33 L, 85.3 L

Crops and Staging:
CLEARFIELD Wheat

Weeds, Rates and Staging:
Note: Maximum ONE APPLICATION of these or any other products containing imazamox in a year.

***Image* at 51 mL per acre plus a non-ionic surfactant at 0.25 L per 100 L of spray solution will control up to the 4 leaf stage:**
- Lamb's-quarters†
- Stinkweed
- Volunteer wheat (not CLEARFIELD varieties)
- Wild mustard

***Image* at 68 mL per acre plus a non-ionic surfactant at .25 L per 100 L of spray solution will control the weeds above plus:**
- **Grasses – 1 to 4 main stem leaves, early until tillering:**
  - Barnyard grass
  - Foxtail (green, yellow)
  - Japanese brome†
  - Persian darnel
  - Volunteer barley
  - Volunteer canaryseed
  - Volunteer oats
  - Wild oats
- **Broadleaf weeds – cotyledon to 4 leaf stage:**
  - Cleavers†
  - Cow cockle
  - Green smartweed
  - Lamb's-quarters
  - Redroot pigweed
  - Round-leaved mallow†
  - Russian thistle†
  - Shepherd's-purse
  - Volunteer canola (not CLEARFIELD varieties)
  - Wild buckwheat†

† Suppression only.

Refer to the product label for complete mixing instructions for this product and its mixes, including registered adjuvants. A general guide to mixing can be found in the introduction.

Application Information:
- **Water Volume:** 40 L per acre.
- **Nozzles and Pressure:** Use 40 psi (275 kPa) when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE medium*** or larger droplets.
- **Screens:** Use 50 mesh or coarser on both nozzle and primary plumbing.

How it Works:
Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
imazamox	POST (foliar) with slight soil activity	ALS Amino Acid inhibitor	Toward growth areas of the plant (Symplast)	Broadleaf & grass	2

Effects of Growing Conditions:
DO NOT spray if temperatures of +5°C or lower are forecast within 3 days of application. Treat crops during warm weather when weeds are actively growing and soil moisture is adequate for rapid growth. Under cool or dry conditions, control of some weeds may be severely reduced.

Tank Mixes:
Unless otherwise indicated, *Image* and tank mix partners are applied at all label rates and include adjuvants indicated in "Rates" above.

Herbicides:
- 2,4-D ester (227 g ae per acre) + non-ionic surfactant at 0.25 L per 100 L spray solution
- *Curtail M* (maximum 0.81 L per acre) + non-ionic surfactant at 0.25 L per 100 L spray solution
- *Frontline A* (41 mL per acre) + *Frontline B* (283 mL per acre) + non-ionic surfactant at 0.25 L per 100 L spray solution*
- MCPA ester (227 to 255 g ae per acre) + *Image* at 51 mL per acre only non-ionic surfactant at 0.25 L per 100 L spray solution*

*** Apply at 3 to 6 leaf stage of crop, not including tillers.**

Fungicides: None registered.
Insecticides: None registered.
Fertilizers: None registered.
NOTE: the above mixes are those listed on the *Image* labels only.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Rainfall within 3 hours of application may reduce product efficacy.
- **Restricted Entry Interval:** DO NOT enter treated fields for 12 hours.
- **Pre-harvest Interval:** Wheat grain and straw can be harvested 79 days after treatment.
- **Grazing Restrictions:** DO NOT treated crop within 14 days or cut for hay within 42 days of application.
- **Re-cropping Interval:** Winter wheat may be seeded 3 months after application. Barley, canaryseed, canola, chickpea, field corn, field peas, flax, lentil, oats, sunflower, and spring wheat may be seeded the first spring after application and tame mustard (condiment types only) the second season after application. The company recommends that a field bioassay (a test strip grown to maturity) be conducted the year before growing any crops other than those listed above. Contact manufacturer for additional information on recropping intervals. Check any tank mix partners for additional recropping restrictions.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** DO NOT freeze. Store in a cool, dry place above 5°C .
- **Buffer Zones:** Avoid spraying in situations where drift may occur.

Application method	Buffer Zones (metres†) Required for the Protection of:
	Terrestrial and Aquatic Habitat
Field sprayer	1

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance is measured from the downwind edge of the boom to sensitive areas.

Sprayer Cleaning:

Refer to 'Method C' in the general section on sprayer cleaning in the introduction.

Hazard Rating:

No specific hazards.

Imazamox

Herbicide Group 2 - imazamox

Company:
BASF Canada (*Solo ADV II*)
ADAMA Canada (*Davai 80 SL*)
Corteva Agriscience (*Amity WDG*)
Agracity (*Samurai*)
Sharda Cropchem (*Next*)
Nufarm Agriculture (*Venim*)
Albaugh (*Dakota*)
Viking (*Viking Imazamox*)
Syngenta Canada (*Canvista*)

Formulation:
***Solo ADV II* (PCP#33720):** 25 g/L imazamox formulated as a solution.
- Container size - 2 x 6.5 L or 3 x 4.33 L

***Amity WDG* (PCP#33180), *Samurai* (PCP#33033), *Next* (PCP#33620), *Dakota* (PCP#34698), *Viking Imazamox* (PCP#34777):**
70% imazamox formulated as a water dispersible granule.
- Container sizes:
  - 4 x 117.5 g water soluble bags
  - *Samurai* - 470 g

***Davai 80 SL* (PCP#32929) *Canvista* (PCP#35015):** 80 g/L imazamox formulated as a solution.
- Container sizes - 2 x 8 L, 96 L

***Venim* (PCP34394):** 350 g/L imazamox formulated as a solution.
- Container size - 2 x 3.66 L

Crops and Staging:
CLEARFIELD sunflower (*Solo ADV II, Next*, *Venim* and *Dakota* only): 2 to 8 leaf stage.
CLEARFIELD canola (*Amity WDG*, *Next* and *Dakota* only): 2 to 6 leaf stage.
CLEARFIELD lentil:
- ***Solo ADV II, Davai 80SL and Canvista:*** 1 to 9 node stage.
- ***Next, Samurai, Venim*, *Dakota*, and *Viking Imazamox:*** 2 to 6 leaf stage.
- Davai 80 SL: 1 to 9 node stage

CLEARFIELD oilseed mustard (*Brassica juncea*) (*Amity WDG, Dakota* and *Next* only): 2 to 6 leaf stage.
Imidazolinone (IMI) tolerant chickpeas (*Solo ADV II* only): 1 to 6 node stage.
Dry bean (*Davai 80SL, Canvista* and *Venim* only): Emergence to 3 expanded trifoliate leaves stage.
Field Pea (*Davai 80SL, Canvista, Samurai, Next*, *Dakota*, *Venim* and *Viking Imazamox* only): 1 to 6 leaf stage.
Soybean (*Solo ADV II, Next, Venim*, *Davai 80SL and Canvista* only): Cotyledon to 4 leaf (3 expanded trifoliates) stage*.
Note: Temporary crop yellowing may be observed shortly after application in CLEARFIELD canola. Not all dry bean varieties have been tested for tolerance to *Davai 80SL*, test new varieties on a small area for tolerance before widespread use.

Weeds, Rates and Staging:
MAXIMUM ONE APPLICATION of these or any other products containing imazamox in a year.
For all products except *Solo ADV II*, add one of the following adjuvants:
- *Merge*, methylated soybean oil (*MSO*) or *Surjet* at 0.5 mL per 100 L of spray solution
- *Carrier adjuvant* at 0.25 mL per 100 L of spray solution.

Note: *Various manufacturers may support different adjuvants with their products. Check the label or with the manufacturer which adjuvant they support.*
***Next/Samurai/Amity/Dakota WDG/Viking Imazamox* at 8.5 grams per acre plus recommended adjuvant above will control up to the 4 leaf stage:**
- Lamb's-quarters†
- Stinkweed
- Volunteer wheat (not CLEARFIELD varieties)
- Wild mustard

***Solo ADV II* at 325 mL per acre (no adjuvant required) or *Next/Samurai/Amity/Dakota WDG/Viking Imazamox* at 11.7 grams per acre, *Davai 80 SL or Canvista* at 100 mL per acre or *Venim* at 23 mL per acre plus recommended adjuvant above will control:**
The weeds above plus:

Grasses - 1 to 4 main stem leaves, early until tillering:

- Barnyard grass
- Foxtail (green, yellow)
- Japanese brome†
- Persian darnel
- Volunteer barley
- Volunteer canaryseed
- Volunteer oats
- Wild oats

Broadleaf Weeds - cotyledon to 4 leaf stage:

- Cleavers†
- Cow cockle
- Flixweed*
- Green smartweed
- Lamb's-quarters
- Redroot pigweed
- Round-leaved mallow†
- Russian thistle
- Shepherd's-purse
- Stork's-bill*
- Volunteer canola (not CLEARFIELD varieties)
- Wild buckwheat†

† Suppression only.

*** *Davai 80SL, Canvista* and *Venim* only.**

Refer to the product label for complete mixing instructions for this product and its mixes, including registered adjuvants. A general guide to mixing can be found in the introduction.

Application Information:

- **Water Volume:** 20 to 40 L per acre.
- **Nozzles and Pressure:** Use 40 psi (275 kPa) when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE (S572.1) medium*** or larger droplets.
- **Screens:** Use 50 mesh or coarser on both nozzle and primary plumbing screens (*Solo WDG, Davai 80SL, Samurai, Next, Venim* and *Mizuna* only).

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
imazamox	POST (foliar) with slight soil activity	ALS Amino Acid inhibitor	Toward growth areas of the plant (Symplast)	Broadleaf & grass	2

Effects of Growing Conditions:

DO NOT spray if temperatures of +5°C or lower are forecast within 3 days of application. Treat crops during warm weather when weeds are actively growing and soil moisture is adequate for rapid growth. Under cool or dry conditions, control of some weeds may be severely reduced.

Tank Mixes:

Unless otherwise indicated, imazamox and tank mix partners are applied at all label rates and include adjuvants indicated in "Rates:" above.

Herbicides:

- ***Field peas only:***
  - *Samurai, Viking Imazamox* and *Dakota* (11.7 g per acre) only
    - *Basagran Forte* or *Boa** (362 mL per acre) plus *UAN 28%* (800 mL per acre)
- ***Field peas, soybeans and dry beans:***
  - *Davai 80 SL, Canvista* at 81 mL per acre only
    - Imazethapyr (*Phantom* only at 26.3 mL per acre) + non-ionic or methylated seed oil adjuvant
  - *Davai 80 SL, Canvista* at 100 mL per acre only
    - *Basagran Forte* (500 mL per acre) + *UAN 28%* (800 mL per acre)
- ***Dry beans only***
  - *Dakota* (11.7g per acre) only
    - *Basagran Forte* (510 mL per acre) + *UAN 28%* (800 mL per acre)
- ***CLEARFIELD canola***
  - *Amity WDG* at 11.7 g per acre only
    - *Lontrel XC* (51 mL per acre) + *Surjet* or *Merge* at 0.5 L per 100 L of spray solution
- ***Clearfield lentils, Clearfield sunflowers, and soybeans***
  - *Solo ADV II* at 325 ml/acre only
    - *Caziva Ultra Q, Assure II* or *Yuma GL Liquid EC* (150 - 300 mL/acre)

*** *Samurai* only.**

Fungicides: None registered.
Insecticides: None registered.
Fertilizers: None registered.

According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.
Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Rainfall within 3 hours of application may reduce product efficacy.
- **Restricted Entry Interval:** DO NOT enter treated fields for 12 hours.
- **Grazing Restrictions:** DO NOT graze treated crops or cut for hay/silage/green-feed unless otherwise indicated below.
  - ***Clearfield Canola or Oilseed Quality Mustard:*** 20 days following application.
  - ***Field Pea:*** 30 days following application of *Davai 80SL, Canvista* or *Venim* or within 20 days of application for *Next, Samurai* and *Viking Imazamox*.
  - ***Clearfield Lentil:*** 20 days following application of *Solo ADV II, Davai 80SL, Canvista, Next, Venim* and *Viking Imazamox*.
  - ***Soybeans:*** 20 days following application of *Solo ADV II* only.
- **Pre-harvest Interval:**
  - ***Clearfield Sunflower:*** 70 days after application.
  - ***Clearfield Canola, Clearfield Oilseed Quality Mustard, Clearfield Lentil, Field Pea and Soybeans:*** 60 days after application.
  - ***Dry Bean:*** 75 days after application.
- **Re-cropping Interval:**
  - ***Solo ADV II, Amity WDG, Next* or *only:*** Winter wheat may be seeded 3 months after application.
  - ***All products:*** Barley, canaryseed, canola, chickpea, field corn, field pea, flax, lentil, oats, sunflower, and spring wheat (including durum) may be seeded the first spring after application and tame mustard (condiment types only) the second season after application. The company recommends that a field bioassay (a test strip grown to maturity) be conducted the year before growing any crops other than those listed above. Contact manufacturer for additional information on recropping intervals. Check any tank mix partners for additional recropping restrictions.
    Note: *Where less than 125 mm of accumulated rainfall is received between June 1 and September 1 in the year of application, or additionally for the brown soil zone where less than 15 mm is received in any single month through June, July and August, regardless of total rainfall during that time, delay planting canaryseed, canola (non-CLEARFIELD), flax, tame oats or, winter wheat and durum wheat by an additional year. If the same drought conditions as described above occur in either the year of application or the year following, delay planting tame mustard by an additional year.*
    - *As with other herbicides that break down through microbial activity, additional conditions that may slow breakdown and increase the risk of follow crop injury are soil pH of less than 6.5, organic matter of less than 3 percent, very sandy soils and prolonged cold.*
- **Aerial Application:** DO NOT apply by air.
- **Storage:** DO NOT freeze. Store in a cool, dry place above 5°C.
- **Buffer Zones:** Avoid spraying in situations where drift may occur.

Application method	Buffer Zones (metres†) Required for the Protection of:
	Terrestrial and Aquatic Habitat
Other imazamox products	1

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** These distances can be reduced by 30 percent using cones on individual nozzles and by 70 percent using a full shield (shroud, curtain) that extends to the crop canopy.**
† Distance is measured from the downwind edge of the boom to sensitive areas.

Sprayer Cleaning:

Refer to 'Method C' in the general sprayer cleaning section in the introduction.

Hazard Rating:

Davai 80SL, Canvista, Venim: Caution – Poison and Eye Irritant

Solo ADV II: Caution – Skin Irritant

Amity WDG, Samurai, Next:
Warning – Eye Irritant
Warning – Contains the Allergen Sulfites

Refer to the Introduction for an explanation of the symbols.

Imazamox / Bentazon

Herbicide Group
2 - imazamox
6 - bentazon

Company:
BASF Canada (*Viper ADV*)
ADAMA Canada (*Python*)
AgraCity (*Boa Pro, Taipan*)
Sharda CropChem (*Benz*)
NuFarm Agriculture (*Ransack*)
Syngenta Canada (*Nelatic*)

Formulation:
***Viper ADV* (PCP#30626), *Benz* (PCP#33830):** 20 g/L imazamox and 429 g/L bentazon formulated as a solution.
- Container sizes - 2 x 8.1 L, 129 L

***Ransack* (PCP#34931), *Nelatic* (PCP#35030):** 20.6 g/L imazamox and 440 g/L bentazon formulated as a solution.
- Container sizes - 2 x 8.1 L, 97.2 L

The *Python* package contains the following components:
***Python A* (PCP#33279):** 80 g/L imazamox formulated as a solution.
- Container size - 4 L

-plus-
***Python B* (PCP#33282):** 480 g/L bentazon formulated as a solution.
- Container size - 2 x 7.26 L

The *Boa Pro* and *Taipan** packages contains the following components:
***Samurai* (PCP#33033):** 70% imazamox formulated as a water dispersible granule.
- Container size - 470 g

-plus-
***Boa* (PCP#33011):** 480 g/L bentazon formulated as a solution.
- Container size - 2 x 7.5 L

All products require the addition of:
BASF 28% UAN (28-0-0) is required, but sold separately.
- Container sizes - 2 x (2 x 8 L), 128 L drums

*** This product is a co-pack based on a supported mix of the higher rate of Boa by the manufacturer, but not supported on individual labels.**

Crops and Staging:
All products:
Field pea: 3 to 6 above-ground nodes (3 to 6 true leaves).
***Viper ADV, Benz, Python, Ransack and Nelatic* only:**
Dry bean (black, cranberry, great northern, navy, pinto, pink, red Mexican†): Imazamox/Bentazon plus additional *Basagran Forte* (see tank mix section) from the fully expanded first trifoliate leaf to the second trifoliate fully expanded.
Even though Imazamox/Bentazon is registered for all the dry bean types above, tolerance may vary between varieties (esp. navy).
Test new varieties on a small area for tolerance before widespread use.
Soybean: Emergence to 3 fully expanded trifoliate leaves.
***Viper ADV, Benz* and *Ransack* only:**
Faba bean: 3 to 6 above-ground nodes (3 to 6 true leaves).
Alfalfa (seedling or established) for seed forage and hay†: Apply *Viper ADV*, *Benz, Ransack, or Nelatic* plus additional *Basagran Forte* (see tank mix section) to seedling alfalfa after the third trifoliate stage or to established alfalfa before flower and prior to canopy closure.
***Viper ADV* only:**
Established and seedling clover (alsike, red, sweet) and sainfoin for seed production only†: Seedling clover and sainfoin tolerant after the third trifoliate stage otherwise apply prior to flowering but before the crop canopy closes.
***Benz* only:**
Established and seedling clover (alsike and red) for seed production only†: Seedling clover tolerant after the third trifoliate stage otherwise apply prior to flowering but before the canopy closes.

***Ransack* and *Nelatic* only:**
Established and seedling clover (alsike, and red) and sainfoin for seed production only†: Seedling clover and sainfoin tolerant after the third trifoliate stage otherwise apply prior to flowering but before the crop canopy closes.
† NOTE: Since these uses are registered under the User Requested Minor Use Label Expansion (URMULE) program, the manufacturer assumes no responsibility for herbicide performance. Those who apply these uses do so at their own risk.

NOTE: Applications under hot, humid conditions may result in temporary leaf yellowing, leaf flecking, bronzing or burning. The crop usually outgrows this condition within 10 days and new tissues will not be affected.

Weeds and Staging:

Grasses - 1 to 4 main stem leaves or until early tillering.

- Barnyard grass
- Foxtail (green, yellow)
- Japanese brome*
- Persian darnel
- Volunteer barley
- Volunteer canaryseed
- Tame oats
- Volunteer wheat (including durum, not CLEARFIELD varieties)
- Wild oats

Broadleaf Weeds - cotyledon to 4 leaf stage.

- Biennial wormwood§§
- Bird Rape**
- Cleavers*†
- Cocklebur**
- Cow cockle
- Flixweed§§
- Flower-of-an-hour**
- Green smartweed
- Kochia*†§
- Lamb's-quarters
- Pigweed (prostrate††*, redroot)
- Round-leaved mallow*§
- Russian thistle§
- Shepherd's-purse
- Stinkweed
- Sow-thistle (spiny annual)††*§
- Stork's-bill††*
- Velvetleaf**
- Volunteer canola (including CLEARFIELD varieties)
- Volunteer lentils (including CLEARFIELD lentils)§
- Wild buckwheat*
- Wild mustard†

*** Suppression only.**
**** *Taipan* only.**
† Including Group 2 resistant biotypes.
†† *Viper ADV, Ransack and Nelatic* requires the addition of *Basagran Forte* (see tank mix section) for activity on these weeds in dry beans and alfalfa only.
§ *Viper ADV*, *Ransack, Nelatic, Taipan* and *Benz* only.
§§ *Python* only.

Rates:

Viper ADV, Benz, Ransack, Nelatic: 400 mL per acre.
Ransack: 300 mL per acre for volunteer canola (non-imidazolinone tolerant, coyledon to 3 - leaf stage).
Python: *Python A* at 0.1 L per acre and *Python B* at 0.36 L per acre.
Boa Pro: *Samurai* at 11.7 g per acre and *Boa* at 362 mL per acre.
Taipan: *Samurai* at 11.7 g per acre and *Boa* at 725 mL per acre.
All Products: Add *28 percent BASF UAN* (sold separately) at 0.81 L per acre.
Failure to include *UAN* will result in significantly reduced product performance. DO NOT use any other adjuvants, additives or fertilizers as injury may result.
DO NOT apply Imazamox/Bentazon more than once or follow Imazamox/Bentazon with any related products containing Imazamox in the same year.
DO NOT apply to any crop other than those registered as severe injury will result. Refer to the product label for complete mixing instructions for this product. A general guide to mixing can be found in the introduction.

Application Information:

- **Water Volume:** Apply in 40 L per acre. High water volumes are required for adequate coverage, particularly when weed densities are high or weed staging is large.
- **Nozzles and Pressure:** Use 40 psi (275 kPa) when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage of ***ASABE medium*** droplets.
- **Screens:** Use 50 mesh or coarser on both nozzle and primary plumbing screens.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
imazamox	POST (foliar)	ALS Amino Acid inhibitor	Symplast	Broadleaf & grass	2
bentazon	POST (foliar)	PSII Inhibitor/Membrane disrupter	Little (Apoplast)	Broadleaf only	6

Effects of Growing Conditions:

DO NOT spray if temperatures of +5°C or less are forecast within 3 days of application. Under cool or dry conditions, control of some weeds may be severely reduced. DO NOT apply to crops stressed from hail damage, flooding, drought, hot, humid weather, widely fluctuating temperatures, prolonged cold or injury from previous herbicides, as crop injury may result.

Tank Mixes:

***Viper ADV, Benz, Ransack and Nelatic* only for dry bean (types above) and alfalfa:**

- *Basagran Forte* (145 mL per acre) plus UAN as above.

***Roundup* Ready Soybean:**

- Glyphosate (360 to 720 mL per acre). UAN is not required for control of weeds listed on the glyphosate label.

Restrictions:

- **Rainfall:** Rain within 6 hours may reduce control.
- **Restricted Entry Interval:** DO NOT enter treated fields for at least 12 hours.
- **Grazing Restrictions:** DO NOT graze, or cut for feed/hay within 20 days of application to alfalfa. DO NOT graze or cut for feed any other listed crop.
- **Pre-harvest Interval:** DO NOT apply within 60 days of harvest.
- **Re-cropping Interval:** Winter wheat may be seeded 3 months after application. Barley, canaryseed, canola, chickpea, field corn, field pea, flax, lentil, oats, sunflower, and spring wheat (including durum) may be seeded the first season after application and tame mustard (condiment types only) the second season after application. The company recommends that a field bioassay (a test strip grown to maturity) be conducted the year before growing any crops other than those listed above. Contact manufacturer for additional information on recropping intervals.
  Note: *Where less than 125 mm of accumulated rainfall is received between June 1 and September 1 in the year of application, or additionally for the brown soil zone where less than 15 mm is received in any single month through June, July and August, regardless of total rainfall during that time, delay planting canaryseed, canola (non-CLEARFIELD), flax, tame oats, winter wheat and durum wheat by an additional year. If the same drought conditions as described above occur in either the year of application or the year following, delay planting tame mustard by an additional year.*
  - *As with other herbicides that break down through microbial activity, additional conditions that may slow breakdown and increase the risk of follow crop injury are soil pH of less than 6.5, organic matter of less than 3 percent, very sandy soils and prolonged cold.*
- **Storage:** DO NOT freeze. Store in a cool, dry place above 5°C.
- **Buffer Zones:** Avoid spraying in situations where drift may occur. Leave at least 11 metres between the outside edge of the sprayed area and sensitive non-target areas such as shelterbelts, hedgerows, wetlands, woodlots, vegetated ditch banks, ponds, streams, and sloughs. Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.

Sprayer Cleaning:

Refer to 'Method B' in the general sprayer cleaning section in the introduction.

Hazard Rating:

Warning – Poison

Warning – Contains the Allergen Soy

Warning – Eye and Skin Irritant

Refer to the Introduction for an explanation of the symbols.

Imazamox / Imazethapyr

Herbicide Group
2 - imazamox, imazethapyr

Company:

BASF *(Odyssey NXT)*
AgraCity (*Ninja*)
ADAMA Canada (*Quasar*)*
Sharda Cropchem (*Judo*)*
Viking (*Viking Skien*)
*** Note:** *This product is no longer manufactured but inventories still remain in distribution. This product may be removed from future editions.*

Formulation:

***Ninja* (PCP#32995), *Judo* (PCP#33949), *Viking Skien* (PCP#34866):** 35% imazamox and 35% imazethapyr formulated as a dispersible granule.

- Container size - 8 x 86.5 g water soluble packs. Adjuvant sold separately.

***Odyssey NXT II* (PCP#33678):** 35% imazamox and 35% imazethapyr formulated as a dispersible granule.

- Container size - 2 x 692 g jugs per 80 acre case. One case will also include 2 x 8.1 L jugs of *Merge*.

The *Quasar* package contains the following components:
***Davai 80 SL* (PCP#32929):** 80 g/L imazamox formulated as a solution.

- Container size - 6.47 L

-plus-
***Phantom* (PCP#30017):** 240 g/L imazethapyr formulated as a solution.

- Container size - 2.08 L

Crops and Staging:

Crop	Leaf Stage
Field pea[Δ], faba bean[ΔΔΔ]	1 to 6 nodes/true leaf stage
CLEARFIELD sunflower[ΔΔΔ]	2 to 8 leaf
CLEARFIELD lentil[ΔΔΔ], CLEARFIELD sunflowers[ΔΔΔ]	1 to 9 above ground nodes
Dry beans[Q]	Emergence to the second trifoliate leaf
Soybean[ΔΔ]	1 to 3
Fenugreek (grain**, seed or forage)[ΔΔΔ], alfalfa*[†ΔΔΔ], bird's-foot trefoil*[†ΔΔΔ], seedling clover (red, alsike and sweet)*[ΔΔΔ], seedling sainfoin*[ΔΔΔ]	1 to 4

*** Seed production only.**
**** Including grain production for human consumption (*Odyssey NXT* only)**
[†] Seedling and established.
[Δ] *Viking Skien* is registered on field peas only.
[ΔΔ] *Odyssey NXT II* and *Quasar* only.
[ΔΔΔ] *Odyssey NXT II* only.
[Q] *Quasar* only.

Temporary crop yellowing may be observed shortly after application in field pea and faba bean.

Weeds, Rates and Staging:

Merge adjuvant (sold separately for *Ninja, Judo* and *Viking Skien*; included in *Odyssey NXT II*) must be used at a rate of 0.5 L per 100 L of spray solution.

At 17.3 grams per acre, *Odyssey NXT II* and *Ninja* or *Quasar* at 80 mL per acre of *Davai 80SL* plus 26 mL per acre of *Phantom* will control:

- **Grasses - 1 to 4 main stem leaves, until tillers are visible:**
  - Barnyard grass[S]
  - Green foxtail
  - Persian darnel[NQ]
  - Volunteer cereals (wheat excluding CLEARFIELD varieties[S], barley[S], oats)
  - Wild oats
  - Yellow foxtail[††]

- **Broadleaf Weeds - cotyledon to 4 leaf stage unless otherwise indicated:**
  - Chickweed
  - Cleavers (up to 4 whorls)[NQ]
  - Flixweed[NQ]
  - Green smartweed
  - Hemp-nettle*[NQ]
  - Lamb's-quarters***
  - Redroot pigweed
  - Russian thistle[†NQ]
  - Shepherd's-purse[NQ]
  - Stinkweed
  - Stork's-bill[NQ]
  - Volunteer canola (not CLEARFIELD varieties)[S]
  - Volunteer tame mustard (not CLEARFIELD oilseed *(B. juncea)* varieties)[NQ]
  - Wild buckwheat*[S]
  - Wild mustard

  *** Suppression only in field peas and CLEARFIELD lentils.**
  **** Suppression only in field peas, not controlled in CLEARFIELD lentils.**
  ***** Suppression only.**
  [†] Suppression only in CLEARFIELD lentils. Not labelled for control in peas with *Ninja*.
  [††] *Quasar* only.
  [NQ] NOT including *Quasar*.
  [S] Suppression only with *Quasar*.

Note: DO NOT apply *Imazamox/Imazethapyr* more than once or follow it with any other product containing imazamox or imazethapyr in the same year.

Refer to the product label for complete mixing instructions for this product and its mixes. A general guide to mixing can be found in the introduction.

Application Information:

- **Water Volume:** 40 L per acre.
- **Nozzles and Pressure:** Maximum 40 psi (275 kPa) when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage of ***ASABE medium*** droplets or larger.
- **Screens:** Use 50 mesh or coarser on both nozzle and primary plumbing screens.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
imazamox	POST (foliar) with slight soil activity	ALS Amino Acid inhibitor	Toward Areas of Growth (Symplast)	Broadleaf & grass	2
imazethapyr	POST (foliar) with some soil activity	ALS Amino Acid inhibitor	Toward Areas of Growth (Symplast)	Broadleaf only	2

Effects of Growing Conditions:

DO NOT spray if temperatures of 5°C are forecast within 3 days of application. Treat crops during warm weather when weeds are actively growing and soil moisture is adequate for rapid growth. Under cool or dry conditions, control of some weeds may be severely reduced.

Tank Mixes:

Herbicides[†]:

- **In field peas, CLEARFIELD lentils, and soybeans only:**
  - *Poast Ultra* (130 to 190 mL per acre).
- **In field peas, CLEARFIELD lentils, faba beans and soybeans:**
  - *Caziva Ultra Q, Assure II* or *Yuma* (154 to 304 mL per acre).

Insecticides: None registered.

Fungicides: None registered.

Fertilizers: None registered.

[†] Note: The above mixes are those listed on the *Odyssey NXT II* label only. No tank mixes are listed on the *Ninja* and *Viking Skien* labels.

According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product..

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Rainfall within 3 hours of application may reduce control.
- **Restricted Entry Interval:** DO NOT enter treated fields for 12 hours.
- **Grazing Restrictions:** DO NOT graze treated canola or soybean or cut for hay. Field pea may be fed to livestock 30 days after application. DO NOT harvest forage or cut for hay.
- **Pre-harvest Interval:** DO NOT apply within 60 days of harvesting faba bean, field pea, and lentil. DO NOT harvest dry beans within 75 days of application (*Quasar* only).
  DO NOT apply within 85 days of harvesting soybean.
- **Re-cropping Interval:** Field pea, lentil, CLEARFIELD canola, oats**, barley, field corn*, chickpea**, soybean and spring wheat may be seeded the first full season after application. Flax**, canola**, canaryseed**, durum wheat and sunflower** may be seeded the second full season after application. The manufacturers recommend that a field bio-assay (a test strip grown to maturity) be conducted the year before growing any crops other than those listed above.
  - ***Note:*** *Where less than 125 mm of accumulated rainfall is received between June 1 and September 1 in the year of application, or additionally for the brown soil zone where less than 15 mm is received in any single month through June, July and August, regardless of total rainfall during that time, delay planting tame oats by an additional year. If the same drought conditions as described above occur in either the year of application or the year following, delay planting non-CLEARFIELD canola by an additional year.*
  - ***Note:*** *As with other herbicides that break down through microbial activity, the breakdown of Imazamox/Imazethapyr may be slowed or delayed by environmental conditions such as drought, excessive cold and/or acid soils (pH less than 6.5) resulting in an increased risk of injury to rotational crops. The most tolerant crops are CLEARFIELD canola and legume crops, then cereals. Contact manufacturer for additional information on re-cropping interval.*

  *** Field corn is not listed as a registered recrop option on the *Ninja* or *Quasar* labels.**
  **** Not listed as a recrop option following *Quasar* application.**
- **Aerial Application:** DO NOT apply by air.
- **Storage:** DO NOT freeze. Store in a cool, dry place above 5°C.
- **Buffer Zones:** Avoid spraying in situations where drift may occur.

Application method	Buffer Zones (metres†) Required for the Protection of:	
	Aquatic Habitats of Depths	Terrestrial habitat
Ground*	11	1

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Refer to 'Method C' in the general sprayer cleaning section in the introduction.

Hazard Rating:

Warning – Eye and Skin Irritant

Warning – Contains Allergen Sulfites

Refer to the Introduction for an explanation of the symbols.

Imazamox/Imazethapyr + Clethodim

Herbicide Group
1 - clethodim
2 - imazamox, imazethapyr

This product is a prepackaged tank mix of imazamox/imazethapyr and clethodim. Information listed is restricted to Crops, Weeds, Rates and Tank mixes. For other detailed restrictions and other general information on the component products see the product pages listed above.

Company:

AgraCity (*Ninja Master*)

Viking (*Viking Floro*)

Formulation:

The *imazamox/Imazethapyr + clethodim* package contains the following components:
***Ninja* (PCP#32995 - *Ninja Master*), *Viking Skien* (PCP# 34866 - *Viking Floro*):** 35% imazamox + 35% imazethapyr formulated as a water dispersible granule.

- Container size - 4 x 692 g

-plus-

***Independence* (PCP#32851 - *Ninja Master*) , *Viking Clethodim* (PCP# 34745 - *Viking Floro*):** 240 g/L clethodim formulated as an emulsifiable concentrate.

- Container size - 8 L

Crops and Staging:

Crop	Leaf Stage	Days to Harvest
Field pea	1 to 6 true leaf stage	75

Weeds, Rates and Staging:

Weeds controlled by imazamox/imazethapyr at 17.3 grams per acre plus the weeds controlled by clethodim at 50 mL per acre.
Ninja Master requires the addition of *Assassin* or *Merge* adjuvant and *Viking Falun* requires the addition of Viking PHC adjuvant both at 0.5 L per 100 L of spray solution, which must be purchased separately.
Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Tank Mixes:

None registered.

See component products for more information on restrictions, application details and handling. Unless indicated differently above use the most limiting restrictions across all components for the mix.

Imazamox / Quizalofop

Herbicide Group
1 - quizalofop
2 - imazamox

This product is a prepackaged tank mix of imazamox and quizalofop. Information listed is restricted to Crops, Weeds, Rates and Tank Mixes. For other detailed information on the effect of growing conditions, and restrictions for the component products see the product pages listed above.

Company:
BASF Canada (*Solo Ultra Q*)
ADAMA Canada (*Davai Q Plus)*

Formulation:
The *Solo Ultra Q* package contains the following components:
***Solo ADV II* (PCP#33720):** 25 g/L imazamox formulated as a solution with built in adjuvant.
- Container size - 2 x 6.5 L jugs

***Caziva Ultra Q* (PCP# 34282):** 96 g/L quizalofop-p-ethyl formulated as an emulsifiable concentrate.
- Container size - 6.16 L

-or-
The *Davai Q Plus* package has the following components:
***Davai 80 SL* (PCP#32929):** 80 g/L imazamox formulated as a solution.
- Container size - 4 L

***Arrow All In (PCP#33225)*:** Quizalofop-p-ethyl 120 g/L formulated as an emulsifiable concentrate.
- Container size - 5.9 L

Crops and Staging:
CLEARFIELD sunflower*: 2 to 8 leaf stage.
CLEARFIELD lentil: 2 to 9 node stage.
Soybean: Cotyledon to 4 leaf stage
Dry bean:** emergence to 2nd trifoliate leaf.
Field pea:** 1 to 6 true leaf stage.
***Solo Ultra Q* only.**
****Davai Q Plus* only.**

Weeds Staging:
Weeds controlled by *Solo ADV* and *Davai 80 SL* (see imazamox) plus the grasses controlled by *Caziva Ultra Q* (see quizalofop) at 0.2 L per acre and *Arrow All In* at 150 mL per acre and the stages indicated on the component product pages plus:
- Annual brome (Downy, Japanese)
- Foxtail barley
- Volunteer corn

Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Rates:
***Solo ADV*:** 325 mL per acre
***Caziva Ultra Q*:** 154 mL per acre
***Davai 80 SL*:** 100 mL per acre
***Arrow All In*:** 150 mL per acre

Tank Mixes:
Herbicides:
- *Quizalofop* (may be added to top up to a total of 300 mL per acre)

Insecticides: None registered.
Fungicides: None registered.
Fertilizers: None registered.
See component products for more information on restrictions, application details and handling. Unless indicated differently above use the most limiting restrictions across all components for the mix.

Imazethapyr

Herbicide Group 2 - imazethapyr

Company:

BASF Canada (*Pursuit 240* – PCP#23844)
AgraCity (*Kamikaze* – PCP#30127)
ADAMA Canada (*Phantom* – PCP#30017)
Viking (*Viking Imazethapyr* – PCP#34747)

Formulation:

240 g/L imazethapyr formulated as a solution.

- Container size - 2 x 3.3 L jugs per case

Crops and Staging:

All products: DO NOT use in the brown or dark brown soil zones (except for use in dry bean and alfalfa under irrigated brown soils); rotational crops may be severely injured due to carry over in these soils.

Crop	Stage
Field pea	May be applied up to the sixth above-ground node stage (6 true leaves).

***Pursuit, Phantom* and *Viking Imazethapyr* only:**

Crop	Stage
Dry bean (pinto, pink and red varieties only)	Up to and including the second trifoliate leaf stage
Soybean (Manitoba only)	Up to and including the third trifoliate leaf stage
Seedling alfalfa (forage or seed production)*	Apply after the first trifoliate leaf stage.
Established alfalfa (seed production only)**	Apply before alfalfa reaches 12 inches (30 cm) in height.
Chickling vetch *(Lathyrus)* grown for seed	Apply at the 5 to 7 leaf stage.

*** Apply only to seedling alfalfa that will remain in production for at least 3 years following application. Apply only once during the life of the alfalfa stand.**
**** DO NOT apply in the last year of established alfalfa stands.**

Weeds and Staging:

In field peas and soybean. Apply up to the 4 leaf stage, unless otherwise indicated:

- Chickweed
- Cleavers
- Green foxtail
- Hemp-nettle
- Redroot pigweed
- Shepherd's-purse
- Smartweed
- Stinkweed
- Volunteer canola (not CLEARFIELD varieties)
- Wild buckwheat†
- Wild mustard
- Wild oats† (2 to 4 leaf stage)

In seedling and established alfalfa:

- Common groundsel*†
- Green foxtail†
- Green smartweed *
- Redroot pigweed
- Shepherd's-purse*†
- Stinkweed
- Volunteer canola (not CLEARFIELD varieties)
- Wild mustard

In dry bean:

- Hairy nightshade (up to 6 leaf stage)

*** Seedling alfalfa only.**
† Suppression only.

Rates:

85 mL per acre.

A non-ionic surfactant with at least 80 percent active ingredient (*Agral 90*, *Agsurf II*, *Surf 92*) should be added at a rate of 0.25 L per 100 L of spray solution. DO NOT over apply imazethapyr, as crop injury may result.

DO NOT apply imazethapyr more than once per season or follow imazethapyr with other products containing imazethapyr in the same year. Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Application Information:

- **Water Volume:** 40 to 160 L per acre.
- **Nozzles and Pressure:** Maximum 40 psi (275 kPa) when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use nozzles and pressure designed to deliver proper coverage with ***ASABE medium*** droplets or larger.

How it Works:

Refer to "How Do Herbicides Work" in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
imazethapyr	POST (foliar)	ALS Amino Acid inhibitor	Toward Areas of Growth (Symplast)	Broadleaf & grass	2

Effects of Growing Conditions:

DO NOT spray if temperatures of +5°C are forecast within 3 days of application. Treat crops during warm weather when weeds are actively growing and soil moisture is adequate for rapid growth. Under cool or dry conditions, control of some weeds may be severely reduced.

Tank Mixes:

None registered.

Restrictions:

- **Rainfall:** No rainfast period is specified on the label; required interval may be up to 8 hours. Contact manufacturer for more information.
- **Restricted Entry Interval:** DO NOT enter treated fields for 12 hours.
- **Grazing Restrictions:** DO NOT graze or harvest seedling alfalfa within 14 days of treatment. DO NOT graze or harvest field peas for feed within 30 days. DO NOT graze other treated crops or cut for feed prior to crop maturity.
- **Pre-harvest Interval:** DO NOT apply within 60 days of harvesting field peas or chickling vetch, within 75 days of harvesting dry beans, or within 85 days of harvesting soybeans.
- **Re-cropping Interval:** Rotate to barley, spring wheat (not durum), lentils, alfalfa, field pea or CLEARFIELD canola the year following application. The manufacturer recommends that a field bioassay (a test strip grown to maturity) be conducted the year before growing any crop other than those listed above. However, yield losses within the test strips may not be noticed unless the yield can be compared to an untreated area seeded adjacent to the imazethapyr-treated strip. In case of crop failure, only field peas or CLEARFIELD canola may be replanted in the year of application.
  - *NOTE: Breakdown of imazethapyr may be slowed or delayed by environmental conditions such as drought, excessive cold and/or acid soils (pH less than 6.5) resulting in an increased risk of injury to rotational crops. The most tolerant crops are CLEARFIELD canola and legume crops, then cereals. Contact manufacturer for additional information on re-cropping intervals.*
- **Aerial Application:** DO NOT apply by air.
- **Storage:** DO NOT freeze. If the product is exposed to temperatures below 0°C, thaw the product completely and shake the container vigorously prior to use.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:	
	Aquatic Habitats	Terrestrial habitat
Ground only*	1	1

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured is metres from the downwind edge of the spray boom to sensitive habitat.

  - **Other Products:** DO NOT apply within 15 m of shelterbelts, water bodies, wetlands, and woodlots.

Sprayer Cleaning:

There are no specific sprayer cleaning directions on the product label. The use of 'Method C' in the general section on sprayer cleaning in the introduction is recommended for other products with similar chemistry. Contact the manufacturer for more information.

Hazard Rating:

Caution – May Cause Skin Irritation

Caution – May Cause Eye Damage

Refer to the Introduction for an explanation of the symbols.

Inferno Trio

Herbicide Group
2 - florasulam, flucarbazone,
14 - carfentrazone-ethyl

Company:
UPL AgroSolutions Canada (PCP#33273)

Formulation:
***Inferno Trio* (PCP#33273):** 141 g/L flucarbazone, 50 g/L florasulam, and 175 g/L carfentrazone-ethyl formulated as a suspension concentrate.
- Container size - 4 x 3.24 L

Crops and Staging:
Spring wheat (NOT including durum): Apply to the soil surface from one week before seeding until crop emergence.

Weeds, Rates and Staging:
Inferno Trio: Apply 40 mL per acre
- Will control the following weeds:
  - Cleavers
  - Cocklebur
  - Dandelion (S)
  - Flixweed†
  - Hemp-nettle (S)
  - Green foxtail
  - Kochia (including glyphosate-resistant)
  - Lamb's-quarters
  - Narrow-leaved hawk's-beard (S)
  - Redroot pigweed*
  - Russian thistle
  - Shepherd's-purse
  - Stinkweed
  - Wild buckwheat
  - Wild mustard
  - Wild oats (S)
  - Volunteer canola*

Inferno Trio: Apply 40 mL per acre plus 180 g ae per acre of glyphosate IPA, DA or K+ salts (see glyphosate) to control:
- *Will control weeds above in addition to the weeds controlled by glyphosate at 180 g ae per acre (see glyphosate) and the weeds above plus:*
  - Barnyard grass
  - Chickweed
  - Corn spurry
  - Cow cockle
  - Dandelion**
  - Eastern black nightshade
  - Kochia (including glyphosate-resistant)
  - Night-flowering catchfly
  - Round-leaved mallow
  - Smartweed (green, Pennsylvania)
  - Stork's-bill
  - Wild tomato
  - Velvetleaf

(S) Suppression.
*** Control of weeds that emerge within 7 days following application.**
**** Top-growth only.**
NOTE: These products applied alone, without glyphosate, requires the addition of a non-ionic surfactant such as Ag-Surf, Agral 90, ProSurf, *etc. at 2.5 L per 1000 L of spray mixture.*

NOTE: DO NOT apply more 6 g ai per acre of flucarbazone (the equivalent of 1 application) per growing season.

Application Information:
- **Water Volume:**
  - ***Ground:*** 20 to 40 L per acre
- **Nozzles and Pressure:** Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE coarse*** droplets. Use a spray pressure of 30 to 50 psi (207 to 345 kPa) pressure.

How it Works:
Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
flucarbazone	POST (foliar – emerged weeds) PRE (soil activity)	ALS Amino Acid Inhibitor	Toward Areas of Growth (Symplast)	Broadleaf & grass	2
florasulam	POST (foliar) with little soil activity	ALS Amino Acid Inhibitor	Toward Areas of Growth (Symplast)	Broadleaf only	2
carfentrazone-ethyl	POST (foliar)	PPO Inhibitor/ Membrane disruptor	Little movement due to rapid cell leakage (Symplast)	Non-selective broadleaf	14

Effects of Growing Conditions:

DO NOT apply to soils with organic matter less than 2.5 percent or soil pH greater than 8. Unacceptable crop injury may occur if applied to soils saturated with water. Unacceptable crop injury symptoms and reduced weed control may be observed under temperature extremes, drought, low fertility, or plant disease.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides:

- ***Pre-Emergent or Post-Plant Pre-Emergent*** - Glyphosate IPA, DA or K+ salts only

Note: The above mixes are those listed on the *Inferno Trio* label only.

Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 1 hour of application may reduce control.
- **Restricted Entry Interval:** DO NOT re-enter treated fields for 12 hours.
- **Grazing Restrictions:** DO NOT graze treated fields.
- **Pre-harvest Interval:** Leave 80 days between application and harvest.
- **Re-cropping Interval:** The following crops may be planted 11 months after an application of *Inferno Trio*:

Soil Zones and Rotational Crops			
Grey-Wooded	Black	Dark Brown	Brown
Spring Wheat Barley Canola Field Pea*	Wheat (spring, durum) Barley Canola Field Pea Field Bean Flax Soybean Sunflower	Wheat (spring, durum) Barley Canola Field Pea Flax Soybean Sunflower	Spring Wheat

*** Field pea may be grown the year following flucarbazone application providing the following conditions are all met:**

1. **Soil pH must be below 7.5**
2. **Organic matter must be above 4 percent, and**
3. **Precipitation must be equal to or above 10-year average (minimum 100 mm within 60 days of application in year of application)**

- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store in a cool, dry place.
- **Buffer Zones:**
  - ***Inferno Trio:***

Application method	Buffer Zones (metres†) Required for the Protection of:	
	Aquatic Habitats	Terrestrial habitat
Ground only*	5	30

See the Key to Product Pages in the introduction for an explanation of the different habitats.

*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**

† Distance measured is metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Residues of these active ingredients in the spray tank can cause severe injury to sensitive crops at very low concentrations. Sprayers should be cleaned out immediately before using another product.

Refer to 'Method A' in the general section on sprayer cleaning in the introduction.

When mixing with other pesticides, combine the method above with the method required for the tank mix partner if it is different from above.

Hazard Rating:

Warning – Contains the Allergen Sulphites

Caution – Skin Irritant

Potential Skin Sensitizer

Refer to the Introduction for an explanation of the symbols.

Infinity

Herbicide Group
6 - bromoxynil
27 - pyrasulfotole

Company:
Bayer (PCP#28738)

Formulation:
37.5 g/L pyrasulfotole and 210 g/L bromoxynil formulated as an emulsifiable concentrate.
- Container size - 2 x 6.7 L jugs per case

Crops and Staging:
The following crops may be treated when at the 1 leaf stage of growth until the flag leaf is just visible but still rolled:
- Barley
- Perennial ryegrass* (seedling & established, grown for seed or forage)
- Red fescue and bromegrass* (established, grown for seed or forage)
- Timothy (seed production only)
- Triticale
- Wheat (spring, durum, winter)

**** NOTE: Since the uses on forage grasses were registered under the User Requested Minor Use Label Expansion (URMULE) program, the manufacturer assumes no responsibility for herbicide performance. Those who apply this use do so at their own risk.***

Weeds, Rates and Staging:
At 0.33 L per acre the following weeds are controlled at the 1 to 6 leaf stage unless otherwise noted:
- Annual sow-thistle
- Chickweed
- Canada fleabane (seedlings up to 10 cm)*
- Canada thistle† (up to 30 cm)
- Cleavers (1 to 3 whorls)
- Cleavers (4 to 6 whorls)*
- Dandelion† (up to 25 cm across††)
- Flixweed (up to 10 cm)
- Hemp-nettle
- Kochia (up to 10 cm)
- Lamb's-quarters
- Narrow-leaved hawk's-beard (up to 10 cm before bolting)
- Pale smartweed
- Ragweed (common, giant†*)
- Perennial sow-thistle†
- Redroot pigweed
- Round-leaved mallow*‡
- Russian thistle (up to 10 cm)
- Shepherd's-purse
- Spreading atriplex (up to 10 leaf)†*
- Stinkweed
- Stork's-bill (up to 8 leaf)***
- Volunteer canola**
- Volunteer soybean*
- Wild buckwheat
- Wild mustard

† Suppression only.
†† Spring seedlings and overwintered rosettes.
‡ Suppression alone or control with the addition of AMS*.
*** Add 200 g of active ammonium sulphate per acre (202 grams per acre of 99 percent dry; 0.5 L per acre of 40 percent liquid; or 0.4 L per acre of 49 percent solution).**
**** All herbicide tolerant varieties.**
***** Only when mixed with 2,4-D + ammonium sulphate.**

DO NOT apply *Infinity* or other products containing pyrasulfotole or bromoxynil more than once in the same year.

Application Information:
- **Water Volume:**
  - ***Ground:*** Minimum 19 L per acre
  - ***Aerial:*** Minimum 11.4 L per acre

  Higher water volumes should be used under dense crop and weed canopies to ensure thorough coverage of the target weeds.
- **Nozzles and Pressure:** Maximum 40 to 45 psi (275 to 310 kPa) with conventional flat fan nozzles. Use nozzles and pressure designed to deliver proper coverage with ***ASABE medium*** droplets. Angle ground sprayer nozzles forward at a 45° angle to improve coverage of vertical leaf targets.

How it Works:
Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
bromoxynil	POST (foliar)	PSII Inhibitor/ Membrane disruptor	Little (Apoplast)	Broadleaf only	6
pyrasulfotole	POST (foliar)	HPPD Pigment Inhibitor	Some – both foliar and root (Apoplast) Somewhat systemic (has soil residues)	Broadleaf only	27

Effects of Growing Conditions:

For best results, apply to emerged, young, actively growing weeds according to the weed stages listed. Under stressed conditions and/or heavy crop canopy, early application will result in improved weed control. Weeds growing under adverse environmental conditions such as drought will be less susceptible herbicide effects.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides:

- ***Wheat (spring, winter, and durum), barley and triticale:***
  - *Liquid Achieve*
- ***Wheat (spring and durum) and barley only:***
  - *Puma Advance*
  - 2,4-D Ester (113 g ae per acre) + Ammonium sulphate (see Rates:)

Insecticides: None registered.

Fungicides: None registered.

Fertilizers: DO NOT mix with fertilizers other than those indicated above.

Note: The above mixes are those listed on the *Infinity* label only.

According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product..

Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 1 hour of application may reduce control.
- **Restricted Entry Interval:** DO NOT re-enter treated area within 12 hours.
- **Grazing Restrictions:** DO NOT graze treated crops or cut for hay within 25 days of application.
- **Pre-harvest Interval:** Leave at least 50 days for wheat and triticale and 45 days for barley from application to harvest of grain or straw.
- **Re-cropping Interval:** Alfalfa, barley, canaryseed, canola, field corn (Manitoba only), flax, potatoes, soybeans (Manitoba only), sunflowers, tame oats, and wheat (durum, spring) may be seeded the year following application. Field peas may be grown the season following application in black, grey-wooded and dark brown soil zones. DO NOT plant field peas the season following Infinity use in the brown soil zone soil pH is above 7.5 and precipitation was less than 125 mm from June 1st until September 1st of the year of application.
- **Aerial Application:** May be applied by air.
- **Storage:** Store product in original containers in a secure, dry area, away from other pesticides, food or feed above –20°C. If stored over winter, shake or mix well before using.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground *	1	1	5
Fixed wing airplane	10	1	375
Helicopter	10	1	225

See the Key to Product Pages in the introduction for an explanation of the different habitats.

*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**

† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

The manufacturer recommends a cleanout process similar to "Method A" using a combination of water and ammonia solution rinses.

For additional information, Refer to the general section on sprayer cleaning in the introduction.

Hazard Rating:

Warning – Poison

Warning – Eye and Skin Irritant

Warning – Contains the Allergen Soy

Refer to the Introduction for an explanation of the symbols.

Infinity FX

Herbicide Group
6 - bromoxynil
27 - pyrasulfotole
4 - fluroxypyr

Company:

Bayer

Formulations:

Co-pack*:

***Infinity* (PCP #28738):** 37.5 g/L pyrasulfotole and 210 g/L bromoxynil formulated as an emulsifiable concentrate.

- Container size - 13.4 L

***FX* (PCP #32006):** 180 g/L fluroxypyr formulated as an emulsifiable concentrate.

- Container size - 6.5 L

-or-

***Infinity FX* (PCP#33248):** 31.1 g/L pyrasulfotole, 174.3 g/L bromoxynil and 72 g/L fluroxypyr formulated as an emulsifiable concentrate.

- Container sizes - 8.1 L, 129.6 L, 405 L

**** Note: This formulation is no longer manufactured but some still remains in the distribution system. This product may be removed from future editions when supplies are exhausted.***

Crops and staging:

Spring Wheat, Durum, Barley: Apply at the 2 leaf stage of growth until the flag leaf is just visible but still rolled.

Forage grasses for forage or seed production:

Seedling and established grasses at the 4 leaf stage until the flag leaf is just visible but still rolled

- Perennial ryegrass
- Timothy
- Red Fescue (creeping red)
- Bromegrass (meadow bromegass and smooth bromegrass)†

†***Infinity FX* only**

Weeds, Rates, Staging:

At the *Infinity* 335 mL per acre and *FX* 160 mL or *Infinity FX* at 405 mL per acre, the weed species controlled by the *Infinity* label plus the following.

- Cleavers (1 to 9 whorls)*
- Chickweed (up to 8 leaf stage)
- Hemp-nettle (up to 8 leaf stage)
- Kochia (up to 15 cm in height)
- Round-leaved mallow (1 to 6 leaf stage)
- Volunteer flax (up to 12 cm)

*** Ammonium sulphate at 200 g of active ingredient per acre may be added for improved broad leaf control (202 grams per acre of 99 percent dry; 0.5 L per acre of 40 percent liquid; or 0.4L per acre of 49 percent liquid).**

Application Information

- **Water Volume**
  - ***Ground:*** Minimum of 19 L per acre . Higher water volumes should be used under dense crop and weed canopies to ensure thorough coverage of the target weed.
- **Nozzles and Pressure:** Maximum 40 to 45 psi (275 to 310 kPa) with conventional flat fan nozzles. Use nozzles and pressure to deliver proper coverage with ***ASABE medium*** droplets. Angle ground sprayer nozzles forward at a 45° angle to improve coverage of vertical leaf targets.

Tank Mixes

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides :

- ***Spring wheat, durum, and barley:***
  - 2,4-D ester + AMS
  - *Liquid Achieve*
  - *Puma Advance*
- ***Spring wheat and durum:***
  - *Horizon NG*
  - *Varro*
- ***Spring wheat and barley:***
  - *Axial*

Fertilizers: DO NOT mix fertilizers other than those indicated above

According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Adding ingredients in the correct order is critical for optimum performance. Check label of both products to be mixed for directions. General guidelines can be found in the introduction.

See component products for more information on restrictions, application details and handling. Unless indicated differently above use the most limiting restrictions across all components for the mix.

Hazard Rating:

Warning – Poison
Eye and Skin Irritant
Potential Skin Sensitizer
Refer to the Introduction for an explanation of the symbols.

Insight Liquid SC

Herbicide Group 14 - tiafenacil

Company:

Gowan Canada

Formulation:

***Insight Liquid SC* (PCP#34689):** 339 g/L tiafenacil formulated as a suspension concentrate.

- Container size – 6 x 2.4 L, 4 x 4.8 L

Crops and Staging:

Wheat (spring, durum, winter), field corn: For burndown of emerged weeds prior to seeding or after seeding but prior to crop emergence.

Fallow and non-crop areas

Weeds, Rates and Staging:

Unless otherwise noted below, apply to young and actively growing weeds that are up to 12.5 cm in height.

Weeds Controlled:

- Kochia
- Lamb's-quarters
- Prickly lettuce*
- Redroot Pigweed
- Russian thistle
- Volunteer canola
- Waterhemp*
- Wild buckwheat
- Wild oat

* **Suppression**

Rate:

30 to 60 mL per acre.

Add *MSO surfactant* at 1 L per 100 L of spray solution.

Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Application Information:

- **Water Volume:** Minimum 40 L per acre.
- **Nozzles and Pressure:** Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASAE medium to coarse*** droplets.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
tiafenacil	POST (foliar)	PPO inhibitor / membrane disruptor	Little movement due to rapid cell leakage	Non-selective	14

Effects of Growing Conditions:

Burndown activity may be slowed or reduced under cloudy and/or foggy or cooler weather conditions, or when weeds are growing under drought or other stress conditions.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.
Herbicides: None
Insecticides: None
Fungicides: None
Fertilizers: None
According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.
Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 1 hour of application may reduce control.
- **Re-entry:** DO NOT re-enter treated fields for 12 hours.
- **Preharvest Interval:** No restrictions on the label.
- **Grazing:** Not applicable.
- **Re-cropping:**
  - ***Field corn, spring wheat (including durum):*** 0 days after application.
  - ***Soybeans:*** 14 days after application.
  - ***All other crops:*** May be seeded the year following application (270 days).
- **Aerial Application:** DO NOT apply by air.
- **Storage:** DO NOT allow product to freeze.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground*	1	1	4

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70% when using shrouds and by 30% when using cones mounted less than 12 inches from the crop canopy.**
† Distance is measured from the downwind edge of the boom to sensitive areas.

Sprayer Cleaning:

Refer to 'Method B' in the general sprayer cleaning section in the introduction.

Hazard Rating:

No specific hazard indicated.

Intruvix*/Intruvix II

Herbicide Group
2 - tribenuron
4 - dicamba
14 - carfentrazone-ethyl

Intruvix is a a prepackaged tank mix of the equivalent of Express FX (Intruvix A) and the equivalent of Aim EC (Intruvix B). Information listed is restricted to Crop, Weeds, Rates and Tank mixes. For other detailed restrictions and other general information on the component products see the product pages listed above.

** **Note:** This product is no longer manufactured but inventories still remain in distribution. This product may be removed from future editions.*

Company:
FMC Corporation

Formulation:
The *Intruvix* package contains the following components:

***Intruvix A* (PCP#33462):** 60.87% dicamba and 6.52% tribenuron-methyl formulated as a water dispersible granule.
- Container size - 3.72 kg

***Intruvix B* (PCP#33530):** 240 g/L carfentrazone-ethyl formulated as an emulsifiable concentrate.
- Container size - 1.2 L

NOTE: Intruvix *is purchased alone but must be tank mixed with glyphosate before use.*

***Intruvix II* (PCP#34898)**: 43.75% dicamba, 4.69% tribenuron-methyl and 11.25% carfentrazone-ethyl formulated as a wettable granule.
- Container size – 2.58 kg.

Crops and Staging:
For application to fallow, post-harvest and 1 day prior to seeding barley, oats or wheat (spring, durum, winter).

Weeds and Staging:
The combination of weeds controlled by *Intruvix A* (see *Express FX*), *Intruvix B* (see *Aim EC*) and glyphosate.

Rates:
Intruvix A: 46.5 grams per acre. DO NOT apply more than 46.5 grams per acre per year.
***Intruvix B*:** 15 mL per acre
-or-
Intruvix II: 64.5 g per acre
Must be tank mixed with glyphosate.
Intruvix/Intruvix II may degrade if left in the sprayer for an extended period. Apply within 24 hours of mixing.
Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Weeds Controlled up to 8 cm:

- Canada fleabane
- Common ragweed
- Narrow-leaved hawk's beard
- Scentless chamomile*

Weeds Controlled up to 10 cm:

- Black nightshade
- Carpetweed
- Cocklebur
- Common waterhemp
- Eastern black nightshade
- Hairy nightshade
- Jimsonweed
- Kochia
- Morning glory
- Pennsylvania smartweed
- Prostrate pigweed
- Purslane (common)
- Round-leaved mallow
- Shepherd's purse
- Smooth pigweed
- Tall waterhemp
- Tansy mustard
- Tumble pigweed
- Velvet leaf

Weeds Controlled up to 15 cm:

- Cleavers
- Dandelion
- Downy brome
- Flixweed
- Giant foxtail
- Green foxtail
- Hemp nettle
- Lady's thumb
- Lamb's-quarters
- Persian darnel
- Redroot pigweed
- Russian thistle
- Tansy mustard
- Tumble pigweed
- Stinkweed
- Volunteer barley
- Volunteer canola
- Volunteer flax
- Volunteer wheat
- Wild mustard
- Wild oats

Weeds Controlled up to 3-leaf:

- Cow cockle

Weeds Controlled up to 8-leaf:

- Wild buckwheat

Weeds Controlled up to Rosette:

- Canada thistle*
- White cockle*

Intruvix/Intruvix II tank-mixed with glyphosate (0.9 L per acre of 360 g/L ae formulation)

Weeds Controlled up to 15 cm:

- Annual bluegrass
- Annual sowthistle
- Crabgrass (large and smooth)
- Narrow-leaved vetch
- Prickly lettuce
- Shepherd's purse

*** Suppression only.**

Application Information:

- **Water Volume:**
  - ***Ground:*** Minimum 40 L per acre. Higher spray volumes are required for dense weed stands. Weed control improves with the amount of coverage.
- **Nozzles and Pressure:** Use a combination of nozzles and pressure designed to deliver thorough, even coverage with *ASABE standard S572*.1 droplets by ground. Low drift nozzles may require higher pressures for proper performance.
- Optimum *Intruvix/Intruvix II* spray clouds should be 450 microns with fewer than 10% of the droplets being 200 microns or smaller.
- **Screens:** Use a 50 mesh or coarser screen and filter system.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
Tribenuron	POST (foliar)	ALS Amino Acid Inhibitor	Toward growth areas of plant (symplast)	Broadleaf only	2
Dicamba	POST (foliar) with slight soil activity	Synthetic auxin	Moves throughout the plant (symplast)	Broadleaf only	4
Carfentrazone-ethyl	POST (foliar)	PPO Inhibitor/ Membrane disruptor	Little movement due to rapid cell leakage (symplast)	Non-selective broadleaf	14

Effects of Growing Conditions:

Weed control is optimized when the product is applied to actively growing weeds. Warm, moist growing conditions promote active weed growth and enhance the activity of *Intruvix/Intruvix II* by allowing maximum foliar uptake and contact activity. Weeds hardened off by environmental stress such as cold weather, drought stress or excessive heat may not be adequately controlled or suppressed, and regrowth may occur.

Intruvix/Intruvix II applied to pre-seed to fields that are stressed by severe conditions such as drought, low fertility, saline soils, waterlogged soils (soils at or near field capacity), disease or insect damage may result in crop injury. Drought, disease or insect damage following application may also result in crop injury, grade or yield loss.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides:

- Glyphosate (182 g ae per acre).

DO NOT use with tank additives that alter the pH of the spray solution.

According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Restrictions:

- **Rainfall:** If rain occurs soon after application, control may be reduced. Environmental conditions that slow the drying of the spray mixture on the foliage may increase the time required for absorption.
- **Re-entry:** DO NOT re-enter treated fields for 24 hours.
- **Preharvest Interval:** Not applicable.
- **Grazing:** None.
- **Re-cropping:** Spring wheat (including durum), winter wheat, spring barley and oats the year after treatment. Fields treated with Intruvix II in the spring may be seeded to any crop the following season.
- **Aerial Application:** DO NOT apply by aircraft.

- **Storage:** Not for use or storage in or around the home. Store in original containers only. Keep container tightly closed. Store in a cool, dry place. Store this product away from food or feed.
- **Buffer Zones:**

Application method	Buffer Zones (metres †) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground*	1	1	5

See the Key to Product Pages for an explanation of the different habitats.
*** Buffer zones can be reduced by 70% when using shrouds and by 30% when using cones mounted less than 12 inches from the crop canopy.**
† Distance is measured from the downwind edge of the boom to sensitive areas.

Sprayer Cleaning:
Refer to 'Method A' in the general section on sprayer cleaning in the introduction. Let solution stand for an extended period for better results. Flush sprayer system with water. See the label for product specific cleaning details.

Hazard Rating:
Danger – Poison
Warning – Contains the allergens milk and sulfites
Refer to the Introduction for an explanation of the symbols

See component products for more information on restrictions, application details and handling. Unless indicated differently above use the most limiting restrictions across all components for the mix.

IPCO Bifecta EZ

Herbicide Group
5 - metribuzin
14 - flumioxazin

Company:
Interprovincial Cooperative Limited (*IPCO Bifecta EZ* - PCP#34589)

Formulation:
347 g/L metribuzin and 77.6 g/L flumioxazin formulated as a suspension concentrate.
- Container size – 2 x 10 L

Crops and Staging:
Apply before planting, during planting, within 3 days of planting - but before the crop emerges, or in the fall prior to seeding the crop indicated.

Crop	Application Rate (per acre)	
	Spring/Early Summer	Fall (Post-Harvest/Burndown)
Soybean	356 mL	356 mL
Lentils, Field peas, Spring wheat	356 mL	356 mL to 506 mL
Post-Harvest/Fall Burndown	N/A	506 mL
Fallow Cropland	506 mL	N/A
Bare Ground in Non-Crop Areas of Farm	506 mL	506 mL

DO NOT apply to fine-textured soils such as clays.
DO NOT use on muck soil.
DO NOT apply to fields with greater than 5% organic matter.
Injury may occur if:
- ***IPCO Bifecta EZ* is applied to sandy soils with less than 2% organic matter.**
- ***IPCO Bifecta EZ* is applied to soils with pH of 7.5 or greater.**
- **Soybeans are planted less than 1.5 inches deep and lentils, field peas and spring wheat are planted less than 1 inch deep.**

Tillage conducted after application may reduce residual efficacy on target weeds.
DO NOT make more than one application of this product or other products containing metribuzin or flumioxazin per year.

Weeds, Rates and Staging:

Unless otherwise noted below, apply to young and actively growing weeds.

Weeds Controlled:

- Barnyard grass
- Canada fleabane
- Carpetweed**
- Chickweed
- Cleavers
- Cocklebur
- Common ragweed
- Dandelion
- Downy brome
- Foxtail (green, yellow)
- Jimsonweed/Devil's trumpet**
- Kochia
- Lamb's-quarters
- Nightshade (Eastern black, hairy)
- Pigweed (green, prostrate, redroot, Palmer, Waterhemp)
- Russian thistle
- Shepherd's-purse
- Smartweed (green, lady's thumb)
- Velvetleaf
- Volunteer canola*
- Wild buckwheat
- Wild mustard
- Yellow woodsorrel

*** Suppression**

**** Pre-emergent only**

Application Information:

- **Water Volume:**
  - ***Ground only:***
    - ***Soybeans:*** Minimum 60 L per acre.
    - ***Other crops:*** Minimum 40 L per acre.
- **Nozzles and Pressure:** Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE medium*** droplets.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active Ingredient	Timing	Target	Movement	Spectrum	WSSA Group
metribuzin	PPI (soil active) POST (foliar)	PSII Inhibitor/ Membrane disruptor	Little foliar; upward soil applied (Apoplast)	Broadleaf & grass	5
flumioxazin	PRE (surface) with residual soil activity	PPO Inhibitor/ Membrane disruptor	PRE: Upward in plant (Apoplast)	Broadleaf only	14

Effects of Growing Conditions:

Many weather-related factors, including splashing or heavy rains or irrigation or cool conditions at or near crop emergence, may result in soybean injury in treated fields. Application after the soybeans have begun to crack, or are emerged, will result in severe crop injury.

Tank Mixes:

Tank mixes with glyphosate do not require the addition of a surfactant. All other tank mixes must be applied with crop oil concentrate at 0.5 to 1.0 L per acre or a non-ionic surfactant at 0.25% v/v.

Tank mix products applied at label rates unless otherwise indicated.

Herbicides:

- ***All Crops and Fallow:***
  - Glyphosate (*Credit Xtreme* only)
- ***In Soybeans:***
  - *BlackHawk*
  - 2,4-D Ester, *Enlist 1*
  - *Roundup Xtend* (dicamba tolerant soybeans only)
  - *Enlist Duo* (2,4-D tolerant soybeans only)
  - *Phantom 240* (see imazethapyr)
- ***In Field Peas and Lentils:***
  - *GoldWing*
- ***For Spring Wheat:***
  - *BlackHawk*
  - *GoldWing*
  - *Conquer II*
- ***In Fallow:***
  - *BlackHawk*
  - 2,4-D Ester
  - Dicamba
- ***Post-Harvest/Fall Burndown prior to the spring seeding of:***
  - ***Soybeans, field Pea, Lentil, Spring wheat:***
    - *BlackHawk*
  - ***Soybeans only***
    - 2,4-D Ester

Restrictions:

- **Re-entry:** DO NOT re-enter treated fields for 12 hours.
- **Preharvest Interval:** DO NOT harvest soybeans with 100 days of application to soybeans, 70 days of application to field peas, lentils, or 60 days of application spring wheat.
- **Grazing:** MUST NOT be grazed by livestock or cut for greenfeed within 21 days of application or cut for hay within 50 days of application to soybean. DO NOT graze or otherwise cut field peas for feed within 40 days of application. DO NOT graze or otherwise cut wheat for feed within 52 days of application. DO NOT graze or otherwise cut lentils for feed.
- **Re-cropping:**

IPCO BIFECTA EZ Rate (mL per acre)	Crop	**Rotational Interval**
356	Soybean, field corn, chickpea, field pea	Immediately
	Spring Wheat, Lentils [small red and large green varieties]	7 days
	Winter wheat, Durum Wheat	4 months
445 to 506	Soybean, field corn, chickpea, field pea	Immediately
	Spring Wheat	7 days
	Winter wheat	4 months
	Lentils [small red and large green varieties]	6 months

All other crops not listed may be seeded after 12 months with a successful field bioassay result.

- **Aerial Application:** DO NOT apply by aircraft.
- **Storage:** Store in a cool, dry, secure place.
- **Buffer Zones:**

Application method	Spray Buffer Zones (metres)† Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground only	5	2	10

See the Key to Product Pages for an explanation of the different habitats.
*** Buffer zones can be reduced by 70% when using shrouds and by 30% when using cones mounted less than 12 inches from the crop canopy.**
† Distance is measured from the downwind edge of the boom to sensitive areas.

Sprayer Cleaning:

Sprayers used to apply *IPCO Bifecta EZ* should be cleaned out thoroughly each day after use. All nozzles, screens and filters should be removed and cleaned after applying this product. Refer to 'Method A' found in the general sprayer cleaning section in the introduction. See label for detailed cleaning instructions. DO NOT use ammonia with chlorine bleach.

Hazard Rating:

Caution – Poison

Potential Skin Sensitizer

Refer to the Introduction for an explanation of the symbols.

IPCO Trigon

Herbicide Group
14 - carfentrazone
6 - bromoxynil
13 - clomazone

This product is a prepackaged tank mix of carfentrazone, bromoxynil, and clomazone. Information listed is restricted to Crops, Weeds, Rates and Tank mixes. For other detailed restrictions and other general information on the component products see the product pages listed above.

Company:
Interprovincial Cooperatives Ltd.

Formulation:
The *IPCO Trigon* package contains the following components:

***IPCO C-Zone* (PCP#33580):** 240 g/L carfentrazone formulated as an emulsifiable concentrate.
- Container size - 1.2 L

***IPCO/COOP Brotex 4AT* (PCP#33554/33828 – *IPCO/COOP Octagon*):** 480 g/L bromoxynil formulated as an emulsifiable concentrate.
- Container size - 9.7 L

***IPCO Clomazone* (PCP#33910):** 360 g/L clomazone formulated as a microcapsule suspension.
- Container size - 10 L

Crops and Staging:
Canola: Prior to seeding the crop.

Weeds and Staging:
Weeds controlled by the Bromoxynil + Carfentrazone-ethyl (co-pack) plus:
- Extended suppression of cleavers emergence.

Rates:
Note: Maximum ONE APPLICATION per year of this or other products containing clomazone.
IPCO C-Zone: 15 mL per acre.
IPCO/COOP Brotex 4AT: 118 mL per acre.
IPCO Clomazone: 125 mL per acre.
Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Tank Mixes:
Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.
Herbicides:
- Glyphosate (label rates).

See component products for more information on restrictions, application details and handling. Unless indicated differently above use the most limiting restrictions across all components for the mix.

Kerb SC

Herbicide Group 3 - propyzamide

Company:
Corteva Agriscience

Formulation:
***Kerb SC* (PCP#30264):** 400 g/L propyzamide formulated as a suspension concentrate.
- Container size - 2 x 10 L

Crops and Staging:
Apply to the following established crops between October 1 and freeze-up or very early spring*. Temperatures should be above freezing at time of application but should not exceed 12°C after application or a reduction in control may be observed. Applications are more effective if followed by a rain. Contact manufacture for specific staging and application guidelines prior to application.

Established alfalfa, bird's-foot trefoil, and established pastures**.

*** Early spring application for seed alfalfa only.**
**** *Severe stand thinning* may occur to pastures consisting primarily of crested wheatgrass, meadow fescue and timothy.**
- **Some thinning (10 to 15 percent) may occur with tall fescue and creeping red fescue.**

Weeds, Rates and Staging:
Apply in late fall or very early spring (seed alfalfa only) prior to the emergence of weeds.

Established grass or grass/legume pastures for control of foxtail barley:
- ***Brown, dark brown or gray wooded soils:*** 0.45 L per acre.
- ***Black soils:*** 0.56 L per acre.

Established Alfalfa† and bird's foot trefoil†:

Weed	Rate (L per acre)
	Kerb SC
Annual grasses, volunteer cereals, wild oats	0.89 L†
Quackgrass, orchardgrass, timothy, chickweed	1.13 to 1.62* L
Dodder (fall application only)	1.62 L

Note that complete control may not be achieved.

*** Maximum 1.13 L per acre with spring application. Low temperatures and adequate moisture following application are needed for efficacy.**

† Including fall application on spring seeded crops.

Caution: DO NOT use on soils with more than 6 percent organic matter. DO NOT apply to soils prone to flooding. DO NOT apply to pastures that contain high proportions of timothy, crested wheat grass or meadow fescue. Consult the manufacturer for other forage grass species sensitivities to Kerb SC.

Application Information:
- **Water Volume:** 120 to 200 L per acre.
- **Nozzles and Pressures:** Maximum 30 to 40 psi (200 to 275 kPa) with conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use nozzles and pressure designed to deliver thorough, even coverage with ***ASABE medium*** droplets.

How it Works:
Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
propazomide	PRE (soil active)	Long-chain Fatty Acid Inhibitor/ Membrane & cell wall production	Little (apoplast)	Broadleaf & grass	15

Effects of Growing Conditions:
Dry soil conditions at time of weed emergence may result in reduced control. Approximately 3 inches of total precipitation is required for adequate activation. Best results when soil temperatures are low but above freezing.

Tank Mixes:
None registered.

Restrictions:
- **Rainfall:** Surface applications are most effective if followed by 0.5 to 1 inch (1.25 to 2.5 cm) of rain within 2 days of application. Avoid application when heavy rain is forecast.
- **Restricted Entry Interval:** DO NOT re-enter treated areas for 24 hours.
- **Grazing Restrictions:** DO NOT graze or harvest for livestock feed within 90 days of the 1.62 L per acre rate of *Kerb SC*, and 60 days of application for lower rates.
- **Re-cropping Interval:** May be replanted to leafy vegetable (except Brassica vegetables) crops after 30 days of treatment and root or tuber vegetables within
  90 days of treatment. DO NOT re-plant to any other crops within 1 year of treatment.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store in a cool, dry place. DO NOT freeze.
- **Buffer Zones:** DO NOT contaminate domestic or natural water sources or wetlands.

Crop	Buffer zone* (metres†) for terrestrial habitat
Established grass pastures, established grass /legume pastures, alfalfa or trefoil grown for seed	5

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:
Refer to the general section on sprayer cleaning in the introduction.

Hazard Rating:
Keep out of reach of children
Refer to the Introduction for an explanation of the symbols.

Korrex II

Herbicide Group
2 - florasulam
4 - dicamba

Company:
Corteva Agriscience

Formulation:
The *Korrex II* package contains the following components:
***Korrex II A* (PCP#31405):** 25% florasulam formulated as water dispersible granules.
- Container size - 1 x 0.45 Kg

***Korrex II B* (PCP#31205):** 480 g/L dicamba dimethylamine salt formulated as a solution.
- Container size - 1 x 7.76 L

Crops and Staging:
Barley, Durum, Oats, Spring Wheat, Winter Wheat:
In the fall following harvest of the previous crop or in spring prior to seeding. No later than 48 hours after seeding and prior to crop emergence.

Weeds, Rates and Staging:
Korrex II must be mixed with glyphosate at least 180 g ae per acre or up to 1000 g ae per acre of glyphosate to control the weeds controlled by glyphosate at these rates (see glyphosate for product rates and weeds controlled).
- **Spring and Fall application:**
  - *Korrex II A* at 5.7 grams per acre plus *Korrex II B* at 97 mL per acre
- **Fall application or Summerfallow** (Note: Fall application is generally more effective in control of perennial weeds)**:**
  - *Korrex II A* at 8.1 grams per acre plus *Korrex II B* at 139 mL per acre

Weeds controlled by glyphosate at the rates above plus enhanced control of the following weeds at the 2 to 4 leaf stage unless otherwise indicated:
- Annual sow thistle†
- Cleavers
- Chickweed
- Cow cockle
- Dandelion (seedling, overwintered or mature plants up to 30 cm across)
- Hemp-nettle
- Kochia
- Narrow-leaved hawk's-beard (up to 8 cm tall)
- Perennial sow-thistle**
- Scentless chamomile†
- Shepherd's-purse
- Smartweed (including lady's-thumb)
- Stinkweed
- Volunteer canola*
- Wild buckwheat
- Wild mustard

† Suppression only.
*** Including all herbicide-tolerant canola varieties.**
**** Applications at advanced stages will reduce control.**

Refer to the product labels for complete mixing instructions for these products. A general guide to mixing can be found in the introduction.

Application Information:
- **Water Volume:** Use a minimum of 20 to 40 L per acre
- **Nozzles and Pressure:** Maximum 22 psi (150 kPa) when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE coarse*** droplets.

How it Works:
Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
florasulam	POST (foliar)	ALS Amino Acid inhibitor	Toward Areas of Growth (Symplast)	Broadleaf only	2
dicamba	POST (foliar)	Synthetic Auxin	Moves throughout the plant (Symplast)	Broadleaf only	4

Effects of Growing Conditions:

***Korrex II A*:** Warm, moist growing conditions promote active weed growth and enhance activity. Weeds hardened off by cold weather or drought stress may not be adequately controlled or suppressed and re-growth may occur.

***Korrex II B*:** Crop damage (stunting, reduced seed set) can occur if the chemical is applied at any time other than the recommended stage. DO NOT apply to crop under stress from adverse environmental conditions, such as excess moisture, drought and disease. Apply when air temperature is between 10 and 25°C.

Tank Mixes:

Herbicides:

- ***Prior to crop emergence:***
  - *Korrex II* must be mixed with glyphosate* (180 to 1000 g ae per acre – see glyphosate for conversion to product rates).

  *** All salt types.**

Insecticides: None registered.

Fungicides: None registered.

Fertilizers: None registered.

According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Heavy rainfall immediately after application may wash the chemical off the foliage and a repeat treatment may be required. DO NOT apply if rainfall is forecast for the time of application. Consult manufacturer for more detail on the time period they support.
- **Restricted Entry Interval:** No specific re-entry period is indicated on the label. Other products with similar component indicated a minimum re-entry period of 12 hours.
- **Pre-harvest Interval:** DO NOT harvest crops for 60 days from application.
- **Grazing Restrictions:** Livestock may graze the treated area 7 days after application.
- **Re-cropping Interval:** Registered crops may be seeded any time after treatment. Preseed fields treated with *Korrex II* in the spring season can be seeded the following year to barley, canola, chickpeas, corn, field beans, flax, *Juncea* canola, lentils, mustard (brown, oriental, yellow), oats, peas, potato (except seed potato), soybeans, sunflower, wheat or fields can be summerfallowed. Fields treated with *Korrex II* for fall application season after August 1st can be seeded only to registered crops.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store in a cool, dry place in original container.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground	5	5	30

See the Key to Product Pages in the introduction for an explanation of the different habitats.

† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

***Korrex II A*:** Refer 'Method A' in the general section on sprayer cleaning in the introduction.

***Korrex II B*:** Refer to 'Method B' in the general section on sprayer cleaning in the introduction.

A combination of 'Method A' and 'Method B' is the best option. The use of *All-Clear* or *Clean-Out* sprayer cleaners are also recommended as an alternative to the combination of methods above.

Hazard Rating:

***Korrex II A*:**

Warning – Eye Irritant

***Korrex II B*:**

Caution – Poison

Warning – Eye Irritant

Refer to the Introduction for an explanation of the symbols.

Laudis

Herbicide Group 27 - tembotrione

Company:
Bayer (PCP#31721)

Formulation:
420g/L tembotrione formulated as a suspension concentrate.
- Container size - 3.6 L

Crops and Staging:
Corn (field and sweet): 2-leaf up to and including 8-leaf stage.

Weeds and Staging:
Unless otherwise noted below, apply to young and actively growing weeds up to the 6-leaf stage.
Note: Maximum of ONE APPLICATION may be made with this product per year in sweet corn. Maximum of TWO APPLICATIONS at least 10 days apart may be made with this product per year in field corn.

Weeds	Rate (mL per acre)
Common lamb's-quarters, common ragweed, redroot pigweed, velvetleaf	60
Above weeds plus: Kochia	73
Above weeds plus: Canada fleabane (up to 10 cm height or diameter), giant ragweed, green foxtail (up to 2 tillers), waterhemp, wild buckwheat	90

A repeat application at 60 mL per acre will provide control or suppression of late emerging weeds listed above for the same rate. A repeat application at 90 mL per acre will provide control or suppression of late emerging weeds plus control of wild buckwheat and green foxtail.
Add *Hasten Spray Adjuvant* at 0.71 L per acre and UAN (28 percent) at 1.42 L per acre.
Laudis may degrade if left in the sprayer for an extended period. Apply within 24 hours of mixing.
Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Application Information:
- **Water Volume:**
  - ***Ground:*** 40 L per acre.
- **Nozzles and Pressure:** Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE medium*** droplets. Sprayers without drift reduction nozzles should use between 29 to 58 psi (200 to 400 kPa). Low drift nozzles may require higher pressures for proper performance.

How it Works:
Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
tembotrione	POST	Pigment inhibitor	Apoplastic and symplastic	Selective- annual broadleaf and grasses in corn	27

Effects of Growing Conditions:
Weed control may be reduced if the application is made when weeds are dust covered or in the presence of heavy dew, fog and mist/rain or when weeds are under stress and not actively growing due to drought, heat, lack of fertility, flooding or prolonged cool temperatures. Under cool and/or dry conditions, activity may be reduced or delayed. If crop is under stress due to abnormal environmental conditions or exhibiting injury from previous herbicide applications, delay application until stress passes and after both crop and weeds have resumed growth.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides:

- ***In field and sweet corn:***
  - *Xtendimax*
  - *Pardner*
- **In field corn only:** *Aatrex Liquid 480*† (follow restrictions on the *Aatrex* page)
- **In corn hybrids with Roundup Ready 2 Technology:**
  - *Roundup Weathermax*
  - *Roundup Transorb*
  - *Roundup Xtend*

  † **DO NOT use in sweet corn.**

Fungicides: None registered.

Fertilizers: None registered.

Insecticides: None registered.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 2 hours of application may reduce control.
- **Restricted Entry Interval:** DO NOT re-enter treated areas for 12 hours.
- **Grazing Restrictions:** DO NOT graze or feed to livestock for 45 days after treatment.
- **Pre-harvest Interval:** Leave 45 days between application and harvest.
- **Re-cropping Interval:** Winter wheat, soybean, field corn, sweet corn, spring wheat, potato the year after treatment. Dry beans may be seeded 22 months after treatment.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** DO NOT contaminate water, food or feed by storage or disposal. Keep in original container during storage. Store the tightly closed container away from feeds, seeds, fertilizers, plants and foodstuffs. DO NOT use or store in or around the home.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground*	1	1	10

See the Key to Product Pages in the introduction for an explanation of the different habitats.

*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**

† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Refer 'Method A' in the general section on sprayer cleaning in the introduction. Let solution stand for an extended period for better results. Flush sprayer system with water. See the label for product specific cleaning details.

Hazard Rating:

Caution – Poison

Warning – Eye Irritant

Refer to the Introduction for an explanation of the symbols.

Lorox L

Herbicide Group 7 - linuron

Company:
Tessenderlo Kerley Inc. (PCP#16279)

Formulations:
480 g/L linuron formulated as a suspension concentrate.
- Container size - 10 L

Crops, Rates and Staging:
Note: *Maximum application volume of 16,000 L of product per person per day for any use.*

Pre-emergent surface (not incorporated) applications for use on loam to clay soils only:

	Rate (L per acre)	
	Soil Organic Matter	
	less than 2 percent	from 2 to 5 percent
Potatoes*	0.72	1.5

*** Application must be made after all soil disturbance (dragging, hilling) is complete for the season and before the crop emerges.**
If used on sandy soils, severe crop injury may result.
Seed the crop at least 2 inches (5 cm) deep. Make only one application per year to field crops.

Post-emergent applications only:

Crop	Stage	*Lorox L* (L per acre)
Shelterbelts (caragana, green ash, Siberian and American elm, Manitoba maple, poplar, willow, white spruce, Colorado spruce, Scots pine)	Apply as an overall spray to dormant stock or as a directed spray if buds have broken.	1.82
Short Rotation Intensive Poplar	Apply as a directed spray under plants that have been established for 1 year or more	1.82

Weeds and Staging:
- **Post-Emergence:**
  - Apply when annual broadleaf weeds are in the 2 to 4 leaf stage and when green foxtail is in the 1 to 3 leaf stage.
  - In shelterbelts, apply when weeds are less than 4 inches (10 cm) tall.
- **When tank mixed with MCPA amine in cereals, the following weeds are controlled:**
  - Buckwheat (tartary, wild)
  - Chickweed
  - Corn spurry
  - Cow cockle
  - Flixweed
  - Green foxtail (suppression possible)
  - Green smartweed
  - Hemp-nettle
  - Lady's-thumb
  - Lamb's-quarters
  - Ragweed (common, giant)
  - Redroot pigweed
  - Shepherd's-purse
  - Stinkweed
  - Stork's-bill
- **Pre-emergent surface treatments and Post-emergent applications in shelterbelts:**
  - Sufficient moisture (1 to 2 inches or 3 to 5 cm) in the form of rainfall or irrigation is necessary within 7 to 10 days of a pre-emergence application or poor weed control will result.
    - Barnyard grass*
    - Common chickweed
    - Common groundsel†
    - Corn spurry†
    - Dandelion (seedlings only)†
    - Foxtail (green, yellow)*
    - Goosefoot
    - Knotweed
    - Kochia†
    - Lamb's-quarters
    - Pigweed (prostrate†, redroot)
    - Plantain (seedlings only)†
    - Purslane
    - Ragweed (common)
    - Shepherd's-purse
    - Smartweed (annual)
    - Sow-thistle (annual, perennial† seedlings only)
    - Stinkweed
    - Wild buckwheat
    - Wild radish†
    - Witch grass
    - Wormseed mustard

    *** Suppression**
    † Not registered with *Lorox L*.

Application Information:

- **Water Volume:**
  - ***Pre-emergent surface:*** 81 to 162 L per acre.
  - ***Shelterbelts and short rotation intensive poplar:*** 90 to 180 L per acre.
- **Nozzles and Pressure:** 25 to 40 psi (175 to 275 kPa) when using conventional stainless steel flat fan nozzles for post emergent applications. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage with a minimum of ***ASABE medium*** droplets. DO NOT apply using hand held or boomless nozzle systems.
- **Screens:** Use a 50 mesh or coarser line strainers and screens.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
linuron	PPI (soil active) POST (foliar)	PSII Inhibitor/ Membrane disruptor	Little foliar; upward soil applied (Apoplast)	Broadleaf & grass	7

Effects of Growing Conditions:

In post-emergent applications the best weed control occurs when temperatures are moderate, when relative humidity is high and when soil moisture is adequate. Injury to cereals (crop lightening) will occur when the crop is under stress because of drought or disease. This injury is worse when the product is applied at advanced leaf stages. In pre-emergent surface treatments, rainfall or irrigation (1 to 2 inches or 3 to 5 cm) is required to move linuron into the root zone of germinating seeds.

Insufficient moisture will result in poor weed control. Drought conditions after application will result in little to no weed control. If rainfall does not occur within 7 to 10 days of application and prior to crop emergence, a shallow rotary hoeing (0.75 to 1.5 inches per 2 to 4 cm) should be made to mix the top layer of soil to help activation. Avoid covering treated ground with un-treated soil. If unusually heavy rain follows application, severe crop injury may result from herbicide in the root zone of the crop. DO NOT use on sandy soils or severe crop injury will result.

Tank Mixes:

Herbicides: None registered.

Fertilizers: None registered.

Insecticides: None registered.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** No rainfast period is specified on the label for post-emergent applications; required interval may be up to 8 hours. Pre-emergent applications require rainfall for activation. Contact manufacturer for more information.
- **Restricted Entry Interval:**

Crop	Application timing	Post Application Activity	REI and/or PHI
		All other activities	12 hrs
Potatoes	Pre-emergence	All tasks	4 days
Shelterbelts	Pre-emergence	All tasks	6 days
Sweet white lupins	Pre-emergence	All tasks	3 days

- **Grazing Restrictions:** DO NOT graze treated crops or cut for feed prior to crop maturity.
- **Pre-harvest Interval:** N/A
- **Re-cropping Interval:** If the intended potato crop fails, fields treated with pre-emergent surface applications of *Lorox L*, may be seeded back only to potatoes. Till the soil thoroughly before reseeding. DO NOT retreat field with a second application of *Lorox L*. No other restrictions 1 year after treatment.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** DO NOT store liquid Linuron formulations at temperatures below 5°C. *Lorox L* may be frozen.

- **Buffer Zones:**

Crop	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Potatoes, shelterbelts	5	1	4

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Refer to the general section on sprayer cleaning in the introduction.

MCPA

Herbicide Group 4 - MCPA

Company and Formulation

	PCP# (Product Name)				
	Na 300*	Amine 500*	Amine 600*	Ester 500**	Ester 600**
ADAMA					31669
AgraCity					34156
Albaugh		27858	31322	27860	32311
Federated Cooperatives					29001
Interprovincial Cooperative Limited	20306		31327		27802
Nufarm Agriculture			28384		27803
Loveland Products Canada	9858		31432		27804 (*CheckMate*)
Sharda Cropchem Limited				34299	34293

*** Formulated as a solution**
**** Formulated as an emulsifiable concentrate**

Crops, Rates and Staging:

The maximum safe rates for various crops are given below. Higher rates used for harder to control weeds (see "Weeds, Rates and Staging") may cause crop injury. Application rates for individual products may vary from those listed. Refer to the label for product specific use rates. Rates greater than those for harder to control weeds may cause crop injury. When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

Crop	Stage	Maximum Rate (L per acre)		
		Amine 500	Amine or Ester 600	Na Salt
Wheat (spring and durum), barley	4 leaf to just before flag leaf emergence.	0.45	0.42 (E)	0.81
Oats	3 leaf to just before flag leaf emergence.††	0.45	0.36	0.81
Spring rye	4 leaf to just before flag leaf emergence.	0.45	0.42	0.81
Flax (NOT solin - low linolenic acid flax)	2 inches (5 cm) in height to prebud stage. Apply at 2 to 4 inches (5 to 10 cm) in height for maximum crop tolerance.	0.4	0.28 (E) or 0.34 (A)	0.71
Winter wheat (WW), fall rye (FR)	In spring, apply from the time growth commences until the early flag leaf stage.	0.45	0.42	0.81

Crop	Stage	Maximum Rate (L per acre)		
		Amine 500	Amine or Ester 600	Na Salt
Corn	As a broadcast spray up to 6 to 7 inch (15 to 18 cm) tall or 6 leaf stage. Up to 3 weeks before tasseling as a directed spray using drop nozzles.	0.45	0.37 (Amine only)	0.61
Peas	Vines 4 to 7 inches (10 to 18 cm) long. For short-statured, determinate flowering peas, apply at the early stages within this range.	0.22*	0.17 (Amine only)	0.36*
Cereals underseeded to alfalfa (not Flemish varieties)	Apply when the majority of seedling legumes are in the 1 to 3 trifoliate leaf stage.	0.22	0.19 (Amine only)	0.4
Underseeded alsike, ladino and red clover	Apply when the majority of seedling legumes are in the 1 to 3 trifoliate leaf stage.	0.28	NR	0.4
Red clover† Seedling (seed and forage) Established† (seed only)	**Seedlings:** 1 to 3 trifoliate stage. DO NOT feed to livestock in the first year. **Established:** Apply at the breaking of dormancy in the spring up to 7.5 cm.	0.23	0.19 (Amine only)	NR
Grass pastures	Spring or fall.	1.42	1.13 (E) or 1.42 (A)	0.71
Seedling forage** grasses (not for seed)	Apply from the 3 leaf stage to the shot blade stage.	0.45**	NR	NR
Established forage** grasses (not for seed)	Apply in the spring up to the shot blade stage or in the fall after harvest.	0.45**	NR	NR

(E) or (A) indicates Ester or Amine formulations. NR = Not Registered
*** The rates given are lower than the registered rates for peas. Less than the maximum label rates are recommended because of crop injury concerns.**
**** MCPA is NOT registered for use on forage grasses grown for forage seed.**
† Nufarm MCPA Amine only.
†† Use the lowest rate of MCPA Amine 600 on oats between the 3 and 6 leaf stage.

Formulation Characteristics:

Formulation	Risk of Vapour Drift	Activity on Weeds	Risk of Crop Injury
LV Ester	Medium	Fast	Medium
Amine	Very Low	Medium	Low
Salts	Very Low	Slow	Very Low

Weeds, Rates and Staging:

Apply at lower rates when weeds are small (2 to 4 leaf stage) and actively growing. Higher rates are needed when weeds are larger, in heavy populations, or growing under stressful conditions (excessively cold, hot, dry or wet).

NOTE: The following rates are a general range for all products. Rate ranges for individual products may differ slightly. Consult the product label for specific rates for each application.

+ Not controlled by Na salt formulations

Susceptible weeds:

- ***Amine 500 formulations – 0.28 to 0.45 L per acre***
- ***Amine and Ester 600 formulations – 0.24 to 0.36 L per acre***
- ***Na formulations – 0.5 to 0.81 L per acre.***
  - Burdock
  - Cocklebur
  - Flixweed (late fall applications or small seedlings)
  - Kochia
  - Lamb's-quarters
  - Mustards (except dog and tansy)
  - Prickly lettuce
  - Ragweed
  - Russian pigweed
  - Shepherd's-purse
  - Stinkweed
  - Wild radish
  - Wild sunflower

Harder to control weeds:

- ***Amine 500 formulations – 0.45 to 0.71 L per acre.***
- ***Ester 600 formulations – 0.42 to 0.61 L per acre.***
- ***Na formulations – 0.81 to 1.1 L per acre.***
  - Annual sow-thistle
  - Biennial wormwood
  - Bluebur+
  - Common peppergrass
  - Curled dock
  - Flixweed (overwintered rosettes prior to bolting)
  - Goat's-beard+
  - Goosefoot+
  - Hemp-nettle (suppression only)
  - Mustard (including dog, tansy and tumble)
  - Plantain
  - Purslane+
  - Redroot pigweed
  - Smartweed (annual)
- **Top growth control only (rates as for harder to control weeds):**
  - Blue lettuce
  - Bindweed (field, hedge)
  - Canada thistle
  - Corn spurry+
  - Dandelion+
  - Gumweed
  - Field horsetail+
  - Hoary cress
  - Leafy spurge
  - Perennial sow-thistle
  - Russian thistle+

Application Information:

- **Water Volumes:**
  - ***Cereals, flax, pastures, forage grasses:*** 40 to 81 L per acre.
  - ***Peas:*** Minimum 61 L per acre.
  - ***Cereals Underseeded to Forage Legumes:*** 61 to 81 L per acre.
- **Nozzles and Pressure:** Maximum 40 psi (275 kPa) when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use nozzles and pressure designed to deliver thorough, even coverage with ***ASABE coarse*** droplets.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
MCPA	POST (foliar)	Synthetic Auxin	Moves throughout the plant (Symplast)	Broadleaf only	4

Effects of Growing Conditions:

Best weed control occurs when temperatures are above 21°C (daytime) or 10°C (night time) and humidity is above 70 percent. DO NOT apply if temperature exceeds 27°C. If applying to flax, injury and a delay in maturity may result from application under hot or humid conditions. Extremely hard water may reduce performance or cause problems in spraying the product.

Tank Mixes:

Herbicides:

- ***In Wheat and barley:***
  - Linuron and *Sencor* (500 amine only).
- ***In Oats:***
  - Linuron (500 amine only)
  - Not all brands are labelled for tank mixing. Check the product label prior to use for registered mixes and rates. Follow all precautions and restrictions on both labels.

Insecticides: None registered.

Fungicides: None registered.

Fertilizers: Liquid nitrogen (28-0-0) may be used in place of water as a carrier with certain amine formulations for application in spring to winter wheat or fall rye.

Note: The above mixes are those listed on the MCPA labels only.

According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 6 hours of MCPA Na salt, 4 hours of MCPA amine, or 2 hours of MCPA Ester application will reduce control.
- **Restricted Entry Interval:** DO NOT enter treated fields for at least 12 hours.
- **Grazing Restrictions:** DO NOT graze within 7 days of application.
- **Re-cropping Interval:** No restrictions the year after application.
- **Aerial Application:** Some products may be applied by air to specific crops. Check the label for detailed instructions.
- **Storage:** MCPA Ester may be frozen. DO NOT freeze MCPA amine or MCPA sodium salt.
- **Buffer Zones:**
  - Hand-held or backpack sprayers, inter-row hooded sprayers and spot treatments are exempt from buffer zone requirements.

Crop	Application method	Buffer Zones (metres†) Required for the Protection of:		
		Aquatic Habitats of Depths		Terrestrial habitat
		Less than 1 m	Greater than 1 m	
Cereals, Flax	Ground*	1	1	4
	Fixed wing aircraft	1	0	60
	Helicopter	1	0	50
Legume forages	Ground*	1	1	4
	Fixed wing aircraft	1	1	25
	Helicopter	1	1	25
Pastures	Ground*	1	1	4
	Fixed wing aircraft	15	0	60
	Helicopter	15	0	50

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

No specific cleaning procedures are indicated on the label. Based on products with similar chemistry, 'Method B' found in the general sprayer cleaning section in the introduction or a commercial spray sprayer cleaning product, may provide adequate cleaning. Contact the manufacturer for more information.

Hazard Rating:

Warning – Poison

Refer to the Introduction for an explanation of the symbols.

MCPB / MCPA

Herbicide Group 4 - MCPB, MCPA

Company:

Interprovincial Cooperative Limited (*Clovitox Plus* – PCP#24336)
Nufarm Agriculture (*Tropotox Plus* – PCP#8211)
Loveland Products Canada (*Topside* – PCP#22003)

Formulation:

375 g/L MCPB present as a sodium (Na) salt and 25 g/L MCPA present as potassium (K) or sodium (Na) salt and formulated as a solution.

- Container size - 10 L

Crops, Rates and Staging:

Registered for all products:

- ***Apply 1.11 to 1.72 L per acre. Apply only that needed to control the target weeds:***

Crop	Stage
Pea	3 to 6 expanded leaves.
Clover (alsike, ladino, red, white Dutch, wild white)	Monofoliate to 3 trifoliate leaf stage (with or without a cover crop).
Oats, wheat, rye or barley (alone or as a companion crop)	2 leaf to flag leaf stage.
Field corn	45 cm high to the start of tasseling – use drop nozzles.
Established pasture	After grazing or cutting when weeds have regrown to a susceptible stage.

Seedling Forage Grasses:

- ***Apply at 1.11 to 1.42 L per acre from the 2 to 4 leaf stage:***
  - Bromegrass (smooth, meadow)
  - Fescue (altai, red, meadow, tall)
  - Green needlegrass
  - Reed canarygrass
  - Timothy
  - Wheatgrass (crested, creeping intermediate, northern, pubescent, slender, stream-bank, tall, western)
  - Wild rye (altai, Russian)

Registered for *Tropotox Plus* and *Clovitox Plus* only:

- Seedling alfalfa for seed production* at the 3 to 6 trifoliate stage.

NOTE: Seedling alfalfa vigour may be reduced in the year of treatment, however, the crop recovers and yield will not normally be affected.

**** Since this use is registered under the User Requested Minor Use Label Expansion program, the manufacturers assume no responsibility for herbicide performance. Users of this treatment on seedling alfalfa do so at their own risk.***

Maximum ONE APPLICATION per year of these and other products containing the active ingredients MCPA/MCPB.

Weeds, Rates and Staging:

Weeds	Stage	Rate (L per acre)
Lamb's-quarters, mustards (ball, wild, wormseed), stinkweed	Seedlings	1.11
Annual sow-thistle*, hemp-nettle*, redroot pigweed, ragweed, shepherd's-purse, volunteer rapeseed (including canola), wild radish*	Seedlings	1.72
Curled dock, perennial sow-thistle**, plantain	Rosette	1.72
Bull thistle	Rosette to early bud	1.72
Buttercup (creeping, tall), field bindweed	In spring during rapid growth	1.72
Canada thistle	6 inches (15 cm) to early bud	1.72
Horsetail*	6 inches (15 cm)	1.72

*** Suppression only**
**** Top growth control only**

Application Information:

- **Water Volume:**
  - ***Clovitox Plus:*** 71 to 91 L per acre.
  - ***Tropotox Plus, Topside:*** 61 to 81 L per acre.
- **Nozzles and Pressure:** Maximum 40 psi (275 kPa) when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE coarse*** droplets.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
MCPB & MCPA	POST (foliar)	Synthetic Auxin	Moves throughout the plant (Symplast)	Broadleaf only	4

Effects of Growing Conditions:

Damage to peas or seedling forage legumes may occur if the crop is sprayed when under drought or disease stress. Under extremely hot or humid conditions, crop injury may be severe. DO NOT apply when temperatures are over 27°C. Best activity on weeds occurs in warm weather.

Tank Mixes:

None registered.

Restrictions:

- **Rainfall:** No rainfast period is specified on the label; required interval may be up to 8 hours. Contact manufacturer for more information.
- **Restricted Entry Interval:**
  - ***Field com:*** A Restricted Entry Interval of 9 days after application is required.
  - ***For all other registerd crops:*** DO NOT enter treated fields for at least 12 hours.
- **Grazing Restrictions:** DO NOT graze crop treated with *Topside* or cut for hay. DO NOT graze or cut seedling forage grasses in the year of treatment. Cereals treated with Tropotox or *Clovitox* may be used for grazing or cut for greenfeed or hay 30 days after application. Forage legumes and peas treated with *Clovitox* may be used for animal feed 30 days after application. Withdraw meat animals from fields treated with *Tropotox* or *Clovitox* at least 3 days before slaughter.
- **Re-cropping Interval:** A minimum rotational crop plant back interval of 12 months must be observed for all crops other than those registered for use with MCPA or MCPB. Phenoxy herbicides can persist in soils for weeks, particularly if dry or cool weather persists. DO NOT seed sensitive crops immediately after spraying.
- **Aerial Application:** *Clovitox* may be applied by air to established pasture and cereal crops (not underseeded to clover).
- **Storage:** DO NOT freeze.
- **Buffer Zones:**
  - Hand-held or backpack sprayers, inter-row hooded sprayers and spot treatments are exempt from buffer zone requirements.

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground only*	1	1	4

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

No specific cleaning procedures are indicated on the label. Based on products with similar chemistry, 'Method B' found in the general sprayer cleaning section in the introduction or a commercial spray sprayer cleaning product, may provide adequate cleaning. Contact the manufacturer for more information.

Hazard Rating:

Clovitox Plus:

Danger – Poison

Danger – Corrosive to Eyes

***Tropotox Plus & Topside*:**

Caution – Poison

Tropotox Plus:

Warning – Contains the Allergen Caseinate (Milk)

Refer to the Introduction for an explanation of the symbols.

Mecoprop-p

Herbicide Group 4 - mecoprop-p

Company:

Loveland Products Canada (*Mecoprop-P* – PCP#27891)

Formulation:

150 g/L mecoprop-p present as potassium salt formulated as a liquid.

Crops and Staging:

Spring wheat (including durum), barley and oats: 3 leaf to flag leaf stage.

Weeds, Rates and Staging:

Apply *Mecoprop-P* at 2.2 to 2.8 L per acre to weeds from the 2 to 4 leaf stage. Use the high rate for weeds in an advanced stage of growth.

- Black medic
- Canada thistle (top growth control only)
- Chickweed
- Cleavers
- Clover (volunteer)
- Corn spurry
- Lamb's-quarters
- Plantain
- Wild mustard

Application Information:

- **Water Volume:** 81 to 121 L per acre.
- **Nozzles and Pressure:** Maximum 40 psi (275 kPa) when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE coarse*** droplets.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
mecoprop	POST (foliar)	Synthetic Auxin	Moves throughout the plant (Symplast)	Broadleaf only	4

Effects of Growing Conditions:

Apply in warm weather under good growing conditions. Avoid spraying in very hot weather or in drought conditions.

Tank Mixes:

None registered.

Restrictions:

- **Rainfall:** No rainfast period is specified on the label; required interval may be up to 8 hours. Contact manufacturer for more information.
- **Grazing Restrictions:** DO NOT graze or feed treated crop to livestock prior to crop maturity.
- **Re-cropping Interval:** No restrictions the year after application.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** DO NOT freeze.

- **Buffer Zones:**
  - Hand-held or backpack sprayers, inter-row hooded sprayers and spot treatments are exempt from buffer zone requirements.

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground only*	1	0	5

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:
No specific cleaning procedures are indicated on the label. Based on products with similar chemistry, 'Method B' found in the general sprayer cleaning section in the introduction or a commercial spray sprayer cleaning product, may provide adequate cleaning. Contact the manufacturer for more information.

Hazard Rating:
Caution – Poison
Refer to the Introduction for an explanation of the symbols.

Metolachlor

Herbicide Group 15 - metolachlor

Company:
Syngenta Canada (*Dual II Magnum* – PCP#25729)
UPL AgroSolutions Canada (*Komodo* – PCP#33599)
Sharda Cropchem (*Metallica* – PCP#34054)
AgraCity (*Stallion* – PCP#34334)

Formulation:
915 g/L s-metolachlor and r-metolachlor formulated as an emulsifiable concentrate.
- Container size - 2 x 10 L

Crops and Staging:
Pre-plant incorporated.
Pre-emergent: In areas with good rainfall or under irrigation, Metolachlor may be applied as a pre-emergence surface treatment. At least 0.5 inches of water (1.25 cm) is required within 10 days of application for proper activity.
Refer to product label for more specific information on timing and rates of applications for each crop type.
- Corn (field, sweet, silage)
- Dry beans (navy, kidney, pinto)*†
- Potatoes
- Soybeans*
- Sweet white lupins

*** Beans should be planted at least 4 cm deep to avoid crop injury. Dry bean varieties vary in their tolerance to metolachlor. Test a limited acreage on all new varieties first.**

Weeds, Rates and Staging:
Pre-emergent and Pre-Plant Incorporated Treatments: Apply 0.47 to 0.7 L per acre prior to weed emergence.
- Barnyard grass
- Foxtail (green, yellow)
- Nightshade (American, Eastern black)
- Redroot pigweed*
- Yellow nutsedge**
- Waterhemp (in soybeans, high rate only)*†
- Witch grass

*** Suppression only.**
**** Pre-plant incorporated treatment only.**

Use higher rates on heavy textured soils or when high populations of weeds are expected.
DO NOT apply to soils with less than 1 percent or greater than 10 percent organic matter.
Maximum ONE APPLICATION per year of this or other products containing the active ingredient s-metolachlor.

† ***NOTE:*** *Since these uses are registered under the User Requested Minor Use Label Expansion (URMULE) program, the manufacturer assumes no responsibility for herbicide performance.* ***Users of this product for these uses do so at their own risk.***

Application Information:

- **Water Volume:** A minimum of 60 L per acre.
- **Nozzles:** Use 30 to 45 psi (200 to 300 kPa) when using conventional flat fan nozzles.
- **Screens:** Use 50 mesh screens.
- **Incorporation:** Apply to a firm seed bed free of large clods or lumps. If using tandem disks, set disks to work the soil at a depth of 4 inches (10 cm) and operate at a speed of 6 km per hourr (4 miles per hour). If using an S-tine cultivator, set the implement to work the soil to a depth of 4 inches (10 cm) and operate at a speed of 10 km per hour (6 miles per hour). Incorporation equipment should include rolling or western harrows.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
metolachlor	PPI, PRE (surface) with residual soil activity	Long-chain Fatty Acid Inhibitor	Little movement (Symplast)	Broadleaf & grass	15

Effects of Growing Conditions:

A moderate rainfall or equivalent irrigation (0.5 inches) is required within 10 days to activate pre-emergent surface treatments. If rain does not occur, a shallow cultivation or use of a rotary hoe is necessary. Drought conditions that persist after any application may reduce annual grass control. On sandy soils, heavy rainfall following application may cause leaching of *Dual II Magnum*, resulting in reduced weed control.

Tank Mixes:

Herbicides:

- ***In corn:*** *AAtrex* and glyphosate in both PPI and pre-emergent applications.
- ***In soybeans:*** *Sencor*, and glyphosate, in both PPI and pre-emergent applications.

Fertilizers: May be applied with liquid fertilizer. May be impregnated onto dry bulk fertilizers (except nitrate fertilizers, superphosphate fertilizers or limestone).

Insecticides: None registered.

Note: The above mixes are those listed on the *Dual II Magnum* label only.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** When applying as a pre-emergent surface treatment, 0.5 inches (1.25 cm) of rain or irrigation is required after application for proper activity.
- **Restricted Entry Interval:** DO NOT enter treated fields for at least 12 hours.
- **Grazing Restrictions:** DO NOT graze the treated immature crop or cut for hay. In corn, immature means before ear emergence.
- **Pre-harvest Interval:** DO NOT harvest corn within 80 days of post-emergent application.
- **Re-cropping Interval:** In the year of treatment, seed only corn, soybeans, white beans, potatoes, snap beans, lima beans, peas, sweet white lupins, or (a minimum of 4.5 months after application) winter cereals.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** May be frozen.
- **Buffer Zones:** Leave a buffer zone of 29 metres between last spray swath and the edge of important wildlife habitats such as wetlands, sloughs and water bodies.

Sprayer Cleaning:

No detailed cleaning procedures are indicated on the label. Use a commercial all purpose spray sprayer cleaning product for adequate cleaning. Contact the manufacturer for more information.

Hazard Rating:

Warning – Eye Irritant

Potential Skin Sensitizer

Refer to the Introduction for an explanation of the symbols.

Metribuzin

Herbicide Group
5 - metribuzin

Company:

Bayer (*Sencor 75 DF, Sencor 480 F*)
UPL AgroSolutions Canada (*Tricor 75 DF, Tricor LQ*)
ADAMA Canada (*Squadron; Squadron II**)
Sharda CropChem Canada (*Buzzin 70 WDG; Mextrix SC; Meter 75DF*)
Agracity (*Meteor*)
Viking (*Viking Metribuzin*)

*** Note:** *This product is no longer manufactured but inventories still remain in distribution. This product may be removed from future editions.*

Formulations:

***Sencor 75 DF* (PCP#17242); *Squadron* (PCP#32081); *Tricor 75 DF* (PCP#30661); *Meter 75DF* (PCP#33932); *Meteor* (PCP#34370) ; Viking Metribuzin (PCP# 34789):**
75% metribuzin formulated as a dispersible granule.

- Container sizes:
  - ***Sencor 75 DF, Tricor 75 DF*** - 4 x 2.5 kg
  - ***Squadron*** - 4 x 5 kg
  - ***Meter 75DF*** - 2.5 kg
  - ***Meteor, Viking Metribuzin*** - 2 x 5 kg

***Buzzin 70 WDG* (PCP#32756):** 70% metribuzin formulated as wettable granule.

- Container size - 2.5 kg

***Metrix SC* (PCP#32876), *Tricor LQ* (PCP#33911), *Sencor 480 F* (PCP#26280):** 480 g/L metribuzin formulated as suspension concentrate.

- Container sizes:
  - ***Metrix SC*** - 4 x 5 L
  - ***Tricor LQ*** - 2 x 9.46 L
  - ***Sencor 480 F*** - 5 L

Crops and Staging:

Barley and wheat (spring and durum only, except *Sencor 480 F and Viking Metribuzin* which is spring only): Post-emergence (POST) 2 to 5 leaf stage.
Chickpea*: Up to 2.5 inches (6 cm) in height, when vines have 1 to 3 above ground nodes.
Note: application past recommended growth stage may result in severe crop injury.
Faba bean, lentil†, soybean*:** Preplant incorporated (PPI) (only in a tank mix with *Treflan EC*).
Lentil*: Single or split post-emergent applications** - up to 6 inches (15 cm) of vine length. For maximum crop tolerance, apply at the 1 to 4 above ground node stage.
Peas (field only): Preplant incorporated (PPI) (when tank mixed with *Rival* or *Treflan EC*). Post-emergence (single or split applications**) - up to 6 inches (15 cm) of vine length. For short-statured, determinate flowering peas, apply at the early stages within this range.
Potato (except Belleisle or Tobique)*:** Pre-emergence (PRE) in sprinkler irrigation systems (apply only in a tank mix with *Eptam Liquid EC* for both systems).
Potato (except Atlantic, Belleisle, Eramosa, Tobique and red-skinned or early maturing varieties)*:** Early post-emergence (up to 4 inches or 10 cm in height).
Shelterbelts: PPI only in a tank mix with *Treflan EC* (except *Squadron II*).
† Fall application only.
*** DO NOT use on lentils, peas or chickpeas seeded less than 2 inches (5 cm) deep or in soils with less than 4 percent organic matter.**
**** Under certain field or weather conditions a split application may provide better weed control and crop tolerance than single applications. The first application should be made at the cotyledon to 2 leaf stage of the weeds. The second application should be made when a second flush of weeds have emerged or if weeds which were more advanced at the time of the first application have started to show regrowth. The split applications are normally 7 to 10 days apart.**
****Consult manufacturer or seed supplier for varietal tolerances to metribuzin applications in soybean and potato.**

Crops and Rates:

Crop		Rates		
		75 WDG forms (g per acre)	*Buzzin* (g per acre)	*Metrix SC/Tricor LQ/ Sencor 480 F* (mL per acre)
Barley		80 to 152	87 to 163	112 to 222
Chickpea		111	119	167
Faba bean - spring PPI†	Coarse soils	111 to 152	119 to 163	172 to 222
	Medium to Fine soils	152 to 222	163 to 238	222 to 344
Faba bean - fall PPI†	Coarse soils	152 to 192	163 to 206	222 to 283
	Medium to Fine soils	192 to 222	206 to 238	283 to 344
Lentil	Single POST app	111	119	172
	Split POST app	60 to 80 (each)	61 to 82 (each)	85 to 112 (each)
Pea (field only) - spring PPI†	Coarse soils	152	163	222
	Medium to Fine soils	152 to 192	163 to 206	222 to 283
Pea (field only), lentils - fall PPI†	Coarse soils	192	206	283
	Medium to Fine soils	190 to 222	206 to 238	283 to 344
Pea (field)	Single POST app	111 to 152	119 to 163	172 to 222
Pea (field only)	Split POST app	60 to 80 (each)	61 to 82 (each)	85 to 112 (each)
Potato	PPI or PRE* (PPI application tank mixed with *Eptam*)	152 to 222	163 to 238	222 to 344
Potato (+ *Eptam*)	PRE through sprinkler irrigation system*	152 to 304	163 to 325	222 to 445
Potato	POST	152	163	222
Potato	PRE or Early POST through split application*	Maximum 605	–	Maximum 911
Spring wheat (including durum)		80 to 111	87 to 119	112 to 172
Soybean (spring PPI only†):	Coarse soils	111 to 152	119 to 163	172 to 222
	Medium to Fine soils	152 to 222	163 to 238	222 to 344
Shelterbelts†	PPI	162	173	243

*** See labels for details.**
† Only in tank mix with liquid trifluralin only.
When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

Weeds, Rates and Staging:

Post-emergence applications should be made when weeds are small – 2 inches (5 cm) in height or diameter.
Split applications (post-emergence on lentils and peas) – 1st application at cotyledon to 2 leaf stage of weeds.
The 2nd application (if necessary) 7 to 10 days after the first.
The following rates are based on the 75 WDG formulations. Check the table in Crops and Rates for corresponding rates for other formulations.

- **Post-emergence at 81 grams per acre:**
  - ***Weeds controlled in spring wheat, barley, field pea and suppressed in lentil:***
    - Chickweed
    - Green smartweed
    - Hemp-nettle* (suppression in all crops)
    - Lamb's-quarters
    - Stinkweed
    - Volunteer canola
    - Wild mustard
  - ***Additional weeds controlled in spring wheat and barley only:***
    - Lady's-thumb
    - Redroot pigweed

- **Post-emergence at 111 grams per acre:**
  - ***Weeds controlled in spring wheat, barley, field pea, and suppressed in lentil and chickpea:***
    - Ball mustard
    - Corn spurry
    - Hemp-nettle
    - Tartary buckwheat
  - ***Additional weeds controlled in spring wheat and barley only:***
    - Common groundsel
    - Night-flowering catchfly
    - Wormseed mustard
- **Post-emergence at 152 grams per acre:**
  - ***Weeds controlled in spring wheat and barley:***
    - Henbit
    - Russian thistle
  - ***Weeds controlled in potatoes only:***
    - ***Weeds listed for 111 grams per acre rate above plus:***
      - Lady's-thumb
      - Redroot pigweed
      - Shepherd's-purse
- **Preplant Incorporated in faba beans, lentils, field pea and soybean (see "Crops and Rates:" above). Must be applied in tank mix with *Treflan EC* or *Rival* (see trifluralin page for rates*):**
  - ***Weeds controlled by either Rival or Treflan EC plus:***
    - Corn spurry (with *Rival* in peas only)
    - Green smartweed
    - Hemp-nettle
    - Kochia (with *Rival* in peas only)
    - Russian thistle (with *Treflan* only - not in faba bean)
    - Shepherd's-purse
    - Stinkweed
    - Volunteer canola
    - Wild mustard

    *** Use the high rate for best control.**

Application Information:

- **Water Volume:**
  - ***Preplant incorporated:*** 40 L per acre.
  - ***Post-emergence applications:***
    - *Cereals* - 40 L per acre.
    - *Lentils, peas, chickpeas* - 70 L per acre.
- **Nozzles and Pressure:** Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE medium*** droplets. If using conventional flat fan nozzles use a maximum of 30 to 40 psi (200 to 275 kPa) with opening no smaller than 6502, 8002 or TK2. Angle nozzles 45° forward to achieve better coverage of vertical weed targets.
- **Screens:** Use 50 mesh or coarser on both nozzle and primary plumbing screens.
- **Incorporation:** All plant growth and stubble should be thoroughly worked into the soil before treatment. Apply directly to the soil surface. Two incorporations are required at right angles for thorough mixing. The first incorporation must be made within 24 hours of spraying. For fall applications, it is preferred that both incorporations be done in the fall. The second incorporation may be delayed until spring to conserve crop residue; however, both incorporations must be done the recommended depth.
- Incorporate with a tandem disc, discer or field cultivator (Vibrashank type). Set equipment to work at a depth of 3 to 4 inches (8 to 10 cm). Operate disc implements at 4 to 6 miles per hour (7 to 10 km per hour), cultivators at 6 to 8 miles per hour (10 to 13 km per hour).

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
metribuzin	PPI (soil active) POST (foliar)	PSII Inhibitor/ Membrane disruptor	Little foliar; upward soil applied (Apoplast)	Broadleaf & grass	5

Effects of Growing Conditions

Crop height reductions or yellowing may occur if high temperatures occur within 48 hours of application. Cold, cloudy weather or frost within 3 days of application will also aggravate injury. If frost occurs, allow 4 to 5 days for crop to recover prior to applying metribuzin. Heavy rainfall soon after application to peas, lentils and chickpeas can result in stand reduction on soils with less than 4 percent organic matter and to spring wheat and spring barley on soils with 3 percent organic matter.

Tank Mixes:

Herbicides:

- ***In spring wheat or barley:*** Dicamba, MCPA amine or 2,4-D amine.
- ***In potatoes (post emergent) Tricor 75 DF and Viking Metribuzin only:*** *Prism SG**
- ***In potatoes (preplant incorporated):*** *Eptam Liquid EC* (Required).
- ***In faba beans, soybeans, lentils, shelterbelts (preplant incorporated):*** *Treflan EC* (Required).
- ***In peas (preplant incorporated):***
  - *Treflan EC* (spring or fall application). Required.
  - *Rival* (preplant incorporated (fall application). Required.
  - All products – *75 WDG forms* at 77 grams per acre** plus 0.19 L per acre MCPA sodium salt (300 g/L).

*** Consult manufacturer or seed supplier for varietal tolerances to metribuzin and *Prism* tank-mix applications in potato.**
**** See corresponding rates for other formulations in the chart in "Crops and Rates"**

Insecticides: None registered.

Fungicides: None registered.

Note: The above mixes are those listed on the metribuzin labels only.

Allow 5 days between application of metribuzin and application of other pesticides.

Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 6 hours may reduce control.
- **Restricted Entry Interval:** DO NOT re-enter treated areas for 12 hours after application.
- **Grazing Restrictions:** DO NOT graze treated cereal crops within 30 days of application, or peas, chickpeas or lentils within 70 days of application.
- **Pre-harvest Interval:** DO NOT harvest barley, wheat or potatoes within 60 days of application. DO NOT harvest lentils, field peas within 70 days of application. DO NOT harvest chickpeas within 40 days of application.
- **Re-cropping Interval:** Preplant incorporated treatments may leave a residue in the soil that will affect succeeding crops when using higher rates of product. DO NOT seed canola, onions, celery, peppers, cole crops, lettuce, spinach, red beets, turnips, pumpkin, squash, cucumbers or melons the year after treatment. Fall seeded crops may be injured when seeded the same year as preplant or post-emergence applications of these products.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** May be frozen.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:			
	Aquatic Habitats of Depths			Terrestrial habitat
	Less than 1 m	1 to 3 m	Greater than 3 m	
Ground only*	5	2	1	10

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured is metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Use 'Method B' in the general section on sprayer cleaning in the introduction.

Hazard Rating:

Caution – Poison

Refer to the Introduction for an explanation of the symbols.

Metsulfuron

Herbicide Group 2 - metsulfuron

Company:

FMC Corporation (*Ally* – PCP#20214, *Ally Toss-N-Go* – PCP #24388*)
Albaugh (*Plotter* – PCP#34619)
AgraCity (*MPower Pro* – PCP#31118)

*** Note:** *This product is no longer manufactured but inventories still remain in distribution. This product may be removed from future editions.*

Formulation:

60% metsulfuron methyl formulated as a water dispersible granule.

- Container size - 122 g
- Mpower Pro - 80 g

Crops and Staging:

Wheat (spring and durum), barley: 2 leaf up to emergence of the flag leaf.

Established forage grasses for forage or seed production*:

- Apply from the 2 leaf to flag leaf stage and before canopy is dense enough to prevent thorough leaf coverage.
  - Crested wheatgrass*
  - Intermediate wheatgrass*
  - Creeping red fescue*
  - Orchardgrass*
  - Timothy*†

† **Fall application *Ally* or *Plotter* only.**

**** NOTE - Since applications to forage grasses have been registered under the User Requested Minor Use program, the manufacturer assumes no responsibility for herbicide performance. Application to forage grasses is at the risk of the user.***

When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

Weeds, Rates and Staging:

Apply up to 3 grams per acre to control weeds at the 2 to 4 leaf stage unless otherwise indicated.
A rate of 2 to 3 grams per acre may be used when mixing with certain other herbicides (See Tank Mixes).
Add a non-ionic surfactant such as *Agral 90*, *Ag-Surf II*, *Companion*, *Super Spreader* or *Citowett Plus* at 0.2 L per 100 L spray volume.

Weeds controlled:

- Ball mustard
- Bluebur
- Chickweed
- Common groundsel
- Corn spurry
- Cow cockle
- Flixweed
- Hemp-nettle
- Pigweed (prostrate, redroot)
- Scentless chamomile
- Shepherd's-purse
- Smartweed (green, lady's-thumb)
- Stinkweed
- Stork's-bill
- Tartary buckwheat
- Volunteer canola*
- Wild mustard

Weeds suppressed:

- Canada thistle**
- Lamb's-quarters (up to 3 in (8 cm))
- Russian thistle
- Sow-thistle (annual, perennial)**
- Toadflax
- Wild buckwheat (up to 3 leaf)

*** CLEARFIELD varieties will be controlled only with the addition of 2,4-D or MCPA.**
**** Apply when thistles are less than 6 inches (15 cm) tall.**

Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Application Information:

- **Water Volume:** Minimum 40 L per acre.
- **Nozzles and Pressure:** No application pressures are recommended by the manufacturer. Typical application pressures for standard flat fan nozzles are from 35 to 40 psi (240 to 275 kPa). Low drift nozzles may require higher pressures for proper performance. Use nozzles and pressures designed to deliver proper coverage with ***ASABE medium*** droplets.
- **Screens:** Use a 50 mesh nozzle screens and in-line filter system.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
metsulfuron	PRE	ALS Amino Acid synthesis Inhibitor	Toward growth areas (Symplast)	Broadleaf	2

Effects of Growing Conditions:

Metsulfuron may injure crops stressed by heavy rainfall, prolonged cool weather, frost conditions, wide fluctuations in day/night temperatures, drought, or water-saturated soils, either before or after application. Weed control will be reduced under dry, cold conditions.

Tank Mixes:

DO NOT mix the soluble bags with liquid fertilizers, substances that contain boron or substances that release free chlorine. Mixing the water soluble bags with any of these compounds will result in an insoluble substance in the tank.

Herbicides:

- ***In wheat:***
  - *Puma Advance*
- ***In wheat and barley:***
  - 2,4-D Amine or Ester (170 to 227 g ae per acre – refer to 2,4-D), plus surfactant*.
  - MCPA Amine or Ester (0.23 to 0.38 L per acre – 600 g/L formulation), plus surfactant.
- ***In creeping red fescue:***
  - *Assure II* (0.2 to 0.3 L per acre) plus *Sure-Mix* adjuvant*.
    *** Use with the 3 grams per acre rate only.**

Consult tank mix partner labels for additional crop staging and variety restrictions.

Insecticides: None registered.

Fungicides: None registered.

Fertilizer: None registered.

According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Rain within 4 hours of application of tank mixes with 2,4-D amine, 2 hours of application of tank mixes with 2,4-D ester, will reduce weed control.
- **Restricted Entry Interval:** DO NOT enter treated fields for 12 hours.
- **Grazing Restrictions:** No restrictions.
- **Re-cropping Interval:**
  - ***Caution:***
    - DO NOT apply more than 3 grams per acre per year.
    - DO NOT use on highly variable soils that have large gravely or sandy areas, eroded knolls, or calcium deposits.
    - Metsulfuron residues can persist for long periods, potentially limiting re-cropping options. Degradation of metsulfuron is dependent on the pH, moisture, and temperature of the soil. Refer to the label for details on rotation and minimum re-cropping intervals.
    - The following re-cropping intervals, based on soil pH, should be considered as guidelines only. Metsulfuron residues may affect crops for a longer period of time than outlined in the following table. Add 12 months to recommendations if less than 5 inches (130 mm) of rainfall in brown and dark brown soils or less than 10 inches (250 mm) rainfall in black or grey wooded soils in any year following application.

      Minimum Re-Cropping Interval (Months)

Soil PH	Barley, Wheat	Oat*	Canola*	Flax*	Lentils	Canary Seed	Yellow Mustard
less than 7.0	10	10	10 (22)	10 (22)	34	48	48
7.0 -7.9	10	10 (22)	22 (34)	34	48	48	48

      *** Figures in brackets refer to re-cropping intervals in brown and dark brown soil zones.**
    - On black and grey wooded soils with pH of 7.5 or less, fescue may be planted 10 months after application and alfalfa, red clover, peas and flax may be planted 22 months after application. DO NOT use on soils with pH greater than 7.9.
    - Effects of metsulfuron residues on crops other than those listed in the table have not been fully evaluated. Because of the length of re-cropping restrictions and the lack of information on many rotational crops, land previously treated with metsulfuron cannot be rotated to crops other than those listed until a field biosassay confirms that residues of metsulfuron are not present. Consult the label for additional instructions on how to perform a field bioassay. Failure to follow these instructions could result in injury to subsequent crops.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store in a cool, dry place. May be frozen.

- **Buffer Zones:**
  - Handheld or backpack applications do not require a buffer.

Use	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat**
	Less than 1 m	Greater than 1 m	
Cropland	1	1	15

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
**** Terrestrial buffers are not required for transport and utility rights-of-way**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Metsulfuron can cause severe injury to sensitive crops at very low concentrations. Sprayers used to apply metsulfuron should be flushed out immediately after metsulfuron is used. All nozzles, screens and filters should be removed and cleaned after applying this product. Refer to 'Method B' found in the general sprayer cleaning section in the introduction. DO NOT use ammonia with chlorine bleach.

Hazard Rating:

Caution – Poison

Caution – Eye Irritant

Refer to the Introduction for an explanation of the symbols.

Muster

Herbicide Group
2 - ethametsulfuron

Company:

FMC Corporation (PCP#21555)

Formulation:

75% ethametsulfuron-methyl formulated as a wettable granule.

- Container size - 320 g (4 x 80 g water soluble bags).

Crops, Rates and Staging:

NOT for use on yellow mustard (*Brassica alba*).

Crop	Rate (g/acre)	Stage
Canola	8 to 12	Minimum 2 leaf stage (main stem) to the start of bolting.
Mustards: brown & oriental condiment as well as oilseed quality (*Brassica juncea*)	8	4 leaf stage but prior to bolting.
Ethiopian mustard (*Brassica carinata*)		
Sunflower	8 to 12	2 to 8 leaf stage (15 to 45 cm)

Muster applied alone requires the addition of *Agral 90*, *Agsurf II*, or *Citowett* at 0.2 L per 100 L of spray solution. When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Weeds, Rates and Staging:

Apply from the cotyledon to 6 leaf stage. Stinkweed must be sprayed in the 1 to 4 leaf stage

At the 8 grams per acre rate:

- Flixweed *
- Green smartweed
- Hemp-nettle
- Stinkweed **
- Wild mustard

The 12 grams per acre rate controls above weeds plus:

- Redroot pigweed **
- Stinkweed

*** Spring seedlings only.**
**** Suppression with *Muster* alone but control with *Assure II* plus *Sure-Mix* or a *Poast Ultra plus Merge* tank mix where permitted.**

Application Information:

- **Water Volume:** 40 L per acre.
- **Equipment, Nozzles and Pressure:** 30 to 40 psi (200 to 275 kPa) when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage of ***ASABE medium*** droplets. Sprayer must be equipped with continuous agitation. Maintain the spray boom at 24 inches or less above the crop canopy.
- **Screens:** Use a 50 mesh or coarser nozzle screen and in-line filter system.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
ethametsulfuron	POST	ALS Amino Acid synthesis Inhibitor	Toward growth areas (Symplast)	Broadleaf	2

Effects of Growing Conditions:

DO NOT apply to crops that are stressed by severe conditions such as drought, low fertility, saline soils, waterlogged soils (soils at or near field capacity), disease or insect damage as crop injury may result. Less than acceptable control will occur in fields where high weed populations exist and where stressful environmental conditions prevail (drought, cold weather). Heavy rainfall soon after application may result in visual crop injury or possible yield reduction. Thin crop stands or application prior to the 2 leaf stage of canola or 4 leaf stage of brown condiment mustard and oriental mustard (condiment and oilseed types), sandy soils or soils with low organic matter may increase the severity of the injury.

Tank Mixes:

DO NOT mix the soluble bags with liquid fertilizers, substances that contain boron or substances that release free chlorine. Mixing the water soluble bags with any of these compounds will result in an insoluble substance in the tank.

Herbicides:

- ***Canola, brown and oriental mustards (Brassica juncea only):***
  - *Assure II* plus *Sure-Mix* adjuvant.
- ***Canola only:***
  - *Poast Ultra* plus *Merge* adjuvant.

Insecticides: None registered.

Fungicides: None registered.

Fertilizers: None registered. DO NOT mix soluble bags with liquid fertilizers.

Note: The above mixes are those listed on the *Muster* label only.

According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 4 to 6 hours may reduce control.
- **Restricted Entry Interval:** DO NOT enter treated fields for at least 12 hours.
- **Grazing Restrictions:** DO NOT graze or feed crop to livestock within 60 days of application. DO NOT graze treated sunflowers.
- **Pre-harvest Interval:** Leave 60 days from application to harvest.
- **Re-cropping Interval:** DO NOT sow wheat, barley, oats or flax within 10 months of application. DO NOT seed canola, lentils, peas, faba beans, tame mustard, alfalfa, canaryseed, dry beans, fescues or red clover within 22 months of application. All other crops must not be sown until a successful "field bioassay" is performed at 22 months after application. Growers may experience reduced yields if other crops are grown without following these guidelines.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** May be frozen.

- **Buffer Zones:**

Crop (By ground only*)	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Canola, Sunflower, Ethiopian Mustard	4	2	55
Mustard (Condiment and Oilseed types)	3	2	40

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:
Sprayers used to apply *Muster* should be flushed out immediately after *Muster* is used. Refer to 'Method A' in the general section on sprayer cleaning in the introduction.

Hazard Rating:
None indicated.

Navius FLEX / TruRange

Herbicide Group
2 - metsulfuron
4 - aminocyclopyrachlor

Company:
Envu Canada (*Navius FLEX* – PCP#30922; *TruRange* – PCP#33964)

Formulation:
39.5% aminocyclopyrachlor and 12.6% metsulfuron formulated as a water dispersible granule.
- Container size - 8 x 1.361 kg

Crops and Staging:
Navius FLEX: Rangeland or non-crop areas (i.e. rights-of-way, roadsides, industrial sites, fence lines and other non-crop areas).
***TruRange*:** Rangeand and permanent pastures only.
DO NOT use in residential or recreational areas, where bystanders could be exposed during or after application.
DO NOT apply to cropland or land expected to be converted to cropland in the foreseeable future.
Note: *The use of this chemical may result in contamination of groundwater particularly in areas where soils are permeable (e.g. sandy soil) and/or the depth to the water table is shallow.*
Avoid application of this product in areas where the roots of desirable trees and/or shrubs may extend unless injury or loss can be tolerated. Root zone areas of desirable trees or vegetation are affected by local conditions and can extend well beyond the tree canopy.

Weeds, and Staging:
For best results, apply to young, actively growing weeds. For woody species, apply between mid-June and mid-August after the brush has leafed out, but before the leaves begin to turn their fall colours.
After the granules have fully dispersed, add surfactant. Either one of the following:
- Non-ionic surfactants (i.e. *Agral 90, Agsurf II*, or *Citowett*) at 0.25 L per 100 L (25 mL per 10 L) of spray solution.
- *Merge* or a crop oil concentrate (oil-surfactant blends such as *Assist*, *Score*, etc.) at 1 L per 100 L (100 mL per 10 L).

Weeds controlled at 68 grams per acre:

- Bluebur
- Buckwheat (tartary, wild*)
- Canada goldenrod†
- Canada thistle
- Chickweed
- Common groundsel
- Common tansy
- Common yarrow
- Corn spurry
- Cow cockle
- Dandelion
- Flixweed
- Giant buttercup†
- Hemp-nettle
- Knapweed (diffuse, spotted)
- Kochia
- Lamb's-quarters*
- Leafy spurge
- Mustard (ball, wild)
- Orange hawkweed
- Ox-eye daisy
- Pigweed (prostrate, redroot)
- Rough cinquefoil†
- Russian thistle
- Scentless chamomile
- Shepherd's-purse
- Smartweed (green, lady's-thumb)
- Sow-thistle (annual, perennial)
- Stinkweed
- Stork's-bill
- Sweet clover (white, yellow)
- Toadflax*
- Volunteer canola (except CLEARFIELD varieties)
- White cockle
- Wild carrot
- Wild parsnip
- Yellow star-thistle

Woody Species:

- Smooth sumac
- Western snowberry
- Wild rose

Weeds controlled at 135 grams per acre:

- *The weeds listed above plus the following Woody Species up to 2.5 metres unless otherwise indicated:*
  - Manitoba maple (Box Elder)
  - Green ash
  - Chokecherry (up to 3 metres)
  - Pin cherry (up to 3 metres)
  - Plains cottonwood
  - Poplar (balsam, black)
  - Trembling aspen (up to 3 metres)
  - Willow (sandbar/ditchbank, pussy)
  - Hackberry
  - Balsam fir (up to 2 metres)
  - Spruce (black, white, Norway – up to 2 metres)

Weeds controlled at 202 grams per acre:

- *The species listed above plus the following Woody Species to 2 metres tall unless otherwise indicated:*
  - Pine (Eastern white, jack, red)
  - Balsam fir (up to 3 metres)
  - Spruce (black, white, Norway – up to 3 metres)

*** Suppression only.**
† Season long control only.

DO NOT apply more than a total of 270 grams per acre per season or apply *Escort* to the same site in the same year as *Navius FLEX/TruRange*. Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Application Information

- **Water Volume:**
  - ***Ground:*** No specific carrier volumes are indicated for ground application but volumes could be up to 162 L per acre for herbaceous weeds and up to 810 L per acre is recommended for foliar application to woody species. See the label for details.
  - ***Aerial:*** Apply in 12 to 20 L per acre of water.
- **Nozzles and Pressure:** Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE coarse*** droplets.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
metsulfuron-methyl	POST (foliar) also has soil activity	ALS Amino Acid Inhibitor	Toward areas of growth (Symplast)	Broadleaf only	2
aminocyclopyrachlor	POST (foliar) also has soil activity	Synthetic Auxin	Throughout the plant (Symplast)	Broadleaf only	4

Effects of Growing Conditions:

Warm, moist growing conditions promote active weed growth and enhance activity. Weeds stressed by moisture or temperature extremes (heat or cold) may be less susceptible and incomplete weed kill may result. Residual control of weeds germinating after application occurs when *Navius FLEX/TruRange* is carried into the root zone by rainfall. DO NOT apply during periods of intense rainfall or to soil saturated with water. Brush hardened off by cold weather and drought stress may not be controlled.

Restrictions:

- **Rainfall:** Rain within 4 hours may reduce effectiveness.
- **Restricted Entry Interval:** DO NOT re-enter treated areas until sprays have dried.
- **Re-cropping Interval:** No recropping interval is indicated. Conduct a bioassay when converting pasture to annual crop land to determine tolerance to potential residues in the soil. The following restrictions apply to all plant materials, or manure from animals fed material, from areas treated with *Navius FLEX/TruRange* within the previous 18 months:
  - DO NOT apply to land used for growing susceptible crops. Manure may only be applied on rangeland.
  - DO NOT use as mulch or compost and do not apply directly on or around desirable plants.
  - Must only be used on-farm.

- **Grazing Restrictions:** No grazing or haying restrictions for non-lactating or lactating animals (including cattle, horses, sheep, and goats) when used as directed. Grazing animals do not have to be moved off the pasture or rangeland before, during or after application.
- **Aerial Application:** May be applied by air.
- **Storage:** Store in a cool, dry place. May be frozen.
- **Buffer Zones:**
  - ***Contact the Saskatchewan Ministry of Environment or Manitoba Sustainable Development Department for additional permitting requirements.***
  - Hand-held or backpack sprayers and spot treatments are exempt from buffer zone requirements.

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat**
	Less than 1 m	Greater than 1 m	
Ground	5	2	45
Fixed wing aircraft	250	100	800
Helicopter	80	45	800

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** For ground vehicle mounted booms, buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
**** Terrestrial buffers are not required for transport and utility rights-of-way. Aquatic buffers still apply.**
† Distance is measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Navius FLEX/TruRange can cause severe injury to sensitive plants at very low concentrations. Use 'Method A' in the introduction to clean sprayers immediately after using *Navius FLEX/TruRange* or directions on the label.

Hazard Rating:

Warning – Contains the Allergens Milk and Sulfites
Refer to the Introduction for an explanation of the symbols.

Nicosulfuron

Herbicide Group 2 - nicosulfuron

Company:

Corteva Agriscience (*Accent *, Accent IS*)
Sharda Cropchem Canada (*Nicosh*)
Albaugh (Primero)
** **Note:** This product is no longer manufactured but inventories still remain in distribution. This product may be removed from future editions.*

Formulation:

***Accent* (PCP#32884), *Nicosh* (PCP#33227) *Primero* (PCP#34948):** 75% nicosulfuron formulated as a water dispersible granule.

- Container sizes:
  - *Accent* - 133.6 g (4 x 33.4 g water soluble bags per pouch)
  - *Nicosh* - 33.4 g package
  - *Primero* - 480 g package

***Accent IS* (PCP#34410):** 54.55% nicosulfuron formulated as a water dispersible granule.

  - • Container size - 6 X 270 g

Crops and Staging:*

Field corn: 1 to 8 leaf stage (six visible collars), coleoptile (short, blunt leaf) is counted as the first leaf.
Sweet corn**: 1 to 6 leaf stage (4 visible collars).
*** Note:** ***Since applications to field and sweet corn in western Canada have been registered under the User Requested Minor Use program, the manufacturer assumes no responsibility for herbicide performance. Application to corn is at the risk of the user.***
**** Note: Nicosulfuron is registered for use on all sweet corn varieties but tolerance may vary depending on variety. Krispy King, Jubilee and Jubilee Supersweet are the only varieties that have been tested for tolerance in western Canada. Test on small areas planted to other varieties for tolerance prior to widespread use.**

Weeds and Staging:

Weeds	Staging
Barnyard grass, foxtail (green, yellow*), witchgrass	1 to 6 leaves (up to 2 tillers)
Quackgrass	3 to 6 leaves (with extended leaf 4 to 8 inches (10 to 20 cm) long)
Wild oats	3 to 6 leaves

*** Suppression only.**

The best control and yield response is achieved by applying at the earlier end of the leaf stage ranges.

Rates:

***Accent, Nicosh, Primero*:** 13.5 grams per acre. Add a non-ionic surfactant (*Citowett Plus, Agsurf* or *Agral 90*) at 0.2 L per 100 L of spray solution.

***Accent IS*:** 18.5 grams per acre. Add one of the following adjuvants: non-ionic surfactant at 0.2 L per 100 L of spray solution; *Merge, Surjet* or *Sure-Mix* at 0.5 L per 100 L of spray solution, *Adapt Oil Concentrate* at 1 L per 100 L of spray solution. Non-ionic surfactants may be applied with 28% liquid urea ammonium nitrate (UAN) at 2 L per acre for improved performance on certain weeds.

Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Application Information:

- **Water Volume:** Minimum 40 L per acre; optimum 56 to 77 L per acre.
- **Nozzles and Pressure:** 25 to 40 psi (175 to 275 kPa) when using conventional flat fan nozzles tilted forward at a 45° angle. Low drift nozzles may require higher pressures for proper performance. Use nozzles and pressures designed to deliver proper coverage with ***ASABE medium*** droplets.
- **Screens:** Use a 50 mesh or coarser screen and filter system.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
nicolsulfuron	POST (foliar)	ALS Amino Acid synthesis Inhibitor	Toward growth areas (Symplast)	Grasses	2

Effects of Growing Conditions:

Poor weed control or crop injury may result if at the time of application, plants are under stress from disease, insect or nematode injury, carryover of herbicide from a previous years application, abnormally hot or cold weather, drought, water-soaked soils, hail damage or frost. Delay application until stress passes and both corn and weeds have resumed growth. When corn is injured by frost, wait 48 to 72 hours after normal growing conditions have resumed before applying nicosulfuron. Stress conditions after application may also result in injury or poor weed control.

Tank Mixes:

Herbicides:

- *Pardner* (0.4 L per acre) plus surfactant.

Fertilizers: DO NOT mix with fertilizers.

Insecticides: None registered. Nicosulfuron should not be applied to corn that has been treated with organophosphate insecticides. Leave 7 days between the application of nicosulfuron and that of a foliar organophosphate insecticide.

Fungicides: None registered.

Note: The above mixes are those listed on the nicosulfuron labels only.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 2 to 4 hours of application may result in reduced weed control.
- **Restricted Entry Interval Interval:** DO NOT enter treated fields for at least 12 hours.
- **Grazing Restrictions:** DO NOT graze or feed treated corn forage, silage, fodder or grain for at least 30 days.
- **Pre-harvest Interval:** Leave at least 30 days in field corn and 40 days in sweet corn from application to harvest.
- **Re-cropping Interval:** Spring cereals, canola, field pea, flax, corn, potato, dry beans[†], sunflower, alfalfa may be seeded 10 months from application For all other crops a field bioassay is recommended before planting.
  [†] Since not all dry bean varieties have been tested for rotational crop tolerance, the first planting of each variety to previously treated fields should be limited to a small area to confirm tolerance prior to widespread recropping.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store product in original container in a secure, dry area away from other pesticides, food or feed.

- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of Terrestrial habitat
Ground only*	2

See the Key to Product Pages in the introduction for an explanation of the different habitats.
***Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
†Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.
Leave a 5 m buffer between the last spray path and woodlots or shelterbelts. Leave a 22 m buffer before wetland areas or water bodies.

Sprayer Cleaning:
Refer to 'Method A' in the general section on sprayer cleaning in the introduction.

Hazard Rating:
***Accent, Nicosh*:**
Caution – Eye Irritant
***Accent IS*:**
Warning – Contains the allergens milk and sulfates
Keep out of reach of children. Avoid breathing spray mist. Avoid contact with skin, eyes and clothing.
Refer to the Introduction for an explanation of the symbols.

OcTTain XL

Herbicide Group
4 - fluroxypyr, 2,4-D

Company:
Corteva Agriscience (*OcTTain XL* – PCP#30077)
Interprovincial Cooperative Ltd. (*CO-OP OcTTain XL* – PCP#33892, *IPCO OcTTain XL* – PCP#33891)
Sharda Crop Chem (*OSim Plus* – PCP#34712)
ADAMA Canada (*Rush 24 All In* – PCP#34878)
AgraCity (*Foxxy Pro* - PCP#35305)

Formulation:
90 g/L fluroxypyr plus 360 g/L 2,4-D LV ester as an emulsifiable concentrate.
- Container sizes - 2 x 9 L, 108 L, 576 L
- *Rush 24 All In* - 2 x 8.9 L, 106.8 L, 427.2 L
- Foxxy Pro - 450 L

Crops and Staging:
Spring wheat (including durum), barley: 4 leaf up to the emergence of the flag leaf.

Winter wheat†: Apply to winter wheat in the spring from the 3 tiller stage to just before the flag leaf stage.

Forage grasses for seed production only*:
- *Seedling and established grasses at the 4 leaf up to the emergence of the flag leaf.*
  - Bromegrass (meadow, smooth)
  - Fescue (creeping red, tall)
  - Timothy
  - Wheatgrass (crested, intermediate)

*** Note:** *Since these uses are registered under the User Requested Minor Use Label Expansion (URMULE) program, the manufacturer assumes no responsibility for herbicide performance.* ***Those who apply these uses do so at their own risk.***
† ***OcTTain XL, IPCO OcTTain XL , Foxxy Pro* and *OSIM Plus* only.**

Rangeland, pasture, industrial vegetation management only (i.e. rights-of-way, roadsides, permanent perennial grass cover areas and industrial vegetation management areas): Based on weed timing (Corteva *OcTTain XL*, *OSIM Plus* and *RUSH 24 ALL IN* only).
When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

Weeds, and Staging:

The following weeds are controlled at the 2 to 4 leaf stage, unless otherwise specified:

- ***OcTTain XL, OSIM Plus, Foxxy Pro* and *RUSH 24 ALL IN* at 0.45 L per acre controls:**
  - Bluebur
  - Burdock
  - Cleavers(1 to 8 whorl)
  - Clover (sweet)
  - Cocklebur
  - Common chickweed (up to 8 cm or 3 inches)†
  - Field horsetail*
  - Flixweed
  - Goat's-beard
  - Hemp-nettle (2 to 6 leaf)
  - Hoary cress*
  - Kochia
  - Lamb's-quarters
  - Mustards (except dog or green and grey tansy mustard)
  - Plantain
  - Prickly lettuce
  - Ragweed
  - Redroot pigweed†
  - Round-leaved mallow (1 to 6 leaf)
  - Shepherd's-purse
  - Sow-thistle (perennial)†*
  - Stinkweed
  - Stork's-bill (1 to 8 leaf)
  - Sunflower (annual)
  - Vetch
  - Volunteer canola
  - Volunteer flax (1 to 12 cm)
  - Wild radish
  - Wild mustard
  - Wild buckwheat (1 to 6 leaf)
- ***OcTTain XL , OSIM Plus, Foxxy Pro* and *RUSH 24 ALL IN* at 0.45 L per acre plus 2,4-D ester (LV700 at 81 mL per acre or LV600 at 95 mL per acre) controls:**
  All weeds listed above plus:
  - Annual sow-thistle†
  - Blue lettuce*
  - Canada thistle†*
  - Dandelion**
  - Docks
  - Field bindweed*
  - Field peppergrass
  - Gumweed
  - Hairy galinsoga
  - Hedge bindweed
  - Leafy spurge*
  - Mustard (dog and tansy)
  - Oak-leaved goosefoot
  - Perennial sow-thistle†*
  - Redroot pigweed
  - Russian thistle
  - Smartweed (including lady's-thumb)
  - Tartary buckwheat
  - Wild buckwheat (1 to 8 leaf)
- **Rangeland or non-crop areas (i.e. rights-of-way, roadsides, permanent perennial grass cover areas and industrial vegetation management areas):**
  - **Corteva *OcTTain XL, OSIM Plus* and *RUSH 24 ALL IN* only at 0.65 L per acre:**
    - ***All weeds listed above plus:***
      - Kochia (up to 50 cm) suppression
  - **Corteva *OcTTain XL, OSIM Plus* and *Rush 24 All In* only at 1.25 L per acre:**
    - ***All weeds listed above plus:***
      - Kochia (up to 50 cm) control

† Suppression only.
*** Top growth only.**
**** Spring rosettes only.**

Make only ONE APPLICATION per year of any of these products or other products containing the same active ingredients. Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Application Information

- **Water Volume:**
  - ***Ground:*** 20 to 40 L per acre. All other uses minimum 40 L per acre.
  - ***Aerial:*** 12 to 20 L per acre.
- **Nozzles and Pressure:** Maximum 30 to 40 psi (200 to 275 kPa) when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage of ***ASABE coarse*** droplets.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
fluroxypyr	POST (foliar)	Synthetic Auxin	Throughout the plant (Symplast)	Broadleaf only	4
2,4-D	POST (foliar)	Synthetic Auxin	Throughout the plant (Symplast)	Broadleaf only	4

Effects of Growing Conditions:

The activity these products are influenced by weather conditions. The temperature range for optimum activity is 12°C to 24°C. Reduced activity will occur when temperatures are below 8°C or above 27°C. Frost 3 days before or after application may reduce weed control and crop tolerance. Weed control may be reduced during stress conditions (drought, heat or cold stress) or if extremely heavy infestations exist.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides:

The following mixes may be used with each of the combinations above unless noted otherwise.

- ***In spring wheat (including durum), winter wheat and barley:***
  - Tralkoxydim*
- **In spring wheat (including durum) only:**
  - Clodinafop 240 EC (93 mL per acre)**
- **In spring wheat (including durum) and winter wheat only:**
  - *Simplicity OD*†
  - *Simplicity GoDRI*††

Insecticides: None registered.

Fungicides: None registered.

Fertilizers: None registered. DO NOT mix with liquid fertilizers.

*** Temporary crop injury or reduced wild oats control may occur with this tank mix.**

*******OcTTain XL* **and** *IPCO OcTTain XL* **only.**

† All products without additional 2,4-D ester only.

††All products Except ***OSim Plus.***

Note: The above mixes are those listed on the ***OcTTain XL*** **labels only.**

According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 1 hour of application may reduce control.
- **Restricted Entry Interval:** DO NOT re-enter treated area within 12 hours.
- **Re-cropping Interval:** Alfalfa, barley, canola, corn, dry beans, flax, forage grasses, lentils, mustard, oats, peas, potatoes, rye, soybeans, sunflowers and wheat may be grown the year after application. There are no re-cropping restrictions the second year after application.
- **Re-cropping Interval** ***RUSH 24 ALL IN*****:** Barley, canola, flax, forage grasses, lentils, mustard, oats, peas, rye and wheat may be grown the year after application. There are no re-cropping restrictions the second year after application.
- **Pre-harvest Interval:** Leave 60 days between application and harvest.
- **Grazing Restrictions:** DO NOT permit lactating dairy animals to graze cereal fields within 7 days of application. DO NOT harvest cereal crops for forage or cut hay within 30 days of application. Withdraw meat animals from treated fields at least 3 days before slaughter. DO NOT feed or cut forage grasses for hay.
- **Aerial Application:** *OcTTain XL, CO-OP OcTTain XL, IPCO OcTTain XL* and *OSIM Plus*. May be applied by air. Rangeland and industrial uses by ground only.
- **Storage:** Avoid freezing. If frozen, bring to room temperature and agitate before use. These products are combustible. DO NOT store near heat or open flame.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Field sprayer (annual crops)	1	0	3*
Field sprayer (range, pasture, IVM)	1	1	5**
Fixed wing aircraft	5	0	95
Helicopter	3	0	80

See the Key to Product Pages in the introduction for an explanation of the different habitats.

*** For ground vehicle mounted booms, buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**

**** Buffer zones for the protection of terrestrial habitats are not required for use on rights-of-ways including rail, utility and road.**

† Distance is measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:
Refer to 'Method B' in the general section on sprayer cleaning in the introduction.

Hazard Rating:
Caution – Poison

Caution – Skin Irritant

Refer to the Introduction for an explanation of the symbols.

Odyssey Ultra Q

Herbicide Group
1- quizalofop
2- imazamox, imazethapyr

This product is a prepackaged tank mix of Odyssey NXT II (see Imazamox/Imazethapyr) and Caziva Ulltra Q (see quizalofop). Information listed is restricted to Crop, Weeds, Rates and Tank mixes. For other detailed restrictions and other general information on the component products see the product pages listed above.

Company:
BASF Canada

Formulation:
The *Oyssey Ultra Q* packages contain the following components:
***Odyssey Ultra NXT II* (PCP#33678):** 35% imazamox and 35% imazethapyr formulated as a dispersible granule.
- Container size - 1 x 692 g jug

***Caziva Ultra Q* (PCP#34282):** 96 g/L quizalofop-p-ethyl formulated as an emulsifiable concentrate.
- Container size - 6.16 L

***Merge* adjuvant (PCP#24702):** Container size - 1 x 8.1 L

Crops and Staging:

Crop	Leaf Stage	Days to Harvest
Field pea	1 to 6*	60
CLEARFIELD lentil	1 to 9*	60
Soybean	1 to 3	85
Faba bean	1 to 6	80

*** Above-ground nodes.**

Weeds, Rates and Staging:
At 17.4 grams per acre *Odyssey Ultra NXT II* and 154 mL per acre *Caziva Ultra Q* controls the weeds controlled by *Odyssey NXT II* plus the additional grass weeds below from the 1 to 6 leaf stage (main stem) up to 2 tillers
- Annual brome (Japanese, Downy)
- Foxtail barley
- Quackgrass (suppression)
- Volunteer corn
- Volunteer Clearfield wheat (including spring and durum)
- Yellow foxtail

Odyssey Ultra Q requires the addition of *Merge* adjuvant at 0.5 L per 100 L of spray solution.
Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Tank Mixes:
Herbicides:
- Quizalofop (top up to a total quizalofop rate of 0.30 L per acre)

Insecticides: None registered.
Fungicides: None registered.
Fertilizers: None registered.

See component products for more information on restrictions, application details and handling. Unless indicated differently above use the most limiting restrictions across all components for the mix.

Olympus

Herbicide Group
2 - propoxycarbazone-sodium

Company:
Bayer

Formulation:
***Olympus* (PCP#32755):** 70% propoxycarbazone-sodium formulated as a wettable granule.
- Container size - 463 g

Crops and Staging:
Spring, durum, and winter wheat: Pre-seed or prior to crop emergence.

Weeds and Rates:
Weeds controlled up to 15 cm in height unless otherwise indicated:

Preplant surface or postplant preemergence	***Olympus:*** 5.8 grams per acre **Glyphosate*:** 180 to 360 grams ae per acre	**Weeds controlled by glyphosate at the rates given plus:** • Canada fleabane (up to 8 cm)[Δ] • Canola, volunteer[†] (1-leaf stage to 4 leaf stage) • Cleavers[Δ] • Common ragweed[Δ] • Downy brome[†Δ] • Flixweed[Δ] • Green foxtail[Δ] • Hemp-nettle[Δ] • Japanese brome (up to and including the 2 leaf stage) • Kochia[ΔΔ] (except glyphosate tolerant biotypes) • Lady's-thumb[Δ] • Lamb's-quarters[Δ] • Persian darnel[Δ] • Redroot pigweed[Δ] • Russian thistle[Δ] • Stinkweed[Δ] • Volunteer barley[Δ] • Volunteer flax[Δ] • Volunteer wheat[Δ] • Wild buckwheat (up to 8 cm in height and up to 3 leaf stage)[Δ] • Wild mustard[Δ] • Wild oats[Δ] • Foxtail barley (seedling to heading)**[†]

*** including all salts**
**** 360 g ae per acre of glyphosate is required for control of foxtail barley**
[†] For more consistent control of subsequent flushes, follow an application of *Olympus* + glyphosate with an in-crop application of *Varro*. Refer to the *Varro* label for additional weeds controlled.
[Δ] Controlled by glyphosate alone at 180 to 275 g ae per acre.
[ΔΔ] Controlled by glyphosate alone at 360 g ae per acre.

Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Application Information:
- **Water Volume:**
  - ***Ground:*** Minimum 20 L per acre
  - ***Aerial:*** Minimum 10 L per acre *(Note: There are restrictions on aerial application – see the note under Restrictions below)*
- **Nozzles and Pressure:** Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE coarse*** droplets or larger. The use of 80° or 110° flat fan nozzles is recommended for optimum spray coverage. DO NOT use flood jet nozzles, controlled droplet application equipment or Sprafoil equipment.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
propoxycarbazone-sodium	POST and PRE (has soil activity)	ALS Amino Acid Inhibitor	Toward areas of growth (Symplast)	Broadleaf & grass	2

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides:

- ***Pre-seed and Pre-Emergent:***
  - Glyphosate

Insecticides: None registered.

Fungicides: None registered.

Fertilizers: None registered. DO NOT mix soluble bags with liquid fertilizers.

Restrictions:

- **Rainfall:** Within 4 hours of application may reduce control.
- **Restricted Entry Interval:** DO NOT re-enter treated fields for 12 hours.
- **Grazing Restrictions:** MUST NOT be grazed or fed to livestock for 71 days after treatment.
- **Pre-harvest Interval:** Leave 71 days between application and harvest.
- **Re-cropping Interval:** Barley, canola, dry beans, field peas, flax, lentils, oats, and soybeans may be grown in the season following appplication.
- **Aerial Application:** *Note* – while *Olympus* may be applied by aerial application, due to the requirement that it be mixed with glyphosate, this aerial option is only available for certain glyphosate products and then only when the field to be treated is too wet to support ground based sprayers. (See glyphosate)
- **Storage:** Store in a cool, dry place.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground*	1	0	1
Fixed wing aircraft	1	0	20
Helicopter	1	0	15

See the Key to Product Pages in the introduction for an explanation of the different habitats.

*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**

† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Refer to 'Method A' in the general section on sprayer cleaning in the introduction. Let solution stand for an extended period for better results. Flush sprayer system with water. See the label for product specific cleaning details.

Hazard Rating:

Warning – Contains the Allergen Milk

Refer to the Introduction for an explanation of the symbols.

OnDeck

Herbicide Group
27 - tolpyralate
6 - bromoxynil

Company:
Corteva Agriscience

Formulation:
***OnDeck* (PCP#34709):** 18.7 g /L tolpyralate and 186.6 g/L bromoxynil formulated as an emulsifiable concentrate.
- Container size - 2 x 6.475 L case, 414.4 L tote

Crops, and Staging:
Wheat (spring, durum, winter) and barley: 1-leaf stage to jointing. Winter wheat applications can be made in the fall or spring.

Weeds and Staging:
Unless otherwise noted below, apply to young and actively growing weeds at the 1 to 6 leaf stage.
Weeds Controlled:
- Annual smartweed (lady's-thumb)
- Chickweed
- Cleavers (4 whorls)*
- Foxtail (green****, yellow)
- Hemp-nettle
- Kochia (up to 10 cm)**
- Lamb's-quarters (up to 8 leaf)
- Redroot pigweed
- Volunteer canola
- Wild buckwheat (4 leaf)***
- Wild mustard

*For control of cleavers up to the 6-whorl stage, apply at 435 mL per acre or the standard rate with a recommended adjuvant.
**Apply at 325 mL per acre for control of lighter populations of kochia (<100 plants per m^2) up to 10 cm in size. For control of kochia in heavier populations up to 15 cm in size, apply at 435 mL per acre or the standard rate with a recommended adjuvant.
***Apply at 325 mL per acre for control of light populations of wild buckwheat (<25 plants per m^2) up to the 4-leaf stage. For control of wild buckwheat in heavier populations up to the 6-leaf stage, apply at 435 mL per acre or the standard rate with a recommended adjuvant.
****Apply at 325 mL per acre for control of green foxtail up to the 4-leaf stage. For control of green foxtail up to the 6-leaf stage, apply at 435 mL per acre or the standard rate with a recommended adjuvant.

Rate:
Standard rate: 325 mL per acre
High rate: 435 ml per acre
Maximum of one application per year.
OnDeck can be applied in tank-mix with methylated seed oil, crop oil concentrate or high surfactant oil concentrate-type adjuvants at a minimum rate of 0.5 L per 100 L of spray solution for enhanced weed control when weed populations are high, weed staging is advanced or when weeds are stressed due to environmental conditions. Apply 0.5 to 1 L of adjuvant per 100 L of spray solution.
Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Application Information:
- **Water Volume:**
  - ***Ground:*** 20-80 L per acre. Recommended 40 L per acre.
  - ***Aerial:*** 20 L per acre
- **Nozzles and Pressure:** Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE coarse*** droplets by ground or by air.

How it Works:
Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
tolpyralate	POST (foliar)	HPPD Pigment Inhibitor	Some – both foliar and root (Apoplast)	Broadleaf and grasses	27
bromoxynil	POST (foliar)	PSII Inhibitor/ Membrane disrupter	Little (Apoplast)	Broadleaf only	6

Effects of Growing Conditions:
Weeds hardened off by cold weather or drought stress may not be adequately controlled or suppressed and re-growth may occur.
For best results, ensure thorough spray coverage of target weeds. Under certain environmental conditions slight delay on barley development can be present; the delay is transient and will not have an impact on yield.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides:

- ***Post-Emergent:***
  - MCPA ester 600 (189 to 235 mL per acre)
  - 2,4-D Ester 700 (202 to 445 mL per acre)
  - *Simplicity GoDRI*
  - *Simplicity OD*
  - Pinoxaden
  - *Horizon NG*
  - Flucarbazone
  - *Traxos*
  - *Varro*

Fungicides: None registered.

Insecticides: None registered.

Fertilizers: *OnDeck* may be applied in spray solutions containing liquid nitrogen fertilizer at up to 0.51 L per acre.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions.

Restrictions:

- **Rainfall:** Within 1 hour of application may reduce control.
- **Restricted Entry Interval:** DO NOT enter treated fields for 12 hours.
- **Preharvest Interval:** Do not harvest the treated mature crop within 50 days after application
- **Grazing:** Livestock may be grazed on treated crops 30 days following application. Do not cut the treated crop for hay or silage within 30 days after application.
- **Re-cropping:** The following crops may be grown 10 months after application: alfalfa, barley, bean (dry), canola, grass (grown for seed or forage), lentils, oats, field peas, potato (not for seed), sorghum, soybean, sunflower. Winter wheat or rye (annual and fall) may be seeded 3 months after application. Corn may be replanted immediately.
- **Aerial Application:** May be applied fixed-wing or by rotary aircraft**.**
- **Storage:** Store this product away from food or feed. Store in original containers in a secure, dry heated storage. Do not allow contamination of seeds, plants, fertilizers or other pesticides. Do not contaminate food, feedstuffs or domestic water supplies. If containers are damaged or spill occurs, use the product immediately or contain the spill with absorbent materials and dispose of waste.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1	
Ground*	1	1	1
Fixed wing aircraft	10	1	25
Helicopter	10	1	25

See the Key to Product Pages in the introduction for an explanation of the different habitats.

*** Buffer zones can be reduced by 70% when using shrouds and by 30% when using cones mounted less than 12 inches from the crop canopy.**

† Distance is measured from the downwind edge of the boom to sensitive areas.

Sprayer Cleaning:

Refer to 'Method B' in the general section on sprayer cleaning in the Introduction. Let solution stand for an extended period for better results. Flush sprayer system with water. See the label for product specific cleaning details.

Hazard Rating:

Warning – Poison

Eye irritant and skin irritant

Potential skin sensitizer

Refer to the Introduction for an explanation of the symbols.

Optica Trio

Herbicide Group
4 - MCPA, mecoprop-p, dichlorprop

Company:
Loveland Products Canada (PCP#29662)

Formulation:
160 g/L MCPA + 130 g/L mecoprop-p + 310 g/L dichlorprop-p formulated as a solution
- Container size - 10 L

Crops and Staging:

Crop	Stage
Barley, oats, spring wheat (including durum)	2 to 5 leaf
Winter wheat	Spring application only; up to 12 inches (30 cm) high (top leaf extended)

Weeds, Rates and Staging:
Weeds controlled at the 2 to 3 leaf stage unless otherwise indicated.

Apply at 0.61 L per acre to control:
- Lamb's-quarters
- Stinkweed
- Volunteer canola
- Wild mustard

Apply at 1.0 L per acre to control the weeds listed above plus:
- Canada thistle*
- Chickweed (Common)
- Cleavers (1 to 2 whorls)
- Kochia
- Lady's-thumb (suppression)
- Ragweed (Common)
- Redroot pigweed
- Wild buckwheat

*** Top growth control only.**

DO NOT apply *Optica Trio* more than once or follow application with any related product in the same year.

Application Information:
- **Water Volume:** Minimum 20 L per acre.
- **Nozzles and Pressure:** 30 to 43 psi (200 to 300 kPa) when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage of ***ASABE medium*** droplets or larger.

How it Works:
Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
dichlorprop, mecoprop-p, MCPA	POST (foliar)	Synthetic Auxin	Moves throughout the plant (Symplast)	Broadleaf only	4

Effects of Growing Conditions:
Less than satisfactory control may result if weeds are not actively growing such as under conditions that are extremes of hot or cold, dry or wet weather prior to spraying.

Tank Mixes:
Herbicides:
- ***Spring wheat (including durum):***
  - *Signal* (93 mL per acre) plus supplied adjuvant.

Insecticides: None registered.
Fungicides: None registered.
Fertilizers: None registered.
Note: The above mixes are those listed on the *Optica Trio* label only.
Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** No rainfast period is specified on the label; required interval may be up to 8 hours. Contact manufacturer for more information.
- **Restricted Entry Interval:** DO NOT enter treated fields for 12 hours.
- **Grazing Restrictions:** DO NOT feed treated crops to milking animals or harvest for forage within 7 days of application. Meat animals grazing treated crops must be removed 3 day prior to slaughter.
- **Pre-harvest Interval:** No pre-harvest interval indicated on label when *Optica Trio* is used alone.
- **Re-cropping Interval:** No information provided on label. Contact manufacturer for information.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Keep from freezing.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground only*	1	1	2

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

No specific cleaning procedures are indicated on the label. Based on products with similar chemistry, 'Method B' found in the general sprayer cleaning section in the introduction or a commercial spray sprayer cleaning product, may provide adequate cleaning. Contact the manufacturer for more information.

Hazard Rating:

Caution – Poison

Danger – Corrosive to Eyes

Refer to the Introduction for an explanation of the symbols.

Option 2.25 OD

For use in Manitoba only.

Herbicide Group 2 - foramsulfuron

Company:
Bayer

Formulations:
***Option 2.25 OD* (PCP#27424):** 22.5 g/L foramsulfuron formulated as an oil-dispersion.
- Container size - 6.3 L jug

Crops and Staging:
Field corn at the 1 to 8 leaf stage or 5 to 6 visible collars

Weeds and Staging:
Annual Grasses:

Weed	Leaf Stage
Barnyard grass	1 to 6 (to early tillering)
Foxtail (green and yellow), Proso millet	2 to 5 (to early tillering)

Broadleaf Weeds:

Weed	Leaf Stage
Chickweed, common	4 to 6
Lamb's-quarters	4 to 8
Mustard, wild	5 to 7
Mustard, wormseed	5 to 9
Nightshade, eastern black	1 to 5
Pigweed, redroot	1 to 7
Ragweed, common*	2 to 4

*** Suppression only.**

Rates:
***Option 2.25 OD*:** 0.63 L per acre plus 28 percent UAN (liquid 28-0-0) at 1.0 L per acre.
NOTE: *Option 2.25 OD* should be tank mixed with *Banvel II* at 121 mL per acre for enhanced control of broadleaf weeds and the management of Group 2 resistant weed biotypes.
Add *Option 2.25 OD* to a half full tank, followed by *Banvel II*, then 28 percent UAN.

Application Information:
- **Water Volume:** 60 L per acre
- **Nozzles and Pressure:** Use 25 to 40 psi (175 to 275 kPa) when using conventional 80° or 110° flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage of ***ASABE medium*** or larger droplets.
- **Screens:** Use 50 mesh or coarser on both nozzle and primary plumbing screens.

How it Works:
Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
foramsulfuron	POST (foliar) also has soil activity	ALS Amino Acid Inhibitor	Toward areas of growth (Symplast)	Broadleaf only	2

Effects of Growing Conditions:
Under optimum conditions weed growth ceases within 1 to 3 days and yellowing of the growing point occurs in 5 to 10 days. Warm moist conditions provide for the best activity. Activity may be reduced or delayed if applied under cool and/or dry conditions or in the presence of heavy dew, fog, mist or rain or if weeds are dust covered. If the crop or weeds are under stress due to environmental conditions, delay application until the both crop and weeds have resumed active growth.

Tank Mixes:

Herbicides: *Banvel II* (121 mL per acre)*

Insecticides: Avoid application to corn that has been treated with organophosphorous insecticides.

Fungicides: None registered.

Fertilizers: DO NOT use any fertilizers or additives other than 28 percent UAN (1 L per acre), recommended*.

*** *Option 2.25 OD* should be applied to corn in Manitoba as a tank-mixture with *Banvel II*. UAN 28 percent is required. See 'Rates' section above.**

Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 6 hours may reduce control.
- **Restricted Entry Interval:** DO NOT enter treated fields until residues have dried.
- **Grazing Restrictions:** DO NOT graze treated corn crops or cut for forage within 45 days of application.
- **Pre-harvest Interval:** Leave 70 days between application and harvest of grain.
- **Re-cropping Interval:** The following crops may be grown the season following application: alfalfa, barley, bean (dry common), canola, clover (red), corn (field and sweet), oats, pea, potato, soybean, timothy, spring wheat. Winter wheat may be seeded 4 months after application.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Keep dry.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground only*	1	1	3

See the Key to Product Pages in the introduction for an explanation of the different habitats.

*** Buffer zones for ground applications can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**

† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Option 2.25 OD residues in the spray tank can cause severe injury to sensitive crops at very low concentrations. Sprayers should be cleaned out immediately before using another product. Refer to 'Method A' in the general section on sprayer cleaning in the introduction.

Hazard Rating:

Caution – Eye Irritant

Warning – Skin Irritant

Potential Skin Sensitizer

Refer to the Introduction for an explanation of the symbols.

Overdrive

Herbicide Group
4 - dicamba
19 - diflufenzopyr

Company:
BASF Canada (PCP#30065)

Formulation:
20% diflufenzopyr and 50% dicamba sodium salts formulated as water dispersible granules.
- Container size - 4 x 3.4 kg

Crops and Staging:
Established permanent grass pasture, non-cropland sites and rangeland. DO NOT apply *Overdrive* on annual crops or newly seeded grasses.

Note: *The use of this chemical may result in contamination of groundwater particularly in areas where soils are permeable (e.g. sandy soil) and/or the depth to the water table is shallow.*

Weeds and Staging:
- Biennial wormwood
- Canada thistle*
- Dandelion**
- Kochia (up to 15 cm)
- Lady's-thumb
- Lamb's-quarters
- Leafy spurge**
- Perennial sow-thistle (2 to 10 leaf)
- Ragweed (common)
- Redroot pigweed
- Sweet clover*
- Velvetleaf
- Vetch*
- Volunteer canola (up to 4 leaf)
- Waterhemp
- Wild buckwheat

*** Top growth control.**
**** Top growth suppression.**

Rates:
115 grams per acre.

Merge Adjuvant at the rate of 0.25 L per 100 L of spray solution or a non-ionic surfactant at 0.25 L per 100L of spray solution plus ammonium nitrate (UAN 28 percent) at 1.25L per 100L of spray solution must also be added. Use of an anti-foam agent is suggested.

Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Application Information:
- **Water Volume:** Minimum 89 L per acre. Use higher water volumes when treating dense or tall vegetation.
- **Nozzles and Pressure:** Maximum 20 psi (150 kPa) when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use a combination of application equipment and pressure that is designed to deliver an even coverage of ***ASABE coarse*** droplets that are less prone to drift. Non-target broadleaf plants are very sensitive to *Overdrive* drift. Avoid conditions that are conducive to drift. (See introduction for drift control suggestions).

How it Works:
Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
dicamba	POST (foliar)	Synthetic Auxin	Throughout the plant (Symplast)	Broadleaf only	4
diflufenzopyr	POST (foliar)	Auxin transport inhibitor	To growth areas of the plant (Symplast)	Broadleaf only	19

Effects of Growing Conditions:
DO NOT spray if temperatures are expected to exceed 27°C. DO NOT spray in high humidity or fog. DO NOT spray if wind velocity exceeds 8 km per hour. Established grasses growing under stress conditions can exhibit various injury symptoms that may be more pronounced if herbicides are applied.

Tank Mixes:
None registered.

Restrictions:

- **Rainfall:** Heavy rain within 4 hours of application may reduce control.
- **Restricted Entry Interval:** DO NOT enter treated fields for at least 12 hours.
- **Grazing Restrictions:** DO NOT permit lactating dairy animals to graze fields within 7 days after application. DO NOT harvest forage or cut hay within 30 days after application. Withdraw meat animals from treated fields at least 3 days before slaughter.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store in a cool, dry place.
- **Buffer Zones:**
  - Hand-held or backpack sprayer and spot treatment DO NOT require a buffer zone from sensitive habitat, but efforts should be made to minimize exposure to sensitive plants and open water or wetlands.

Application method	Buffer Zones (metres†) Required for the Protection of:	
	Freshwater habitat	Terrestrial habitat
Field sprayer*	15	10

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Refer to 'Method A' in the general section on sprayer cleaning in the introduction.

Hazard Rating:

Caution – Poison

Caution – Eye Irritant, Potential Skin Sensitizer

Warning – Contains the Allergen Sulfites

Refer to the Introduction for an explanation of the symbols.

Oxbow

Herbicide Group
4 - dichlorprop
6 - bromoxynil

Company:

Nufarm Agriculture Inc.

Formulation:

***Oxbow* (PCP#34883):** 435 g/L dichlorprop + 174 g/L bromoxynil formulated as an emusifiable concentrate

- Container size – 2 x 9.71 L, 116.5 L, 466 L

Crops and Staging:

Spring wheat, durum, barley: 3-leaf to prior to the flag-leaf stage

Winter wheat: Apply in the spring from early tillering to prior to flag-leaf stage

Weeds and Staging:

Unless otherwise noted below, apply to young and actively growing weeds up to the 4 leaf stage

Weeds Controlled:

- Bluebur
- Broadleaf plantain
- Chickweed
- Cocklebur
- Common ragweed
- Cow cockle
- False cleavers (4 whorl)
- Green smartweed
- Kochia (1-12 leaf)
- Lady's-thumb
- Lamb's-quarters (8 leaf)
- Pale smartweed
- Redroot pigweed*
- Round leaved-mallow
- Russian thistle (5 cm high, 2-12 leaf)
- Sow thistle (annual)
- Stinkweed (8 leaf)
- Tartary buckwheat (8 leaf)
- Volunteer canola
- Wild buckwheat (8 leaf)
- Wild mustard (8 leaf)

*** Suppression only.**

Rate:

Oxbow: 0.485 to 0.648 L/acre. Use the high rate when the field has heavy weed pressure.

Application Information:

- **Water Volume:**
  - ***Ground:*** 20-40 L/acre.
  - ***Aerial:*** Minimum 12-16 L/acre. Use higher volume for heavy crop canopy, or when the majority of weeds are cow cockle, smartweed, or pigweed.
- **Nozzles and Pressure**: Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ASABE coarse droplets at a minimum by ground or air.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
Bromoxynil	POST (foliar)	PSII Inhibitor/ Membrane disrupter	Little (Apoplast)	Broadleaf only	6
Dichlorprop	POST (foliar)	Synthetic Auxin	Moves throughout the plant (Symplast)	Broadleaf only	4

Effects of Growing Conditions:

Best weed control when weeds are actively growing when adequate soil moisture is present and warm temperatures prevail. Applications made under dry conditions may result in reduced control. Crops under stress from adverse environmental conditions such as frost, drought, or water saturated soils may be injured. Do not apply when daytime temperatures exceed 27°C.

Tank Mixes:

Tank mix partners applied at label rates and include recommended adjuvants unless otherwise noted.

Herbicides: None registered on product label.

According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 1 hour of application may reduce control. Avoid application when heavy rain is forecast.
- **Re-entry:** DO NOT re-enter treated fields for 24 hours.
- **Preharvest Interval:** Leave 60 days between application and harvest.
- **Grazing:** MUST NOT be grazed or fed to livestock for 40 days after treatment. Do not harvest forage or cut for hay within 30 days after application.
- **Re-cropping:** Grow all major crops the year after treatment.
- **Aerial Application:** May be applied by aircraft.
- **Storage:** Oxbow will solidify at temperatures below -20°C but will become useable at temperatures above 0°C
- **Buffer Zones:**

Application method	Buffer Zones (metres †) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground*	1	1	1
Fixed wing aircraft	10	1	30
Rotary wing aircraft	10	1	30

See the Key to Product Pages for an explanation of the different habitats.

*** Buffer zones can be reduced by 70% when using shrouds and by 30% when using cones mounted less than 12 inches from the crop canopy.**

† Distance is measured from the downwind edge of the boom to sensitive areas.

Sprayer Cleaning:
Refer to 'Method C' in the general section on sprayer cleaningin introduction.

Hazard Rating:
Danger – Poison
Skin Irritant
Potential skin sensitizer
Refer to the Introduction for an explanation of the symbols.

Paradigm PRE

Herbicide Group
2 - florasulam
4 - halauxifen

Company:
Corteva Agriscience (PCP#31304)

Formulation:
20% halauxifen present as methyl ester and 20% florasulam formulated as a water dispersible granule.
- Container size - 4 x 600 g jugs per case

Crops and Staging:
Pre-seed and Post Harvest Applications:
- Prior to the planting of wheat (winter, spring and durum), oats and barley (or a maximum of 48 hours after seeding).
- Must be used in combination with a mixture of glyphosate at 180 to 1020 g ae per acre.

Weeds, Rates and Staging:
Apply to actively growing weeds at the 1 to 8 leaf stage unless otherwise specified. Mix with glyphosate at 180 to 1020 g ae per acre.
Apply *Paradigm PRE* at 7.5 grams per acre when applied in a spring burndown or prior to winter wheat seeding in the fall in a mix with glyphosate to control or suppress the following weeds in addition to those weeds controlled by glyphosate at 180 g ae per acre (see glyphosate page):
- Canada thistle (suppression up to 30 cm)
- Chickweed
- Cleavers (1 to 9 whorl stage)
- Dandelion (seedlings and spring rosettes up to 15 cm across)
- Lamb's-quarters
- Mustard (wild)
- Shepherd's-purse

Apply *Paradigm PRE* at 10 grams per acre in a fall burndown or prior to winter wheat seeding in the fall in a mix with glyphosate to control or suppress the following weeds in addition to the weeds controlled by glyphosate at 180 g ae per acre (see glyphosate page):
The weeds controlled or suppressed above plus:
- American dragonhead (up to bud stage or 15 cm)
- Barnyard grass (up to 5 leaf, 2-tiller)
- Buckwheat, wild
- Canada thistle (suppression up to 30 cm)
- Cow cockle
- Dandelion (seedlings, rosettes and mature plants up to 30 cm across)
- Henbit (up to 8 leaf or 15 cm)
- Kochia* (up to 15 cm)
- Night-flowering catchfly§ (up to bolting, 15 cm in height)
- Redroot pigweed
- Round-leaved mallow (up to 6 leaf)
- Scentless chamomile§ (up to the bud stage)
- Smartweed (green)
- Sow-thistle, annual§
- Sow-thistle, perennial§ (up to 6 leaf)
- Stork's-bill
- Velvet leaf (up to 5-leaf)
- Volunteer alfalfa (up to 25 cm)
- Volunteer canola (all varieties)
- White cockle§ (spring seedlings and over-wintered plants up to the bud stage)

§ Suppression only.
*** Light to moderate infestation (up to 150 plants per square metre).**

Application Information:
- **Water Volume:** Minimum 20 to 40 L per acre. Use the higher volume when there is a heavy crop canopy or weeds are at an advanced stage.
- **Nozzles and Pressure:** Use 30 to 40 psi (200 to 275 kPa) if applying without drift reduction nozzles. Drift reduction nozzles may require higher pressures for proper performance. Select the nozzle and pressure combination that produces of ***ASABE S572.1 coarse*** droplets while maintaining good coverage of foliage.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
florasulam	POST (foliar)	ALS Amino Acid inhibitor	Toward areas of growth (Symplast)	Broadleaf only	2
halauxifen	POST (foliar)	Synthetic Auxin	Throughout the plant (Symplast)	Broadleaf only	4

Effects of Growing Conditions:

Weeds and crops must be actively growing. Extreme growing conditions such as drought or near freezing temperature prior to, at or following time of application may reduce weed control. Allow 5 days from application until tillage. Soil disturbance caused by seeding may reduce control.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides:

- ***Preseed Burndown (Fall or Spring):***
  - Glyphosate IPA, DMA or K+ formulations from 180 to 1020 g ae per acre (see glyphosate page for weeds controlled and conversion to product rates)

Insecticides: None registered.

Fungicides: None registered.

Fertilizers: None registered.

Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 1 hour of application may reduce control.
- **Restricted Entry Interval:** DO NOT enter treated fields for 12 hours.
- **Grazing Restrictions:** DO NOT graze livestock within 7 days of application. DO NOT cut for silage or hay within 21 days of application.
- **Pre-harvest Interval:** DO NOT harvest crops within 60 days of application.
- **Re-cropping Interval:** Registered crops above can be planted any time after application. Alfalfa, barley (spring), canola (including oilseed quality *B. juncea*), corn, dry bean, fababean, field pea, flax, mustard (oriental, brown and yellow), oats, soybeans, sunflower can be seeded a minimum of 10 months after treatment (typically the first season following spring application) or fields can be summerfallowed. Lentils may be grown 22 months after application.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store in a heated, dry place in original container.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground only	1	1	2

See the Key to Product Pages in the introduction for an explanation of the different habitats.

† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Refer to 'Method B' in the general section on sprayer cleaning in the introduction using All Clear Tank Decontaminator as the detergent component.

Hazard Rating:

Caution – Potential Skin Sensitizer

Refer to the Introduction for an explanation of the symbols.

Permit WG

Herbicide Group 2 - halosulfuron

Company:
Gowan Canada (PCP#31210)

Formulation:
72.6% halosulfuron methyl ester formulated as water dispersible granules.
- Container size - 567 g

Crops and Staging:
Pre-emergent surface†:
- ***Dry beans*:*** Apply 14.2 to 19 grams per acre after seeding but prior to soil cracking.

Post-emergent foliar†:
- ***Dry beans*:*** Apply 14.2 to 28.3 grams per acre at the 2 to 4 trifoliate leaves, prior to flowering. Maximum of one application per year.
- ***Corn (sweet, popcorn):*** Apply 19 to 28.3 grams per acre up to the 10 to 12 leaf stage. A second application of 19 grams per acre may be applied with drop nozzles if needed, avoiding contact with the whorl. Maximum of two applications per year.
- ***Corn (Field):*** Apply 19 to 37.6 grams per acre up to the 10 to 12 leaf stage. A second application of up to 37.6 grams per acre may be applied with drop nozzles if needed. Maximum of two applications per year.
- ***Proso millet:*** Apply 14 to 19 grams per acre from the 2 leaf up to prior to head emergence. Maximum one application per year.

*** Note: not all varieties have been tested for tolerance. For untested varieties apply to a small area to determine tolerance prior to use on a large scale.**

† Applications to emerged weeds require the addition of a non-ionic surfactant with 80 percent or greater active ingredient content at the lowest labelled rate for the surfactant regardless of crop stage.

When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

Weeds, Rates and Staging:
Weeds controlled with pre-emergent soil applications of 14 to 19 grams per acre unless otherwise indicated:
- Annual sunflower
- Canada fleabane
- Chickweed (common)
- Cocklebur
- Common groundsel
- Corn spurry
- Creeping yellow cress
- Flower-of-an-hour
- Fringed (Northern) willowherb
- Hairy galinsoga
- Jimsonweed
- Lamb's-quarters
- Plantain (broadleaf)
- Pigweed (redroot, smooth)
- Prickly lettuce
- Purslane*
- Ragweed (common)
- Round-leaved mallow
- Shepherd's-purse
- Smartweed (Lady's-thumb, Pennsylvania)
- Spiny amaranth
- Stinking mayweed
- Wild mustard
- Wild radish
- Velvetleaf
- Volunteer canola (except CLEARFIELD varieties)
- Yellow nutsedge**

*** Suppression only**

**** Requires a rate of 28.3 to 37.6 grams per acre rate for suppression based on the maximum rate for each crop.**

Weeds controlled from the 3 leaf stage (unless otherwise indicated) to the maximum weed height indicated:

Weed	Maximum Weed Height (cm)	
	14 to 19 g/acre	28.3 to 37.6 g/acre
Annual sunflower	31	38
Bindweed (Hedge)*	5	10
Cocklebur	23	36
Common milkweed*	13	31
Corn spurry	5	10
Creeping yellowcress	5	10
Fleabane (Philadelphia)	8	8
Flower-of-an-hour	8	31
Hairy galinsoga	5	10
Horsetail*	5	10
Pigweed (redroot, smooth)	8	15
Ragweed (common)	23	31

Weed	Maximum Weed Height (cm)	
	14 to 19 g/acre	28.3 to 37.6 g/acre
Ragweed (giant)	8	15
Shepherd's-purse	5	10
Smartweed (Lady's-thumb, Pennsylvania)	5	10
Spiny amaranth	8	15
Wild mustard	8	15
Wild radish	8	15
Velvetleaf	23	31
Volunteer canola (except CLEARFIELD varieties)	8	-
Yellow nutsedge	8 to 15	8 to 31

*** Suppression only.**

Application Information:

- **Water Volume:** Minimum 40 to 55 L per acre. Use the higher volume when there is a heavy crop canopy or weeds are at an advanced stage.
- **Nozzles and Pressure:** Use 40 psi (275 kPa) if applying without drift reduction nozzles. Drift reduction nozzles may require higher pressures for proper performance. Select the nozzle and pressure combination that produces of ***ASABE medium*** droplets while maintaining good coverage of foliage.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
halosulfuron	PRE, POST	ALS Amino Acid synthesis Inhibitor	Toward growth areas (Symplast)	Broadleaf	2

Effects of Growing Conditions:

Moisture is necessary to activate the herbicide in soil for effective weed control. Dry weather following applications may reduce effectiveness. Extremes in environmental conditions such as temperature, moisture, soil conditions, and cultural practices may affect activity.

Optimum activity is experienced between 12 to 24° C when weeds are actively growing. Weeds may not be actively growing and as a result reduced activity will occur when temperatures are below 8° C or above 27° C.

Tank Mixes:

Herbicides:

- ***In dry beans:***
  - *Eptam Liquid EC* (1.72 to 2.12 L per acre) as pre-plant incorporated tank mix – see *Eptam Liquid EC* page for incorporation instructions.
- ***In field corn only:***
  - 2,4-D (label rates)
  - *Accent* (label rates)
  - *AAtrex* (label rates)
  - Dicamba (label rates)
  - Glyphosate in glyphosate tolerant corn only (label rates)

Insecticides: None registered.
NOTE: The application of foliar organophosphate insecticides to treated crops can increase the risk of crop injury.
Fungicides: None registered.
Fertilizers: UAN or high grade ammonium sulfate (21-0-0) may be used if a tank mix partner requires it as an additive.
DO NOT use liquid fertilizer as a spray carrier.
Note: The above mixes are those listed on the *Permit WG* label only.
According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product..

Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Activity of foliar applications may be reduced if rainfall or irrigation occurs within 4 hours. Pre-emergent surface applications will benefit from some rainfall but excessive rainfall (greater than 1 inch or 2.5 cm) shortly after application may result in injury, especially when seeding is shallow.
- **Restricted Entry Interval:** DO NOT enter treated fields for 12 hours.
- **Grazing Restrictions:** DO NOT graze or cut corn for livestock greenfeed within 30 days of the last application. Allow 30 days for sweet corn and 65 days for popcorn or grain corn from the last application to foliage and the harvesting of silage. Proso (crown) millet may be grazed immediately after treatment. DO NOT cut proso (crown) millet for hay within 37 days of application or feed straw within 50 days of application.
- **Pre-harvest Interval:** DO NOT harvest dry beans within 30 days of post-emergent applications. DO NOT harvest proso (crown) millet within 50 days of application. There is no pre-harvest interval indicated for grain corn.
- **Re-cropping Interval:** Delay seeding the following crops for the interval indicated:
  - ***Dry common beans*** – no delay required
  - ***Field corn*** - 1 month
  - ***Cereals (wheat barley and oats)*** - 2 months
  - ***Potatoes, peas forage legumes and soybeans*** - 1 year
  - ***Canola and sunflowers*** - 2 years
  - Refer to label for all other crops including vegetable field crops.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store in a cool, dry place in original container.
- **Buffer Zones:**

Crop	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Proso (Crown) millet	10	4	15
Dry beans	10	5	20
Corn (sweet, pop)	15	5	30
Corn (field)	15	10	40

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

- Spray when winds are under 16 km per hour, but not dead calm.

Sprayer Cleaning:

Refer to Refer to 'Method A' in the general section on sprayer cleaning in the introduction.

Hazard Rating:

Caution – Poison

Caution – Eye Irritant

Refer to the Introduction for an explanation of the symbols.

Pinoxaden

Herbicide Group 1 - pinoxaden

Company:

Syngenta Canada (*Axial* with built in adjuvant; *Trondus* plus *Adigor Adjuvant*)
ADAMA Canada (*Brazen II* plus *Cohere Adjuvant, Brazen All In*)
Nufarm Agriculture (*Epic* adjuvant sold separately; *Epic II* adjuvant sold seperately)
Interprovincial Cooperatives (*CO-OP Avant, IPCO Avant* plus *IPCO MSO Adjuvant*)
Sharda CropChem (*Pina* with built in adjuvant)
Advantage Crop Protection (*Advantage Pinoxaden*)
AgraCity (*Ace 50* with built in adjuvant)
Viking (*Viking Pinoxaden 50* with built in adjuvant))

Formulation:

***Axial* (PCP# 30431), *Pina* (PCP#34640), *Ace 50* (PCP#34668), *Viking Pinoxaden 50* (PCP#34956), *Brazen All In* (PCP#35086):** 50 g/L pinoxaden formulated as an emulsifiable concentrate.

- Container sizes - 2 x10 L, 80 L, 400 L (*Axial* only)
- *Ace 50* and *Viking Pinoxaden* - 2 x 10 L, 120 L, 480 L, 1000 L

***Brazen II* (PCP#33551); *Epic* (PCP#33603); *CO-OP Avant* (PCP#34378); *IPCO Avant* (PCP#34377); *Trondus* (PCP#33448); *Epic II* (PCP#34423); *Advantage Pinoxaden* (PCP#34865):** 100 g/L pinoxaden formulated as an emulsifiable concentrate.
-plus-
***Cohere Adjuvant* (PCP#33552 - for use with Brazen II); *IPCO MSO Adjuvant* (with *CO-OP/IPCO Avant* - PCP#33757 - for use with *CO-OP/IPCO Avant*); Adigor Adjuvant (PCP#28151 - for use with *Trondus*):** various blends of methylated seed oil and ethoxylated alcohols.

- Container sizes:
  - *Brazen II, CO-OP/IPCO Avant* - 9.71 L + *Cohere Adjuvant, IPCO MSO Adjuvant* 11.3 L
  - *Epic* - 2 x 9.72 L, 77.7 L (adjuvant sold separately)
  - *Trondus* - 9.7 L, 77.6 L + *Adigor Adjuvant* - 11.3 L, 90.4 L
  - *Advantage Pinoxaden* - 2 x 9.7 L (adjuvant sold seperately)

Crops and Staging:

All products:
Spring wheat* and durum (Epic, Epic II, Advantage Pinoxaden, CO-OP/IPCO Avant only), winter wheat (Axial and Pino only) and barley*,** – all products; winter wheat – Axial and Pina only; durum wheat - Epic, CO-OP Avant and Advantage Pinoxaden only: Up to the emergence of the flag leaf.
When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

***Axial* only:**
Forage grasses and legumes for seed production only:***

- Apply to seedling grasses at the 2 to 5 leaf stage:
  - Bromegrass (meadow, smooth)
  - Fescue (creeping red)
- Apply to seedling legume forages at the 2 to 5 leaf stage.

**** **NOTE:** Since these uses are registered under the User Requested Minor Use Label Expansion (URMULE) program, the manufacturer assumes no responsibility for herbicide performance. Application is at the risk of the user.*

Weeds, Rates, and Staging:

Apply from the 1 to 6 leaf up to the emergence of the 4th tiller. Apply at the 2 to 3 leaf stage for optimum control.
***Brazen II, CO-OP/IPCO Avant, Epic, Epic II, Advantage Pinoxaden or* at 160 mL plus *Cohere Adjuvant (Brazen II)* at 283 mL per acre, *Carrier Adjuvant* (*Epic, Epic II, Advantage Pinoxaden* - sold separately) or *IPCO MSO Adjuvant* (*CO-OP/IPCO Avant*) at 500 mL per 100 L to control:**

- Persian darnel†

***Axial, Pina, Viking Pinoxaden 50, Ace 50* or *Brazen All In* at 0.5 L per acre (no adjuvant required)* or *Brazen II, CO-OP/IPCO Avant, Epic, Epic II, Advantage Pinoxaden* or *Trondus* at 243 mL per acre plus a recommended adjuvant.**

- ***Adjuvants: Cohere Adjuvant (Brazen II)* or *Adigor Adjuvant (Trondus)* at 283 mL per acre, *Carrier Adjuvant* (*Epic, Epic II, Advantage Pinoxaden* - sold separately) or *IPCO MSO Adjuvant* (*CO-OP/IPCO Avant*) at 500 mL per 100 L:**
  - **Controls the weeds above plus:**
    - Barnyard grass
    - Foxtail (green, yellow)
    - Proso millet
    - Volunteer oats
    - Volunteer canary seed
    - Wild oats

*** DO NOT mix with any other adjuvant other than what is provided in the formulation.**
† *Brazen II, Epic, Epic II, Advantage Pinoxaden* and *CO-OP/IPCO Avant* only.
Maximum ONE APPLICATION per year of these or other products containing the active ingredient pinoxaden.

Application Information:

- **Water Volume:**
  - ***Ground:*** 20 to 40 L per acre.
  - ***Aerial:*** 12 L per acre.
- **Nozzles and Pressure:** 40 to 45 psi (275 to 310 kPa) when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage of ***ASABE medium*** droplets.
- **Screens:** Use a 50 mesh or coarser screen and filter system.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
pinoxaden	POST (foliar)	ACCase Lipid synthesis inhibitor	Toward growth areas (Symplast)	Grasses only	1

Effects of Growing Conditions:

DO NOT apply to crops that are stressed (frost, low fertility, drought or flooding, disease or insect damage) as crop injury may result.

Weed control may be reduced if pinoxaden is applied under stress conditions such as drought, heat, insufficient fertility, flooding or prolonged cool temperatures.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides:

- Bromoxynil/MCPA (*Buctril M* and *Mextrol 450* only)†
- *Curtail M*
- Fluroxypyr + MCPA (*Trophy* only)†
- *Infinity*
- MCPA Ester† (0.34 to 0.45 L per acre - 500 g/L form)
- Florasulam/fluroxypyr + MCPA Ester§
- *Pixxaro* (*Axial* and *Ace 50* only)
- *Refine SG* + MCPA Ester***† (12 grams per acre + 0.23 to 0.28 L per acre)
- Thifensulfuron/tribenuron (*Refine SG* only)**

  *** Always consult the label of the broadleaf herbicide prior to use.**
  **** Addition of surfactants other than those included in or with pinoxaden are not required.**
  ***** Suppression only of green foxtail.**
  † A reduction in barnyard grass control may be observed.
  § Check label for specific products.

Insecticides: None registered.

Fungicides:

- Propiconazole (*Tilt* only).

Fertilizers: None registered.

According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 1 hour of treatment may reduce control.
- **Restricted Entry Interval:** DO NOT enter treated fields for 12 hours.
- **Pre-harvest Interval:** Leave at least 60 days between treatment and harvest of grain and straw.
- **Grazing Restrictions:** DO NOT graze livestock within 7 days or cut for hay within 30 days of application.
- **Re-cropping Interval:** No restrictions the year following treatment. DO NOT seed any crops in the year of treatment following application (emergency re-crop).
- **Aerial Application:** May be applied by air.
- **Storage:** Store in a cool, dry place. May be frozen.

- **Buffer Zones:** Buffers are not required for hand-held and backpack applications.

Application method	Buffer Zones (metres†) Required for the Protection of Terrestrial habitat
Ground only*	1
Aerial by airplane or helicopter	25

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:
Refer to 'Method B' in the general section on sprayer cleaning in the introduction.

Hazard Rating:
Caution – Poison

Warning – Eye and Skin Irritant

Refer to the Introduction for an explanation of the symbols.

Pinoxaden/fluroxypyr

Herbicide Group
1 - pinoxaden
4 - fluroxypyr

Company:
Syngenta Canada (*Axial Xtreme* - PCP#30391)
Sharda CropChem (*Kingpin* - PCP# 35070)

Formulation:
50 g/L pinoxaden and 87.5 g/L fluroxypyr formulated as an emulsifiable concentrate.
- Container sizes - 2 x 10 L, 80 L, 400 L

Crops and Staging:
Spring wheat (NOT including durum) and barley:
1 to 6 leaf stage prior to the emergence of the 4th tiller and before the first node can be felt in the stem.

Weeds, Rates and Staging:
Apply at 0.5 L per acre (no adjuvant required)

Grasses - 1 to 6 leaf prior to the emergence of the 4th tiller
- Barnyard grass
- Foxtail (green, yellow)
- Proso millet
- Volunteer oats
- Volunteer canary seed
- Wild oats

Broadleaf Weeds - stages indicated below:
- Cleavers (up to 4 whorls)
- Kochia (2 to 8 leaf)
- Stork's bill (up to 6 leaf)*
- Wild buckwheat (up to 4 leaf)*

*** Suppression.**

Maximum ONE APPLICATION per year of this or other products containing pinoxaden or fluroxypyr.

Application Information:
- **Water Volume:** 20 to 40 L per acre.
- **Nozzles and Pressure:** Maximum 40 to 45 psi (275 to 310 kPa) when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE coarse*** classification droplets.
- **Screens:** Use a 50 mesh or coarser screen and filter system.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
pinoxaden	POST (foliar)	ACCase Lipid synthesis inhibitor	Toward growth areas (Symplast)	Grasses only	1
fluroxypyr	POST (foliar)	Synthetic Auxin	Moves throughout the plant (Symplast)	Broadleaf only	4

Effects of Growing Conditions:

Tolerance and efficacy is best when applied during warm weather when weeds are actively growing and soil moisture is adequate for rapid growth. Under prolonged stress caused by excessive cool or heat, flooding or drought, or poor fertility, control of some weeds may be reduced and or crops may be injured.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides:

- Bromoxynil/MCPA†
- *Curtail M*†
- *Infinity*††
- MCPA Ester (280 to 310 mL per acre – 600 g/L form)†
- Thifensulfuron/tribenuron (*Refine SG* only)
- Thifensulfuron/tribenuron (*Refine SG* only) + MCPA Ester (rates above)†

† **A reduction in barnyard grass control may be observed with this mix.**
†† **A reduction in green foxtail control may be observed with this mix.**

Fungicides:

- Propiconazole (*Tilt* only at 101 to 202 mL per acre)

Insecticides: None registered.

Fertilizers: None registered.

According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 1 hour of application may reduce control.
- **Restricted Entry Interval:** DO NOT re-enter treated fields for 12 hours.
- **Pre-harvest Interval:** DO NOT apply within 60 days of harvest.
- **Grazing Restrictions:** Must not be grazed within 7 days or cut for livestock feed within 30 days of treatment.
- **Re-cropping Interval:** Barley, canola, flax, forage grasses, lentil, mustard, oats, peas, rye or wheat may be seeded the first full season after application or fields can be fallowed.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store in a cool, dry place. DO NOT freeze.
- **Buffer Zones:** Avoid drift. Leave at least 15 metres between the downwind edge of the boom and sensitive areas such as shelterbelts, hedgerows, wetlands, woodlots, vegetated ditch banks, ponds, streams, and sloughs. Buffer zones can be reduced by 70 percent when using shrouds or by 30 percent when using cones mounted less than 12 inches from the crop canopy.

Sprayer Cleaning:

Refer to 'Method B' in the introduction. Use 500 g or mL per 100 L of rinsate for alkali detergents or 250 g or mL per 100 L of rinsate for concentrated laundry detergents. DO NOT use chlorine based cleaners.

Hazard Rating:

Warning – Eye and Skin Irritant

Potential Skin Sensitizer

Refer to the Introduction for an explanation of the symbols.

Pixxaro

Herbicide Group 4 - halauxifen, fluroxypyr, MCPA

Company:
Corteva Agriscience

Formulation:
The *Pixxaro* package contains the following components:
***Pixxaro A* (PCP#31303)/*Pixxaro Flexx* (PCP#34381):** 16.25 g/L halauxifen and 250 g/L fluroxypyr present as ester and formulated as an emulsifiable concentrate.
- Container sizes - 1 x 4.9 L, 2 x 9.8 L, 4 x 9.8 L

***Pixxaro B/Plus M Ester 600* (PCP#29622):** 600 g/L MCPA Ester formulated as an emulsifiable concentrate.
- Container sizes - 1 x 9.45 L, 75.1 L

Crops and Staging:
Wheat (spring, durum, winter) and barley: 3 leaf stage to just prior to emergence of the flag leaf.
Timothy, seedling and established for seed production only*: In the spring when weeds are actively growing at the 1 to 8 leaf stage.
**** NOTE: Since applications to field and timothy have been registered under the User Requested Minor Use program, the manufacturer assumes no responsibility for herbicide performance. Application to timothy is at the risk of the user.***

Weeds and Staging:
Apply to actively growing weeds up to 10 cm high or wide unless otherwise specified:
- **Weeds controlled:**
  - American dragonhead† (up to bud stage)
  - Barnyard grass (up to 5 leaf, 2-tiller)
  - Burdock (prior to 4 leaf)
  - Canada thistle (up to 30 cm)*
  - Chickweed†††
  - Cleavers (1 to 9 whorl)
  - Cocklebur
  - Cow Cockle (up to 8 leaf or 15 cm)
  - Dandelion (rosettes up to 30 cm in diameter)*
  - Field horsetail*
  - Fleabane, Canada†
  - Flixweed
  - Hemp-nettle†††
  - Henbit† (up to bud stage)
  - Kochia†
  - Lamb's-quarters†††
  - Marshelder (false ragweed)
  - Mustard (ball, wild)
  - Nightshade†† (black, hairy and cutleaf/wild tomato)
  - Plantain, common
  - Prickly lettuce
  - Ragweed (common††, giant†††)
  - Redroot pigweed†††
  - Round-leaved mallow††
  - Shepherd's-purse (up to 20 cm)
  - Smartweed (green, lady's-thumb)*
  - Sow-thistle, annual* (up to 4 leaf)
  - Sow-thistle, perennial*††
  - Stinkweed
  - Stork's-bill†††
  - Velvetleaf (up to 5 leaf stage)
  - Vetch
  - Volunteer alfalfa (up to 25 cm)
  - Volunteer canola†††
  - Volunteer flax†
  - Wild buckwheat†††
  - Wild radish
  - Wild sunflower (annual)

  *** Suppression only.**
  † Up to 15 cm in height.
  †† 1 to 6 leaf only.
  ††† 1 to 8 leaf stage.

Rates:
***Pixxaro A/Pixxaro Flexx*:** 125 mL per acre.
***Pixxaro B*:** 235 to 283* mL per acre. Use the 283 mL per acre rate for improved control of heavy infestations or larger redroot pigweed or smartweeds.
*** Note: Additional MCPA Ester must be purchased separately above what is indicated in "Container Size:" above to achieve this higher rate.**

Application Information:
- **Water Volume:**
  - ***Ground:*** Minimum 20 to 80 L per acre.
  - ***Aerial:*** Minimum 12 L per acre.
- **Nozzles and Pressure:** Use 30 to 40 psi (200 to 275 kPa) if applying without drift reduction nozzles. Drift reduction nozzles may require higher pressures for proper performance. Select the nozzle and pressure combination that produces of ***ASABE coarse*** droplets while maintaining good coverage of foliage.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
halauxifen	POST (foliar)	Synthetic Auxin	Throughout the plant (Symplast)	Broadleaf only	4
fluroxypyr	POST (foliar)	Synthetic Auxin	Throughout the plant (Symplast)	Broadleaf only	4
MCPA	POST (foliar)	Synthetic Auxin	Throughout the plant (Symplast)	Broadleaf only	4

Effects of Growing Conditions:

Weeds and crops must be actively growing. Weeds hardened off by cold weather or drought stress may not be adequately controlled or suppressed and re-growth may occur.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides:

- ***Spring wheat (including durum) and barley:***
  - Fenoxaprop 120 EC (0.31 L per acre)
  - *Liquid Achieve*
  - *Puma Advance* (0.41 L per acre)
- ***Spring Wheat and Barley:***
  - *Axial*
- ***Spring Wheat (including durum):***
  - *Simplicity OD/Simplicity GoDRI*
  - Clodinafop 240 EC (93 mL per acre plus adjuvant)
  - *Horizon NG* (376 mL per acre)
  - *Traxos*

Insecticides: None registered.
Fungicides: None registered.
Fertilizers: None registered.

Off-label tank mixes, as previously permitted under the Pest Management Regulatory Agency (PMRA) Off-label Tank Mix Policy memo of 2009 are no longer allowed under new guidance from PMRA. As of December 20, 2022 only products specifically indicated on product labels may be mixed, or when the labels of two or more products to be mixed include the statement quoted in the introduction. As of December 2024 this memo will no longer be recognized by Health Canada.

Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 1 hour may reduce control.
- **Restricted Entry Interval:** DO NOT enter treated fields for 12 hours.
- **Grazing Restrictions:**
  - ***Wheat and barley:*** DO NOT graze livestock within 7 days of application. DO NOT cut for silage or hay within 21 days of application.
  - ***Timothy:*** DO NOT cut treated fields for hay/forage. DO NOT graze treated fields. DO NOT feed seed screenings and aftermath (straw, stubble) to livestock.
- **Pre-harvest Interval:** DO NOT harvest crops within 60 days of application.
- **Re-cropping Interval:** Winter wheat and fall rye may be seeded 3 months after application. Alfalfa, barley, canola, corn, dry bean (*Phaseolus vulgaris* species including pinto, kidney and white types), faba bean, flax, field peas, mustard, oats, soybean, spring wheat, sunflower and timothy may be seeded the first spring following application. Lentils may be grown the second season after application.
- **Aerial Application:** May be applied by air.
- **Storage:** Store over winter in a heated, dry place in original container.

- **Buffer Zones:** Spot treatments using hand held equipment DO NOT require a buffer zone.

Application method	Crop	Buffer Zones (metres†) Required for the Protection of:		
		Aquatic Habitats of Depths		Terrestrial habitat
		Less than 1 m	Greater than 1 m	
Field sprayer*	Cereals	1	0	1
	Timothy	1	1	2
Aerial (Fixed wing)	Cereals	4	0	70
	Timothy	5	1	80
Aerial (Helicopter)	Cereals	1	0	55
	Timothy	5	1	65

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** The buffer zones for this product can be modified based on weather conditions and spray equipment configuration by accessing the 'Buffer Zone Calculator' on the Pesticides portion of the Canada.ca website.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Refer to 'Method A' in the general section on sprayer cleaning in the introduction. Check the cleanout requirements of pesticides mixed with this product. Additional cleanout measures may need to be integrated into those provided here.

Hazard Rating:

***Pixxaro A*:**

Warning – Skin and Eye Irritant

Caution – Potential Skin Sensitizer

***Pixxaro B*:**

Warning – Poison

Refer to the Introduction for an explanation of the symbols.

Poast Ultra*

Herbicide Group 1 - sethoxydim

** **Note:** This product is no longer manufactured but inventories still remain in distribution. This product may be removed from future editions.*

Company:
BASF Canada (PCP#24835)

Formulation:
450 g/L sethoxydim formulated as an emulsifiable concentrate.
- Container size - 2 x 7.7 L

Crops, Rates and Staging:
Crops are tolerant at all growth stages. However, the Preharvest interval outlined in the "Restrictions:" section must be followed to avoid unacceptable residues of sethoxydim in harvested crops.

To a maximum of 0.13 L per acre: Borage

To a maximum rate of 0.19 L per acre: Chickpea

To a maximum rate of 0.23 L per acre: Tame buckwheat

To a maximum rate of 0.26 L per acre:
- Alsike clover**
- Caraway
- Cicer milkvetch**
- Coriander
- Dill
- Safflower
- Sainfoin**
- Solin (low linolenic acid flax)
- Sweet clover**

**** Seedling stands.**

To a maximum rate of 0.45 L per acre:
- Alfalfa
- Alsike clover*
- Canola
- Chickling vetch
- Cicer milkvetch*
- Creeping red fescue (for seed only)
- Dry beans (kidney, pinto, white)
- Dry field peas
- Faba beans
- Fenugreek
- Flax (NOT including low linolenic acid flax)
- Lentil
- Lupin
- Mustard
- Potatoes
- Sainfoin*
- Shelterbelts
- Soybeans
- Sunflower
- Sweet clover*

*** Established stands.**

Weeds, Rates and Staging:
Optimum yield response occurs when weeds are controlled early.

Weeds and Stages	Staging	Rate (L per acre)
Green or yellow foxtail, barnyard grass, volunteer corn, Persian darnel, proso millet, witchgrass	1 to 6 leaf	0.13
Wild oats, volunteer wheat, oats and barley	1 to 6 leaf stage except for low rate (See footnote*)	0.13* or 0.19
Quackgrass suppression	1 to 3 leaf stage	0.19
Quackgrass (season long control)	1 to 3 leaf stage	0.45
Foxtail barley suppression	prior to tillering	0.45

*** Use the low rate in canola, flax and peas only under the following conditions:**
- **when wild oats, volunteer wheat and volunteer barley are from 1 to 4 leaves (best results prior to tillering)**
- **under ideal growing conditions (adequate moisture, good fertility and moderate temperatures (15 to 28°C). DO NOT apply under stress conditions.**
- **with water volumes between 20 to 40 L per acre.**

***Merge Adjuvant* (sold separately):** Must always be used with *Poast Ultra*. When *Poast Ultra* is applied alone use *Merge* at 0.5 L to 1.0 L per 100 L of total spray solution. When applying to quackgrass and/or foxtail barley use *Merge* at 1.0 L per 100 L of spray solution. See the tank mix section for *Merge* rates for tank mixing. *Merge* should be added at rates of 0.10 to 0.20 L per acre when applied by air.

Application Information:

- **Water Volume:**
  - ***Ground:*** 20 to 40 L per acre - 40 L to 81 L per acre if crop or weed growth is dense, and when spraying quackgrass.
  - ***Aerial:*** 10 to 20 L per acre.
- **Nozzles and Pressure:** Use 40 to 45 psi (275 to 300 kPa) with conventional 80° or 110° flat fan nozzles tilted forward at an angle of 45°. Low drift nozzles may require higher pressures for proper performance. Contact the herbicide manufacturer regarding the suitability of low drift nozzles for use with this product. Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE medium*** droplets.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
sethoxydim	POST (foliar)	ACCase Lipid Synthesis Inhibitor	Toward areas of growth (Symplast)	Grass only	1

Effects of Growing Conditions:

Most effective control is achieved when grasses are actively growing. Weeds stressed by drought, flooding, hot or prolonged cool temperatures (<15°C) and poor fertility are more difficult to control. Use the higher of the recommended rates for grasses stressed for less than 20 days. DO NOT apply to grasses stressed more than 20 days because of lack of moisture. Control may be reduced if temperatures are below 15°C. Subsequent tillering may occur under stress conditions or if fertility is low.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides: The following tank mixes can be applied with 0.13 to 0.19 L per acre of *Poast Ultra*.

Merge Adjuvant (sold separately): Use at 0.75 to 1.0 L of *Merge* per 100 L of mixed spray solution for most mixes except when mixing with *Pursuit* use 1.0 L per 100 L of solution.

- ***In Flax:***
  - *Buctril M* (including solin).
  - *Logic M* (including solin).
  - MCPA Ester (up to 0.38 L per acre - 600 g/L formulations)
  - The above tank mixes may reduce grass control, especially under adverse weather conditions.
- ***In Canola:***
  - *Muster*
- ***In Liberty Link Canola only:***
  - *Poast Ultra* (0.09 L per acre) plus *Liberty* (1.08 L per acre)
- ***In Field Pea:***
  - ***Poast Ultra (0.19 L per acre) plus Merge (0.4 L per acre) may be tank mixed with:***
    - *Pursuit* (40 mL per acre) to control:
      - Chickweed
      - Cleavers
      - Hemp-nettle (peas only)
      - Redroot pigweed (light infestations only)
      - Smartweed
      - Stinkweed
      - Volunteer canola (non-CLEARFIELD varieties)
      - Wild buckwheat (light infestations only)
      - Wild mustard
        - The company does not provide guidelines for weed densities under light infestations. When in doubt, use the higher rate below or contact the manufacturer.
    - *Pursuit* (85 mL per acre) for all weeds on the *Pursuit* label.

Check label directions for mixing order and additional timing restrictions for broadleaf partners.

Allow 4 days between application of *Poast Ultra* and application of herbicides other than those registered for tank mixing. Allow 5 days between application of *Sencor* and *Poast Ultra*. Allow 14 days for regrowth when applied in sequence with a grass control herbicide.

Insecticides: None registered.

Fungicides: None registered.

Fertilizers: None registered.

Note: The above mixes are those listed on the *Poast Ultra* label only.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 1 hour of application may reduce control.
- **Restricted Entry Interval:** DO NOT enter treated field for 12 hours.
- **Grazing Restrictions:** DO NOT graze the treated crop or cut for feed prior to crop maturity. Forage legumes may be cut after the specified
- **Preharvest interval:**

Preharvest Interval (Days)	Crop
30	Forage legumes (excluding alfalfa)
60	Dry peas, fenugreek, flax
65	Lentil, chickpea
70	Canola, chickling vetch, alfalfa, borage
76	Mustard
80	Potato, dry bean, soybean, faba bean, lupin
85	Buckwheat
86	Solin
90	Safflower
105	Sunflower

- **Re-cropping Interval:** DO NOT plant cereals or grass within 14 days of application.
- **Aerial Application:** May be applied by air.
- **Storage:** May be frozen.
- **Buffer Zones:**

Application method	Crop	Buffer Zones (metres†) Required for the Protection of:		
		Aquatic Habitats of Depths		Terrestrial habitat
		Less than 1 m	Greater than 1 m	
Ground*	All	1	0	2
Fixed wing airplane	Food or feed crops	1	0	70
	Shelter-belts	5	0	150
Helicopter	Food or feed crops	1	0	60
	Shelter-belts	1	0	85

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance from downwind edge of spray boom and non-target area.

Sprayer Cleaning:

Refer to 'Method B' in the general section on sprayer cleaning in the introduction. Empty and clean spray tank using this method if an oil film accumulates.

Hazard Rating:

Caution – Poison

Caution – Eye and Skin Irritant

Refer to the Introduction for an explanation of the symbols.

Predicade

This product is a prepackaged tank mix of Predicade Broadleaf (equivalent to Barricade II), Predicade Grass (equivalent to Varro), and MCPA Ester 600. Information listed is restricted to Crops, Weeds, Rates and Tank mixes. For other detailed restrictions and other general information on the component products see the product pages listed above.

Herbicide Group
2 - thifensulfuron/ tribenuron, thiencarbazone
4 - fluroxypyr, MCPA

Company:
FMC Corporation

Formulation:
The *Predicade* package contains the following components:
***Predicade Broadleaf* (PCP#31713):** 25% thifensulfuron methyl and 25% tribenuron methyl formulated as a soluble granule.
- Container size - 486 g

***Predicade Grass* (PCP#31735):** 10 g/L thiencarbazone-methyl formulated as a suspension concentrate.
- Container size - 8 L

***Perimeter II* (PCP#30094):** 333 g ae/L fluroxypyr formulated as an emulsifiable concentrate.
- Container size - 3.4 L

***Albaugh MCPA Ester 600* (PCP#32311), ADAMA MCPA Ester 600 (PCP#34073), Nufarm MCPA Ester 600 (PCP#27803):** 600 g ae/L MCPA Ester formulated as an emulsifiable concentrate.
- Container size - 7.6 L

Crops and Staging:
Spring wheat (including durum):
Apply from the fully emerged 3 leaf to 6 leaf stage, with a maximum of three tillers, and before the first node can be felt in the stem. DO NOT apply beyond 35 days of seeding.
Winter wheat:
Spring application from the 3 tiller stage and before the first node can be felt in the stem. DO NOT apply after the presence of the first node as crop injury may occur.

Rates:
***Predicade Broadleaf*:** 12 grams per acre
***Predicade Grass*:** 200 mL per acre
Perimeter II: 85 mL per acre
***MCPA Ester 600*:** 190 mL per acre

Weeds and Staging:
Weeds controlled by *Barricade II* and *Varro* plus:
- Dandelion (spring and fall rosettes, up to 15 cm in diameter)
- Scentless chamomile
- Volunteer canola (all varieties) – 2 to 4 leaf
- White cockle

See component products for more information on restrictions, application details and handling. Unless indicated differently above use the most limiting restrictions across all components for the mix.

Primextra II Magnum

Herbicide Group
15 - metolachlor
5 - atrazine

Company:
Syngenta Canada (PCP#25730)

Formulation:
400 g/L of s-metolachlor and 320 g/L of atrazine formulated as a liquid.
- Container size - 2 x 10 L

Crops and Staging:
Pre-plant incorporated or pre-emergent in corn. Pre-emergent applications of *Primextra II Magnum* require at least 0.5 inches of water (1.25 cm) within 10 days of application for proper activity.

Weeds and Staging:
Apply prior to the emergence of weeds. Weeds that have emerged prior to application will not be controlled.
- Barnyard grass
- Buckwheat
- Foxtail (green, yellow)
- Lamb's-quarters
- Nightshade (American, Eastern black)
- Pigweed (prostrate, redroot)
- Purslane
- Ragweed
- Smartweed (lady's-thumb)
- Wild mustard
- Witch grass
- Yellow nutsedge*

*** Herbicide must be incorporated for best control.**

Rates:

Weed Populations	Rate (L per acre)
Light infestations	1.2
Medium infestations	1.4
Heavy infestations	1.6

DO NOT apply *Primextra II Magnum* to:
- soils with less than 1 percent organic matter content
- soils with more than 10 percent organic matter content.

It is recommended that any products containing atrazine not be used in areas treated with this product during the previous season.

Application Information:
- **Water Volume:** 61 L per acre.
- **Pressure:** 30 to 45 psi (200 to 300 kPa).
- **Nozzles:** Flat fan.
- **Screens:** Use 50-mesh nozzle and main plumbing screens.
- **Incorporation:**
  - Incorporate using S-tine or C-tine cultivators or tandem disk. DO NOT incorporate deeper than 4 inches (10 cm).
  - To ensure that the product remains in the top 2 inches (5 cm) of soil, apply to a firm seedbed free of large clods or lumps. If using tandem disks, set disks to work the soil at a depth of 4 inches (10 cm) and operate at a speed of 6 km per hour (4 miles per hour). If using an S-tine cultivator, set the implement to work the soil to a depth of 4 inches (10 cm) and operate at a speed of 10 km per hour (6 miles per hour).

How it Works:
Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
atrazine	PPI, PRE (surface) with residual soil activity	PSII Inhibitor/ Membrane disruptor	Little foliar; upward soil applied (Apoplast)	Primarily broadleaf	5
metolachlor	PPI, PRE (surface) with residual soil activity	Long-chain Fatty Acid Inhibitor	Little movement (Symplast)	Broadleaf & grass	15

Effects of Growing Conditions:

Extended periods of dry soil conditions may result in reduced weed control. Moderate rainfall (0.5 inch) after application will enhance activity. Heavy rainfall following application of *Primextra II Magnum* may dilute the metolachlor deeper than 2 inches (5 cm) and result in reduced weed control, particularly on light textured soils.

Tank Mixes:

Herbicides: None registered.

Fertilizers: May be tank mixed with liquid fertilizer for pre-plant incorporated applications. Conduct a compatibility test by performing a jar test prior to mixing the products in the tank. May be impregnated onto dry bulk fertilizers (except nitrate or superphosphate fertilizers or limestone).

Note: The above mixes are those listed on the *Primextra* label only.

Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Moderate rainfall shortly after application will enhance activity. Heavy rainfall reduces weed control by leaching the chemical out of the top few centimeters of soil. Inadequate rainfall after application (within 10 days) will cause reduced weed control.
- **Restricted Entry Interval:** DO NOT re-enter treatment area within 12 hours of application.
- **Grazing Restrictions:** DO NOT graze or cut corn for feed before ear emergence.
- **Re-cropping Interval:** This product contains atrazine. All crops except corn and triazine-tolerant canola may be affected the year following the use of atrazine. Other more sensitive crops may be affected two or more growing seasons after application.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store in a dry place.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:	
	Aquatic habitat	Terrestrial habitat
Ground only*	29	10

See the Key to Product Pages in the introduction for an explanation of the different habitats.

*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**

† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

- DO NOT mix or load this product within 30 metres of any sensitive aquatic habitats

Sprayer Cleaning:

No specific cleaning procedures are indicated on the label. Based on products with similar chemistry, 'Method B' found in the general sprayer cleaning section in the introduction or a commercial spray sprayer cleaning product, may provide adequate cleaning. Contact the manufacturer for more information.

Hazard Ratings

Caution Poison

Caution – Eye Irritant

Potential Skin Sensitizer

Refer to the Introduction for an explanation of the symbols.

Prominex

Herbicide Group 4 - halauxifen, clopyralid, fluroxypyr

Company:
Corteva Agriscience (PCP#34021)

Formulation:
4.7 g/L halauxifen , 97.8 g/L clopyralid and 122.2 g/L fluroxypyr formulated as a micro emulsion.
- Container size - 2 x 8.3 L, 99.4 L

Crops and Staging:
Spring wheat (including durum), winter wheat and barley: from 3 leaf stage to just prior to flag leaf emergence.

Weeds, Rates and Staging:
Apply 414 mL per acre 1 to 8 leaf stage, unless otherwise specified.

Weeds controlled:
- American dragonhead (up to bud and 15 cm)
- Barnyardgrass (up to 5-leaf, 2-tiller)
- Canada fleabane (up to 15 cm)*
- Canada thistle (rosette to pre-bud)
- Chickweed
- Cleavers (1 to 9 whorl)
- Common ragweed (up to 6 leaf)
- Cow cockle (up to 8 leaf and 15 cm)
- Flixweed (up to 8 leaf and 8 cm)
- Hemp-nettle
- Henbit (up to bud stage and 15 cm)
- Giant ragweed
- Kochia (up to 15 cm)
- Lamb's-quarters
- Nightshade (eastern black, hairy, cutleaf - up to 6 leaf)
- Pigweed, redroot
- Round-leaved mallow (up to 6 leaf)
- Shepherd's-purse (to bolting and 20 cm)
- Stork's-bill
- Velvetleaf (up to 5 leaf)
- Volunteer alfalfa (up to 25 cm)
- Volunteer flax (up to 15 cm)
- Wild buckwheat.

Weeds suppressed:
- Annual sow-thistle (up to 5 leaf)
- Wild mustard (1 to 4 leaf, up to 10 cm)

Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Application Information:
- **Water Volume:**
  - ***Ground:*** 20 to 80 L per acre.
  - ***Aerial*:** Minimum 12 L per acre.
- **Nozzles and Pressure:** Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE coarse*** or larger droplets. Use a spray pressure of 30 to 40 psi (207 to 275 kPa) pressure when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance.

How it Works:
Refer to 'How Do Herbicides Work' in the Weed Control Section.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
halauxifen	POST (foliar)	Synthetic Auxin	Throughout the plant (Symplast)	Broadleaf only	4
clopyralid	POST (foliar)	Synthetic Auxin	Throughout the plant (Symplast)	Broadleaf only	4
fluroxypyr	POST (foliar)	Synthetic Auxin	Throughout the plant (Symplast)	Broadleaf only	4

Effects of Growing Conditions:
Extreme growing conditions such as drought or near freezing conditions prior to, at or following time of application may reduce weed control and increase risk of crop injury at all stages of growth. Under conditions of low crop and high weed density, control may be reduced.

Tank Mixes:

Herbicides:

- ***In all crops:***
  - MCPA ester
  - 2,4-D ester
- ***In wheat (spring, winter and durum):*** Alone or in mixture with 2,4-D or MCPA
  - *Simplicity OD* or *GoDRI,*
- ***In wheat (spring and durum only):*** Alone or in mixture with MCPA
  - *Horizon NG*
  - *Traxos*
- ***In wheat (spring and durum only) and barley:*** Alone or in mixture with 2,4-D or MCPA
  - *Liquid Achieve SC*
  - *Puma Advance*
- ***In wheat (spring NOT durum) and barley:*** Alone or in mixture with MCPA
  - Pinoxaden *(Axial, Trondus)*

Insecticides: None registered.

Fungicides: None registered.

Fertilizers: None registered.

Adding ingredients in the correct order is critical for optimum performance. Check labels for tank mix instructions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 4 hours of application may reduce control.
- **Restricted Entry Interval:** DO NOT re-enter treated fields for at least 12 hours.
- **Preharvest Interval:** DO NOT harvest within 60 days of application.
- **Grazing Restrictions:** Livestock may be grazed 7 days after application. DO NOT cut the treated crop for hay or silage within 21 days of application.
- **Re-cropping Interval:** Spring wheat, barley, oats, canola, corn, soybeans, flax, field peas, mustard, timothy can be grown 10 months after application. Very dry soil conditions following application can result in a risk of injury to soybeans or field peas. If severe drought conditions are experienced during the months of June to August inclusive (less than 140 mm of rainfall) in the year of application, delay seeding of soybeans and field peas until 22 months after application.
- **Aerial Application:** May be applied by air.
- **Storage:** Store in original containers in a secure, dry heated storage.
- **Buffer Zones:** Avoid spraying in situations where drift may occur. DO NOT apply during periods of dead calm.

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic habitat		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground only*	1	1	2
Fixed wing aircraft	10	1	125
Helicopter	5	1	95

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Tank Cleaning:

This product utilizes a combination of 'Method A' and 'Method B' for cleanout requiring the use of All Clear Spray Tank Decontaminator for the tank plus ammonia for nozzles screens and filters for the second rinse. Refer to the general section on sprayer cleaning in introduction. Let solution stand for an extended period for better results. Flush sprayer system with water before reuse. See the label for product specific cleaning details.

Hazard Ratings

Warning – Eye and Skin Irritant

Refer to the Introduction for an explanation of the symbols.

Prospect

Herbicide Group
4 - halauxifen
14 - carfentrazone

Company:
Corteva Agriscience (PCP#33635)

Formulation:
15 g/L halauxifen plus 27.97 g/L carfentrazone formulated as an emulsifiable concentrate.
- Container size - 2 x 10.8 L case

Crops and Staging:
Prior to seeding canola, flax, mustard (Oriental, brown, yellow), soybeans, field peas, field corn, spring wheat, durum wheat and barley.

Weeds and Staging:
Alone *Prospect* will control the following broadleaf weeds from the 1 to 8 leaf stage unless otherwise indicated:
- American dragonhead (up to bud stage and 15 cm in height)
- Barnyard grass (up to 5 leaf, 2-tiller stage)
- Canada fleabane (up to 8 leaf and less than 10 cm in height)
- Chickweed
- Cleavers (up to 25 cm in size)
- Cow cockle (up to 8 leaf and 15 cm in height)
- Dandelion (suppression of rosettes up to 15 cm)
- Flixweed (up to early stem extension and 10 cm)
- Hemp-nettle
- Henbit (up to bud stage and 15 cm in height)
- Lamb's-quarters
- Nightshade, Eastern black
- Redroot pigweed
- Round-leaved mallow (up to 6 leaf)
- Shepherd's-purse (up to bolting and 20 cm high)
  Stinkweed (suppression up to the bud stage)
- Velvetleaf (up to the 5-leaf stage)
- Volunteer alfalfa (up to 25 cm tall)
- Waterhemp (up to 5 cm tall)
- Wild buckwheat (suppression)

Prospect plus glyphosate 180 g ae per acre will control the weeds above plus the weeds controlled by glyphosate at 180 g ae per acre plus the following from 1 to 8 leaves unless otherwise indicated:
- Dandelion (rosettes up to 15 cm)
- Flixweed (up to early stem extension and 20 cm)
- Kochia*
- Lady's-thumb
- Stinkweed (up to the bud stage)
- Volunteer canola (all varieties up to 5 leaf)
- Wild buckwheat (up to 6 leaf)

*** Light to moderate infestations of kochia (up to 150 plants per square metre; up to 15 cm in height).**

Rates:
***Prospect* Alone:** 135 mL per acre plus a methylated seed oil at 0.5 L per 100 L.
***Prospect* plus glyphosate:** Rates above plus at least 180 g ae per acre or up to 1020 g ae per acre of glyphosate. Adjuvant is not required when mixing with glyphosate. See glyphosate page for weeds controlled at higher glyphosate rates.
Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Application Information:
- **Water Volume:**
  - ***Ground:*** 20 to 40 L per acre.
- **Nozzles and Pressure:** Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE coarse*** droplets by ground. Sprayers without drift reduction nozzles should use between 30 to 40 psi (200 to 275 kPa). Low drift nozzles may require higher pressures for proper performance.

How it Works:
Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
halauxifen	POST (foliar)	Synthetic Auxin	Throughout the plant (Symplast)	Broadleaf only	4
carfentrazone	POST (foliar)	PPO Inhibitor/ Membrane disruptor	Little movement due to rapid cell leakage (Symplast)	Non-selective broadleaf	14

Effects of Growing Conditions:
Prospect must be applied prior to seeding of the crop, in tank-mix with glyphosate, to the main flush of actively growing broadleaf and grassy weeds. Warm, moist growing conditions promote active weed growth and enhances activity by allowing maximum foliar uptake and activity. Weeds hardened off by cold weather or drought stress may not be adequately controlled or suppressed and re-growth may occur. For best results, ensure thorough spray coverage of target weeds.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.
Herbicides: Glyphosate.
Fungicides: None registered.
Insecticides: None registered.
Fertilizers: None registered.
Note: The above mixes are those listed on the *Prospect* label only.
Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 1 hour of application may reduce control.
- **Restricted Entry Interval:** DO NOT re-enter treated fields for 12 hours.
- **Preharvest Interval:** Canola may be harvested 60 days or more after application.
- **Grazing Restrictions:** MUST NOT be grazed or fed to livestock for 21 days after treatment.
- **Re-cropping Interval:** Fields previously treated with *Prospect* can be seeded after a minimum of 10 months to spring wheat, barley, oats, canola, field corn, soybeans, sunflowers, flax, field peas, potatoes (except seed potatoes), mustard, alfalfa, dry bean (*Phaseolus vulgaris* species including pinto, kidney and white types) and timothy or fields can be summerfallowed. Lentils can be planted 22 months after application of *Prospect Herbicide*. Fall rye and winter wheat can be planted 3 months after application of *Prospect Herbicide*.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store in original containers in a secure, dry heated storage.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic habitat		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground*	1	1	2

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Refer to 'Method B' in the general section on sprayer cleaning in the introduction. Let solution stand for an extended period for better results. Flush sprayer system with water. See the label for product specific cleaning details.

Hazard Ratings

Warning – Contains the Allergen Soy
Refer to the Introduction for an explanation of the symbols.

Quinclorac

Herbicide Group
4 - quinclorac (broadleaf)
26 - quinclorac (grass)

Company:

BASF Canada (*Facet L*)
Farmers Business Network Canada (*Clever*)
Advantage Crop Protection *(Advantage Quinclorac, Ingenious)*

Formulation:

***Clever* (PCP#31365); *Advantage Quinclorac* (PCP#35274), *Ingenious* (PCP#32213):** 75% percent quinclorac formulated as a water dispersible granule (WDG).

- Container size - 10 x 1 kg bags

***Facet L* (PCP#31539):** 180 g/L quinclorac formulated as a solution.

- Container size - 2 x 9.07 L

Crops, Rates and Staging:

Merge adjuvant (purchased separately) must be used at 0.5 to 1 L per 100 L of spray solution to control for all products and rates.

Pre-emergent surface:

Facet L at 227 to 280 mL per acre may be mixed with or without glyphosate and applied prior to the seeding of canola.

Post-emergent:

Quinclorac 75 percent WDG at 54.6 grams per acre or *Facet L* at 227 mL per acre may be applied post-emergence to:

- Barley - 1 to 4 leaf (prior to tillering)* (*Facet L* only may be used on barley for human consumption).
- Canola (all varieties) - Up to 6 leaf for *Facet*; 2 to 6 leaf for Quinclorac 75% WDG formulations.

Quinclorac 75 percent WDG only at 54.6 grams per acre acre may be applied post-emergence to:

- Mustard (brown, oriental and oil quality *Brassica juncea*) - 2 to 6 leaf.

Quinclorac at 54.6 to 66.7 grams per acre or *Facet L* at 227 to 280 mL per acre may be applied post-emergence to:

- Canaryseed - 3 to 5 leaf *†.
- Spring wheat (including durum) - 1 to 5 leaf.

*** Not for use on crops for human consumption.**
† Not for use on crops for livestock consumption.

DO NOT apply products that contain quinclorac more than once every two years. When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

Weeds, Rates and Staging:

Pre-emergent surface:

Facet L applied at 227 mL per acre will control emerged weeds listed below, plus suppression of secondary flushes of cleavers emerging from seed.

Facet L applied at 280 mL per acre will control emerged weeds listed below, plus plus control of secondary flushes of cleavers and green foxtail emerging from seed.

Post-emergent:

Apply quinclorac at 54.6 to 66.7* grams per acre or *Facet L* at 227 to 280* mL per acre plus *Merge* adjuvant (purchased separately) at 1 L per 100 L of spray solution to control:

Grasses:

- Barnyard grass (1 to 5 leaves)
- Green foxtail* (1 to 5 leaves, up to 2 tillers)

Broadleaves:

- Cleavers (1 to 3 whorls), (1 to 6 whorls for *Facet L* when tank mixed with *Liberty 150SN*)
- Volunteer flax (1 to 8 cm)
- Sow-thistle (annual and perennial – 2 to 6 leaf)**

*** Use the high rate for heavy infestations of green foxtail only. For clarification of what constitutes a heavy infestation contact the manufacturer.**
**** Suppression only.**

DO NOT apply products that contain quinclorac more than once every two years.

Early treatment of weeds is important to maximize crop yield potential by eliminating early weed competition. Refer to broadleaf tank mix partner for additional timing restrictions.

Application Information:

- **Water Volume:** Minimum 45 L per acre.
- **Nozzles & Pressure:** 40 to 60 psi (275 to 425 kPa) when using standard flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage ***ASABE fine*** droplets or larger. Flat fan nozzles may be tilted forward 45 degrees to improve coverage on vertical surfaces (i.e. grasses).
- **Screens:** Use 50 mesh or coarser on both nozzle and primary plumbing screens

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
Quinclorac	POST (foliar)	Synthetic Auxin	Throughout the plant (Symplast)	Broadleaf only	4
		Cellulose Synthesis Inhibitor	Throughout the plant (Symplast)	Grass only	26

Effects of Growing Conditions:

DO NOT apply to crop that is under stress from conditions such as frost, hail, flooding, drought or extremes in temperature. Cool weather may delay weed control and if prolonged may result in poor weed control.

Tank Mixes:

Herbicides: When mixing with broadleaf partners a slight reduction in green foxtail control may result. If spraying for green foxtail, use the high rate of quinclorac. Add *Merge* adjuvant at 1 L per 100 L spray solution for all tank mixes.

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

In barley*:

- Buctril M
- MCPA amine or ester (0.41 to 0.45 L per acre - 500 g/L formulations)
- *Refine Extra***

In canaryseed*:

- *Buctril M*

In spring wheat (including durum) only*:

- 2,4-D amine or ester (160 to 212 g ae per acre)
- *Buctril M*
- MCPA amine or ester (0.34 to 0.45 L per acre - 500 g/L formulations)
- *Refine Extra***
- *Express* + 2,4-D**

In canola only:

- Pre-emergent surface – *Facet L* at 227 to 280 mL per acre may be mixed with glyphosate at 180 to 325 g ae per acre (see glyphosate page for product rates).
- Post-emergent - Quinclorac 75 percent WDG at 25 grams per acre or *Facet L* at 170 to 227 mL per acre may be mixed with:
  - Glyphosate at rates registered in glyphosate tolerant canola varieties only
  - *Ares SN* in CLEARFIELD canola varieties only (*Facet L* only).
- Post-emergent in *Liberty Link* canola quinclorac 75 percent WDG at 25 grams per acre or *Facet L* at 113 to 227 mL per acre may be mixed with:
  - *Liberty 150SN* - up to 1.62 L per acre
  - *Liberty 150SN* - up to 1.35 L per acre, plus clethodim (*Centurion* only) at 50 to 75 mL per acre (*Facet L* only).

***Advantage Quinclorac, Clever and Ingenious only**

****Clever and Ingenious only. Addition of surfactants other than Merge is not required.**

Refer to individual product labels for application details such as staging and varietal restrictions.

Insecticides: None registered.
Fungicides: None registered.
Fertilizers: None registered.

Note: Allow 4 days between the application of quinclorac and any other chemical not listed as a tank mix.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 6 hours may reduce control.
- **Restricted Entry Interval:** DO NOT enter treated fields for 12 hours after application.
- **Grazing Restrictions:** DO NOT graze or cut for feed within 77 days of application. DO NOT graze canaryseed or use for consumption by livestock. DO NOT graze or cut treated canola crops for feed. Canola meal may be fed.
- **Pre-harvest Interval:** DO NOT harvest wheat or canaryseed within 77 days of application. DO NOT harvest canola or mustard within 60 days of application. DO NOT harvest spring barley within 80 days of application.
- **Re-cropping Interval:** In case of crop failure, only barley, canola or spring wheat (including durum) may be reseeded the same year. Barley, canola, field peas, oats, sunflowers and wheat may be grown the year after application. Flax and lentils may be grown the second year after application. On low organic matter soils or under dry conditions, flax and lentils should not be grown until the third year after application. DO NOT use quinclorac on land where potatoes or vegetables are grown.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** May be frozen. Should product freeze, warm to room temperature before using.
- **Buffer Zones:**

Application method	Application Rate		Buffer Zones (metres†) Required for the Protection of:	
	75WDG (g/acre)	*Facet L* (mL/acre)	Aquatic habitat	Terrestrial habitat
Wheat, canaryseed	67	270	10	4
Canola, mustard**, barley, wheat, canaryseed	55	227	10	3

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
**** 75% WDG formulations only.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Refer to 'Method A' in the general section on sprayer cleaning in the introduction.

Hazard Rating:

Caution – Poison

Caution – Eye and Skin Irritant

Refer to the Introduction for an explanation of the symbols.

Quizalofop

Herbicide Group 1 - quizalofop

Company:

AMVAC (*Assure II*)
Gowan Canada (*Yuma GL Liquid EC*)
Interprovincial Cooperative Limited (*COOP/IPCO Contender II*)
AgraCity (*Quiz*)
Nufarm Agriculture (*Idol*)
ADAMA (*Leopard, ADAMA Quizalofop*)
Sharda (*Elegant 10EC*)
WinField United (*Marshall**)
BASF (*Caziva Ultra Q* – only available in *Odyssey Ultra Q* or *Solo Ultra Q* packs)
Viking (*Viking Quizalofop*)

* ***Note:*** *The marked product is no longer manufactured but some may remain in the distribution system. This product will be removed from future editions when supplies are exhausted.*

Formulation:

Assure II **(PCP#25462),** ***Yuma GL*** **(PCP#30100),** ***COOP/IPCO Contender II*** **(PCP#33961/PCP#33960),** ***Quiz*** **(PCP#33481),** ***Idol*** **(PCP#33906),** ***Elegant 10EC*** **(PCP#33617),** ***Marshall*** **(PCP#33681),** ***Caziva Ultra Q*** **(PCP#34282),** ***Viking Quizalofop*** **(PCP#34759):** 96 g/L quizalofop-P-ethyl formulated as an emulsifiable concentrate.

- Container sizes:
  - *Assure II* + *Sure-Mix* Adjuvant - 8 L + 8 L, 96 L + 96 L, or 500 L + 500 L
  - *Yuma GL Liquid EC, Elegant 10EC, Viking Quizalafop* - 2 x 8 L, 500 L *(adjuvant purchased separately)*
  - *COOP/IPCO Contender II* + *IPCO MSO Adjuvant* - 8 + 8 L
  - *Quiz* - 2 x 8 L, 96 L, 500 L (adjuvant purchased separately)
  - *Idol* - 2 x 8 L (Carrier adjuvant sold separately)
  - *Marshall* - 2 x 10 L (adjuvant sold separately)
  - *Caziva Ultra* - see *Odyssey Ultra Q* and *Solo Ultra Q*

Leopard **(PCP#33715) and** ***ADAMA Quizalofop*** **(PCP#34935):** 100 g/L quizalofop-P-ethyl formulated as an emulsifiable concentrate.

- Container size - 2 x 7.8 L

Crops and Staging:

Annual Crops: Where there is no leaf stage restriction do not apply beyond the pre-harvest interval listed in the table:

Crop	Preharvest Interval (Days)	Max Leaf Stage
Camelina*	64	
Canola	64	
Chickpea	85	
Dry bean*†	30	
Ethiopian mustard (*Brassica carinata*)*	64	
Faba bean*§	30	
Flax or solin (low linolenic acid flax)	82	
Hemp (for fibre, seed, or oil)*	73	6 leaf (up to 25 cm)
Lentil§	65	
Oriental mustard (condiment types and oilseed quality *Brassica juncea*)	64	
Pea (field)§	65	
Soybean§	80	
Sunflower*††§	60	8 leaf
Yellow and brown mustard	64	

† **NOTE: While quizalofop has been registered for use on all dry field bean types not all types have been tested for tolerance. When using quizalofop on a new dry bean type or variety for the first time evaluate tolerance on a small area first before applying large acreages and check with seed supplier for variety sensitivity.**
†† ***Assure II, CO-OP/IPCO Contender II, Elegant, Marshall*** **and** ***Yuma GL Liquid EC*** **only.**
§ ***Caziva Ultra Q*** **for use on marked crops only.**

Forage Crops (seed production only):

- ***Seedling or Established:*** Alfalfa, clover (alsike, red, sweet)*, sainfoin*, bird's-foot trefoil*, creeping red fescue.
- ***Seedling only:*** Clover (white)*
- ***Established only:*** Cicer milkvetch*

Forage Crops (seed, forage or hay production)

- ***Seedling or Established:*** Creeping red fescue** (2 leaf to pre-heading)

**** NOTE: Since applications to these crops have been registered under the User Requested Minor Use program, the manufacturer assumes no responsibility for herbicide performance. Application to these crops is at the risk of the user.***

*****Assure II only***

When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

Weeds, Rates and Staging:

Apply quizalofop according to weed stage below to the maximum rates of 0.3 L per acre for all crops except Ethiopian mustard (*B. carinata*) where the maximum rate is 0.2 L per acre.

Add one of the following registered adjuvants to the spray tank when applying:

- ***Assure II* only:** *Sure-Mix* or a Methylated Seed Oil (MSO) type adjuvant (0.5 L per 100 L of spray solution), *LI700* (0.25 to 0.5 L per 100 L of spray solution), or *Merge* (0.5 to 1.0 L per 100 L of spray solution)
- ***COOP/IPCO Contender II:*** *Merge* or *IPCO MSO Adjuvant* (0.5 to 1.0 L per 100 L of spray solution), *Sure-Mix* (rates above), *LI 700* (0.25 to 0.5 L per 100 L of spray solution) or *Liberate MSO Adjuvant* (rates above)
- ***Yuma GL Liquid EC* or *Quiz:*** *Merge* or *XA Oil Concentrate* (0.5 to 1.0 L per 100 L of spray solution), or *MSO adjuvant* or *Sure-Mix* (0.5 L per 100 L of spray solution)
- ***Viking Quizalofop:*** *Merge* (0.5 to 1.0 L per 100 L of spray solution), or *Sure-Mix* (0.5 L per 100 L of spray solution)

Use the higher rate *of XA Oil Concentrate* when wild oats or quackgrass are present in the field or when growing conditions are poor.

Weed	Stage	Rate (L per acre)	
		96 g/L forms	Leopard and ADAMA Quizalofop
Green foxtail	2 leaf to early tillering	0.15	0.148
Volunteer wheat, barley, oats*	2 leaf to early tillering		
Volunteer corn	2 to 6 leaf stage		
Wild oats	1 to 5 leaf (without tillers)		
Wild oats*	up to 2 tillers	0.20	0.194
Barnyard grass, yellow foxtail, proso millet, old witchgrass	2 leaf to early tillering		
Quack grass suppression	2 to 6 leaf stage		
Foxtail barley	3 to 4 leaf max 3 tillers		
Downy† and Japanese†† brome	2 to 5 leaf stage		
Quack grass season long control	2 to 6 leaf stage	0.30	0.291

*** Best results are likely to occur if applications are made before tillering begins. Apply at the 2 to 3 leaf stage for optimum control.**

† Except *Quiz*, *Idol* and *Viking Quizalofop*.

†† Except *Elegant*.

Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Application Information:

- **Water Volume:**
  - ***Ground:*** Minimum 40 L per acre. Up to 162 L per acre of water may be used under heavy populations to improve coverage.
  - ***Aerial:*** Minimum 10 L per acre to a maximum of 20 L per acre.
- **Nozzles and Pressure:** 30 to 40 psi (210 to 275 kPa) when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE medium*** droplets.
- **Screens:** Use a 50 mesh or coarser screen and filter system.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
quizalofop-p-ethyl	POST (foliar)	ACCase Lipid Synthesis Inhibitor	Toward areas of growth (Symplast)	Grass only	1

Effects of Growing Conditions:

Crop injury may occur if crops are stressed because of drought or flooding. Less than acceptable weed control may be expected if weeds are under stress because of drought, flooding or cool weather.

Tank Mixes:

Herbicides:

- ***In Canola:***
  - *Muster* (8 to 12 grams per acre) plus adjuvant.
- ***Glufosinate tolerant canola (Liberty Link) only:***
  - *Liberty 150 SN** (0.54 to 1.6 L per acre) plus *Sure-Mix, LI 700* or MSO adjuvants, including *Liberate** or *IPCO MSO*.
- ***In Dry Bean (Pinto, Pink, Great Northern, Small Red):***
  - *Basagran* (label rates with quizalofop at 0.25 L per acre plus *Sure-Mix* adjuvant).
- ***In Oriental Mustard (B. juncea condiment and oilseed):***
  - *Muster* (8 grams per acre plus quizalofop at 0.15 to 2.0 L per acre plus adjuvant). DO NOT use on yellow mustard as injury will result.
- ***In Soybean:***
  - *Pinnacle* (2.2 to 3.3 grams per acre).
  - *Pinnacle* (2.2 to 3.3 grams per acre) plus *Basagran Forté* (label rates) plus quizalofop (0.25 L per acre) plus *Sure-Mix* adjuvant.
- ***In Tribenuron Tolerant Sunflowers:***
  - *Express SG* (6 grams per acre) plus *Sure-Mix* or *Merge*** adjuvants.
- ***In Established creeping red fescue for seed:***
  - *Ally* (label rates) plus quizalofop (0.2 to 0.3 L per acre) plus adjuvant.
- Allow 24 hours after application before applying a broadleaf herbicide. If the broadleaf herbicide is applied first, wait 7 days before application of quizalofop.

Insecticides: None registered.
Fungicides: None registered.
Fertilizers: None registered.

Note: The above mixes are those listed on the quizalofop labels only.

According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 1 hour of application may reduce control.
- **Restricted Entry Interval:** 4 days for camelina and 12 hours for all other crops.
- **Grazing Restrictions:** DO NOT graze treated crops or cut for feed in the year of treatment. Assure II use on seedling or established creeping red fescue for seed, forage and hay production - DO NOT permit livestock to graze or cut hay within 60 days after application.
- **Pre-harvest Interval:** See 'Crops and Staging' chart above.
- **Re-cropping Interval:** No restrictions the year after treatment.
- **Aerial Application:** May be applied by air when used alone.
- **Storage:** DO NOT freeze.
- **Buffer Zones:**

Rates (L per acre)	Application method	Buffer Zones (metres†) Required for the Protection of:		
		Aquatic Habitats of Depths		Terrestrial habitat
		Less than 1 m	Greater than 1 m	
0.15 to 0.20	Ground *	1	0	3
Up to 0.30	Ground	1	0	5

Rates (L per acre)	Application method	Buffer Zones (metres†) Required for the Protection of:		
		Aquatic Habitats of Depths		Terrestrial habitat
		Less than 1 m	Greater than 1 m	
Up to 0.15	Winged aircraft	1	0	85
	Helicopter	1	0	70
Up to 0.20	Winged aircraft	1	0	100
	Helicopter	1	0	85
Up to 0.30	Winged aircraft	1	0	150
	Helicopter	1	0	125

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones for ground applications can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Cleanout is recommended but no specific cleaning procedures are indicated on the label. Based on products with similar chemistry, 'Method B' found in the general sprayer cleaning section in the introduction or a commercial spray sprayer cleaning product, may provide adequate cleaning. Contact the manufacturer for more information.

Hazard Rating:

Leopard:

Caution – Poison

Other Products:

Danger – Corrosive to Eyes

Skin Irritant, Potential Skin Sensitizer

Refer to the Introduction for an explanation of the symbols.

Reclaim II / ClearView

Herbicide Group
2 - metsulfuron
4 - aminopyralid, 2,4-D

Company:
Corteva Agriscience

Formulations:
***Reclaim II A* (PCP#30062); *ClearView* (PCP#29752):** 52.5% aminopyralid + 9.45% metsulfuron methyl formulated as a water dispersible granule.
- Container size - 1.84 kg

***Reclaim II B* (PCP#30063):** 660 g/L 2,4-D ester formulated as an emulsifiable concentrate.
- Container size - 2 x 6.48 L

NOTE: Limited availability through selected retail outlets.

Crops and Staging:
Rights of way, industrial and non-crop areas, rangeland and pastures - Apply in spring or early summer.
Note: The use of this chemical may result in contamination of groundwater particularly in areas where soils are permeable (e.g. sandy soil) and/or the depth to the water table is shallow. Avoid use in these situations.

Weeds, Rates and Staging:
Application timing is critical for weed control. For optimum weed control apply when weeds are emerged, young and actively growing in the vegetative stage for proper translocation and systemic weed activity.
Maximum of 49 g ae (active ingredient) per acre of *Reclaim II* (equivalent of 93 g product per acre) or other product containing aminopyralid (*Restore II, Milestone, Clearview, Sightline*) per season. Treated areas should not receive more than 49 g ae per acre a product containing aminopyralid the year after initial treatment.
Add a surfactant such as *Gateway*, or non-ionic adjuvant such as *Ag-surf, Agral 90*, or *Cittowet Plus* at 0.2 L per 100 L of spray solution after adding *Reclaim II/ClearView* components.

Weeds controlled by *Clearview* at 55 g per acre:
- Bluebur
- Buckwheat (tartary, wild[§])
- Bull thistle
- Canada fleabane
- Canada goldenrod[§]
- Canada thistle*[§§]
- Chickweed
- Clover
- Common groundsel
- Common ragweed
- Common tansy
- Corn spurry
- Cow cockle
- Dandelion (*Clearview*[†§§§], *Reclaim II*[††])
- Field scabious
- Flixweed
- Hemp-nettle
- Horse-nettle
- Knapweed (spotted)
- Lamb's-quarters[§]
- Musk or nodding thistle
- Mustard (ball, wild)
- Narrow-leaved hawk's-beard
- Oxeye daisy (pre-bud)
- Pigweed (prostrate)
- Russian thistle
- Scentless chamomile[†]
- Shepherd's-purse
- Smartweed (green, lady's-thumb)
- Sow-thistle (perennial)
- Stinkweed
- Stork's bill
- Sweet clover
- Tall buttercup
- Volunteer canola
- Yellow star-thistle

Shrubs
- Western snowberry (buckbrush)

***Reclaim II A* at 55 g per acre plus *Reclaim II B* at 0.69 L per acre; or *Clearview* at 55 g per acre plus 2,4-D Amine 340 to 445 g ae per acre at provides season long control of the weeds above, plus the weeds controlled by 340 to 445 g ae of 2,4-D, plus the following weeds unless indicated otherwise:**
- *Weeds controlled or suppressed by* Clearview *above plus:*
  - Absinthe
  - Biennial wormwood (*Reclaim II* only)
  - Canada goldenrod
  - Dandelion[††]
  - Gumweed (topgrowth)
  - Hawkweed
  - Knapweed (Russian)
  - Pasture sage
  - Tumbleweed (*Reclaim II* only)
  - Wild strawberry[††]

  Shrubs
  - Silverberry (wolf willow)

Weeds controlled by *Clearview* at 69 g per acre:

- *Weeds controlled by* Clearview *above plus:*
  - Absinthe[§]
  - Canada thistle[†§§§*]
  - Cudweed
  - Curled dock
  - Fireweed
  - Hoary alyssum
  - Perennial pepperweed
  - Western (perennial) ragweed
  - Pasture sage[§§]
  - Prairie sage[†]
  - Pussy toes
  - Volunteer alfalfa
  - Wild carrot
  - Wild strawberry[††]

  Shrubs
  - Prairie wild rose[§§§]
  - Western snowberry (buckbrush)[†]

***Reclaim II A* at 69 g per acre plus *Reclaim II B* at 0.69 L per acre; or *Clearview* at 69 g per acre plus 2,4-D Amine 340 to 445 g ae per acre at provides season long control of the weeds above plus the weeds controlled by 340 to 445 g ae of 2,4-D plus the following weeds unless indicated otherwise:**

- *Weeds controlled by* Clearview *above plus:*

  Shrubs
  - Shrubby cinquefoil[††]

Weeds controlled by *Clearview* at 81 g per acre:

- *Weeds controlled by* Clearview *above plus:*
  - Baby's-breath
  - Black henbane
  - Cleavers
  - Wild caraway
  - Wild parsnip

***Reclaim II A* at 81 grams per acre plus *Reclaim II B* at 0.69 L per acre; or *Clearview* at 81 g per acre plus 2,4-D Amine 340 to 445 g ae per acre at provides season long control of the weeds controlled by *Clearview* above plus the weeds controlled by 340 to 445 g ae of 2,4-D plus the following weeds unless indicated otherwise.**

- Canada thistle[*††]

  Shrubs
  - Prairie wild rose[††]
  - Silverberry (wolf willow)[††]
  - Western snowberry (buckbrush)[††]

Weeds controlled by *Clearview* at 93 g per acre:

- *Weeds controlled by Clearview above plus:*
  - Absinthe
  - Knapweed (Brown, diffuse**)
  - Hawkweed (orange[†], yellow)***
  - Hoary cress
  - Hound's-tongue
  - Japanese knotweed
  - Mullein
  - Prickly lettuce
  - Purple loosestrife
  - Yarrow[§]

  Shrubs
  - Shrubby cinquefoil[††]

Weeds controlled by *Reclaim II A* at 93 grams per acre plus *Reclaim II B* at 0.69 L per acre; or *Clearview* at 93 g per acre plus 2,4-D Amine 340 to 445 g ae per acre at provides season long control of the weeds controlled by *Clearview* above plus the weeds controlled by 340 to 445 g ae of 2,4-D plus the following weeds unless indicated otherwise.

Weeds controlled by Clearview above plus:

- Prairie sage[††]
- Shrub
- Shrubby cinquefoil[††]

[§] Season long suppression only.
[§§] Suppression up to 12 months from application.
[§§§] Suppression up to 24 months from application.
[†] Controlled up to 12 months from application.
[††] Controlled up to 24 months after application. DO NOT retreat again in year after treatment.
*** Removal of competing vegetation may result in new Canada thistle shoots emerging.**
**** Apply when plants are actively growing with the optimum time of application occurring from rosette to the bolting stages of development or in the fall. Use of the highest application rate improves or extends the duration of control.**
***** Apply to plants in the bolting stage of development.**

Individual plant or Spot/Strip Applications:

- ***Clearview:*** 1.35 to 2.3 grams plus 20 mL surfactant such as *Gateway, Ag-Surf, Agral 90* or *Citowett* per 10 L of spray solution.
- ***Reclaim II:*** 2.3 grams of *Reclaim II A* plus 17 mL of *Reclaim II B* plus 20 mL of surfactant such as *Gateway Adjuvant, Ag-Surf, Agral 90* or *Citowett Plus* per 10 L of spray solution.

Application Information:

- **Water Volume:**
  - ***Ground:*** 80 L per acre minimum.
  - ***Aerial:*** 20 L per acre minimum. For better coverage apply at 50 L per acre.
- **Nozzles and Pressure:** Use a combination of application equipment and pressures that will apply ***ASABE coarse*** droplets in a uniform pattern. Drift of even small amounts of *Reclaim II* into sensitive plants or areas where sensitive crops may be grown can cause injury. DO NOT apply under conditions prone to drift (i.e. high winds, dead calm, or temperature inversions).

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
metsulfuron-methyl	POST (foliar) also has soil activity	ALS Amino Acid Inhibitor	Toward areas of growth (Symplast)	Broadleaf only	2
aminopyralid	POST (foliar) also has soil activity	Synthetic Auxin	Throughout the plant (Symplast)	Broadleaf only	4
2,4-D	POST (foliar)	Synthetic Auxin	Throughout the plant (Symplast)	Broadleaf only	4

Effects of Growing Conditions:

Application should be avoided when pasture and targeted weeds are under stress of drought, excess moisture, extreme heat or cold or other environmental stresses. Target weeds must be actively growing. Avoid applications when temperatures exceed 28°C.

Tank Mixes:

Herbicides:

- ***Reclaim II:*** *Grazon XC* (1.0 L per acre)
- ***Clearview:***
  - ***Permanent grass areas:*** 2,4-D
  - ***Bare ground only:***
    - Glyphosate (a surfactant is required)
    - *Arsenal*
    - *Torpedo EZ (356 to 492 mL per acre)*
    - *Torpedo EZ plus glyphosate (rates above)*

Note: The above mixes are those listed on the *Reclaim II* label only.

Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** No rainfast period is specified on the label. Contact manufacturer for more information.
- **Restricted Entry Interval:** DO NOT re-enter treated areas for 12 hours.
- **Grazing Restrictions:**
  - ***Clearview alone:*** Grazing not restricted for livestock or lactating dairy animals.
  - ***Reclaim II:*** DO NOT allow lactating dairy animals to graze treated areas within 7 days of application. Withdraw meat animals from treated areas and feed untreated feed for at least 3 days before slaughter. DO NOT harvest forage or cut hay within 30 days of application.
  - ***Both products:*** Allow 3 days of grazing on untreated pasture or feed untreated hay before transferring livestock to areas where sensitive broadleaf crops may be grown, since feces and urine may contain the herbicide.
- **Re-cropping Interval:** DO NOT apply to pastures where legumes are an essential component. DO NOT break up treated pasture and plant to sensitive broadleaf crops for at least 3 years after application. Conduct a field bioassay prior to planting.
- **Aerial Application:** May be applied by air.
- **Storage:** Store product in original, labeled containers in a secure, dry, cool area. DO NOT freeze.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:	
	Aquatic habitat	Terrestrial habitat
Ground*	10	15
Fixed wing airplane	80 to 175**	250 to 750**
Helicopter	70 to 150**	175 to 650**

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
**** Distance varies depending on spray droplet size. Consult the *Clearview/Reclaim II* labels to determine buffer zone size when applying by air.**
† Distance is measured from the downwind edge of the boom to sensitive areas.

- DO NOT apply this product directly to any water body or mix or load near water or wells. DO NOT apply when heavy rains are forecast or on moderate to steep slopes toward sensitive areas or to light soils with shallow water table. Contact the provincial environment department for additional permits to apply near water.

Sprayer Cleaning:

Refer to 'Method A' found in the general sprayer cleaning section in the introduction or a commercial spray sprayer cleaning product such as *All Clear* or *Clean Out* spray cleaner. The inclusion of detergent in 'Method B' may provide improved cleaning. Contact the manufacturer for more information.

Hazard Rating:

Clearview/Reclaim II A:

Caution – Eye Irritant

Reclaim II B:

Caution – Poison

Warning – Skin Irritant

Potential Skin Sensitizer

Refer to the Introduction for an explanation of the symbols.

Reflex*

Herbicide Group 14 - fomesafen

** For use only in the Red River Valley of Manitoba.*

Company:

Syngenta Canada (PCP#24779)

Formulation:

240 g/L fomesafen formulated as a solution.

- Container size - 10 L

Crops and Staging:

Apply *Reflex* at 235 mL per acre at the 1 to 2 trifoliate leaf stage of the following crops:

- **Soybeans:** Apply only as a tank mix with *Basagran* at 0.71 L per acre plus *Agral 90* at 1 L per 1000 L of spray solution or as a mix with glyphosate at registered rates in glyphosate tolerant soybean.
- **Dry beans*:** Apply only as a tank mix with *Basagran* at 0.71 L per acre per acre plus *Agral 90* at 1 L per 1000 L of spray solution.

**** NOTE - Since applications to dry beans in the Red River Valley has been registered under the User Requested Minor Use program, the manufacturer assumes no responsibility for herbicide performance. Application to dry beans is at the risk of the user.***

DO NOT use before the 1st trifoliate leaf stage or increased risk of crop injury may result.

Maximum ONE APPLICATION EVERY TWO CONSECUTIVE YEARS of *Reflex* or other products containing the active ingredient fomesafen.

Weeds, Rates and Staging:

Broadleaf weeds controlled by *Basagran* at the 0.71 L per acre rate or glyphosate at registered rates in glyphosate tolerant soybeans plus improved control of the following weeds up to the 4-leaf stage:

- Cocklebur
- Eastern black nightshade
- Lady's-thumb
- Lamb's-quarters*
- Ragweed (common)
- Redroot pigweed
- Volunteer canola
- Wild mustard
- Velvetleaf (3 leaf)

*** Suppression only**

Application Information:

- **Water Volume:** Minimum 81 L per acre. Increase water volume to 142 L per acre for fields with heavy weed densities or with weeds at the upper limit of their recommended stage.
- **Pressure:** 275 kPa (40 psi). Increase pressure to 420 kPa (60 psi) for fields with heavy weed densities or with weeds at the upper limit of their recommended stage.
- **Nozzles:** Use nozzles capable of delivering appropriate pressures and volumes.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
fomesafen	POST (foliar) with slight soil activity	PPO Inhibitor/ Membrane disruptor	Little movement due to rapid cell leakage (Symplast)	Broadleaf only	14

Effects of Growing Conditions:

Weed control and crop tolerance may be reduced under certain stress conditions such as cold temperatures, excess moisture, drought and injury from hail or previous herbicide applications.

Tank Mixes:

Herbicides:

- **Dry beans and soybeans:**
  - *Basagran* (0.71 L per acre)
- **Glyphosate tolerant soybeans only:**
  - *Glyphosate* (360 to 720 g ae per acre)

Fungicides: None registered.

Fertilizers: None registered.

Insecticides: None registered.

Note: The above mixes are those listed on the *Reflex* label only.

Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 4 hours may reduce control.
- **Grazing Restrictions:** DO NOT graze treated crop or cut for hay. There is insufficient data to support such use.
- **Pre-harvest Interval:** Leave at least 84 days from application to harvest.
- **Re-cropping Interval:** Winter wheat may be sown 4 months after application. Spring wheat, dry beans, soybeans and field corn may be grown the year following an application.
  - These re-cropping restrictions refer only to the Red River Valley of Manitoba. Use outside this is region is not registered as re-cropping options have not been determined.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store in a cool place away from food or feed. Store above 0°C. Storing *Reflex* below 0°C can negatively affect product quality.
- **Buffer Zones:** Leave a buffer zone of at least 15 metres between the last spray swath and the edge of sensitive terrestrial areas such as shelterbelts, hedgerows and shrublands as well as aquatic areas such as ponds, streams, rivers, prairie potholes and sloughs. DO NOT apply when winds are greater than 15 km per hour.

Sprayer Cleaning:

No specific cleaning procedures are indicated on the label. Based on products with similar chemistry, 'Method B' found in the general sprayer cleaning section in the introduction or a commercial spray sprayer cleaning product, may provide adequate cleaning. Contact the manufacturer for more information.

Hazard Rating:

Danger – Corrosive to Eyes

Refer to the Introduction for an explanation of the symbols.

Restore II / Milestone

Herbicide Group
4 - aminopyralid, 2,4-D

Company:
Corteva Agriscience

Formulation:
***Restore II* (PCP#30632):** 50 g/L aminopyralid and 400 g/L 2,4-D both present as amine salts formulated as a solution.
- Container size - 2 x 9.7 L

***Milestone* (PCP#28517):** 240 g/L aminopyralid formulated as a solution.
- Container size - 2 x 10 L

Note: Limited availability through selected retail outlets.

Maximum of 49 g ae (active ingredient) per acre of *Restore II* (97 L product per acre) or other products containing aminopyralid (*Reclaim II, Milestone, Clearview, Sightline*) PER SEASON.

Crops and Staging:
Industrial and non-crop areas, rangeland and pastures: Apply in spring or early summer.

Note: The use of this chemical may result in contamination of groundwater particularly in areas where soils are permeable (e.g. sandy soil) and/or the depth to the water table is shallow. Avoid use in these situations.

Weeds, Rates and Staging:
Apply when weeds are young and actively growing in the vegetative stage for control unless indicated otherwise.

Note: the use of the highest rate structure improves level and duration of weed control and is recommended when weed populations are dense.

***Milestone* at 120 mL per acre (2.9 mL per 10 L of water for backpack sprayers) will control:**
- Bull thistle
- Buttercup (hairy, tall)
- Canada goldenrod†††
- Canada fleabane
- Canada thistle††
- Curled dock†††
- Horse-nettle
- Nodding thistle
- Ox-eye daisy (pre-bud)
- Perennial sow-thistle
- Ragweed (common, western†††)
- Scentless chamomile†††
- Spotted knapweed
- Sulphur cinquefoil†††
- Yellow star-thistle (rosette through bolting)

***Restore II* at 0.57 L per acre or *Milestone* at 120 mL per acre plus 2,4-D Amine at 340 g ae per acre will control:**
- *Weeds controlled by* Milestone *above plus weeds controlled by 2,4-D at 340 g ae per acre (see 2,4-D page):*
  - Canada goldenrod*
  - Curled dock (< 4 leaf)*
  - Gumweed*††
  - Hawkweeds*
  - Scentless chamomile*

***Milestone* at 154 mL per acre (3.8 mL per 10 L of water for backpack sprayers) will control:**
- *Weeds controlled by* Milestone *at 120 mL per acre above plus:*
  - Absinth (wormwood)†††
  - Clover
  - Cudweed
  - Curled dock
  - Fleabane, hairy
  - Scentless chamomile
  - Tansy ragwort
  - Western ragweed

***Restore II* at 0.86 L per acre or *Milestone* at 154 mL per acre plus 2,4-D Amine at 340 g ae per acre will control:**
- *Weeds controlled by* Milestone *at 154 mL per acre above, plus weeds controlled by 2,4-D at 340 g ae per acre (see 2,4-D page):*
  - Canada goldenrod††**
  - Dandelion††*
  - Hawkweeds**
  - Heal-all**
  - Smartweed (green and Pennsylvania)**
  - Sulphur cinquefoil††**

***Milestone* at 202 mL per acre (5.0 mL per 10 L of water for backpack sprayers) will control:**
- *Weeds controlled by* Milestone *at 154 mL per acre above plus:*
  - Absinth (wormwood)
  - Clover
  - Common tansy†††
  - Dandelion†††
  - Fireweed*
  - Hawkweed, orange (bolting)*
  - Knapweed††† (diffuse, Russian)
  - Mullein*
  - Prickly lettuce
  - Purple loosestrife
  - Tall ironweed
  - Yarrow, Common†††

Milestone at 154 mL per acre plus 2,4-D Amine at 437 g ae per acre will control:
- Absinth (wormwood)††
- Dandelion††

***Restore II* at 0.97 L per acre or Milestone at 202 mL per acre plus 2,4-D Amine at 340 g ae per acre will control:**

- *Weeds controlled by* Milestone *at 202 mL per acre above, plus weeds controlled by 2,4-D at 340 g ae per acre (see 2,4-D page):*
  - Absinth (wormwood)
  - Biennial wormwood††**
  - Bindweed (field and hedge)††**
  - Blue Lettuce††**
  - Burdock††**
  - Canada goldenrod††**
  - Dandelion††**
  - Field bindweed††**
  - Gumweed††**
  - Hoary cress††**
  - Leafy spurge††**
  - Mouse-eared chickweed††**
  - Western snowberry ††*
  - Yellow rocket††**

***Milestone* at 202 mL per acre plus 2,4-D Amine at 583 g ae per acre will control:**

- Common Tansy††
- Western Snowberry††

*** *Milestone* or *Milestone* + 2,4-D only**
**** *Restore II* only.**
† Top growth control only.
†† Season long control.
††† Suppression only.

Individual plant or spot/strip applications:

- ***Milestone:*** See rates above. Apply to target plant so that it is evenly covered with spray solution but not to the point of runoff. Use higher rate when growing conditions are less than favourable or when plant foliage is tall and dense.
- ***Restore II:*** 14-24 mL of Restore II per 10 L of spray solution. Thoroughly and uniformly wet the foliage of all target plants but not to the point of runoff. Use the higher rate when growing conditions are less than favorable or when plant foliage is tall and dense.

Application Information:

- **Water volume:**
  - ***Ground:*** 80 L per acre minimum.
  - ***Aerial:*** 20 L per acre minimum
- **Nozzles and Pressure:** Use a combination of application equipment and pressures that will apply ***ASABE coarse*** droplets in a uniform pattern.
  - Drift of even small amounts of *Restore II* into sensitive plants or areas where sensitive crops may be grown can cause injury. DO NOT apply under conditions prone to drift (i.e. high winds, dead calm, or temperature inversions).
  - Avoid applications closer that the drip line or outer edge of the canopies of trees or injury may occur to the tree.

NOTE: Use closed handling systems when using bulk containers and/or if handling more than 663 L of product per day. Handheld applications are limited to 20 L of product per day. Respirators must be worn if applying more than 12.5 L per day using handheld equipment.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
aminopyralid	POST (foliar) also has soil activity	Synthetic Auxin	Throughout the plant (Symplast)	Broadleaf only	4
2,4-D	POST (foliar)	Synthetic Auxin	Throughout the plant (Symplast)	Broadleaf only	4

Effects of Growing Conditions:

Application should be avoided under conditions of drought or other environmental stress.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides:

- ***Restore II:*** none registered.
- ***Milestone:***
  - ***Permanent grass stands:*** 2,4-D amine (340, 437, & 583 gae/acre respectively or 150, 190 & 260 mL per 10 L of water respectively for backpacks)
  - ***Bare ground only:***
    - *Arsenal* (1.2 L/acre)
    - Glyphosate (rates as per glyphosate page up to 1750 g ae per acre)
    - *Torpedo EZ* (356 to 492 mL per acre)
    - *Torpedo EZ* plus glyphosate (rates above)

Restrictions:

- **Rainfall:** No rainfast period is specified on the label; required interval may be up to 8 hours. Contact manufacturer for more information.
- **Restricted Entry Interval:** DO NOT re-enter treated areas for 12 hours.
- **Grazing Restrictions:**
  - ***Milestone alone:*** Grazing not restricted for livestock or lactating dairy animals.
  - ***Restore II:*** DO NOT allow lactating dairy animals to graze treated areas within 7 days of application. Withdraw meat animals from treated fields at least 3 days before slaughter. DO NOT harvest forage or cut hay within 30 days of application.
  - ***Both products:*** Allow 3 days of grazing on an untreated pasture (or feed untreated hay) before transferring livestock to areas where sensitive broadleaf crops may be grown.
- **Re-cropping Interval:** DO NOT use if legumes are essential in a pasture. DO NOT break up treated pasture and plant to sensitive broadleaf crops for at least 3 years after application.
- **Aerial Application:** May be applied by air.
- **Storage:** Store product in original, labelled containers in a secure, dry, cool area. DO NOT freeze.
- **Buffer Zones:**
  - Handheld equipment is exempt from the buffer zones indicated below when implementing Early Detection and Rapid Response (EDRR) measures on isolated plants or patches. DO NOT apply to water.

Application method	Buffer Zones (metres†) Required for the Protection of:	
	Aquatic Habitats	Terrestrial habitat
Ground *	10	10
Fixed wing airplane	80 to 175**	80 to 175**
Helicopter	70 to 150**	70 to 150**

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
**** Distance varies depending on spray droplet size. Consult the *Restore II* label to determine buffer zone size when applying by air.**
† Distance is measured from the downwind edge of the boom to sensitive areas.

  - DO NOT apply this product directly to any water body or mix or load near water or wells. DO NOT apply when heavy rains are forecast or on moderate to steep slopes toward sensitive areas or to light soils with shallow water table. Contact the provincial environment department for permits to apply near water.

Sprayer Cleaning:

'Method A' found in the general sprayer cleaning section in the introduction.

Hazard Rating:

Danger – Eye and Skin Irritant

Refer to the Introduction for an explanation of the symbols.

Restore NXT

Herbicide Group
4 - aminopyralid
4 - florpyrauxifen

Company:
Corteva Agriscience (PCP #34730)

Formulation:
80 g/L aminopyralid and 6.36 g/L florpyrauxifen present as solution concentrate.
- Container size – 2 x 10 L jug

Note: Limited availability through selected retail outlets.

Crops, and Staging:
Permanent grass pasture and rangeland. Apply in spring or early summer.
Note: The use of this product in areas where soils are permeable, particularly where the water table is shallow, may result in groundwater contamination.

Weeds, Rates and Staging:
Apply to young weeds that are actively growing at time of application. Post emergence applications should be made before bud stage or early flowering, unless otherwise specified. Only weeds present at the time of application will be controlled.
A surfactant is required with *Restore NXT*. Add a surfactant such as *Gateway* adjuvant or a non-ionic surfactant (NIS) at 0.25 L to 0.5 L per 100 L of spray solution or methylated seed oil (MSO) at 0.5 L to 1 L per 100 L of spray solution of spray solution after adding *Restore NXT*.
Note: Maximum of one application of this or other products containing (aminopyralid) per year.

***Restore NXT* at 304 mL per acre will control:**
- Canada fleabane (bolting up to 20 cm)
- Canada thistle*
- Common waterhemp (up to 3 leaf and 8 cm)
- Spotted knapweed*
- Velvetleaf (up to 3 leaf and 8 cm)

***Restore NXT* at 352 mL per acre will control the weeds above plus:**
- Canada fleabane
- Canada goldenrod*
- Common ragweed
- Curled dock*
- Ox-eye daisy (pre-bud)
- Perennial sowthistle
- Scentless chamomile*
- Spotted knapweed
- Sulphur cinquefoil (pre-bud)*
- Tall buttercup
- Thistle (bull, Canada, musk or nodding, plumeless)

***Restore NXT* at 352 mL per acre plus 340 grams ae per acre 2,4-D will control all the weeds by 352 mL per acre of *Restore NXT* alone and all the weeds listed on the 2,4-D label at 340 grams ae per acre plus:**
- Annual sow thistle
- Bluebur, burdock (less than 4 leaf)
- Blue lettuce***
- Bull thistle***
- Buttercup, gumweed***
- Canada goldenrod
- Canada thistle**
- Cocklebur
- Common plantain
- Curled dock (less than 4 leaf)
- Flixweed
- Goat's beard
- Hoary cress***
- Orange hawkweed
- Peppergrass
- Perennial sow thistle***
- Prickly lettuce
- Ragweeds
- Scentless chamomile
- Stinging nettle
- Spotted knapweed
- Sweet clover

***Restore NXT* at 453 mL per acre will control:**
- *Weeds controlled by* Restore NXT *at 352 mL per acre above plus:*
  - Absinth wormwood*
  - Canada goldenrod*
  - Clover
  - Cudweed
  - Curled dock
  - Poison hemlock
  - Scentless chamomile
  - Tansy ragwort

***Restore NXT* at 453 mL per acre plus 437 grams ae per acre 2,4-D will control all the weeds by 453 mL per acre of *Restore NXT* alone and all the weeds listed on the 2,4-D label at 437 grams ae per acre plus:**
- absinth wormwood**
- dandelion**

***Restore NXT* at 607 mL per acre will control:**

- *Weeds controlled by Restore NXT at 453 mL per acre above plus:*
  - Absinth wormwood
  - Annual sowthistle (up to 3 cm)
  - Canada goldenrod*
  - Cleavers (up to 10 cm)
  - Common tansy*
  - Common yarrow*
  - Dandelion*
  - Diffuse knapweed (bolting)*
  - Fireweed
  - Lamb's quarters (prior to bud stage)
  - Mullein
  - Orange hawkweed (bolting)****
  - Prickly lettuce
  - Purple loosestrife
  - Russian knapweed (bud to flowering)*
  - Scotch thistle
  - Wild caraway
  - Wild parsnip

***Restore NXT* at 607 mL per acre plus 583 grams ae per acre 2,4-D will control all the weeds by 607 mL per acre of *Restore NXT* alone and all the weeds listed on the 2,4-D label at 583 grams ae per acre plus:**

- common tansy**

***Suppression only.**
****Season long control**
*****top growth control**
******seasonal and 12 month control**

Individual plant or spot strip applications: 15 mL of *Restore NXT* plus 50 mL of surfactant (surfactant such as *Gateway* adjuvant, MSO, NIS (such as *Ag-Surf, Agral 90* or *Citowett Plus*) per 10 L of spray solution. Thoroughly and uniformly wet the foliage of all target plants but not to the point of runoff.

Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Application Information:

- **Water Volume:**
  - ***Ground:*** Minimum 80 L per acre.
  - ***Aerial:*** 12 L per acre minimum. For better coverage apply at 20 L per acre.

Nozzles and Pressure: Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ASABE coarse droplets by ground or by air.

- For applications by air: Reduce drift caused by turbulent wingtip vortices. Nozzle distribution along the spray boom length MUST NOT exceed 65% of the wing- or rotorspan. Nozzles must always point backward parallel with the air stream and never be pointed downwards more than 45 degrees.
- Do not apply during periods of dead calm or when wind velocity and direction pose a risk of spray drift. Do not spray when the wind is blowing towards a nearby sensitive crop, garden, terrestrial habitat (such as shelter-belt).
- Avoid application within the dripline (outermost edge of the tree canopy) of desirable coniferous and deciduous trees unless injury can be tolerated.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Introduction section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
Aminopyralid	POST (foliar) also has soil activity	Synthetic auxin	Throughout the plant (Symplast)	Broadleaf only	4
Florpyrauxifen	POST (foliar)	Synthetic auxin	Throughout the plant (Symplast)	Broadleaf only	4

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides:

- Permanent pasture and rangeland: 2,4-D

Fungicides: None registered.
Insecticides: None registered.
Fertilizers: None registered.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction

Restrictions:

- **Rainfall:** Avoid application when heavy rain is in the forecast. Contact manufacturer for more information.
- **Re-entry:** DO NOT re-enter treated fields for 12 hours.
- **Grazing:** The following restrictions for livestock or lactating dairy animals grazing in treated areas must be followed:
  - Forage: Grazing/feeding is permitted on the day of application (0 days)
  - Hay: Allow 7 days after application to cut or feed hay.
  - Allow 3 days of grazing on an untreated pasture (or feed untreated hay) before transferring livestock to areas where sensitive broadleaf crops may be grown.
  - Do not transfer livestock from treated grazing areas onto broadleaf crop areas without first allowing 3 days of grazing on untreated grass pasture.
- **Re-cropping:** DO NOT use if legumes are essential in a pasture. DO NOT break up treated pasture and plant to sensitive broadleaf crops for at least 3 years after application.
  - Aerial Application: May be applied by aircraft.
  - Storage: Store this product away from food or feed. Store product in original, labelled containers in a secure, dry, cool area. DO NOT freeze.
  - **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1	
Ground*	5	3	10
Fixed wing aircraft	275	150	225
Helicopter	125	75	150

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70% when using shrouds and by 30% when using cones mounted less than 12 inches from the crop canopy.**
† Distance is measured from the downwind edge of the boom to sensitive areas.

To reduce runoff from treated areas into aquatic habitats avoid application to areas with a moderate to steep slope, compacted soil, or clay. Avoid application when heavy rain is forecast. Contamination of aquatic areas as a result of runoff may be reduced by including a vegetative filter strip between the treated area and the edge of the water body.

Sprayer Cleaning:

Refer to 'Method A,' in the general section on sprayer cleaning in the Introduction. Let solution stand for an extended period for better results. Flush sprayer system with water. See the label for product specific cleaning details.

Hazard Rating:

None listed.

Reward

Herbicide Group 22 - diquat

Company:
Syngenta Canada (PCP#26271)

Formulation:
240 g/L diquat formulated as a solution.
- Container size - 4 x 3.78 L

Use:
For use in farm dugouts and other clear, slow moving water bodies to control water weeds, such as:
- Canada water weed
- Coontail
- Duckweed
- Flowering rush
- Pond weeds
- Water milfoil

Offers temporary control of certain species of algae.
High levels of suspended organic matter or clay particles in water will reduce control.
NOTE: A permit must be obtained from Saskatchewan Water Security Agency or Manitoba Sustainable Development for application of pesticides directly to or within a set distance of water bodies that are not wholly contained within a private parcel of land.

Timing:
Mid-May through late June when water weeds or algae are actively growing. Apply before weeds have developed a heavy mat of growth for effective control.

Rates:
Dugouts less than 5 feet (1.5 m) deep: Apply *Reward* at 7.4 L per acre.
- At this rate, 2.2 L of *Reward* will treat a dugout that is 160 feet by 80 feet (49 m x 24.4 m).

Dugouts more than 5 feet (1.5 m) deep: Apply *Reward* at 10.1 to 11.8 L per acre.
- At these rates, a dugout that is 160 feet by 80 feet (49 m x 24.4 m) will require 3.0 to 3.5 L of *Reward*. Milfoil can be controlled in early stages by 3.7 L per acre in early stages of growth.

Application:
- Dilute 1 part *Reward* with 4 parts clean water.
- Spray over the water surface, inject below the water surface or pour directly onto the water surface from a moving boat or for small water bodies, apply from the banks. See label for detailed instructions. Note: *Reward* is bound rapidly to soil, so material must enter the water directly to be effective.

How it Works:
Reward is a non-volatile fast acting herbicide for the control of water weeds. Control of susceptible weeds generally occurs within 1 to 2 weeks. *Reward* is inactivated upon contact with soil, mud or lake bottoms. Therefore, it has no residual herbicidal effect.

Restrictions:
- **Grazing Restrictions:** DO NOT use water for animal consumption for 24 hours after application.
- **Irrigation:** DO NOT use water for irrigation for 5 days after application.
- **Domestic Use:** DO NOT use water for human consumption for 5 days after application. DO NOT swim in water for 24 hours after treatment.
- **Storage:** DO NOT freeze.
- **Environment:** If weed growth is dense, protect fish by not treating more than one-fourth of dugout at a time.

Equipment Clean Out:
Refer to 'Method C' in the general section on sprayer cleaning in the introduction.

Hazard Rating:
Warning – Poison

Caution – Skin Irritant, Potential Skin Sensitizer

Refer to the Introduction for an explanation of the symbols.

Rexade

Herbicide Group
2 - pyroxsulam
4 - halauxifen, 2,4-D

Company:
Corteva Agriscience

Formulation:
***Rexade A* (PCP #32520):** 5% halauxifen and 15% pyroxsulam formulated as water dispersible granules.
- Container size - 1 x 1.62 kg jug

***Rexade B* (PCP #32294):** 660 g/L 2,4-D ester formulated as an emulsifiable concentrate.
- Container size - 1 x 8.58 L jug

Crops and Staging:
Wheat (Spring, Durum, Winter): From the 2 leaf stage up to the emergence of the flag leaf.

Weeds, Rates and Staging:
Use *Rexade A* at 40.5 grams per acre and *Rexade B* at 215 mL per acre for control or suppression of following weed species.

Weeds controlled:
- ***Grasses: 1 to 5 leaf stage unless otherwise indicated.***
  - Barnyard grass
  - Brome, Japanese (1 to 6 leaf stage)
  - Brome, Downy (2 to 6 leaf, 4 tillers)[§]
  - Foxtail (green[§], yellow)
  - Wild oats (up to 4 leaf, 2 tiller)
- ***Broadleaves:***
  - American dragonhead (up to bud stage and 15 cm in height)
  - Annual sow-thistle[§] (up to 5 leaf)
  - Annual (wild) sunflower
  - Bluebur
  - Burdock
  - Canada fleabane (up to 15 cm height)
  - Canada thistle (up to 30 cm tall, pre bud stage)[§]
  - Chickweed, common (up to 10 cm)
  - Cleavers[†] (1 to 9 whorl)
  - Cocklebur
  - Corn spurry (up to 2 whorl stage, <10 cm in height)
  - Cow cockle
  - Dandelion (seedlings and overwintered rosettes, up to 20 cm)[§]
  - Flixweed (up to 10 cm)
  - Hemp-nettle[†]
  - Henbit (up to bud stage, 15 cm tall)
  - Kochia[**†§]
  - Lamb's-quarters[†]
  - Mustard (except dog and green tansy)
  - Night-flowering catchfly[§] (up to bolting stage, up to 15 cm height)
  - Plantain
  - Prickly lettuce
  - Ragweed (common, giant)
  - Redroot pigweed[†]
  - Round-leaved mallow (up to 6 leaf stage, < 10 cm height)
  - Russian thistle
  - Smartweed (1 to 5 leaf stage)
  - Shepherd's purse (up to 30 cm tall)
  - Stinkweed (up to 30 cm tall)
  - Stork's-bill (up to 8 leaf stage)
  - Sweet clover
  - Velvetleaf (up to 5 leaf stage)
  - Volunteer alfalfa (up to 25 cm height)
  - Volunteer canola (1 to 6 leaf stage)
  - Volunteer flax (up to 15 cm height)
  - Volunteer sunflower
  - White cockle (up to bud stage, less than 15 cm height)[§§]
  - Wild buckwheat
  - Wild radish

[§] Suppression only.
[§§] Season long control.
**** Light to moderate infestations (suppression of up to 150 plants per m^2, up to 15 cm in height control of up to 50 plants per m^2, up to 10 cm in height when tankmixed with 2,4-D).**
[†] Including group 2 resistant biotypes.

Application Information:
- **Water volume:**
  - ***Ground:*** 20 to 40 L per acre
  - ***Aerial:*** 12 L per acre
- **Nozzles and Pressure:** Use boom pressure of 235 kPa or less. Use nozzles and pressure designed to produce ***ASABE coarse*** droplets. To reduce drift caused by turbulent wingtip vortices, the nozzle distribution along the spray boom length must not exceed 65 percent of the wing or rotor span.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
pyroxsulam	POST (foliar)	ALS Amino Acid Inhibitor	Toward areas of growth (Symplast)	Broadleaf & grass	2
halauxifen	POST (foliar)	Synthetic Auxin	Throughout the plant (Symplast)	Broadleaf only	4
2,4-D	POST (foliar)	Synthetic Auxin	Throughout the plant (Symplast)	Broadleaf only	4

Effects of Growing Conditions:

Weeds hardened off by cold weather or drought stress may not be adequately controlled or suppressed and re-growth may occur.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides:

- 2,4-D ester up to an additional 70 g ae per acre (see 2,4-D).

Insecticides: None registered.

Fungicide: None registered.

Fertilizers: None registered.

Adding ingredients in the correct order is critical for optimum performance. Check label of both products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 2 hours may reduce control.
- **Restricted Entry Interval:** DO NOT re-enter treated field until 12 hours post-application.
- **Grazing Restrictions:** DO NOT graze treated crops or cut for hay within 7 days of application.
- **Pre-harvest Interval:** DO NOT harvest treated crops for 50 days after application.
- **Re-cropping Interval:** Fields can be re-seeded 11 months with spring barley, spring wheat, oats, canola, flax, brown and yellow mustard, canola quality *Brassica juncea*, field peas and soybeans or fields can be fallowed. Sunflowers can be planted 10 months and lentils 22 months after application.
- **Aerial Application:** May be applied by air.
- **Storage:** Store in original containers in dry well ventilated storage. Store in heated storage. If the product is frozen, bring to room temperature and agitate before use.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Freshwater Habitat of Depths:		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground sprayer	1	**1**	2
Fixed wing aircraft	5	**1**	90
Helicopter	5	**1**	75

See the Key to Product Pages in the introduction for an explanation of the different habitats.

*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**

† Distance is measured from the downwind edge of the boom to sensitive areas.

Sprayer Cleaning:

Refer to 'Method B' in the general section on sprayer cleaning in the introduction. Let solution stand for an extended period for better results. Flush sprayer system with water before reuse. See the label for product specific cleaning details.

Hazard Rating:

Rexade A:

Caution – Eye Irritant

Rexade B:

Caution – Poison

Warning – Skin Irritant

Potential Skin Sensitizer

When handling more than 400 L of *Rexade B* (2,4-D) per day use a close transfer system.

Refer to the Introduction for an explanation of the symbols.

Rezuvant*/Rezuvant XL

Herbicide Group
1 - pinoxaden
4 - halauxifen, fluroxypyr

Rezuvant *is the equivalent of a prepackaged tank mix of Pixxaro A and Axial (see pinoxaden). Information listed is restricted to Crop, Weeds, Rates and Tank mixes. For other detailed restrictions and other general information on the component products see the product pages listed above.*
** **Note:** This product is no longer manufactured but inventories may still remain in distribution. This product may be removed from future editions.*

Company:
Corteva Agriscience

Formulation:
The *Rezuvant* package contains the following components:
***Rezuvant A* (PCP#33262):** 16.2 g/L halauxifen and 250 g/L fluroxypyr present as ester and formulated as an emulsifiable concentrate.
- Container sizes - 4.9 L, 2 x 9.8 L

***Rezuvant B* (PCP#33277):** 50 g/L pinoxaden formulated as an emulsifiable concentrate.
- Container sizes - 2 x 10 L, 80 L

***Rezuvant XL* (PCP#34045):** 4.2 g/L halauxifen, 104.2 g/L fluroxypyr, 50 g/L pinoxaden co-formulated as an emulsifiable concentrate.
- Container sizes - 2 x 9.7 L, 116.4 L

Crops and Staging:
Wheat (spring, winter) and barley: 3 leaf stage to just prior to emergence of the flag leaf.

Weeds and Staging:
Apply to actively growing weeds up to 10 cm high or wide unless otherwise specified:
- ***Grass weeds controlled by* Axial *plus the following broadleaf weeds from 1 to 8 leaf stage, unless otherwise indicated:***
  - American dragonhead (up to bud stage[†])[§]
  - Chickweed
  - Cleavers (1 to 9 whorl)
  - Cow cockle (8 leaf[†])[§]
  - Fleabane, Canada[†]
  - Flixweed (up to 8 leaf & 8 cm)
  - Hemp-nettle
  - Henbit (up to bud stage[†])[§]
  - Kochia[†]
  - Lamb's-quarters
  - Nightshade (eastern, black, hairy and cutleaf/wild tomato)[††]
  - Ragweed (common[††], giant)
  - Redroot pigweed
  - Round-leaved mallow[††]
  - Russian thistle*[§]
  - Shepherd's-purse (to bolting or 20 cm)
  - Sow-thistle, annual* (to 5 leaf)
  - Stork's-bill
  - Velvetleaf (1 to 5 leaf stage)
  - Volunteer alfalfa (to 25 cm)
  - Volunteer flax[†]
  - Wild buckwheat
  - Wild mustard (to 4 leaf or 10 cm)[§§]

*** Suppression only.**
[†] Up to 15 cm in height.
[††] 1 to 6 leaf stage.
[§] *Rezuvant XL* only.
[§§] Suppression with *Rezuvant* and control with *Rezuvant XL*.

Rates:
Note: Maximum of ONE APPLICATION of this or other products containing pinoxaden per year.
Rezuvant A: 125 mL per acre
-plus-
***Rezuvant B*:** 500 mL per acre
-or-
Rezuvant XL: 486 mL per acre
Rezuvant/Rezuvant XL is intended to be used with the addition of MCPA Ester 600 at the rate of 188 to 290 mL per acre. MCPA Ester 600 is not included in the *Rezuvant* packages and must be purchased separately.
Addition of surfactant is NOT required. Use the spray suspension as soon as it is prepared. Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Application Information:
- **Water volume:**
  - ***Ground:*** Minimum 20 to 40 L per acre
  - ***Aerial:*** 12 L per acre
- **Nozzles and Pressure:** Use boom pressure of 200 to 275 kPa. Use nozzles and pressure designed to produce ***ASABE coarse*** droplets. To reduce drift caused by turbulent wingtip vortices, the nozzle distribution along the spray boom length must not exceed 65 percent of the wing or rotor span.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
pinoxaden	POST (foliar)	ACCase Lipid synthesis inhibitor	Toward areas of growth (symplast)	Grasses only	1
fluroxypyr	POST (foliar)	Synthetic auxin	Moves throughout plant (symplast)	Broadleaf only	4
halauxifen	POST (foliar)	Synthetic auxin	Moves throughout plant (symplast)	Broadleaf only	4

Effects of Growing Conditions:

Extreme growing conditions such as drought or near freezing temperature prior to, at or following time of application may reduce weed control and increase the risk of crop injury at all stages of growth. If foliage is wet at the time of application, control may be decreased. Under conditions of low crop and high weed density, control may be reduced.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides:

- ***Wheat (spring, winter) and barley:***
  - MCPA 600 ester (188 to 280 mL per acre).
  - 2,4-D 700 ester (174 to 214 mL per acre).

Insecticides: None registered.

Fungicide: None registered.

Fertilizers: None registered.

Note: The above mixes are those listed on the *Rezuvant/Rezuvant XL* label only.

Off-label tank mixes, as previously permitted under the Pest Management Regulatory Agency (PMRA) Off-label Tank Mix Policy memo of 2009 are no longer allowed under new guidance from PMRA. As of December 20, 2022 only products specifically indicated on product labels may be mixed, or when the labels of two or more products to be mixed include the statement quoted in the introduction. As of December 2024 this memo will no longer be recognized by Health Canada.

Adding ingredients in the correct order is critical for optimum performance. Check label of both products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 1 hour of application may reduce control.
- **Restricted Entry Interval:** DO NOT re-enter treated fields for 12 hours.
- **Grazing Restrictions:** DO NOT graze treated crops within 7 days of application. DO NOT cut the treated crop for hay or silage within 30 days after application.
- **Pre-harvest Interval:** DO NOT harvest treated crops for 60 days after application.
- **Re-cropping Interval:** Fields can be re-seeded after a minimum of 10 months with spring wheat, barley, oats, canola, corn, soybeans, sunflowers, flax, field peas, potatoes (except seed potatoes), mustard, alfalfa, dry bean (*Phaseolus vulgaris* species including pinto, kidney and white types) and timothy or fields can be summer fallowed. Lentils can be planted 22 months after application.
- **Aerial Application:** May be applied by air.
- **Storage:** Store in a cool, dry place. Avoid freezing. If frozen, bring to room temperature and agitate before use.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Freshwater Habitat of Depths:		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground sprayer	1	**1**	3
Fixed wing aircraft	5	**1**	100
Helicopter	5	**1**	90

See the Key to Product Pages in the introduction for an explanation of the different habitats.

*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**

† Distance is measured from the downwind edge of the boom to sensitive areas.

Sprayer Cleaning:

This product utilizes a combination of 'Method A' and 'Method B' for cleanout requiring the use of All Clear Spray Tank Decontaminator for the tank plus ammonia for nozzles screens and filters for the second rinse. Refer to the general section on sprayer cleaning in introduction. Let solution stand for an extended period for better results. Flush sprayer system with water before reuse. See the label for product specific cleaning details.

Hazard Rating:

Rezuvant A:

Warning – Eye and Skin Irritant

Potential Skin Sensitizer

Rezuvant B:

Danger – Eye and Skin Irritant

Rezuvant XL:

Potential Skin Sensitizer

Refer to the Introduction for an explanation of the symbols.

See component products for more information on restrictions, application details and handling. Unless indicated differently above use the most limiting restrictions across all components for the mix.

Rimsulfuron

Herbicide Group 2 - rimsulfuron

Company:

Corteva Agriscience (*Prism SG*)
Sharda Cropchem Canada (*Sharda Rimsulfuron*)
Albaugh (*Hinge*)

Formulation:

***Prism SG* (PCP#30057); *Hinge* (PCP#34352):** 25% rimsulfuron formulated as a water soluble granule.

- Container size - 480 g

***Sharda Rimsulfuron* (PCP#32932):** 25% rimsulfuron formulated as a water dispersible granule.

- Container size - 480 g

Crops and Staging:

Irrigated potato*: prior to flower initiation. Potato tolerance differs by variety. Limit first use to a small area of each variety prior to widespread adoption in the field. Delay cultivation for 7 to 10 days after application.

Field Corn in the Red River Valley of Manitoba only (*Hinge* and *Sharda Rimsulfuron* only):**

- ***Pre-emergent surface:*** Apply to the soil surface after seeding but before the emergence of the crop and weeds.
- ***Post emergent**:*** Coleoptile leaf (spike) to 3 leaves (2 collars visible) or 20 cm in height - leaf extended.

**** NOTE: Since application to irrigated potato in western Canada has been registered under the User Requested Minor Use program, the manufacturer assumes no responsibility for herbicide performance. Application to irrigated potato in western Canada is at the risk of the user.***

***** NOTE: Corn hybrids with heat unit ratings of less than 2500 CHU have shown sensitivity to rimsulfuron. DO NOT make post-emergent applications to corn varieties with less than 2500 CHU or in areas with less than 2500 CHU on average. Some corn hybrids with CHU ratings of greater than 2500 may also be injured by rimsulfuron. Consult with corn seed suppliers on which varieties are sensitive to rimsulfuron.***

Weeds, Rates and Staging:

Note: Maximum of 6 grams per acre of the active ingredient rimsulfuron per acre (this equates to 24 g rimsulfuron products per acre) PER YEAR.

24 grams per acre controls the following weeds at the stage indicated:

Weeds	Weed Stage
Barnyard grass, foxtail (green, yellow*)	Pre-emergence
Barnyard grass, foxtail (green, yellow), witch grass	1 to 6 leaf, maximum 2 tillers

Weeds	Weed Stage
Quackgrass	3 to 6 leaf (less than 10 inches or 25 cm leaf extended)
Lamb's-quarters*, redroot pigweed	4 to 6 leaf (less than 4 inches or 10 cm tall or across)

*** Suppression.**

Add a recommended non-ionic surfactant such as *Citowett Plus*, *Agsurf II*, or *Agral 90* at 0.2 L per 100 L spray solution.

Refer to the product label for complete mixing instructions for this product and its mixes. A general guide to mixing can be found in the introduction.

Application Information:

- **Water Volume:** Minimum 40 L per acre.
- **Nozzles and Pressure:** 25 to 40 psi (175 to 275 kPa) when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage of ***ASABE medium*** droplets.
- **Screens:** Use a 50 mesh or coarser screen and filter system.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
rimsulfuron	POST (foliar)	ALS Amino Acid Inhibitor	Toward areas of growth (Symplast)	Broadleaf & grass	2

Effects of Growing Conditions:

Apply when the temperature 24 hours before and after application is between 5°C and 28°C. Temperatures beyond this range increase the potential for crop injury. Rapid fluctuations in temperature will stress the crop (greater than a 20°C difference within 24 to 36 hours). Allow 48 to 72 hours for the crop to acclimatize before spraying if severe temperature fluctuations occur.

Crop injury may result if applications are made when potatoes are stressed by abnormally hot, humid, or cold weather conditions, frost, low fertility, drought, water saturated soil, compacted soil, previous pesticide applications, disease or insect damage. If potatoes have been injured by frost, wait 48 to 72 hours after normal growing conditions have resumed before applying.

Warm, moist conditions after application promote good weed control while cool and/or dry conditions may reduce or delay activity. Weeds hardened off by cold weather or drought stress may not be controlled.

Tank Mixes:

None registered.

Restrictions:

- **Rainfall:** Within 2 to 4 hours may reduce control.
- **Restricted Entry Interval:** DO NOT enter treated fields for at least 12 hours.
- **Pre-harvest Interval:** Leave 30 days from application to harvest.
- **Grazing Restrictions:** DO NOT graze the treated crop or cut for hay.
- **Re-cropping Interval:** Field corn may be planted any time after application. Winter wheat may be planted 4 months after application. Barley, canola*, chickpeas*, clover (red)*, corn (including sweet and seed*), dry bean*, faba bean*, field pea*, flax*, lentil*, oats*, potato, soybean*, sorghum*, wheat (spring, winter, durum*) and sunflowers* may be planted the year after application. For all other crops, a field bioassay is recommended before planting.
  ***Prism SG* only.**
- **Aerial Application:** DO NOT apply by air.
- **Storage:** May be frozen.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground only*	1	1	5

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

- DO NOT apply in areas where surface water from the treated area can run off to adjacent cropland, streams, irrigation water or wells.

Sprayer Cleaning:
Refer to 'Method A' found in the general sprayer cleaning section in the introduction. Check the label or contact the manufacturer for more specific sprayer cleaning information information.

Hazard Rating:
Warning – Eye Irritant

Warning – Contains the Allergen Sodium Sulfite

Refer to the Introduction for an explanation of the symbols.

Roundup Xtend*/Roundup Xtend 2

Herbicide Group
9 - glyphosate
4 - dicamba

** **Note:** This product is no longer manufactured but inventories still remain in distribution. This product may be removed from future editions.*

Company:
Bayer

Formulation:
***Roundup Xtend* (PCP#32274)*:** 240 g ae/L glyphosate and 120 g/L dicamba both present as monoethanolamine salts, formulated as a solution.

- Container size - 2 x 10 L

***Roundup Xtend 2* (PCP#33502)*:** 317 g ae/L glyphosate present as the monoethanolamine salt plus 159 g/L dicamba present as the diglycolamine salt, formulated as a solution.

- Container size - 10 L, 450 L

Roundup Xtend and *Roundup Xtend 2* also contain ingredients within the formulation to reduce volatility (i.e. *VaporGrip Technology*).

Crops and Staging:
Glyphosate+dicamba tolerant (RR2 Xtend) soybean:

- ***Pre-plant or pre-emergence***: Apply any time prior to the emergence of the crop.
- ***Post-emergence:*** Apply once or twice, at least two weeks apart, up to the early flower stage (R1).

Corn hybrids with Roundup Ready 2 Technology:

- ***Pre-emergence:*** Apply prior to the emergence of the crop.
- ***Post-emergence:*** Spike to 5-leaf stage

Note: The use of this chemical may result in contamination of groundwater, particularly in areas where soils are permeable (e.g. sand, loamy sand and sandy loam soils) and/or the depth to the water table is shallow. Avoid use in these situations.

Weeds, Staging and Rates:
Apply to small actively growing weeds that are less than 4 inches (10 cm) in height or width. Early applications when the weeds are small reduce early season weed competition and provide maximum yield potential.

Note: DO NOT add acidifying buffering agents, acidic pH adjusting agents or adjuvants other than agriculturally approved NIS to the spray solution. DO NOT add ammonium sulfate (AMS), AMS-containing adjuvants, water conditioners, or sprayable fluid fertilizers.

Roundup Xtend (L per acre):	*Roundup Xtend 2* (L per acre)	Weeds controlled:		
1.0	0.77	**Annual broadleaf weeds:** Buckwheat (tartary, wild) Chickweed Cleavers Corn spurry Cow cockle Flixweed Hemp-nettle Narrow-leaved hawk's-beard Night-flowering catchfly Kochia Lamb's-quarters	Mustard, wild Pigweed, redroot Shepherd's-purse Smartweed (green, lady's-thumb) Stinkweed Stork's-bill Russian thistle Volunteer canola (non glyphosate-tolerant) Wild tomato	**Annual grass weeds:** Barnyard grass Green foxtail Volunteer barley Volunteer wheat Wild oats **Perennial weeds:** Canada thistle* Dandelion (suppression only) Foxtail barley* Quackgrass Sow-thistle (perennial)*

Roundup Xtend (L per acre):	*Roundup Xtend 2* (L per acre)	Weeds controlled:
1.5	1.14	*All weeds listed above plus:* **Annual broadleaf weeds:** Biennial wormwood (2 to 8 leaf stage) Bur cucumber (up to 18 leaf stage)* Cocklebur Canada fleabane (post-emergent up to 8 cm) Eastern black nightshade Narrow-leaved vetch Pigweed (smooth) Prickly lettuce Ragweed (common) Round-leaved mallow* Smartweed (Pennsylvania) Sow-thistle (annual) Stork's-bill Velvetleaf Volunteer flax **Annual grass weeds:** Annual blue grass Downy brome Persian darnel Yellow foxtail Proso millet **Perennial weeds:** Common milkweed* Dandelion (pre-emergent to crop) Dandelion ** Field bindweed* Foxtail barley Yellow nutsedge*
2.0	1.52	*All weeds listed above plus:* Mustard (hare's ear, Indian, tumble, wormseed) Russian pigweed Ragweed (false, giant) **Short term residual activity on annual broadleaf weeds:** Lamb's-quarters Redroot pigweed Ragweed (common) Velvetleaf (suppression only) Wild buckwheat

*** Single application provides suppression. Sequential applications provide control. For sequential applications, ensure the crop has not advanced beyond the recommended growth stage. The sequential application should be applied at least two weeks after the first application.**

**** Control with a single application prior to seeding in the spring. The addition of 360 g ae per acre of addition glyphosate (see tank mixes) will improve control of heavy infestation and plants over 15 cm (6 inches) across.**

***NOTE: The 2 L per acre rate of* Roundup Xtend*, or the 1.52 L per acre rate of* Roundup Xtend 2 *to be used only once in a growing season. DO NOT exceed the maximum season total of 4 L per acre of* Roundup Xtend *or 3 L per acre of* Roundup Xtend 2.**

Application Information:

DO NOT allow herbicide solution to mist, drip, drift or splash onto desirable vegetation because severe injury or destruction to desirable broadleaf plants could result. Apply when air temperature is between 10 and 25°C. DO NOT spray when the temperature is expected to exceed 30°C.

When applying *Roundup Xtend* adjacent to sensitive crops, apply as a pre-plant, pre-emergent or early post-emergent treatment to avoid potential drift onto the sensitive crops.

- **Water Volume:** Minimum 40 L per acre.
- **Nozzles and Pressure:** Use only spray nozzles that produce ***ASABE S-572.1Extremely Coarse (XC) to Ultra Coarse (UC)*** spray qualities and minimal amounts of fine spray droplets. ***DO NOT use conventional flat fan nozzles that produce Medium or Fine spray qualities***. Adjust pressure for selected nozzles to maintain XC to UC spray qualities. Use at least 30 psi (200 kPa) to ensure proper pattern overlap and check this visually.

DO NOT apply during a temperature inversion because off-target movement potential is high. Temperature inversions increase drift potential because fine droplets may remain suspended after application and move in unpredictable directions with light and variable wind. (See 'Avoiding Spray Drift' in introduction for more information on how to avoid drift.)

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
glyphosate	POST (foliar)	EPSP Amino Acid Synthesis Inhibitor	Toward areas of growth (Symplast)	Broadleaf & grass	9
dicamba	POST (foliar) also has soil activity	Synthetic Auxin	Throughout the plant (Symplast)	Broadleaf only	4

Effects of Growing Conditions:

Reduced control may result if treatments are made during poor growing conditions such as drought stress, disease or insect damage, or if weeds have been mowed, grazed or cut. Heavy dust on foliage or a crop or weed canopy covering smaller weeds may also reduce control. Extremely cool or cloudy weather following treatment or prolonged drought conditions may slow activity of this product and delay the visual effects of control.

Tank Mixes:

DO NOT add acidifying buffering agents, acidic pH adjusting agents or adjuvants other than agriculturally approved NIS to the spray solution. DO NOT add ammonium sulfate (AMS), AMS-containing adjuvants, water conditioners, or sprayable fluid fertilizers. Non-ionic surfactant (minimum 70 percent active) may be added to the spray solution at 0.25 L per 100 L of spray solution.

Herbicides:

- Glyphosate *(Roundup brands)* – top up of total glyphosate to a maximum of 720 g ae per acre.

Fungicides: None registered.
Insecticides: None registered.
Fertilizers: None registered.

According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 4 hours of application may reduce control.
- **Restricted Entry Interval:** DO NOT enter treated fields for 12 hours following application.
- **Pre-harvest Interval:** 7 to 10 days for soybean forage and 13 to 15 days for soybean hay.
- **Grazing Restrictions:** DO NOT permit lactating dairy animals to graze fields within 7 days after application.
  DO NOT harvest forage or cut hay within 30 days after application. Withdraw meat animals from treated fields at least 3 days before slaughter.
- **Re-cropping Interval:** A plant back interval of 120 days is required for those crops not on the label.
- **Aerial Application:** DO NOT apply by aircraft.
- **Storage:** Store above -10°C to keep product in solution. If the product freezes and crystals form, place in a warm room (20°C), allow the product to reach room temperature and roll or shake periodically until crystals have re-dissolved.
- **Buffer Zones:**

Method of application	Buffer Zones (metres†) required for the protection of:	
	Aquatic Habitat	Terrestrial Habitat
Field sprayer	15	15

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance is measured from the downwind edge of the boom to sensitive areas.

Sprayer Cleaning:

Refer to 'Method A or B' in the general section on sprayer cleaning in the introduction. Let solution stand for an extended period for better results. Flush sprayer system with water. See the label for product specific cleaning details.

Hazard Rating:

No specific hazards indicated. Wear chemical resistant clothing, gloves and footwear to load mix and cleanup. Avoid direct inhalation of spray mist.

Samurai Master

Herbicide Group
1 - clethodim
2 - imazamox

This product is a prepackaged tank mix of Samurai (see Imazamox) and Independence (see Clethodim). Information listed is restricted to Crops, Weeds, Rates and Tank mixes. For other detailed restrictions and other general information on the component products see the product pages listed above.

Company:
AgraCity

Formulation:
The *Samurai Master* package contains the following components:
***Samurai* (PCP#33033):** 70% imazamox formulated as a water dispersible granule.
- Container size - 4 x 470 g

-plus-
***Independence* (PCP#32851):** 240 g/L clethodim formulated as an emulsifiable concentrate.
- Container size - 8 L

Crops and Staging:

Crop	Leaf Stage	Days to Harvest
Field pea	1 to 6 true leaf stage	75

Weeds and Staging:
Weeds controlled by *Samurai* at 11.7 grams per acre plus the weeds controlled by *Independence* at 50 mL per acre
Samurai Master requires the addition of *Assassin* or *Merge* adjuvant at 0.5 L per 100 L of spray solution, and which must be purchased separately.
Note: Maximum of ONE APPLICATION of this or other products containing imazamox per year.

Tank Mixes:
None registered.

See component products for more information on restrictions, application details and handling. Unless indicated differently above use the most limiting restrictions across all components for the mix.

Select Plus

Herbicide Group
1 – clethodim, quizalofop

Company:
UPL AgroSolutions Canada (*Select Plus* – PCP#34744 & *Amigo* – PCP#22644)

Formulation:
240 g/L of clethodim and 120 g/L of quizalofop-p-ethyl formulated as an emulsifiable concentrate
- Container size – 3 L *Select Plus* + 9 L *Amigo*

Crops and Staging:
Crops are tolerant at all growth stages at maximum rate, but pre-harvest intervals must be observed to prevent excess residue in the grain (see "Restrictions" section below).

Crops:
- Alfalfa (grown for seed)
- Canola
- Chickpea
- Dry bean
- Faba bean
- Field pea
- Flax
- Lentil
- Mustard, condiment (brown, oriental, yellow)
- Soybean

Weeds, Rates and Staging:
Apply *Select Plus* at 51 to 76 mL per plus *Amigo Adjuvant* at 0.5 L per 100 L solution.
Unless otherwise noted below, apply to young and actively growing weeds that are at 2 to 6 leaf stage (prior to tillering)

Weeds Controlled:
- Barnyard grass
- Fall panicum
- Foxtail barley*
- Green foxtail
- Japanese brome*
- Persian darnel**
- Proso millet
- Smooth crabgrass**
- Volunteer barley
- Volunteer canary grass
- Volunteer corn
- Volunteer oat
- Volunteer wheat
- Wild oat
- Witchgrass
- Yellow foxtail

*Apply at 76 mL per acre to control at 2 to 6 leaf plus 3 tillers.
**Control only at 76 mL per acre rate

Application Information:
- **Water Volume:**
  - ***Ground:*** 22.5 to 45 L per acre
  - ***Aerial:*** minimum of 11 L per acre
- **Nozzles and Pressure:** Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ASAE S572.1 droplets by ground or air.
- **Screens:** Use a 50 mesh or coarser screen and filter system.

How it Works:
Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
clethodim	POST (foliar)	ACCase Lipid Synthesis Inhibitor	Towards regions of growth (Symplast)	Grasses only	1
quizalofop-p-ethyl	POST (foliar)	ACCase Lipid Synthesis Inhibitor	Toward regions of growth (Symplast)	Grasses only	1

Effects of Growing Conditions:
Select Plus will be less effective when plants are stressed by the lack of moisture, excessive moisture, low temperatures and/or very low relative humidity. Regrowth by tillering may occur if application is made under any of the above stress conditions.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides:

- ***In glufosinate ammonium tolerant canola:***
  - *Interline* at 1.08 to 1.6 L per acre
  - *Interline* at 1.35 L per acre + Facet L at 113 mL per acre
- ***In canola:***
  - Lontrel 360
- ***In flax:***
  - *Buctril M*
  - *Logic M*
  - *Curtail M*
  - Lontrel 360 at 227 to 336 mL per acre
  - MCPA Ester 600 at 283 mL per acre
- ***In field pea:***
  - *Odyssey* at 11.7 to 17.4 grams per acre

Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found in the Introduction.

Restrictions:

- **Rainfall:** Within 1 hour of application may reduce control.
- **Re-entry:** DO NOT re-enter treated fields for 12 hours.
- **Pre-harvest Interval:** Canola, mustard – 64 days; dry bean, faba bean, lentil – 65 days; field peas – 75 days; soybeans – 80 days; flax - 82 days; chickpea - 85 days.
- **Grazing:** DO NOT graze treated fields.
- **Re-cropping:** No restrictions. A 30-day plant back interval should be observed for all unlabeled crops.
- **Aerial Application:** DO NOT apply to alfalfa by air.
- **Storage:** DO NOT freeze. Store this product away from food or feed. Store in a cool, dry place.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1	
Field sprayer	1	1	2
Fixed wing aircraft	3	1	40
Helicopter	1	1	40

See the Key to Product Pages in the introduction for an explanation of the different habitats.
***Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy. †Distance is measured from the downwind edge of the boom to sensitive areas.**

Sprayer Cleaning:

Refer to 'Method B' in the general section on sprayer cleaning in the Introduction. Let solution stand for an extended period for better results. Flush sprayer system with water. See the label for product specific cleaning details.

Hazard Rating:

None.

Sentrallas

Herbicide Group
2 - thifensulfuron-methyl
4 - fluroxypyr

Company:
FMC of Canada distributed by Loveland Canada

Formulation:
***Sentrallas* (PCP# 32143):** 30 g/L thifensulfuron-methyl plus 150 g/L fluroxypyr formulated as a suspension.
- Container size - 2 x 8 L jug

Crops and Staging:
Spring wheat, durum, barley and oats: 2-leaf to the emergence of the flag leaf.
Winter wheat: Apply in the spring from the 3-tiller to just before the emergence of the flag leaf.

Weeds and Staging:
Unless otherwise noted below, apply to young and actively growing weeds that are less than 4 inches (10 cm) in height or width.
Weeds controlled:
- Annual smartweed (green, lady's-thumb)
- Cleavers (1 to 4 whorls)
- Common chickweed (1 to 6 leaf)
- Cow cockle
- Corn spurry
- Hemp-nettle
- Kochia
- Lamb's-quarters
- Redroot pigweed
- Russian thistle
- Stinkweed
- Wild buckwheat (1 to 5 leaf)
- Wild mustard

Rate:
0.2 L per acre
Maximum ONE APPLICATION of this or other products containing (thifensulfuron-methyl/fluroxypyr) per year.
Note: This product may degrade if left in the sprayer for an extended period. Apply within 24 hours of mixing.
Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Application Information:
- **Water Volume:**
  - ***Ground:*** Minimum 40 L per acre.
  - ***Aerial:*** 10 to 20 L per acre.
- **Nozzles and Pressure:** Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE medium*** droplets by ground or ***ASABE coarse*** droplets by air. Sprayers without drift reduction nozzles should use between 30 to 40 psi (210 to 275 kPa). Low drift nozzles may require higher pressures for proper performance.
- **Screens:** Use a 50 mesh or coarser screen and filter system.

How it Works:
Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
thifensulfuron-methyl	POST	ALS amino acid synthesis inhibitor	Toward areas of growth (symplast)	Broadleaf	2
fluroxypyr	POST	Synthetic auxin	Moves throughout plant (symplast)	Broadleaf	4

Effects of Growing Conditions:
Sentrallas herbicide activity is influenced by weather conditions. Optimum activity requires active crop and weed growth. Temperature is best between 12°C to 24°C. Reduced activity will occur when temperatures are below 8°C or above 27°C. Frost occurring 3 days before or after application may reduce weed control and crop tolerance. Weed control may be reduced during stress conditions, e.g. drought, heat or cold stress, or if weeds have initiated flowering, or if heavy infestations exist. Application to crops that are stressed by severe weather conditions, frost, low fertility, water-logged soil (soil at or near field capacity), disease or insect damage before or after application may result in crop injury. Under certain conditions, such as heavy rainfall, prolonged cool weather, frost or wide fluctuations in day/night temperatures, temporary lightening in crop colour, and occasionally, a slight reduction in crop height may occur.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides:

- ***All registered crops:***
  - MCPA Amine or Ester
- ***Wheat (spring, durum, winter) and barley:***
  - 2,4-D Amine or Ester
- ***Spring wheat (excluding durum), winter wheat and barley:***
  - *Axial*
  - *Axial* plus MCPA Ester
- ***Wheat (spring, durum, winter):***
  - *Simplicity*
  - *Simplicity* plus MCPA Ester
  - *Varro*
  - *Varro* plus MCPA Ester
- ***Wheat (spring and durum only):***
  - *Horizon NG*

Insecticides: None registered.
Fungicide: None registered.
Fertilizers: None registered.

Use only water as a carrier. Other carriers may accelerate the breakdown of *Sentrallas* and reduce its effectiveness.

According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Adding ingredients in the correct order is critical for optimum performance. Check label of both products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 2 hours of application may reduce control.
- **Restricted Entry Interval:** DO NOT enter treated fields for 12 hours.
- **Pre-harvest Interval:** Leave 60 days from application to harvest.
- **Grazing Restrictions:** DO NOT graze or feed to livestock for 7 days after treatment.
- **Re-cropping Interval:** Alfalfa, barley, canola, corn, dry beans, flax, forage grasses, lentils, mustard, oats, peas, potatoes, rye, soybeans, sunflowers or wheat can be seeded the year after treatment.
- **Aerial Application:** May be applied by air.
- **Storage:** Store in a cool, dry place. Avoid freezing. If frozen, bring to room temperature and agitate before use.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground*	1	1	5
Fixed wing aircraft	4	1	200
Helicopter	1	1	175

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Refer to 'Method A' found in the general sprayer cleaning section in the introduction. Let solution stand for an extended period for better results. Flush sprayer system with water. See the label for product specific cleaning details.

Hazard Rating:

Warning – Contains the Allergen Soy

Potential Skin Sensitizer

Refer to the Introduction for an explanation of the symbols.

Shieldex 400SC

Herbicide Group 27 - tolpyralate

Company:
ISK Biosciences Corporation, distributed in Canada by Gowan Canada (PCP#32943)

Formulation:
400 g/L tolpyralate formulated as a suspension concentrate.
- Container size - 6 x 1.2 L

Crops and Staging:
Corn: up to 50 cm tall or up to and including 6 leaf collars (V6), whichever is more restrictive.

Weeds, Rates and Staging:
Apply to actively growing weeds less than 10 cm tall:

Broadleaf Weeds	30.4 mL per acre	40.5 mL per acre
Green pigweed	S	S
Cocklebur	S	C
Lamb's-quarters	S	C
Redroot pigweed	S	C
Smooth pigweed	C	C
Purslane	S	S
Ragweed (common, giant)	S	S
Shepherd's-purse	S	S
Smartweed (Pennsylvania)	S	S
Waterhemp	C	C

Apply to grasses less than 10 cm tall or before tillering:

Grasses	30.4 mL per acre	40.5 mL per acre
Barnyard grass	S	S
Foxtail (yellow)	S	S
Green foxtail	S	C

C = Control **S = Suppression**

MSO Concentrate (sold separately): Apply 1 percent v/v or 10 L MSO Concentrate per 1000 L of spray mixture.
Refer to the product label for complete mixing instructions for this product and its mixes. A general guide to mixing can be found in the introduction.

Application Information:
- **Water volume:** 57 to 190 L per acre.
- **Nozzles and Pressure:** Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASAE medium*** or larger droplets.
- **Screens:** Use 50-mesh (or coarser) filter screen.

How it Works:
Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
tolpyralate	POST (foliar)	HPPD Pigment Inhibitor	Some – both foliar and root (Apoplast) Somewhat systemic (has soil residues)	Broadleaf only	27

Effects of Growing Conditions:
Poor weed control or crop injury may result from applications made to plants under stress from abnormally hot or cold weather; environmental conditions such as drought, water-saturated soils, hail damage or frost; disease, insect or nematode injury; or prior herbicide or carryover from a previous year's herbicide application.

Tank Mixes:
Herbicides:
- Atrazine (227 g ai per acre) – DO NOT apply atrazine if corn is greater than 30 cm tall.

Fertilizers: Use 12.5 to 25 L per 1000 L spray solution of a high-quality urea ammonium nitrate (UAN) such as 28 percent N or 32 percent N or 8.4 to 20.4 kg per 1000 L of a spray grade ammonium sulphate (AMS), recommended.
Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Rainfast in 1 hour.
- **Restricted Entry Interval:** DO NOT enter treated fields for 12 hours.
- **Grazing Restrictions:** DO NOT graze or feed treated corn forage or silage for 21 days after application.
- **Pre-harvest Interval:** DO NOT apply to field corn within 85 days of harvest.
- **Re-cropping Interval:** The following crops may be grown 9 months after application: alfalfa, barley, bean (dry), canola, grass (grown for seed or forage), oats, pea, potato, sorghum, soybean, sunflower, spring wheat. Winter wheat or rye (annual and fall) may be seeded 3 months after application.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** To prevent contamination, store this product away from food or feed.
- **Buffer Zones:** Avoid spraying in situations where drift may occur. DO NOT apply during periods of dead calm.

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground*	1	1	2

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones may be reduced when using drift reduction measures. See the Buffer Zone Calculator on the Pest Management Regulatory Agency website.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Tank Cleaning:

Refer to 'Method A' in the general section on sprayer cleaning in the introduction.

Hazard Rating:

None listed.

Sightline

Herbicide Group
4 – aminopyralid, fluroxypyr
2 - metsulfuron

This product is the equivalent of a pre-packaged tank mix of Clearview plus fluroxypyr. Information listed is restricted to Crops, Weeds, Rates and Tank mixes. For other detailed restrictions and other general information on the component products see the product pages listed above.

Company:
Corteva Agriscience

Formulation:
The *Sightline* package contains two components:
- ***Sightline A*** **(PCP#30409):** 52.5% aminopyralid + 9.45% metsulfuron methyl formulated as a water dispersible granule.
  - Container size -1.84 kg
- ***Sightline B*** **(PCP#30063):** 333 g/L fluroxypyr formulated as an emulsifiable concentrate.
  - Container size - 6.72 L

NOTE: Limited availability through selected retail outlets.

Crops and Staging:
Rangeland, permanent pasture, industrial sites and other non-crop areas.

Weeds and Staging:
Weeds controlled by the comparable rates listed for *Clearview* from 55 to 93 g per acre plus:
- Suppression of kochia from 2 to 8 leaves when *Sightline B* is applied at 0.17 L per acre.
- Control of kochia from 2 to 8 leaves when *Sightline B* is applied at 0.34 L per acre.

Rate:
Note: *Maximum of one application of this or other products containing (list other relevant active ingredients) per year. Areas treated for 24 month control should be treated no more than once every two years.*
Sightline A**:** 55 to 93 g per acre (one package treats 20 to 33 acres.
-plus-
Sightline B**:** 0.17 to 0.34 L per acre (one package treats 20 to 40 acres).
Add Gateway, *Agral 90, Agsurf II,* or *Citowett Plus* at 0.2 L per 100 L of spray solution.
Sightline A may degrade if left in the sprayer for an extended period. Apply within 24 hours of mixing.
Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Tank Mixes:
Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.
Herbicides:
Bare ground locations:
Glyphosate
Fungicides: None registered.
Insecticides: None registered.
Fertilizers: None registered.
Note: the above Tank Mixes are those listed on the *Sightline* label only.
Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

See component products for more information on restrictions, application details and handling. Unless indicated differently above use the most limiting restrictions across all components for the mix.

Restrictions:

- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:	
	Aquatic Habitats of Depths	Terrestrial habitat
Ground*	10	15
Fixed wing airplane	80 to 175**	250 to 750**
Helicopter	70 to 150**	175 to 650**

See the Key to Product Pages for an explanation of the different habitats.
*** Buffer zones can be reduced by 70% when using shrouds and by 30% when using cones mounted less than 12 inches from the crop canopy.**
† Distance is measured from the downwind edge of the boom to sensitive areas.
**** Distance varies depending on spray droplet size. Consult the Clearview/Fluroxypyr labels to determine buffer zone size when applying by air.**
DO NOT apply this product by direclty to any water body or mix or load near water or wells. DO NOT apply when heavy rains are forecast or on moderate to steep slopes toward sensitive areas or to light soils with shallow water table. Contact the provincial environment department for additinal permits to apply near water.

Signal FSU

Herbicide Group
1 - clodinafop
2 - thifensulfuron/tribenuron
4 - fluroxypyr

Company:
Nufarm Agriculture

Formulation:
The *Signal FSU* package contains the following components:
***Signal F* (PCP#31434):** 112 g/L clodinafop propargyl and 217 g/L fluroxypyr ester formulated as an emulsifiable concentrate.
- Container size - 8 L

***Boost* (PCP#30377):** 50% thifensulfuron methyl and 25% tribenuron methyl formulated as a water dispersible granule.
- Container size - 320 g

***NuFarm Enhance Adjuvant* (PCP#29952):** Container size - 4 L

Crops and Staging:
Wheat (spring, durum) only: 2 leaf up to the emergence of the 4th tiller.

Weeds and Staging:
Grass weeds:

Weed	Stage
Barnyard grass	1 to 5 leaf prior to tillering
Green and yellow foxtail	1 to 5 leaf stage, prior to emergence of 3rd tiller
Volunteer canaryseed, wild oats	1 to 6 leaf, maximum 3 tillers
Volunteer oats	3 to 6 leaf, maximum 3 tillers

Broadleaf weeds:
- Unless otherwise noted below, apply to young and actively growing weeds that are less than 4 inches (10 cm) in height or width.
  - Annual smartweed (green, lady's-thumb)
  - Ball mustard
  - Chickweed (1 to 6 leaf)
  - Cleavers (1 to 4 whorls)
  - Common groundsel
  - Corn spurry
  - Cow cockle
  - Flixweed
  - Hemp-nettle
  - Kochia (2 to 8 leaf)
  - Lamb's-quarters
  - Narrow-leaved hawk's-beard
  - Redroot pigweed
  - Russian thistle
  - Shepherd's-purse
  - Stinkweed
  - Tartary buckwheat
  - Volunteer canola (not CLEARFIELD varieties)
  - Volunteer flax (up to 12 cm)
  - Volunteer sunflower
  - Wild buckwheat (1 to 3 leaf)
  - Wild mustard

Weeds suppressed:

- Canada thistle, sow-thistle (less than 6 inches (15 cm) tall or across and prior to budding)
- Scentless chamomile
- Stork's-bill (2 to 6 leaf)

Rate:

***Signal F*:** 0.2 L per acre.
***Boost*:** 8 grams per acre.
***Enhance Adjuvant*:** 0.25 L per 100 L of total spray solution.
Maximum ONE APPLICATION per year of *Signal FSU* or other products containing clodinafop, thifensulfuron, tribenuron, or fluroxypyr. Thifensulfuron/tribenuron may degrade if left in the sprayer for an extended period. Apply within 24 hours of mixing. Refer to the product label for complete mixing instructions.

Application Information:

- **Water Volume:** Minimum 40 L per acre.
- **Nozzles and Pressure:** Use 29 to 40 psi (200 to 275 kPa) if applying without drift reduction nozzles. Drift reduction nozzles may require higher pressures for proper performance. Select the nozzle and pressure combination that produces of ***ASABE coarse*** droplets while maintaining good coverage of foliage. Keep booms lower than 60 cm from crop canopy.
- **Screens:** Use of 50 mesh screens or coarser are required.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
clodinafop	POST (foliar)	ACCase Lipid synthesis inhibitor	Toward growth areas (Symplast)	Grasses only	1
thifensulfuron/ tribenuron	POST (foliar)	ALS Amino Acid synthesis Inhibitor	Toward growth areas (Symplast)	Broadleaf only	2
fluroxypyr	POST (foliar)	Synthetic Auxin	Moves throughout the plant (Symplast)	Broadleaf only	4

Effects of Growing Conditions:

Application to crops stressed by extreme weather conditions such as frost, hail, saturated soils or drought as well as low fertility, insect damage or disease pressure may result in crop injury and/or reduce weed control. Crop and weeds that are growing rapidly produce optimum activity. The optimum temperature range for the best activity is between 12 to 24°C. Activity will be reduced below 8°C and above 27°C.

Tank Mixes:

Herbicides:

- ***In wheat (spring and durum) only:***
  - 2,4-D Ester (up to 113 g ae per acre)
  - MCPA Ester (up to 190 mL of a 600 g/L form per acre)

Fungicides: None registered.
Fertilizers: None registered.
Insecticides: None registered.
Note: The above mixes are those listed on the *Signal F* and *Boost* labels only.
Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 4 hours will reduce control.
- **Restricted Entry Interval:** DO NOT enter treated fields for 12 hours.
- **Pre-harvest Interval:** Leave 60 days between application and harvest.
- **Grazing Restrictions:** DO NOT graze or feed treated crop to livestock within 3 days of application.
- **Re-cropping Interval:** Barley, canola, field peas, flax, forage grasses, lentils, mustard, oats, rye and registered crops may be seeded the season after application.
- **Aerial Application:** DO NOT apply by aircraft.
- **Storage:** Store in a cool, dry place in original container. Shake well before using. If frozen, warm liquid component gradually to 10°C and shake well to reconstitute component before use.

- **Buffer Zones:**

Crop	Buffer Zones (metres†) Required for the Protection of:	
	Aquatic Habitats	Terrestrial habitat
Ground only	15	15

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Tank Cleaning:

Thifensulfuron/tribenuron can cause severe injury to sensitive crops at very low concentrations. Sprayers used to spray thifensulfuron/tribenuron should be drained and flushed out immediately after use.
Refer to 'Method A' in the general section on sprayer cleaning in the introduction. The addition of detergent will enhance cleanout.

Hazard Rating:

***Signal F*:**

Danger – Skin Irritant
Caution – Eye Irritant

***Boost*:**

Warning – Skin and Eye Irritant

***Nufarm Enhance Adjuvant*:**

Caution – Skin Irritant
Warning – Contains the Allergen Soy

Refer to the Introduction for an explanation of the symbols.

Simazine

Herbicide Group 5 - simazine

Company:

Syngenta Canada (*Princep Nine-T*)
Loveland Products Canada (*Simazine 480*)

Formulations:

***Princep Nine-T* (PCP#16370):** 90% simazine formulated as a water dispersible granular.
- Container size - 5 kg

***Simazine 480* (PCP#23181):** 480 g/L simazine formulated as a solution.
- Container size - 2 x 10 L

Crops and Staging:

Established alfalfa or bird's-foot trefoil (*Princep Nine-T* only):
DO NOT use in year of seeding. Apply after final cut in fall until freeze-up. DO NOT apply to the same field more than three consecutive years. Residues may build up with yearly applications.
Corn (field, sweet): Apply one week prior to seeding and incorporate to a depth of 1 inch (2.5 cm), or apply no later than 4 days after seeding corn. Rainfall is required to activate herbicide.
Established shelterbelts (elm (American, Siberian), caragana, green ash, Manitoba (boxelder) maple): Apply in fall or early spring before weeds begin growth. Injury may occur to shelter belts growing under saline conditions.
DO NOT apply to frozen ground

Weeds and Staging:

Simazine is applied prior to the emergence of the weeds and kills them when they are exposed to the treated layer of soil.
- Barnyard grass
- Lamb's-quarters
- Perennial species starting from seed
- Purslane
- Ragweed
- Smartweed (including lady's-thumb)
- Volunteer clovers
- Wild buckwheat
- Wild oats
- Yellow foxtail

Rates:

- **Forage crops:**
  - ***Princep Nine-T:*** 0.45 kg per acre.
- **Corn:***
  - ***Princep Nine-T:*** 0.61 to 0.81 kg per acre.
  - ***Simazine 480:*** 1.4 to 3.4 L per acre.
- **Shelterbelts:**
  - ***Princep Nine-T:*** 1.8 kg per acre.
  - ***Simazine 480:*** 3.8 to 5.7 L per acre.

*** Rate of application to corn is dependent on soil texture. Refer to specific labels for correct application rates on corn.**

Application Information:

- **Water Volume:** Minimum 121 L per acre. In shelterbelts, use a minimum of 202 L per acre.
- **Nozzles and Pressure:** For conventional flat fan nozzles use a maximum pressure of 30 to 45 psi (200 to 300 kPa). Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE medium*** droplets.
- **Screens:** Use 50 mesh or coarser nozzle screens and filter system.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
simazine	PPI (soil active)	PSII Inhibitor/ Membrane disruptor	Upward soil applied (Apoplast)	Broadleaf & grass	5

Effects of Growing Conditions:

When applying to forage stands, dry soil conditions at the time of weed emergence may result in reduced weed control.

Tank Mixes:

None registered.

Note: The above mixes are those listed on the simazine labels only.

Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Moderate rainfall after application enhances activity.
- **Restricted Entry Interval:** DO NOT enter treated areas for 12 hours following application.
- **Grazing Restrictions:** In forage stands, allow 30 days between application and grazing, 60 days between application and cutting for feed. DO NOT graze or cut corn for feed prior to ear emergence.
- **Re-cropping Interval:** Simazine is persistent and residues may persist for several years depending on soil pH, available soil moisture, number of yearly applications, and the sensitivity of the following crop. Simazine will break down in soil more slowly under conditions of high pH and/or low rainfall. Corn will tolerate soil residues of simazine and may be planted the year of application. Navy beans, onions, peas may be injured 12 month after application.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** DO NOT freeze *Simazine 480*. *Princep Nine-T* may be frozen. Store in a cool, dry place.
- **Buffer Zones:**

Crops	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Alfalfa	1	1	4
Bird's-foot trefoil, sweet corn	1	1	5
Field corn	1	1	10
Shelter-belts	2	1	20

See the Key to Product Pages in the introduction for an explanation of the different habitats.

*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**

† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:
No specific cleaning procedures are indicated on the label. Based on products with similar chemistry, 'Method B' found in the general sprayer cleaning section in the introduction or a commercial spray sprayer cleaning product, may provide adequate cleaning. Contact the manufacturer for more information.

Hazard Rating:
Simazine 480: Caution – Poison
Refer to the Introduction for an explanation of the symbols.

Simplicity

Herbicide Group 2 - pyroxsulam

Company:
Corteva Agriscience

Formulation:
***Simplicity 30 OD* (PCP#28887):** 30 g/L pyroxsulam formulated as an oil-dispersion.
- Container size - 2 x 8 L (plus water conditioner 2 x 1.5 L)

***Simplicity GoDRI* (PCP#31916):** 21.5% pyroxsulam formulated as a water dispersible granule.
- Container size - 4 x 2.24 kg

Crops and Staging:
Wheat (spring and durum):
- ***Simplicity OD:*** 3 leaf stage until prior to the emergence of the flag leaf.
- ***Simplicity GoDRI:*** 2 leaf stage until the emergence of the flag leaf.

Winter wheat:
- ***Fall:*** 1 to 3 leaf stage.
- ***Spring:*** 2 to 7 leaf plus 4 tillers.

Rye (*Simplicity GoDRI* only): Apply to actively growing rye (fall and spring-seeded) from the 2 leaf stage until the 1st node can be felt at the base of the stem.
Triticale (*Simplicity GoDRI* only): Apply to actively growing triticale from the 3 leaf stage until the 1st node can be felt at the base of the stem.
When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

Weeds, Rates and Staging:
When applied alone, add a 90 percent active non-ionic surfactant such as *Agral 90, AgSurf* or *Sentry* at 0.25 L per 100 L of spray solution.
- Adjuvant purchased separately.

See the *Simplicity* or *Simplicity GoDRI* labels for additional adjuvant requirements.
Shake *Simplicty 30 OD* jug well before adding to spray tank.
Wild oats (less than 75 plants per sqm):
Simplicity 30 OD at 0.15 L per acre or Simplicity GoDRI at 21 grams per acre:
- Wild oats (less than 75 plants per sqm)
- Japanese brome (1 to 4 leaf, 2 tiller – whichever comes first).

Simplicity 30 OD at 0.20 L per acre or Simplicity GoDRI at 28 grams per acre:
The weeds controlled above plus those listed below.
- ***Grasses:***

Weed	Stage
Wild oats, Persian darnel*	up to the 4 leaf, 2 tillers
Barnyard grass, yellow foxtail, green foxtail*	1 to 5 leaf
Japanese brome (under sub-optimal growing conditions)	1 to 6 leaf
Downy brome†	1 to 6 leaf, up to 4 tillers

- ***Broadleaves:***
  - Canada thistle* (up to 30 cm, before budding)
  - Cleavers (up to 6 whorl)
  - Cow cockle (up to 8 leaf)
  - Common chickweed (up to 10 cm)
  - Corn spurry (up to 2 whorl or 10 cm tall)
  - Dandelion* (rosettes <20 cm diameter)
  - Field violet (up to 6 leaf)*
  - Flixweed (up to 10 cm)
  - Hemp-nettle (1 to 8 leaf)
  - Night-flowering catchfly (up to rosette stage)*
  - Redroot pigweed (1 to 8 leaf)
  - Round-leaved mallow (up to 6 leaf or 10 cm)
  - Russian thistle* (up to 10 cm)
  - Shepherd's-purse (up to 30 cm)
  - Smartweed (1 to 5 leaf)
  - Stinkweed (up to 30 cm)
  - Volunteer canola (1 to 6 leaf)**
  - White cockle* (<20 cm up to first flower)
  - Wild buckwheat (1 to 4 leaf)*

  *** Suppression only.**
  **** Not CLEARFIELD varieties.**
  † Control with fall application in winter wheat; suppression only in spring applications on both winter and spring wheat.

Winter wheat (*Simplicity* alone) for downy brome suppression use the following adjuvant:

- *Merge* at 0.5 L per 100 L of spray (spring application only). See the *Simplicity* or *Simplicity GoDRI* labels for additional adjuvant requirements.

Application Information:

- **Water Volume:**
  - ***Ground:*** 20 to 40 L per acre.
  - ***Aerial:*** 12 L per acre.
- **Nozzles and Pressure:** Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE coarse*** droplets. See the label for detailed instructions on aerial application.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
pyroxsulam	POST (foliar)	ALS Amino Acid Inhibitor	Toward areas of growth (Symplast)	Broadleaf & grass	2

Effects of Growing Conditions:

DO NOT apply to crops that are stressed (frost, low fertility, drought or flooding, disease or insect damage) as crop injury may result and/or weed control may be reduced.

Tank Mixes:

Herbicides:

- The addition of an adjuvant to *Simplicity OD* is not required in tank mixes unless the adjuvant is required by the tank mix partner. Consult the *Simplicity GoDRI* label for added requirements.

Tank-Mix Partner	Product Rates
2,4-D Ester	280 g ae per acre
Buctril M (bromoxynil + MCPA)	0.4 L per acre
Curtail M	0.6 L per acre
Exhilarate A + MCPA Ester 600	10 g per acre + 189 mL per acre
Exhilarate A + MCPA Ester 600 + Lontrel XC	10 g per acre + 189 mL per acre + 52 mL per acre
MCPA Ester (600 formulation)	0.23 to 0.38 L per acre
OcTTain XL	0.45 L per acre
*Pixxaro***	40 acres per case
Prestige XC	27 acres per case
Stellar/ Stellar XL	40 acres per case
Thumper (bromoxynil + 2,4-D)	0.4 L per acre

Fungicides:
- *Tilt** (label rates)
- *Stratego**(label rates)
- MCPA + *Tilt* *
- MCPA + *Stratego**

Fertilizers: None registered
*** High rate of *Simplicity GoDRI* only**
**** *Simplicity GoDRI* only.**
Note: The above mixes are those listed on the *Simplicity OD* or *Simplicity GoDRI* labels only.
According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:
- **Rainfall:** Within 2 hours may reduce control.
- **Pre-harvest Interval:** Leave 60 days between treatment and harvest.
- **Grazing Restrictions:** Must NOT be grazed or fed to livestock for 7 days after treating crop.
- **Re-cropping Interval:**
  - ***Both products:*** Barley, condiment and oilseed quality brown mustard (*B. juncea* types), canola, chickpea, dry bean, flax, lentil, oats, field pea, potato, spring wheat, soybean, sunflower and yellow mustard may be seeded 11 months following treatment.
  - **Simplicity GoDri *only:*** Field corn, sunflower and potatoes after 10 months; alfalfa after 11 months.
- **Aerial Application:** May be applied by air.
- **Storage:** *Simplicity 30 OD* will freeze at -10°C. DO NOT freeze; store above -9°C. Allow product to warm above 7°C before using and thoroughly mix the product prior to use. *Simplicity GoDRI* is not affected by freezing. Keep *Simplicity GoDri* away from fire or open flame, or other source of heat.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground*	1	1	2
Helicopter	1	1	60
Fixed wing aircraft	1	1	70

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** These distances can be reduced by 30 percent using cones on individual nozzles and by 70 percent using a full shield (shroud, curtain) that extends to the crop canopy.**
† Distance is measured from the downwind edge of the boom to sensitive areas.

Sprayer Cleaning:
Refer to the general section on sprayer cleaning in the introduction. See label for specific cleaning details.

Hazard Rating:
Simplicity 30 OD:

Warning – Poison

Warning – Contains the Allergen Soy

Caution – Eye and Skin Irritant, Potential Skin Sensitizer

Simplicity GoDri:

Caution – Eye Irritant

Refer to the Introduction for an explanation of the symbols.

Smoulder

Herbicide Group
2 - metsulfuron
14 - saflufenacil

Company:
BASF Canada

Formulations:
The *Smoulder* package contains the following components:
***Smoulder* (PCP#33943):** 64.6% active ingredient saflufenacil plus metsulfuron-methyl 5.4% formulated as a water dispersible granule.
- Container size - 907 g

-plus-
***Merge* (PCP#24702):** 50% surfactant/50% solvent blend adjuvant.
- Container size - 2 x 8.1 L

Crops and Staging:
Barley, wheat (including durum, spring, and winter), oats, triticale and fall rye: Pre-seed, post harvest

Weeds and Staging:
Broadleaf weeds (up to 8-leaf except where indicated):
- ***Weeds controlled:***
  - Kochia (up to 15 cm in height)
  - Canada Fleabane
  - Canada Thistle (up to 15 cm)†*
  - Cleavers (up to 4-whorl stage)
  - Dandelion (up to 15 cm)*
  - Flixweed*
  - Lamb's-quarters
  - Narrow-leaved hawk's-beard
  - Redroot pigweed
  - Round-leaved mallow
  - Stinkweed
  - Volunteer canola**
  - Wild buckwheat
  - Wild mustard

† Season-long top growth control.
*** When tank mixed with glyphosate will provide rapid burndown control of these weeds in addition to those weed listed under *Smoulder* applied alone.**
**** Provides control of secondary flushes of volunteer canola (except CLEARFIELD varieties) in addition to burndown control of volunteer canola (all HT types).**

Rates:
Smoulder: 11.3 grams per acre
-plus-
Merge: 0.2 to 0.4 L per acre
Use higher rates of *Merge* is recommended for higher weed densities and when the environmental conditions at the time of herbicide application may negatively impact herbicide uptake. Maximum ONE APPLICATION per year.

Application Information:
- **Water Volume:**
  - ***Ground:*** 20 to 40 L per acre
- **Nozzles and Pressure:** Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE medium*** droplets by ground. Low drift nozzles may require higher pressures for proper performance. DO NOT apply in periods of dead calm.
- **Screens:** Use 50 mesh or coarser screen and filter system.

How it Works:
Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
saflufenacil	POST (foliar) with slight soil activity or preharvest	PPO Inhibitor/ Membrane disrupter	Little movement due to rapid cell leakage (Symplast)	Non-selective broadleaf	14
metsulfuron-methyl	POST (foliar) also has soil activity	ALS Amino Acid Inhibitor	Toward growth area (Symplast)	Broadleaf only	2

Effects of Growing Conditions:
Limited or reduced residual control can be observed on high organic matter soils (>8 percent soil organic matter). Heavy rainfall or irrigations soon after application may result in residual crop injury of possible yield reduction. DO NOT use on variable soils that have large gravelly or sandy areas, eroded knolls or calcium deposits, or crop injury could result. Weeds hardened off by environmental stress such as cold weather, drought or excessive heat may not be adequately controlled.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.
Herbicides: *Smoulder* should be tank mixed with glyphosate at 180 to 360 g ae per acre.
Fungicides: None registered.
Fertilizers: None registered.
Insecticides: None registered.
Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** No rainfast period is specified on the label; required interval may be up to 8 hours. Contact manufacturer for more information.
- **Restricted Entry Interval:** DO NOT enter treated areas for 12 hours following application.
- **Grazing Restrictions:** DO NOT cut as feed (hay or silage) or graze within 30 days of application.
- **Pre-harvest Interval:** 60 days when used as a pre-seed application.
- **Re-cropping Interval:** DO NOT seed treated fields to barley or wheat (spring, durum winter) within 24 hours of application. Canola (all types), faba beans, field corn, CLEARFIELD lentils, peas and soybeans may be seeded 11 months after application. Flax can be seeded 11 months after application in all regions except in the brown soil zone, where a minimum 22 month recropping interval must be observed. Oats may be seeded anytime in the following season. Fields treated in the fall with post-harvest application may be seeded in the spring to wheat (spring or durum), spring barley or oats.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store this product away from food and feed. Store the product in original, tightly closed container, in a cool, dry, secure, well-ventilated area.
- **Buffer Zones:**

Crops	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground*	1	1	3

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Refer to 'Method A' in the general section on sprayer cleaning in the introduction. Let solution stand for an extended period for better results. See the label for product specific cleaning details.

Hazard Rating:

Caution – Possible Skin Irritant

Caution – Eye Irritant

Refer to the Introduction for an explanation of the symbols.

Sortan IS

Herbicide Group 2 - rimsulfuron

Company:
Corteva Agriscience (PCP#32627)

Formulation:
20% rimsulfuron formulated as a water dispersible granule.
- Container size - 1.2 kg

Crops and Staging:
Field corn:
- Pre-emergent
- Post-emergent up to 5 leaf (3 visible collars).

Weeds and Staging:
Maximum 30.4 grams per acre of *Sortan IS* or 6.1 grams per acre of the active ingredient rimsulfuron PER YEAR.
Pre-emergent surface: 30.4 grams per acre controls the following weeds emerging from seed:
- Barnyard grass
- Foxtail (green, yellow*)
- Lady's-thumb*
- Proso millet
- Shepherd's-purse
- Sow-thistle (annual)*
- Volunteer canola (NOT CLEARFIELD varieties)
- Volunteer wheat (NOT CLEARFIELD varieties)

*** Suppression only.**

Post-emergent: *Sortan IS* applied alone requires the addition of a non-ionic surfactant such as *Agral 90, Agsurf II* or *Cittowet Plus* at 0.2 L per 100 L of spray solution.
- *The weeds listed above plus the following:*

Weed	Maximum leaf stage	Rate	
		15.2 g per acre	30.4 g per acre
Barnyard grass	1 to 4 leaf		✓
Foxtail (green, yellow*)	1 to 4 leaf		✓
Lamb's-quarters*	2 to 4 leaf		✓
Redroot pigweed	2 to 4 leaf	✓	✓
Shepherd's-purse	Cotyledon – 4 leaf		✓
Volunteer canola (NOT CLEARFIELD varieties)	Cotyledon – 5 leaf	✓	✓
Volunteer soybeans	Up to the 1st trifoliate	✓*	✓
Volunteer wheat (NOT CLEARFIELD varieties)	Up to 1 tiller	✓	
Wild buckwheat	up to 4 leaf	(If mixed with glyphosate)	✓
Wild oats*	2 leaf to 1 tiller		✓
Witchgrass	1 to 4 leaf		✓
Quackgrass	3 to 6 leaf		✓

*** Suppression only.**

Post-emergent: 22.8 grams per acre for more consistent control under heavier weed populations.
- Redroot pigweed (cotyledon to 4 leaves)
- Wild buckwheat (when tankmixed with glyphosate in *Roundup* ready corn only) cotyledon to 4 leaves

Application Information:
- **Water Volume:** Minimum 40 to 77 L per acre. Higher water volumes may provide better performance.
- **Nozzles and Pressure:** Use 25 to 40 psi (175 to 275 kPa) if applying without drift reduction nozzles. Drift reduction nozzles may require higher pressures for proper performance. Select the nozzle and pressure combination that produces of ***ASABE medium*** droplets while maintaining good coverage of foliage.
- **Screens:** Use 50 mesh filter screens or larger.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
rimsulfuron	POST (foliar)	ALS Amino Acid Inhibitor	Toward areas of growth (Symplast)	Broadleaf & grass	2

Effects of Growing Conditions:

Apply ONLY when the temperature in the 24 hours before AND after application ranges between 5°C and 30°C. Temperatures outside this range increase the risk of crop injury. For optimum residual control, rainfall is required within 3 to 5 days after application for activation.

Tank Mixes:

Herbicides: Glyphosate (360 g ae per acre) – pre-emergent; post-emergent (glyphosate tolerant corn only).
Insecticides: None Registered.
Sortan IS should not be applied to corn that has been treated with organophosphate insecticides. Leave 7 days between the application of *Sortan IS* and that of a foliar organophosphate insecticide.

Note: The above mixes are those listed on the *Sortan IS* label only.

Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 2 to 4 hours may reduce the efficacy of post emergent treatments. A modest rainfall after pre-emergent applications will improve control of emerging seedlings.
- **Restricted Entry Interval:** DO NOT enter treated fields for 12 hours.
- **Grazing Restrictions:** DO NOT feed (silage, grazing, greenfeed, grain) treated crop to livestock within 30 days of application.
- **Pre-harvest Interval:** DO NOT apply within 30 days of harvest for feed or grain.
- **Re-cropping Interval:** Winter wheat may be seeded 4 months after application. Corn may be seeded any time after application. Barley, canola, chickpea, corn (seed or sweet), dry beans, faba beans, field pea, flax, lentil, oats, potatoes, soybean, sunflower and wheat (spring, durum) may be grown the year after application.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store in original containers in away from other fertilizers, food or feed. Freezing will not impair effectiveness.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground	1	1	5

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones may be reduced when using drift reduction measures. See the Buffer Zone Calculator on the Pest Management Regulatory Agency website.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Refer to 'Method A' in the general section on sprayer cleaning in the introduction.

Hazard Rating:

Warning – Contains the Allergens Milk and Sulfites

Warning – Contains Phenol

Refer to the Introduction for an explanation of the symbols.

Steadfast IS

Herbicide Group 2 - rimsulfuron & nicosulfuron

Company:
Corteva Agriscience (PCP#33369)

Formulation:
12.5% rimsulfuron and 25% nicosulfuron formulated as a water dispersible granule.
- Container size - 6 x 540 g case

Crops and Staging:
Field corn: Emergence to V4 (4 visible collars)

Weeds and Staging:
Green foxtail, wild oats: 1 to 4 leaves (up to early tillering)
Volunteer wheat*: 1 to 3 leaves (up to early tillering)
Volunteer canola*: Cotyledon – 5 leaves
*** NOT Clearfield varieties.**

Rates:
Apply at 16 to 27 g per acre as a broadcast spray, with a recommended non-ionic surfactant such as *Agral 90, Agsurf II*, or *Citowett Plus* at 0.2 L per 100 L of spray solution. Use higher rates for dense weed populations or late weed growth stages for more consistent control.
Make only one application of *Steadfast IS* or other product containing rimsulfuron or nicolsulfuron per year.
Steadfast IS will degrade in acidic or highly alkaline water. Mix no more than can be used in one day. If spraying is interrupted, thoroughly re-agitate the spray mixture before resuming spraying.
Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Application Information:
- **Water Volume:**
  - ***Ground:*** Minimum 40 L per acre. Optimum water volume is 55 to 80 L per acre.
- **Nozzles and Pressure:** Use a spray pressure of 25 to 40 psi (175 to 275 kPa). Flat fan nozzles are recommended. Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE medium*** droplets by ground. Low drift nozzles may require higher pressures for proper performance.
- **Screens:** Use 50 mesh filter screens or larger.

How it Works:
Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
rimsulfuron, nicosulfuron	POST	ALS Amino Acid synthesis Inhibitor	Toward growth areas (Symplast)	Broadleaf & grasses	2

Effects of Growing Conditions:
Apply ONLY when the temperature in the 24 hours before AND after application ranges between 5°C and 30°C. Temperatures beyond this range increase the potential for crop injury.
WARNING: Crop injury, including bleaching, may result if application is made to corn that has been stressed by abnormally hot, humid or cold weather conditions, frost, low fertility, drought, water saturated soil, compacted soil, previous pesticide applications, disease or insect damage. If corn has been injured by frost, wait 48 to 72 hours before applying.
Dry conditions following application may reduce the soil residual activity. If an activating rainfall is not received before germination of susceptible weeds, weed control will be reduced. DO NOT cultivate corn within 7 days before or after an application.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.
Herbicides: Glyphosate – 360 g ae per acre when applied to **glyphosate tolerant corn only**. No surfactant required when tank mixed with glyphosate.
Fungicides: None registered.
Insecticides: None registered. DO NOT tank mix with an organophosphorus insecticide or apply an organophosphorus insecticide within 7 days before or after an application of *Steadfast IS*.
Fertilizers: None registered.

Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 2 to 4 hours may reduce control.
- **Restricted Entry Interval:** DO NOT re-enter treated fields for 12 hours.
- **Grazing Restrictions:** DO NOT graze or feed treated corn forage, silage, fodder or grain for at least 30 days after application.
- **Pre-harvest Interval:** Leave 30 days between application and harvest.
- **Re-cropping Interval:** Winter wheat may be seeded 4 months after application. Spring and durum wheat, oats, barley, soybean, canola, field pea, lentil, flax, corn, potato, dry bean*, sunflower and alfalfa may be seeded 10 months after application.
  * Since not all dry bean varieties have been tested for tolerance to *Steadfast IS*, first planting of each variety to previously treated field should be limited to a small area to confirm tolerance prior to general field scale.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** To prevent contamination store this product away from food or feed. Not for use or storage in or around the home. Keep container closed. Keep product container away from moisture.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground*	1	1	5

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Refer to 'Method A' in the general section on sprayer cleaning in the introduction. Let solution stand for an extended period for better results. Flush sprayer system with water. See the label for product specific cleaning details.

Hazard Rating:

⚠ Warning – Contains the Allergens Milk and Sulfites
Refer to the Introduction for an explanation of the symbols.

Strim MTZ

Herbicide Group
5 - metribuzin
15 - metolachlor

Company:
UPL AgroSolutions Canada (PCP#33753)

Formulation:
405 g/L S-metolachlor/R-enantiomer and 135 g/L metribuzin formulated as an emulsifiable concentrate.
- Container size - 2 x 10.5 L, 375 L

Crops and Staging:
Potato:
- Pre-plant incorporated
- Pre-emergent*
  ***DO NOT use on the varieties Belleisle, Tobique, or Superior as crop injury may result. Potato varieties may vary in their tolerance to *Strim MTZ*.**

Weeds and Staging:
This product is most effective when applied prior to weed emergence and provides early season residual control.
Weeds controlled:
- Barnyard grass
- Common chickweed
- Common ragweed
- Dandelion (seedling)
- Eastern black nightshade*
- Foxtail (green, yellow)
- Green smartweed
- Lady's-thumb
- Lamb's-quarters
- Redroot pigweed
- Velvetleaf
- Wild mustard
- Witchgrass
- Yellow nutsedge (S)**

(S) Suppression only.
*** Pre-emergent gives better control than PPI.**
**** PPI treatment only.**

Rates:
Note: Maximum of ONE APPLICATION of this product per year.
Pre-plant incorporated: 1.17 to 1.21 L per acre
Pre-emergent: 1.17 to 1.58 L per acre
For improved burndown of any potentially emerged, small annual weeds, the following additives may be used:
- Liquid UAN (28-0-0) or liquid ammonium phosphate (10-34-0) at 5 L per 100 L of spray solution
- Crop oil concentrate at 1 L per 100 L of spray solution
- Non-ionic surfactant at 0.1 L per 100 L of spray solution.

DO NOT use on soils that are less than 1 percent or greater than 10 percent organic matter content.
Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Application Information:
- **Water Volume:**
  - ***Ground:*** Minimum of 40 L per acre for PPI treatment; 60 to 120 L per acre for pre-emergent applications.
- **Nozzles and Pressure:** Use a combination of nozzles and pressure designed to deliver thorough, even coverage with nozzle tips no finer than 6502, 8002, or TK2. Sprayers should use between 30 to 45 psi (200 to 300 kPa).
- **Screens:** Use screens no finer than 50 mesh in nozzle and in-line strainers. A 16 mesh screen is recommended for the filter inlet side of the pump.
- **Equipment:** Sparge tube, jet or mechanical agitation is required. Return line agitation is not sufficient. A pump must be of sufficient capacity to provide adequate volume through the by-pass and/or jet agitation system to provide sufficient agitation even while the booms are operating.
- **Incorporation:** Avoid deep incorporation. Incorporate with implements which provide uniform, shallow incorporation. A single incorporation is satisfactory, however a second incorporation will generally improve herbicide soil blending and improve weed control (particularly on coarse soils).

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
metribuzin	PPI, PRE (soil active)	PSII Inhibitor/ Membrane disruptor	Little foliar; upward soil applied (apoplast)	Broadleaf & grass	5
S-metolachlor	PPI, PRE (surface) with residual soil activity	Long-chain Fatty Acid Inhibitor	Little movement (symplast)	Broadleaf & grass	15

Effects of Growing Conditions:

Rain is required within 10 days of a pre-emergent application. In areas of low rainfall, follow pre-emergence application by light irrigation of 0.3 to 0.4 inches (0.7 to 1.27 cm). Dry weather conditions as well as excessive rainfall or irrigation following application may reduce weed control. On sandy soils, heavy rainfall following an incorporated treatment may cause leaching of the herbicide.

If heavy rain occurs soon after application, plant injury may result, especially in poorly drained areas where water may stand for several days.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides: None registered.

Fungicides: None registered.

Insecticides: None registered.

Fertilizers: 28-0-0 or 10-34-0 as adjuvants as indicated above.

Note: the above tank mixes are those listed on the *Strim MTZ* label only.

According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** A small amount of rainfall or irrigation is required following application.
- **Restricted Entry Interval:** DO NOT re-enter treated fields for 12 hours.
- **Grazing Restrictions:** DO NOT graze treated immature crops or cut for hay.
- **Pre-harvest Interval:** Leave 60 days between application and harvest.
- **Re-cropping Interval:** DO NOT plant canola the year after application. DO NOT plant fall seeded wheat, oats, or rye in the same season as application.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store away from food or feed.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:	
	Aquatic Habitat	Terrestrial habitat
Ground only*	29	10

See the Key to Product Pages in the introduction for an explanation of the different habitats.

*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**

† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Refer to 'Method B' in the general section on sprayer cleaning in the introduction. Let solution stand for an extended period for better results. Flush sprayer system with water. See the label for product specific cleaning details.

Hazard Rating:

Caution – Eye Irritant

Refer to the Introduction for an explanation of the symbols.

Sulfentrazone

Herbicide Group 14 - sulfentrazone

Company:

FMC Corporation (*Authority 480* - PCP#29012, *Sulfentra* - PCP#35231)
Sharda CropChem Canada (*Intensa* - PCP#35041)
Interprovincial Cooperative Limited (*Co-op Governor* PCP#35237, *IPCO Tactic* PCP#35236)
AgraCity (*Throne II* PCP#35249)
Viking (Viking Sulfentrazone - PCP#35327)

Formulation:

480 g/L sulfentrazone formulated as a suspension concentrate.

- Container size - 4 x 3.79 L

Crops, Rates and Staging:

Pre-plant surface: Apply to the soil surface prior to seeding the crop.
Pre-emergent: Apply to the soil surface up to 3 days after seeding. Crops emerging or near emerging at application may be injured.
After harvest once soil temperatures have dropped below 10°C and prior to freeze up*: Any registered crop can be seeded the following spring.
* *Authority 480* and *Sulfentra* only

At 88 mL per acre:

- Mustard †
- Wheat (spring, durum)*

*** DO NOT apply *Authority 480* (or any other herbicide containing sulfentrazone) to spring wheat if an application of *Focus* (or any other herbicide containing pyroxasulfone) was applied in the previous fall.**

Up to 118 mL per acre:

- Alfalfa, dormant, established grown for seed production (Authority 480 only)†
- Chickpea*
- Faba bean
- Field pea*
- Flax*
- Soybean*
- Sunflower*

**Throne II* and *Viking Sulfentrazone* are only registered for these crops, NOT REGISTERED on mustard, wheat or faba bean.

† Note: Since these uses are registered under the User Requested Minor Use Label Expansion program, the manufacturer assumes no responsibility for herbicide performance. **Users of this product do so at their own risk.**

All applications require rainfall for proper activation. (See "Effects of Growing Conditions")

Note: The use of this chemical may result in contamination of groundwater particularly in areas where soils are permeable (e.g. sand, loamy sand or sandy loam) and/or the depth to the water table is shallow.

Weeds, Rates and Staging:

Controls the following weeds when applied to the soil prior to emergence:
At 88 mL per acre:

- Kochia
- Lamb's quarters*
- Powell (green) pigweed*
- Redroot pigweed*
- Russian thistle (suppression only)

At 118 mL per acre:

- *Above weeds plus:*
  - Cleavers (suppression)**
  - Common groundsel
  - Eastern black nightshade
  - Purslane
  - Waterhemp
  - Wild buckwheat
  - Yellow woodsorrel

* *Authority 480* and *Sulfentra* only.
Use the higher rates within the rate range for soils with pH less than 7.0 and organic matter greater than 3 percent when crops are registered for both rates.
** All products **except** *Throne II* and *Viking Sulfentrazone*
Use the higher rates with the rate range for soils with pH less than 7.0 and organic matter greater than 3 percent when crops are registered for both rates.

DO NOT APPLY sulfentrazone to:

- coarse-textured (sand, loamy sand, sandy loam) soils,
- fine textured soils with less than 1.5 percent organic matter,
- soils with organic matter content greater than 6 percent,
- soils with a pH of 7.8 or greater,
- fields treated with sulfentrazone per 24-month period (Including fall application).

Application Information:

- **Water Volume:** Minimum 40 L per acre. Use as high water volume as practical to achieve even distribution over the soil surface.
- **Nozzles and Pressure:** Maximum 30 psi (175 kPa) if using conventional nozzles. Low drift nozzles may require higher pressures for proper performance. Use nozzles and pressure designed to deliver proper coverage with ***ASABE medium*** droplets or larger.
- DO NOT mechanically incorporate in the fall or spring as this can destroy the herbicide barrier and allow weed escapes.
- DO NOT apply to frozen soils or existing snow cover to prevent run-off of the herbicide.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
sulfentrazone	PRE (residual soil activity)	PPO Inhibitor/ Membrane disruptor	Little movement (Symplast)	Broadleaf	14

Effects of Growing Conditions:

All applications require rainfall for proper activation. If weed growth begins before activation occurs, poor control may result on emerged weeds. A moderate rainfall (10 to 20 mm) or equivalent irrigation is required within 10 to 14 days to activate pre-emergent surface treatments. Dry conditions that persist after any application may reduce weed control. On sandy soils, heavy rainfall following application may cause leaching of *Authority 480* that may result in reduced weed control and increased risk of crop injury.

DO NOT apply to fields that are covered in snow.

Tank Mixes:

Herbicides:

- ***Field Peas only:*** Imazethapyr (28.3 mL per acre) – black and grey wooded soils only.*
- ***Wheat (spring, durum*), faba bean*, field peas and soybean only**:*** *Express SG* (6 grams per acre) + glyphosate.
  all products except *Throne II* and *Viking Sulfentrazone
  **** See precautions on 'Tribenuron' regarding potential pulse crop injury.**

According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Restrictions:

- **Rainfall:** Rainfall following application is required for adequate weed control.
- **Grazing Restrictions:** DO NOT graze stubble after a post harvest fall application.
- **Pre-harvest Interval:** Leave 60 days between application and harvest.
- **Restricted Entry Interval:** DO NOT re-enter treated area within 12 hours.
- **Re-cropping Interval:**
  - Registered crops may be planted anytime after application of *Authority 480, Sulfentra, Intensa, Co-op Governor* and *IPCO Tactic* and 16 months after *Throne II* and *Viking Sulfentrazone*.
  - Winter wheat may be seeded 4 months after application of *Authority 480, Sulfentra, Intensa, Co-op Governor* and *IPCO Tactic* and 16 months after *Throne II* and *Viking Sulfentrazone*.
  - Alfalfa, barley, canary grass, canola, field corn, mustard (following use of high rate), oats and wheat (spring and durum - following use of the high rate) may be seeded 12 months after application of *Authority 480, Sulfentra, Intensa, Co-op Governor* and *IPCO Tactic*.
  - Alfalfa, barley, field corn, wheat (spring and durum) maybe be seeded 12 months after application of Throne II and Viking Sulfentrazone
  - Sweet corn, lentils and sorghum may be seeded 24 months after application of *Authority 480, Sulfentra, Intensa, Co-op Governor* and *IPCO Tactic*.
  - Sweet and popcorn, sorghum and canola maybe be seeded 24 months after application of *Throne II* and *Viking Sulfentrazone*
  - Lentils may be seeded 36 months after application of *Throne II* and *Viking Sulfentrazone*
  - For all other crops 36 months must pass following application and a successful bioassay indicating adequate tolerance before planting.
  - **For each year of drought** experienced, **add one year** to the intervals above and conduct a bioassay to confirm tolerance of the rotational crop. Longer re-cropping intervals should be used under dry conditions.

- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store above 5°C to keep from freezing. If frozen, and solid crystals are observed, warm to above 15°C and shake or roll container periodically to dissolve solids.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground only*	1	0	10

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:
Refer to 'Method A' in the general section on sprayer cleaning in the introduction. Leaving cleaning solution in the sprayer tank and plumbing for an extended period will improve cleaning effectiveness.

Hazard Rating:
Caution – Poison
Refer to the Introduction for an explanation of the symbols.

Talinor

Herbicide Group
6-bromoxynil
27-bicyclopyrone

Company:
Syngenta Canada Inc.

Formulation:
Talinor (PCP#32681): 37.5 g/L bicyclopyrone and 175 g/L bromoxynil formulated as an emulsifiable concentrate.
- Container size – 2 x 8.1 L, 129.6 L, 324L

Crops and Staging:
Spring wheat, durum wheat and barley 2 to 6 leaf on the main stem (up to 3 tillers). Do not treat spring wheat, durum wheat and barley under-seeded to forages.

Weeds and Staging:
405 mL per acre.

Weeds Controlled (1 to 6 leaf unless otherwise noted):
- Annual sow thistle
- Cleavers (1 to 6 whorls)
- Common chickweed
- Flixweed (up to 10 cm in height)
- Hemp-nettle
- Kochia (up to 10 cm in height)
- Lamb's-quarters
- Narrow-leaved hawk's- beard (up to 15 cm height)
- Redroot pigweed
- Scentless chamomile*
- Shepherd's-purse
- Stinkweed
- Wild buckwheat
- Volunteer canola
- Wild mustard

Weeds Suppressed:
- Canada thistle (Up to 30cm height)
- Dandelion (Up to 10 cm in height and 25 cm in diameter)
- Horsetail (up to 15 cm in height)
- Round-leaved mallow
- Russian thistle (up to 10 cm in height)
- White cockle (up to 15 cm in height)

* Spring seedlings only
For optimum results, apply actively growing weeds. An early application will maximize crop yields by reducing weed competition.

Application Information:

- **Water Volume:**
  - Ground: Minimum 20 to 40 L per acre.
  - Aerial: Minimum 12 L/acre
- **Nozzles and Pressure:** 80° or 110° drift reducing flat fan (e.g. those with a pre-orifice or turbulence chamber) or air induction nozzles are recommended. DO NOT use flood type nozzles, controlled droplet application equipment, spray foils or hollow cone nozzles. Use pressure as recommended by the nozzle manufacturer to achieve ASAE medium sized droplets.
- **Screens:** 50 mesh nozzle screens.

How it Works:

Refer to Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
bicyclopyrone	POST (foliar)	HPPD Pigment Inhibitor	Some – both foliar and root (Apoplast) Somewhat systemic (has soil residues)	Broadleaf only	27
bromoxynil	POST (Foliar)	PSII Inhibitor/ Membrane disruptor	Little (Apoplast)	Broadleaf only	6

Effects of Growing Conditions:

Temporary crop injury may occur with tank-mixes under extreme weather conditions or when the crop is suffering from stress due to inadequate or abnormally high moisture levels or extreme temperatures.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides:

- *Axial* (500 mL per acre)
- *Axial Xtreme* (500 mL per acre)
- *Broadband* (263 mL per acre plus 283 mL per acre *Adigor*)
- *Traxos* (500 mL pr acre)
- *Sierra 3.0* (39 to 59 mL per acre)
- *Everest 3.0* (39 to 58 mL per acre)
- *Simplicity* (200 mL per acre)
- *Varro* (200 mL per acre)

Fungicides: None registered.
Insecticides: None registered.
Fertilizers: None registered.

Restrictions:

- **Rainfall:** Avoid application when heavy rain is forecast.
- **Re-entry:** DO NOT enter or allow worker entry into treated areas for 12 hours.
- **Preharvest Interval:** 60 days after treatment for grain and straw.
- **Grazing:** DO NOT graze or feed to livestock for 30 days after treatment for forage and hay.
- **Re-cropping:** Alfalfa, canola, chickpeas, flax, mustard, potato, soybeans, barley, oats, wheat (spring and durum) and field peas* may be grown 10 months after application. Dry beans and lentils may be grown 22 months after application.
  *** Field peas may be grown the year following *Talinor* application providing the following are met: precipitation must be equal to or above 10-year average (minimum 100 mm within 60 days of application in the year of application), organic matter must be above 2.5%, soil pH must be above 6.0.**
- **Aerial Application:** May be applied by aircraft.
- **Storage:** Store this product away from food or feed. Keep in original container, tightly closed, during storage. Store in a cool, dry, well ventilated area, out of the reach of children and animals. Keep away from fire or open flame, or other sources of heat. If frozen, allow to thaw and agitate thoroughly prior to use.

- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground*	1	0	3
Fixed wing aircraft	10	0	125
Helicopter	10	0	100

*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy**.

† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Refer to 'Method B' in the general section on sprayer cleaning in the introduction. Let solution stand for an extended period for better results. Flush sprayer system with water. See the label for product specific cleaning details.

Hazard Rating:

Danger – Poison
Warning – Skin irritant / Skin sensitizer. Contains the allergen soy.
Refer to the Introduction for an explanation of the symbols.

Tandem

Herbicide Group
2 - pyroxsulam
4 - fluroxypyr

This product is the equivalent of a prepackaged tank mix of Tandem A and Tandem B (See Fluroxypyr). Information listed is restricted to Crops, Weeds, Rates and Tank mixes. For other detailed restrictions and other general information on the component products see the product pages listed above.

Company:

Corteva Agriscience

Formulation:

The *Tandem* package contains the following components:
***Tandem A* (PCP#29985):** 30 g/L pyroxsulam formulated as an oil-dispersion.
- Container size - 8 L jug

***Tandem B* (PCP#29965):** 333 g ae/L fluroxypyr formulated as an emulsifiable concentrate.
- Container size - 4.84 L jug

Crops and Staging:

Spring wheat (including durum): 3 leaf stage to just prior to flag-leaf emergence.
Winter wheat: Apply in the spring from the 3 tiller stage to just before the flag leaf stage.
When tank-mixing always check the tank mix partner recommendations for additional staging restrictions.

Weeds, Rates and Staging:

***Tandem A* at 200 mL per acre plus *Tandem B* at 121 mL per acre:**
- ***The weeds controlled by Simplicity at the high application rate plus the following broadleaf weeds:***

Weed	Maximum Application Stage
Hemp-nettle†, kochia, stork's-bill*	8 leaves or whorls
Volunteer flax	12 cm

*** Suppression only.**
**** Not CLEARFIELD varieties.**
† NOTE Group 2 resistant biotypes only controlled to the 6 leaf stage.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides:

- ***In spring wheat (including durum):***
  - 2,4-D Ester 700 (0.24 to 0.32 L per acre)
  - *Curtail M*
  - MCPA Ester (0.24 to 0.38 L per acre) (600 g ae/L forms)

Fungicides: None registered.
Insecticides: None registered.
Fertilizers: None registered.
Note: The above mixes are those listed on the *Tandem* label only.

According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product..

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions (different from the components):

- **Aerial Application:** May be applied by air.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground *	1	1	3
Helicopter	3	1	80
Fixed wing aircraft	5	1	95

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** These distances can be reduced by 30 percent using cones on individual nozzles and by 70 percent using a full shield (shroud, curtain) that extends to the crop canopy.**
† Distance is measured from the downwind edge of the boom to sensitive areas.

See component products for more information on additional restrictions, application details and handling. Unless indicated differently above use the most limiting restrictions across all components for the mix.

Telar XP

Herbicide Group 2 - chlorsulfuron

Company:
Envu Canada (PCP #30036)

Formulation:
75% chlorsulfuron, presented as a water dispersible granule.
- Container size - 10 x 500 g

Crops and Staging:
Non-crop areas where vegetation is not desirable such as utility rights of ways, roadsides, industrial sites, railroads and storage areas. DO NOT apply to crop land.
The use of this chemical may result in contamination of any body of water, including irrigation that may be used on crops.

Weeds and Staging:
For best results apply *Telar XP* Herbicide post-emergence to young (less than 10 cm tall or across) annual weeds; biennial and perennial weeds. Weeds should be actively growing at time of application.
DO NOT allow spray mixture to remain in tank for more than 24 hours before spraying or the effectiveness may be reduced.
Residual control of weeds germinating after spray application is achieved when *Telar XP* Herbicide is carried into the root zone by rainfall. For best results, sufficient rainfall to move *Telar XP* 5 to 7 cm deep into the soil is required after application, before weeds develop an established root system and grow beyond the seedling stage.
Add Adjuvant: non-ionic surfactant (i.e *Agral 90, Agsurf II*, or *Hasten NT*) at 0.1 L per 100 L of spray solution.

Weeds controlled at 6 grams per acre + 2,4-D amine 500 at 0.32 to 0.45 L per acre or 2,4-D Ester LV 700 at 0.25 to 0.32L per acre:
- Annual smartweed (green, lady's-thumb)
- Annual sunflower
- Common tansy
- Cow cockle
- Flixweed
- Hemp-nettle
- Lambs-quarters
- Mustard (ball, wild)
- Narrow-leaved hawk's-beard (spring seedlings)
- Plantain
- Prickly lettuce
- Ragweed (common)
- Redroot pigweed
- Russian Pigweed
- Russian thistle
- Scentless chamomile
- Shepherd's-purse
- Stinkweed
- Stork's-bill
- Sweet clover
- Volunteer rapeseed

Weeds controlled at 12 grams per acre:
- Annual smartweed (green, lady's-thumb)
- Common chickweed
- Common groundsel
- Corn spurry
- Cow cockle
- Flixweed
- Hemp nettle
- Lamb's-quarters
- Prickly lettuce
- Redroot Pigweed
- Scentless chamomile
- Shepherd's-purse
- Stinkweed
- Stork's-bill
- Volunteer rapeseed
- Wild mustard

Weeds controlled at 16 grams per acre:
Weeds listed above plus:
- Wild carrot

Weeds controlled at 28 grams per acre:
Weeds listed above plus:
- Canada thistle*
- Dandelion*
- Goldenrod*
- Horsetail
- Perennial sow-thistle
- Russian thistle
- Sow thistle
- Sweet clover
- Wild rose*
- Wild strawberry*

Note: Broadleaf weed control in non-crop land (where vegetation is not desirable). This rate of *Telar XP* may cause severe injury for certain grass species.

Weeds controlled at 49 grams per acre:
Weeds listed above plus:
- Canada thistle
- Narrow-leaved hawk's-beard
- Wild buckwheat
- Willow*

*** Suppression only.**

Application Information:

- **Water Volume:**
  - ***Ground:*** 81 to 162 L per acre.
- **Nozzles and Pressure:** Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE coarse*** droplets. Sprayers without drift reduction nozzles should use between 30 to 40 psi (210 to 275 kPa). Low drift nozzles may require higher pressures for proper performance.
- **Screens:** Use a 50 mesh or coarser screen and filter system.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
chlorsulfuron	POST (foliar) also has soil activity	ALS Inhibitor	Toward areas of growth (symplast)	Broadleaf only	2

Effects of Growing Conditions:

Telar XP controls susceptible annual weeds by both foliar and root uptake. Best control of emerged annual weeds is obtained when weeds are actively growing. Warm, moist growing conditions promote active weed growth and enhance activity; weeds stressed by moisture or temperature extremes may be less susceptible and incomplete weed kill may result. Residual control of weeds germinating after spray application is achieved when the product is carried into the root zone by rainfall. For best results, sufficient rainfall to move *Telar XP* 5 to 7 cm deep into the soil is required after application, before weeds develop an established root system and grow beyond the seedling stage.

Tank Mixes:

Herbicides:

- ***Telar XP at 12, 16, 28 or 49 grams per acre with non-selective herbicides***
  - 2,4-D Amine
  - Atrazine
  - *Hyvar X*
  - *Hyvar X-L*
  - *Karmex DF*
  - *Krovar I*
  - *Princep*
  - *Velpar*

Adding ingredients in the correct order is critical for optimum performance. Check label of both products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Avoid application when heavy rain is forecast.
- **Restricted Entry Interval:** DO NOT enter treated areas for 12 hours after application.
- **Grazing Restrictions:** DO NOT graze or cut treated areas for forage as research does not support this use.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store in cool, dry place. Keep away from other pesticides, fertilizer, food or feed. Store in original container.
- **Buffer Zones:** Hand-held or backpack sprayer and spot treatment DO NOT require a buffer zone:

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Field Sprayer	5	3	75

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Refer to 'Method A' found in the general sprayer cleaning section in the introduction. Let solution stand for an extended period for better results. Flush sprayer system with water. See the label for product specific cleaning details. DO NOT use ammonia with chlorine bleach.

Hazard Rating:

Caution – Poison

Warning – Contains the Allergens Milk and Sulfites

Refer to the Introduction for an explanation of the symbols.

Thifensulfuron

Herbicide Group 2- thifensulfuron

Company:

FMC Corporation (*Pinnacle SG, Pinnacle Toss n Go**)
Albaugh (*Volta*)

** Note: This product is no longer manufactured but inventories still remain in distribution. This product may be removed from future editions.*

Formulation:

***Pinnacle SG* (PCP#29349):** 50% thifensulfuron methyl as a water soluble granule.
- Container size - 240 g

***Pinnacle SG Toss-n-Go* (PCP#30741):** 50% thifensulfuron methyl as a water soluble granule.
- Container size - 8 x 12 g water soluble pouches

***Volta* (PCP#33178):** 75% thifensulfuron methyl as a water dispersible granule.
- Container size - 324 g

Crops and Staging:

Pinnacle SG* and *Pinnacle SG Toss-n-Go* and *Volta:
- ***Soybean:*** First fully expanded trifoliate leaf to before soybeans have initiated flowering.

***Pinnacle SG* and *Pinnacle SG Toss-n-Go* only:**
- ***Camelina (Thifensulfuron tolerant varieties only)†:*** After camelina is established up to 60 days prior to harvest.

***Volta* only:**
- ***Barley, wheat (including durum and winter), oats:*** 2 leaf up to flag leaf stage. NOT for crops underseeded to a forage.

NOTE:** ***Since these uses are registered under the User Requested Minor Use Label Expansion (URMULE) program, the manufacturer assumes no responsibility for herbicide performance. Those who apply these uses do so at their own risk.

Weeds, Rates and Staging:

In soybeans or thifensulfuron tolerant camelina*: Apply up to weeds 4 inches (10 cm) tall or wide.
- ***Pinnacle SG, Pinnacle SG Toss-N-Go* at 3.3 grams per acre or *Volta* at at 2.2 g per acre will control:**
  - Lady's-thumb
  - Redroot pigweed
  - Wild mustard
- ***Pinnacle SG, Pinnacle SG Toss-N-Go* at 4.8 grams per acre or *Volta* at 3.2 g per acre will control the weeds above plus:**
  - Lamb's-quarters
  - Velvetleaf *

In cereals only at *Volta* at 8 g per acre will control the weeds above plus:
  - Annual smartweed (green)
  - Chickweed (1 to 6 leaf)
  - Corn spurry
  - Cow cockle
  - Hemp-nettle
  - Russian thistle
  - Stinkweed
  - Volunteer canola (not CLEARFIELD or SU tolerant varieties)
  - Wild buckwheat (1 to 3 leaf)

† ***Pinnacle* only.**

*** Soybeans only: The addition of 28-0-0 liquid fertilizer at 4 L per 100 L of spray solution or 2.4 kg of 46-0-0 dry urea fertilizer may improve control of velvetleaf. Refer to the product label for complete mixing instructions.**

Thifensulfuron requires the addition of a non-ionic surfactant such as *Agral 90*, *Agsurf II*, or *Citowett* at 1 L per 1000 L of spray solution. Oil surfactant blends such as *Assist* at 0.4 to 0.8 L per acre, or *Sure-Mix* at 0.5 L per 100 L of spray solution may be used as adjuvants (check label for use rates). A general guide to mixing can be found in the introduction.

Application Information:

- **Water Volume:** Minimum of 45 L per acre.
- **Nozzles and Pressure:** Maximum 40 psi (275 kPa) when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage of ***ASABE medium*** droplets.
- **Screens:** Use a 50 mesh or coarser screen and filter system.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
thifensulfuron	POST	ALS Amino Acid synthesis Inhibitor	Toward growth areas (Symplast)	Broadleaf	2

Effects of Growing Conditions:

Thifensulfuron applied to crops that have been under stress before application may result in crop injury. Stress conditions within 3 days after application may also result in crop injury.

Weeds under stress conditions at the time of application may not be adequately controlled.

Stress conditions are severe weather conditions, frost, low fertility, drought, water-saturated soils, and disease or insect damage.

Injury symptoms in soybean can be crop discoloration (yellowing, purpling or reddening of leaf veins), or stunting.

Tank Mixes:

Herbicides:

- ***In soybeans only:***
  - *Assure II* (0.2 L per acre) plus *Sure-Mix** adjuvant.
  - *Basagran* (0.71 or 0.91 L per acre) plus *Assist* adjuvant*.
  - *Basagran Forté* (0.71 or 0.91 L per acre)*.
  - *Assure II* (0.25 L per acre) plus *Basagran Forté* (0.71 or 0.91 L per acre) plus *Sure-Mix* adjuvant*.
- ***In cereals only:***
  - MCPA Amine at 500 g ae per acre (0.4 L per acre of a 500 g/L formulation) plus surfactant as above.

  *** Refer to appropriate labels for thifensulfuron and adjuvant rates of application.**

Fungicides: None registered.

Insecticides: None registered.

According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Up to 25 mm of rain beginning 1 hour or more after spraying will not reduce the effectiveness of thifensulfuron.
- **Restricted Entry Interval:** DO NOT enter treated fields for at least 12 hours.
- **Pre-harvest Interval:** Leave 60 days from application to harvest.
- **Grazing Interval:** DO NOT graze treated crops or cut for hay.
- **Re-cropping Interval:** DO NOT plant any crop other than soybean, tomatoes, thifensulfuron tolerant camelina, CLEARFIELD canola, wheat or barley for 30 days after application.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store in closed original container in a dry area away from food or feed.
- **Buffer Zones:**
  - Hand-held or backpack sprayers, inter-row hooded sprayers and spot treatments are exempt from buffer zone requirements.

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground only*	1	0	15

See the Key to Product Pages in the introduction for an explanation of the different habitats.

*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**

† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Thifensulfuron can cause severe injury to sensitive crops at very low concentrations. Sprayers used to spray thifensulfuron should be flushed out immediately after use. Refer to 'Method A' in the general section on sprayer cleaning in the introduction.

Hazard Rating:

Warning – Contains the Allergen Milk/Sufites

Thifensulfuron/Tribenuron + Fluroxypyr + Clopyralid

Herbicide Group
2 - thifensulfuron, tribenuron
4 - fluroxypyr, clopyralid

This product is a prepackaged tank mix of Thifensulfuron/Tribenuron, Fluroxypyr and Clopyralid listed is restricted to Crops, Weeds, Rates and Tank mixes. For other detailed restrictions and other general information on the component products see the product pages listed above.

Company:

AgraCity (*Foxxy CRX*)
Viking (*Viking Larvik*)

Formulation:

The Thifensulfuron/Tribenuron + Fluroxypyr + Clopyralid package contains the following components:
***Foxxy* (PCP#32952 - *Foxxy CRX*), *Viking Fluroxypyr* (PCP# 34778 - *Viking Larvik*):** 180 g/L fluroxypyr formulated as an emulsifiable concentrate.

- Container sizes - 9.6 L, 230 L

-plus-
***MPOWER RX* (PCP#33520 - *Foxxy CRX*), *Viking Navik* (PCP# 34791 - *Viking Larvik*):** 50% thifensulfuron methyl + 25% tribenuron methyl formulated as a water dispersible granule.

- Container sizes - 320 g, 24 x 320 g

-plus-
***Clobber* (PCP#33114 - *Foxxy CRX*), *Viking Clopyralid* (PCP# 34779 - *Viking Larvik*):** 360 g/L clopyralid formulated as an emulsifiable concentrate.

- Container sizes - 3.4 L, 81 L

Crops and Staging:

Barley, spring wheat, durum wheat only: 3 leaf to flag leaf.

Weeds, Rates and Staging:

Weeds controlled by *Foxxy* and *Viking Fluroxypyr* (see Fluroxypyr) at 0.24 L per acre plus the weeds controlled by *MPOWER RX* and *Viking Navik* (see thifensulfuron:tribenuron (2:1) at 8 grams per acre and *Clobber* and *Viking Clopyralid* (see clopyralid) at 112 mL per acre.
If applied alone, *Foxxy CRX* and *Viking Larvik* requires the addition of *Icon*, *Agral 90, Ag-Surf* or *Citowett Plus* adjuvant at 0.2 L per 100 L of spray solution, and which must be purchased separately.
Foxxy CRX and *Vikikng Larvik* may degrade if left in the sprayer for an extended period. Apply within 24 hours of mixing.

Tank Mixes:

None registered.
According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.
See component products for more information on restrictions, application details and handling. Unless indicated differently above use the most limiting restrictions across all components for the mix.

Thifen:Triben (2:1) + Fluroxypyr + 2,4-D

Herbicide Group
2 - thifensulfuron & tribenuron
4 - fluroxypyr & 2,4-D

This product is a prepackaged tank mix of the equivalent of thifensulfuron/tribenuron and fluroxypyr and 2,4-D. Information listed is restricted to Crops, Weeds, Rates and Tank mixes.
For other detailed information on the component products see the product pages listed above.

Company:
Loveland Products Canada (*Retain SG*)
AgraCity (*Foxxy Pro RX*)
Viking (*Viking Avesta*)

Formulations:
The *Retain SG* package contains the following components:
***Retain A* (PCP#30129):** 33.35% thifensulfuron + 16.65% tribenuron formulated as a water soluble granule.
- Container size - 486 g

***Retain 333 B* (PCP#32845):** 333 g/L fluroxypyr formulated as an emulsifiable concentrate.
- Container size - 2.6 L

Loveland Products Canada 2,4-D Ester 700 (PCP#27818): 660 g/L 2,4-D ester formulated as an emulsifiable concentrate.
- Container size - 6.8 L

-or-
The *Foxxy Pro RX* package contains the following components:
***MPOWER RX* (PCP#33520):** 50% thifensulfuron and 25% tribenuron formulated as a water dispersible granule.
- Container sizes - 320 g, 16 x 320 g

***Foxxy* (PCP#32952):** 180 g/L fluroxypyr formulated as an emulsifiable concentrate.
- Container sizes - 4.8 L, 77 L

***2,4-D Ester 700 II* (PCP#34808):** 660 g ae/L 2,4-D Ester formulated as an emulsifiable concentrate.
- Container sizes - 6.8 L, 109 L

-or -
The *Viking Avesta* package contains the following components:
***Viking Navik* (PCP#34791):** 50% thifensulfuron and 25% tribenuron formulated as a water dispersible granule.
- Container size - 320 g

***Viking Fluroxypyr* (PCP#34778):** 180 g/L fluroxypyr formulated as an emulsifiable concentrate.
- Container size - 9.6 L

***Viking 2,4-D Ester 700* (PCP#34813):** 660 g ae/L 2,4-D Ester formulated as an emulsifiable concentrate.
- Container Size 9.8L

Crops and Staging:
Wheat (spring, durum) and barley: 4 leaf to flag leaf stage.
Winter Wheat*: In spring from the 3 tiller stage until the emergence of the flag leaf.
*** *Retain SG* only.**

Weeds and Staging:
Apply from the seedling to 4 leaf or whorl stage (unless otherwise indicated) of the following weeds:
- Weeds controlled by thifensulfuron/tribenuron (2:1) plus 2,4-D ester as well as:
  - ***Retain SG:*** cleavers*
  - ***Foxxy Pro RX:*** cleavers, kochia (2 to 8 leaf), volunteer flax (up to 12 cm), stork's-bill suppression (1 to 8 leaf)

  *** Not Group 2 resistant biotypes**

Rates:
Retain SG:
- ***Retain A*:** 12 grams per acre.
- ***Retain 333 B:*** 70 mL per acre.
- **Loveland Products Canada 2,4-D:** 0.2 L per acre.

Foxxy Pro RX:
- ***MPOWER RX:*** 8 grams per acre.
- ***Foxxy:*** 240 mL per acre.
- ***2,4-D 700 ester 700 II*:** 245 mL per acre.

Viking Avesta:

- ***Viking Navik:*** 8 grams per acre.
- ***Viking Fluroxypyr:*** 242 mL per acre.
- ***Viking 2,4-D 700 ester:*** 245 mL per acre

Add *Agral 90*, *Agsurf II*, or *Citowett Plus* at 0.2 L per 100 L of spray solution.

Thifensulfuron and tribenuron may degrade if left in the sprayer for an extended period. Apply within 24 hours of mixing.

Tank Mixes:

None registered.

According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product..

Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

See component products for more information on restrictions, application details and handling. Use the most limiting restrictions across all components for the mix.

Thifen / Triben (25:25) + Fluroxypyr

Herbicide Group
2 - thifensulfuron, tribenuron
4 - fluroxypyr

Company:

FMC Corporation (*Barricade II*)
AgraCity (*Foxxy R*)

Formulation:

The *Barricade II* package contains the following components:
***Barricade SG* (PCP#29544):** 25% thifensulfuron methyl plus 25% tribenuron methyl formulated as a water soluble granule.

- Container size - 486 g

***Perimeter II* (PCP#30094):** 333 g ae/L fluroxypyr formulated as an emulsifiable concentrate.

- Container size - 3.4 L

The *Foxxy R* and *Foxxy RCK* packages contain the following components:
***Rumour* (PCP#33574):** 25% thifensulfuron methyl plus 25% tribenuron methyl formulated as a water soluble granule.

- Container sizes:
  - *Foxxy R* - 2 x 320 g, 12 x 320 g
  - *Foxxy RCK* - 2 x 486 g, 36 x 486 g

***Foxxy* (PCP#32952):** 180 g ae/L fluroxypyr formulated as an emulsifiable concentrate.

- Container sizes:
  - *Foxxy R* - 2 x 6.4 L, 77 L
  - *Foxxy RCK* - 2 x 9.6 L, 230 L

Crops and Staging:

Barley, and spring wheat (including durum) only: 2 leaf until first node can be felt at the base of the stem.
Oats (*Barricade II* + MCPA ester mix only): 3 leaf until first node can be felt at the base of the stem.
Winter wheat: In the spring from the 3 tiller stage until the emergence of the flag leaf.

Weeds and Staging:

Unless otherwise noted below, apply to young and actively growing weeds that are less than 4 inches (10 cm) in height or width.

Weeds controlled:

- Annual smartweed (green, lady's-thumb)
- Canada thistle (less than 6 inches (15 cm) tall or across and prior to budding)*
- Cleavers§
- Common chickweed (1 to 6 leaf)**
- Cow cockle
- Flixweed**
- Hemp-nettle
- Kochia (seedling to 8 leaf/10 cm**)
- Lamb's-quarters
- Narrow-leaved hawk's-beard**
- Night-flowering catchfly**
- Redroot pigweed
- Round-leaved mallow (1 to 5 leaf)**
- Russian thistle**
- Shepherd's-purse (up to 20 cm)**
- Sow-thistle (perennial)**
- Stinkweed
- Stork's-bill§§***
- Volunteer canola (not Group 2 tolerant varieties)
- Wild buckwheat (1 to 8 leaf)
- Wild mustard
- Volunteer flax (up to 12 cm)***

***Suppression only.**
**** *Barricade II* only.**
***** *Barricade II* and *Foxxy RCK* only.**
§ Cleavers from the 1 to 6 whorl stage with *Barricade II* and 1 to 4 whorls with *Foxxy R*.
§§ Stork's-bill from the 1 to 6 leaf with *Barricade II* and 1 to 8 leaf with *Foxxy RCK*.

Rate:

For *Barricade II:*

- ***Barricade SG:*** 12 grams per acre
- ***Perimeter II:*** 85 mL per acre

-or-

For *Foxxy R, Viking Brevik:*

- ***Rumour:*** 12 grams per acre
- ***Foxxy:*** 160 mL per acre

-or-

For *Foxxy RCK*:

- ***Rumour:*** 12 grams per acre
- ***Foxx***y: 240 mL per acre

Add *Agral 90*, *Agsurf II*, *Citowett Plus*, *Enhance, HiActivate, Liberate* or *Super Spreader* at 0.2 L per 100 L of spray solution.
Thifensulfuron and tribenuron may degrade if left in the sprayer for an extended period. Apply within 24 hours of mixing.
Maximum of ONE APPLICATION per year of this or other products containing thifensulfuron or fluroxypyr.
Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Application Information:

- **Water Volume:**
  - ***Ground:*** Minimum 20 L per acre.
  - ***Aerial:*** 10 to 20 L per acre.
- **Nozzles and Pressure:** Flat fan nozzles are recommended. Sprayers without drift reduction nozzles should use between 30 to 40 psi (210 to 275 kPa). Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE medium*** droplets by ground or ***ASABE coarse*** droplets by air.
- **Screens:** Use a 50 mesh or coarser screen and filter system.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
thifensulfuron, tribenuron	POST (foliar)	ALS Amino Acid synthesis Inhibitor	Toward growth areas (Symplast)	Broadleaf only	2
fluroxypyr	POST (foliar)	Synthetic Auxin	Moves throughout the plant (Symplast)	Broadleaf only	4

Effects of Growing Conditions:

DO NOT apply to registered crops that are stressed by severe weather conditions (frost, drought or water saturated soil) as crop injury may result. Reduced activity will occur when temperatures are below 8°C or above 27°C. Frost 3 days before or after application may reduce weed control and crop tolerance. Under certain conditions (heavy rainfall, prolonged cool weather, frost conditions, and wide fluctuations in day/night temperatures), lightening in crop colour and reduction in crop height may occur.

Tank Mixes:

Herbicides:

Tank mix partners are applied at all their label rates and stages and include recommended adjuvants unless otherwise noted.

- ***All crops*:**
  - MCPA Ester* (190 mL per acre)
- ***Spring wheat including Durum**:***
  - *Horizon NG*
  - *Simplicity OD*
  - *Simplicity OD* + MCPA Ester
  - *Traxos* + MCPA Ester* (190 mL per acre)

    *** Rate for MCPA Ester 600. Minimum and maximum staging for MCPA applies.**

    **** *Barricade II* only.**

Fertilizers: None registered.

According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Rainfall within 1 hour of application may reduce efficacy.
- **Restricted Entry Interval:** DO NOT re-enter treated fields for 12 hours.
- **Pre-harvest Interval:** Leave 60 days between application and harvest.
- **Grazing Restrictions:** MUST NOT be grazed or fed to livestock for 7 days after treatment.
- **Re-cropping Interval:** Alfalfa, barley, corn, canola, dry beans, faba bean, flax, forage grasses, lentil, mustard, oats, peas, potatoes, rye, soybeans, sugar beets, sunflowers, wheat or fields can be fallowed the year after treatment.
- **Aerial Application:** May be applied by aircraft.
- **Storage:** Store in a cool, dry place. Avoid freezing. If frozen, bring to room temperature and agitate before use. DO NOT store near heat or open flame.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground*	1	0	15
Fixed wing aircraft	5	0	125
Helicopter	3	0	100

See the Key to Product Pages in the introduction for an explanation of the different habitats.

*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**

† Distance is measured from the downwind edge of the boom to sensitive areas.

Sprayer Cleaning:

Follow the sprayer cleaning instructions on the thifensulfuron/tribenuron page. The addition of a wetting agent (detergent) will also aid the cleaning process. Refer to the general section on sprayer cleaning in the introduction for additional information.

Hazard Rating:

Danger – Poison

Warning – Contains the Allergens Milk and Sulfites

Refer to the Introduction for an explanation of the symbols.

Thifensulfuron / tribenuron (2:1 ratio)

Herbicide Group 2 - thifensulfuron, tribenuron

Company:
FMC Corporation (*Refine SG*)
AgraCity (*MPOWER RX*)
Nufarm Agriculture (*Boost*)
Albaugh (*Draft*)
Viking (*Viking Navik*)

Formulation:
***Refine SG* (PCP#28285):** 33.35% thifensulfuron methyl plus 16.65% tribenuron methyl formulated as a water soluble granule.
- Container size - 486 g

***Boost* (PCP#30377), *Draft* (PCP#31904), *MPOWER RX* (PCP#33520), *Viking Navik* (PCP#34791) = 75% WDG formulations:** 50% thifensulfuron methyl plus 25% tribenuron methyl formulated as a water dispersible granule.
- Container size - 320 g

Crops and Staging:
Apply from 2 leaf to the flag leaf stage.
When tank mixing, always check the tank mix partner recommendations for additional staging restrictions
- **Cereals:**
  - Barley
  - Oat
  - Wheat (including durum spring and winter)
- **Sulfonylurea (SU) tolerant canola – 2 to 5 leaf and prior to bolting (*Draft* only).**
- **Seedling or established forage grasses for forage or seed production:***
  - Bromegrass (meadow, smooth)
  - Fescue (creeping red, tall)
  - Kentucky bluegrass**
  - Orchardgrass
  - Wheatgrass (crested, intermediate, northern, pubescent, slender, streambank, tall, western)

**** NOTE: Since the use of this product on forage grasses is registered under the User Requested Minor Use registration system, the manufacturer assumes no responsibility for herbicide performance. Users of this product on forage grass do so at their own risk.***
**** Established stands only.**

Weeds and Staging:
Unless otherwise noted below, apply to young and actively growing weeds that are less than 4 inches (10 cm) in height or width.
- **Weeds controlled:**
  - Annual smartweed (green, lady's-thumb)
  - Ball mustard
  - Chickweed (1 to 6 leaf)
  - Common groundsel
  - Corn spurry
  - Cow cockle
  - Flixweed
  - Hemp-nettle
  - Lamb's-quarters
  - Narrow-leaved hawk's-beard
  - Redroot pigweed
  - Russian thistle
  - Shepherd's-purse
  - Stinkweed
  - Tartary buckwheat
  - Volunteer canola (CLEARFIELD varieties controlled with 2,4-D or MCPA mixes in cereals or grass crops only)
  - Volunteer sunflower
  - Wild buckwheat*
  - Wild mustard
- **Weeds suppressed:**
  - Canada thistle (less than 6 inches or 15 cm tall or across)**
  - Cleavers (1 to 3 whorls)
  - Round-leaved mallow (2 to 6 leaf)
  - Scentless chamomile
  - Sow-thistle (less than 6 inches or 15 cm tall or across)**
  - Stork's-bill (2 to 6 leaves)
  - Toadflax (less than 6 inches or 15 cm tall)

*** *Refine SG:* up to 5 leaf stage; 75% WDG formulations: up to 3 leaf stage only.**
**** Prior to budding.**

Rate:
***Refine SG*:** 12 grams per acre.
75% WDG formulations: 8 grams per acre.
Add *Agral 90*, *AgSurf II**, *Citowett Plus, HiActivate*, Liberate, Nufarm Enhance, or Super Spreader** surfactants at 0.2 L per 100 L of spray solution.
**** Refine SG* only.**
Maximum of ONE APPLICATION per year of thifensulfuron/tribenuron or other products with the same active ingredients.
Thifensulfuron/tribenuron may degrade if left in the sprayer for an extended period. Apply within 24 hours of mixing. Refer to the product label for complete mixing instructions.
A general guide to mixing can be found in the introduction.

Application Information:

- **Water Volume:**
  - ***Ground:*** Minimum 22 L per acre.
  - ***Aerial (Refine SG only):*** Minimum 10 L to maximum 20 L per acre.
- **Nozzles and Pressure:** Use 30 to 40 psi (210 to 275 kPa) when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE medium*** droplets.
- **Screens:** Use a 50 mesh or coarser screen and filter system.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
thifensulfuron/ tribenuron	POST (foliar)	ALS Amino Acid Synthesis Inhibitor	Toward growth areas (Symplast)	Broadleaf only	2

Effects of Growing Conditions:

DO NOT apply to wheat, barley or oats that are stressed by severe weather conditions (frost, drought or water saturated soil) as crop injury may result.

Under certain conditions (heavy rainfall, prolonged cool weather, frost conditions, wide fluctuations in day/night temperatures) lightening in crop colour and reduction in crop height may occur.

Tank Mixes:

Herbicides:

- Tank mix partners applied at all label rates. Recommended adjuvants are used unless otherwise noted.

Tank Mix Partner	Crops				
	Spring wheat	Winter wheat	Durum	Barley	Oats
2,4-D amine or ester (160 to 212 g ae per acre)*†	✓	✓	✓	✓	
Curtail M (0.61 L per acre)†	✓			✓	
Fenoxaprop 120 EC (0.16 to 0.31 L per acre)	✓		✓	✓	
Fenoxaprop 120 EC (0.16 to 0. 31 L per acre) plus MCPA Ester (0.23♦ or 0.34 L per acre)*	✓		✓	✓	
Fluroxypyr (*Perimeter II* at 63 mL per acre only)†	✓		✓	✓	
Fluroxypyr + 2,4-D (*Flurox-24* only)†	✓ΔΔ		✓ΔΔ	✓ΔΔ	
MCPA amine or ester (0.23♦ or 0.28 to 0.45 L per acre)*†	✓	✓	✓	✓	✓
Simplicity 30 OD (0.15 to 0.20 L per acre) †	✓Δ		✓Δ		

† Marked tank mixes require the addition of a non-ionic surfactant. Unmarked mixes do not require additional adjuvant beyond what is provided for by the tank mix partner.

Δ *Refine SG* only.

ΔΔ *Boost* and *MPOWER R* only.

*** 500 g ai/L formulation.**

♦ Tank mix with 0.23 L per acre to control CLEARFIELD canola at the 2 to 4 leaf stage.

- Check the above tank mix partner(s) respective labels for additional staging and varietal restrictions.

Fertilizers: None registered.

Note: The above mixes are those listed on the Thifensulfuron/tribenuron (2:1) labels only.

According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Rainfall of 1 inch (25 mm) or more beginning within 1 hour of application of *Refine SG* or 4 hours for 75% WDG formulations may reduce control.
- **Restricted Entry Interval:** DO NOT enter treated fields for 12 hours following application.
- **Grazing Restrictions:** Must NOT be grazed or fed to livestock for 7 days after treatment.
- **Re-cropping Interval:** No restrictions the year after treatment. Canola, flax, lentil and alfalfa may be planted 2 months after application.
- **Aerial Application:** *Refine SG* may be applied by air. DO NOT apply 75% WDG formulations by air.
- **Storage:** Store in a cool, dry place. May be frozen.
- **Buffer Zones:**
  - ***Refine SG:***

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground *	1	0	15
Fixed wing airplane	1	0	125
Helicopter	1	0	100

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

  - ***75% WDG formulations (Ground equipment only):***
    - Leave a 15 metre buffer zone between last spray swath and sensitive upland or aquatic habitats such as shelterbelts, wetlands, sloughs and woodlots.

Sprayer Cleaning:

Thifensulfuron/tribenuron can cause severe injury to sensitive crops at very low concentrations. Sprayers used to spray thifensulfuron/tribenuron should be drained and flushed out immediately after use.

Refer to 'Method A' in the general section on sprayer cleaning in the introduction. If mixing with another pesticide with different cleaning measures, those measures should be integrated into 'Method A' (e.g. addition of detergent).

Hazard Rating:

75% WDG formulations:

Warning – Eye and Skin Irritant

***Refine SG*:**

Warning – Contains the Allergen Milk

Refer to the Introduction for an explanation of the symbols.

Thifensulfuron / tribenuron (2:1) + MCPA Ester

Herbicide Group
2 - thifensulfuron & tribenuron
4 - MCPA

These products are prepackaged tank mix of Refine SG and MCPA Ester. Information listed is restricted to Crops, Weeds, Rates and Tank mixes. For other detailed information on the component products see the product pages listed above.

Company:
FMC Corporation (*Refine M*)
Loveland Products Canada (*BroadSide*)

Formulation:
***Refine SG* (PCP#28285):** 33.35% thifensulfuron methyl + 16.65% tribenuron methyl; formulated as a water soluble granule.
- Container size - 486 g

***MCPA Ester* (*Refine M* – PCP#32311, *Broadside* – PCP#27804):** 600g/L MCPA formulated as an emulsifiable concentrate.
- Container size - 1 x 7.6 L of MCPA Ester

Crops and Staging:
Barley, wheat (including durum and winter) and oats: fully expanded 3rd leaf to the flag leaf stage.
When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

Weeds and Staging:
Weeds controlled or suppressed by *Refine SG* plus 'Susceptible Weeds' controlled by MCPA Ester, plus:
- Dandelion (rosettes, less than 15 cm in diameter)
- Volunteer canola (2 to 4 leaf)

Rates:
***Refine SG*:** 12 grams per acre
MCPA 600 Ester: 0.19 L per acre
Refer to the product labels for complete mixing instructions.
A general guide to mixing can be found in the introduction.

Tank Mixes:
Herbicides: None Registered.
According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.
See component products for more information on restrictions, application details and handling. Unless indicated differently above use the most limiting restrictions across all components for the mix.

Thunderhawk

This product is a prepackaged tank mix of Thunderhawk A (equivalent of Goldwing) and Thunderhawk B (equivalent of florasulam). Information listed is restricted to Crops, Weeds, Rates and Tank mixes. For other detailed restrictions and other general information on the component products see the product pages listed above.

Herbicide Group
2 - florasulam
4 - MCPA Ester
14 - pyraflufen-ethyl

Company:
Nufarm Agriculture

Formulation:
The *Thunderhawk* package contains the following components:
***Thunderhawk A* (PCP#33687):** 13.5 g/L pyraflufen-ethyl and 420 g ae/L MCPA ester formulated as a emulsifiable concentrate.
- Container size - 10.7 L

-plus-
***Thunderhawk B* (PCP#33717):** 50 g/L florasulam formulated as a suspension concentrate.
- Container size - 3.2 L

Crops and Staging:
Spring wheat (NOT including durum), barley, oats: Apply to emerged weeds prior to seeding or just after seeding, but prior to crop emergence. Applications can be made up to a maximum of 2 days after seeding.

Weeds and Staging:
Weeds controlled or suppressed by the component products.

Rates:
Thunderhawk A: 134 mL per acre
Thunderhawk B: 40 mL per acre
Note: If Thunderhawk *is applied alone without glyphosate, add an non-ionic surfactant at 0.25 percent L per 100 L of spray solution.*
Refer to the product labels for complete mixing instructions. A general guide to mixing can be found in the introduction.

Tank Mixes:
Herbicides: Glyphosate
Fungicides: None registered.
Insecticides: None registered.
Fertilizers: None registered.

See component products for more information on restrictions, application details and handling. Unless indicated differently above use the most limiting restrictions across all components for the mix.

Topline

Herbicide Group
2 - florasulam
4 - MCPA

This product is a prepackaged tank mix of Florasulam and MCPA.
Information listed is restricted to Crops, Weeds, Rates and Tank mixes. For other detailed restrictions and other general information on the component products see the product pages listed above.

Company:
ADAMA Canada (*Topline*)

Formulation:
The *Topline* package contains the following components:
***Florasulam SC* (PCP#30814):** 50 g/L florasulam formulated as a suspension concentrate.
***Checkmate MCPA Ester 600* (PCP#27804):** 600 g/L MCPA Ester formulated as an emulsifiable concentrate.

- Container sizes -
  - ***Florasulam SC*:** 1.6 L
  - ***Checkmate MCPA Ester*:** 9.33 L

Crops and Staging:
Spring wheat (including durum), barley and oats: 2 to 6 leaf stage.
When tank-mixing, always check the tank mix partner recommendations for additional staging restrictions.

Weeds and Staging:
Broadleaf weeds controlled at the 2 to 4 leaf stage:

- Ball mustard
- Burdock**
- Chickweed
- Cleavers
- Flixweed**
- Hemp-nettle♦
- Lamb's-quarters
- Prickly lettuce**
- Ragweed (common)
- Redroot pigweed♦
- Russian pigweed**
- Shepherd's-purse
- Smartweed
- Stinkweed
- Sunflower (annual)**
- Volunteer canola*
- Wild mustard
- Wild buckwheat

Broadleaf weeds suppressed:

- Canada thistle
- Dandelion***♦
- Narrow-leaved hawk's-beard
- Plantain†
- Stork's-bill
- Sow-thistle (annual)
- Sow-thistle (perennial)†

*** Including all herbicide-tolerant canola varieties.**
**** Up to the 4 leaf stage of development.**
***** Seedlings and overwintered rosettes less than 15 cm (6 inches).**
♦ For improved control of this weed add an additional 47.5 mL per acre of *MCPA LV600*.
† Top growth control.

Rate:
***Florasulam SC*:** 40 mL per acre
-plus-
***MCPA 600 Ester*:** 0.23 L per acre
Refer to the product label for complete mixing instructions for this product and its mixes. A general guide to mixing can be found in the introduction.

Tank Mixes:
None registered.

According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include general wording on their respective labels indicating they may be mixed with other pesticides. please see each manufacturer's list of supported unlabelled tank mixes for a complete list.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

See component products for more information on restrictions, application details and handling. Unless indicated differently above use the most limiting restrictions across all components for the mix.

Topramezone

Herbicide Group 27 - topramezone

Company:
AMVAC (*Impact* – PCP#28141)
BASF Canada (*Armezon* – PCP#30131)
Sharda CropChem Canada (*Topple* - PCP#35126)

Formulation:
336 g/L topramezone formulated as a suspension.
- Container sizes:
  - *Armezon* - 0.6 L
  - *Impact* - 0.6 L

Crops and Staging:
Corn (field†, seed, sweet††): From the 1 to 7 leaf stage
Flax*: 2 to 4 inches (5 to 10 cm)
*** NOTE: Since these uses are registered under the User Requested Minor Use Label Expansion (URMULE) program, the manufacturer assumes no responsibility for herbicide performance. Those who apply these uses do so at their own risk.**

† Including both conventional and herbicide tolerant varieties.
†† NOTE: Tolerance of sweet corn varieties to topramezone and its mix partners may be variable. When tolerance is unknown, check with the supplier of seed and/or apply to a small area first to assess tolerance.

Weeds and Staging:
The following weeds are controlled with topramezone unless otherwise indicated:
Topramezone use in corn MUST BE applied in tank mix with one of the herbicide options indicated in "Tank Mixes:"
- ***Grass weeds below from the 1 to 4 leaf stage:***
  - Barnyard grass*
  - Foxtail (green, yellow)*
- ***Broadleaf weeds below from the 1 to 8 leaf stage:***
  - Chickweed (common)*
  - Kochia (up to 10 cm)**
  - Lamb's-quarters*
  - Lady's-thumb*
  - Nightshade (eastern black)
  - Pigweed (redroot, green)
  - Ragweed (common)
  - Velvetleaf*
  - Volunteer canola (up to 8 leaf) including glyphosate-tolerant varieties**
  - Wild mustard

  *** Suppression only.**
  **** *Armezon* only. All types including glyphosate-resistant varieties.**

Rates:
15 mL per acre
Must be applied with (when not mixed with glyphosate) either:
- *Merge* adjuvant (0.5 L per 100 L of spray solution)

-or-
- *Hasten NT* spray adjuvant (0.25 L per 100 L of spray solution)

-or-
- *MSO Concentrate with Leci-Tech* (1 L per 100 L of of spray solution) plus UAN (1.25 L per 100 L of spray solution)

-or-
- *Destination MSO* (0.25 L per 100 L of spray solutions plus UAN (1.25 L per 100 L of spray solution)

-or-
- *Assist* (or *XA Oil concentrate*) (1.25 L per 100 L of spray solution) plus UAN (liquid 28-0-0) (1.25 L per 100 L of spray solution)

For control of secondary flushes of volunteer canola, a sequential application of *Armezon* at 15 mL per acre may be applied before the corn exceeds the 7 leaf stage. The sequential application of *Armezon* may be applied with glyphosate at 360 g ae per acre or with *Merge* at 0.5 percent v/v.
Note: MAXIMUM of 10.2 g ai per acre of topramezone per season.

Application Information:
- **Water Volume:** Minimum 81 L per acre.
- **Nozzles and Pressure:** Use 20 to 40 psi (140 to 276 kPa) if applying without drift reduction nozzles. Drift reduction nozzles may require higher pressures for proper performance. Select the nozzle and pressure combination that produces of ***ASABE medium*** droplets while maintaining good coverage of foliage.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
topramezone	POST (foliar)	HPPD Pigment Inhibitor	Little (Apoplast) some uptake by roots	Broadleaf & grass	27

Effects of Growing Conditions:

When weeds are stressed because of drought, flooding, hot or cool temperatures, weeds are not actively growing, control may be reduced.

Tank Mixes:

Herbicides:

Topramezone must be mixed with one of the following:

- ***Field and Sweet Corn:***
  - *AAtrex* (0.42 L per acre) (DO NOT use Merge with this mix in sweet corn)
- ***Field corn only:***
  - *Frontier Max* (0.3 L per acre) + *AAtrex* (rates above)
- ***Glyphosate tolerant corn only:***
  - Glyphosate (360 g ae per acre, no adjuvant required) (see glyphosate page for details)
  - Glyphosate + *AAtrex* (rates above)
  - Glyphosate + *AAtrex* (rates above) + *Frontier Max* (rates above)

Fungicides: None registered.
Fertilizers: None registered.
Insecticides: None registered.
Note: The above mixes are those listed on the topramezone label only.

Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** DO NOT apply if heavy rain is forecast. Contact manufacturer for more information.
- **Restricted Entry Interval:** DO NOT enter treated fields for at least 12 hours.
- **Grazing Restrictions:** DO NOT graze treated fields or cut for feed within 45 days of application.
- **Pre-harvest Interval:** Leave 45 days between application and harvest.
- **Re-cropping Interval:**
  - **After two applications of *Armezon* (30 mL per acre total):** Field corn only may be seeded to treated areas after a crop failure. Winter wheat may be seeded four months following application. Spring wheat, canola (all types), and field corn may be seeded the following year.
  - **After one application of *Armezon* or *Impact* or *Topple(15 mL per acre total):*** Field corn only may be seeded to treated areas after a crop failure. Winter wheat may be seeded a minimum four months after application. Spring wheat, (all types), field corn, navy (white) bean, soybean, lentils, pea, canola, potato, flax (*Impact, Topple* only), sunflower (*Impact* , *Topple* only) and alfalfa may be seeded the following crop year. Check tank mix options for additional reseeding restrictions. Conduct a field bioassay (a test strip grown to maturity) the year before growing any other crop.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store in a cool (above 5°C), dry area. If product is frozen, bring to room temperature and agitate before use.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground *	1	1	5

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

- Spray when winds are under 16 km per hour, but not dead calm.

Sprayer Cleaning:

Refer to 'Method A' in the general section on sprayer cleaning in the introduction.

Hazard Rating:

Warning – Contains the Allergen Soy

Refer to the Introduction for an explanation of the symbols.

Tordon 22K

Herbicide Group 4 - picloram

Company:
Corteva Agriscience (PCP#9005)

Formulation:
240 g/L picloram acid present as a potassium salt, formulated as a solution.
- Container size - 10 L

Note: *Available only through selected retail outlets.*

Crops and Staging:
Apply at any stage of permanent grass pastures, rangeland and non-cropland.
NOTE: It is strongly recommended that this product be applied by a licensed applicator.

Weeds, Rates and Staging:
For the control of biennial and deep-rooted perennial weeds listed below:

Weed	Rate L per acre	Backpack (mL of *Tordon 22K* per 100 M^2)*
Scentless chamomile	0.445	11
Knapweed (diffuse, spotted)	0.91	22
Canada thistle, pasture sage, poverty weed, Russian knapweed, perennial sow-thistle or *Low plant densities of:* Leafy spurge, field bindweed, toadflax	1.8	45
Leafy spurge, field bindweed, toadflax	3.6†	90†

† NOTE: This rate is only registered for spot application treating a maximum of one acre out of every two acre area at this rate.
*** Mix with 18 litres of water and the spray solution over 100 square metres.**

For best results, applications should be made when perennial weeds have fully developed, green leaves. Application in late summer (or periods of dry weather) when plants are not actively growing may result in unsatisfactory control.

Application Information:
- **Water Volume:** 160 to 325 L per acre without spray running off foliage.
- **Nozzles and Pressure:** Maximum 150 to 350 kPa (20 to 50 psi) when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use a combination of application equipment and pressure that is designed to deliver an even coverage of coarse droplets that are not prone to drift. Non-target broadleaf plants are very sensitive to *Tordon 22K* drift.
- Avoid conditions that are conducive to drift. (See introduction for drift control suggestions).

How it Works:
Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
picloram	POST (foliar) also has soil activity	Synthetic Auxin	Throughout the plant (Symplast)	Broadleaf only	4

IMPORTANT: *Tordon 22K* is a very persistent and water-soluble herbicide. Treated soil should NOT be moved from the treated area. DO NOT apply to soils that are permeable, have sinkholes, or lie over limestone bedrock. DO NOT apply to soils whose surfaces are composed of fractured rock or unconsolidated gravel. Application to these sites may allow the movement of herbicide to underlying water sources or aquifers. If shallow aquifers are present, DO NOT apply *Tordon 22K*. This product is moderately toxic to fish. DO NOT apply to any water bodies or in areas where the runoff from treated areas will reach fish-bearing waters.

Tordon 22K must not be applied on range and pasture acres that are irrigated. DO NOT compost or mulch clippings from grass treated with *Tordon 22K*.

Effects of Growing Conditions:
Avoid application when pasture and target weeds are under stress from drought, flooding, extreme heat or cold, as injury to grass or unacceptable control may result. Avoid spraying if temperatures exceed 28°C.

Tank Mixes:
None registered.

Restrictions:
- **Rainfall:** Rain within 6 hours of application may cause poor results. Heavy rainfall may dissolve and carry *Tordon 22K* away from the target area, or it may leach dissolved *Tordon 22K* out of the root zone or to undesirable locations.
- **Grazing Restrictions:** DO NOT graze lactating dairy animals within 6 weeks after treatment. There are no grazing restrictions for other livestock. DO NOT use manure from animals grazing treated forage to fertilize susceptible plants or crops.
- **Re-cropping Interval:** *Tordon 22K* may persist in the soil for up to 5 years. For this reason *Tordon 22K* may only be applied on permanent grass pastures and rangeland unless applied by an authorized pesticide applicator. Avoid the root zone of desirable trees or shrubs.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** DO NOT freeze.
- **Buffer Zones:**
  - Hand-held or backpack sprayer and spot treatment DO NOT require a buffer zone from sensitive habitat, but efforts should be made to minimize exposure to sensitive plants and open water or wetlands.

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground only	4	2	120

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** These distances can be reduced by 30 percent using cones on individual nozzles and by 70 percent using a full shield (shroud, curtain) that extends to the crop canopy.**
† Distance is measured from the downwind edge of the boom to sensitive areas.

Sprayer Cleaning:
Tordon 22K can cause severe injury to sensitive crops (especially pulses and other broadleaf crops) at very low concentrations. Spray equipment should be flushed out immediately after spraying *Tordon 22K*. Refer to 'Method A' in the general section on sprayer cleaning in the introduction.

Hazard Rating:
Caution – Poison

Danger – Eye Irritant

May Cause Skin Irritation

Refer to the Introduction for an explanation of the symbols.

Tough EC

Herbicide Group 6 - pyridate

Company:
Belchim Crop Protection Canada

Formulation:
***Tough EC* (PCP#34647):** 600g/L pyridate formulated as an emulsifiable concentrate.
- Container size - 2 x 9.18 L

Crops and Staging:
Pre-seed or pre-emergent burndown: canola, chickpea, corn (field and sweet), and field peas.
Post-emergent:

Crop	Staging
Corn, field and sweet	up to the 8-leaf stage
Chickpea	up to 9-node stage (maximum height of 20 cm or 8 inch)

Repeat applications may be made 10 to 14 days from the first as long as the maximum yearly rate (below) is not exceeded.

Weeds, Rates and Staging:
Note: Maximum of 607 mL per acre per year.
Unless otherwise noted below, apply to young and actively growing weeds that are less than 4 to 6 inches (10 to 15 cm) in height or width.

Weed	Rate mL per acre
False cleavers	202
Black nightshade	304
Redroot pigweed	202 to 405
Lamb's-quarters	304 to 405
Kochia, Wild mustard	405 to 607
Waterhemp*	607

*** Suppression only.**
Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Application Information:
- **Water Volume:** Minimum 40 L per acre.
- **Nozzles and Pressure:** Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE medium*** droplets.

How it Works:
Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
Pyridate	POST (foliar)	PSII Inhibitor, Site II	Little	Broadleaf only	6

Effects of Growing Conditions:
Weeds hardened off by cold weather or drought stress may not be adequately controlled or suppressed and re-growth may occur.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides:

- ***In corn (field only):***
  - **Post-Emergent up to the 8-leaf stage:**
    - *Shieldex 400SC*
    - Topramezone
    - Dicamba
    - *Aatrex 480*

Fungicides: None registered.
Fertilizers: None registered.
Insecticides: None registered.
Note: The above mixes are those listed on the *Tough EC* label only.

According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Avoid application when heavy rain is forecast.
- **Restricted Entry Interval:**
  - ***Corn (field and sweet) and chickpeas:*** Hand set/hand line irrigation (7 days); scouting (3 days); all other activities (12 hours).
  - ***Field peas and canola:*** All other activities (12 hours).
- **Grazing Restrictions:** DO NOT allow animals to graze treated corn forage within 45 days of the last application. DO NOT cut treated corn stover for feed or silage within 100 days of the last application. DO NOT graze or harvest chickpeas for feed that have been treated with a foliar application of *Tough EC* as data is not available to support this use.
- **Pre-harvest Interval:** Field corn (100 days); sweet corn (45 days); chickpeas (60 days); dry peas, lentils and canola (at maturity).
- **Re-cropping Interval:** Not specified.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** DO NOT freeze. Store in a cool, dry, secure and well-ventilated area.
- **Buffer Zones:** Handheld or backpack applications do not require a buffer.

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground only*	1	1	1

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance is measured from the downwind edge of the boom to sensitive areas.

Sprayer Cleaning:

Refer to 'Method B' in the general section on sprayer cleaning in the introduction. Let solution stand for an extended period for better results. See the label for product specific cleaning details.

Hazard Rating:

Warning – Skin and Eye Irritant

Potential Skin Sensitizer

Refer to the Introduction for an explanation of the symbols.

Tralkoxydim

Herbicide Group 1 - tralkoxydim

Company:
Corteva Agriscience (*Liquid Achieve* – PCP#28555 & *Carrier* adjuvant – PCP#30639)
ADAMA Canada (*Bison* – PCP#29256 & *Addit* adjuvant – PCP#29263)
Loveland Products Canada (*Marengo* – PCP#29289 & *Marengo* adjuvant – PCP#31670)
Nufarm Agriculture (*Nufarm Tralkoxydim Liquid* – PCP#32078 & *Carrier adjuvant* – PCP#30639)

Formulation:
400 g/L tralkoxydim formulated as a suspension concentrate.

- Container sizes:
  - *Marengo* - 8 L of tralkoxydim plus 5 L Marengo
  - *Bison* - 8 L of tralkoxydim plus 8 L *Addit* adjuvant
  - *Liquid Achieve* - 2 x 8 L or 96 L of tralkoxydim (adjuvant sold separately)
  - *Nufarm Tralkoxydim Liquid* - 2 x 8 L of tralkoxydim (*Carrier* adjuvant sold separately)

Crops and Staging:
No staging restrictions unless otherwise indicated.

Cereals:
- Barley
- Rye (spring, fall)
- Triticale
- Wheat (spring, durum, winter)

Forage legumes: May be used on wheat and barley crops undersown to the following (if not tank mixed with a broadleaf herbicide).
- Alfalfa
- Bird's-foot trefoil
- Clovers
- Sanfoin

Forage Grasses (seed production only)*:
- ***Under-seeded with a cereal or grown alone (seedling or established)*:***
  - Bromegrass (meadow, smooth , hybrid**)
  - Creeping red fescue
  - Wheatgrass (crested, intermediate, slender**)
- ***Grown alone (seedling only)*:***
  - Wheatgrass (northern, slender, western)

  **** Liquid Achieve, Nufarm Tralkoxydim Liquid* and *Bison* only.**
  ***** Liquid Achieve* only.**

NOTE: Since applications to these crops have been registered under the User Requested Minor Use program, the manufacturer assumes no responsibility for herbicide performance. An application to these crops is at the risk of the user.

When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

Weeds and Staging:
Wild oats: 1 to 6 leaf stage (total leaves including tillers), with a maximum of 2 tillers.
Volunteer tame oats: 1 to 6 leaf stage.
Green and yellow foxtail: 1 to 5 leaf stage (total leaves including tillers), with a maximum of 1 tiller.
Barnyard grass, Persian darnel: 1 to 4 leaf stage (total leaves including tillers).
For forage grasses and perennial cereal rye, apply prior to tillering of the above weeds.

Apply at the 2 to 3 leaf stage for optimum control. Optimum weed control and yield response occurs when weeds are removed before tillering.

Rates:
0.2 L per acre.
Add *Turbocharge*, *Carrier,* or *Addit* adjuvant at a rate of 0.5 L per 100 L spray solution.
Maximum ONE APPLICATION of these products or other products containing tralkoxydim per season.

Note: If water analysis shows bicarbonate levels are 400 ppm or greater, add 0.9 to 1.8 kg of active ammonium sulphate per 100 L of spray water prior to mixing to eliminate antagonism.

Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Application Information:

- **Water Volume:**
  - ***Ground:*** 20 to 40 L per acre. Application in less than 20 L per acre water volume may result in mixing problems or unacceptable crop injury.
  - ***Aerial:*** 12 to 18 L per acre.
- **Nozzles and Pressure:** Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE medium*** droplets. See the label for detailed instructions on aerial application.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
tralkoxydim	POST (foliar)	ACCase Lipid Synthesis Inhibitor	Toward areas of growth (Symplast)	Grass only	1

Effects of Growing Conditions:

Cereal crops that have set tillers may incur injury (yellowing and/or stunting) if applications are made within 48 hours of freezing temperatures. Cereal crops that have not set tillers may be injured if exposed to temperatures of 4°C or less up to 48 hours before or after application. Tank mixing with a broadleaf weed herbicide under adverse conditions may increase severity of crop injury. Crops under stress from foliar diseases or low fertility are more susceptible to injury from application. Temporary crop injury may occur when tralkoxydim tank mixes (particularly dichloprop/2,4-D ester products, and bromoxynil/MCPA Ester products + additional MCPA Ester) are applied under extreme environmental conditions (dry or wet, cool or hot weather) resulting in crop stress. Control of grasses could be reduced when they are stressed due to drought, heat, lack of fertility, flooding or prolonged cool temperatures.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

DO NOT tank mix tralkoxydim products with a broadleaf herbicide when applying to underseeded forage grasses or legumes.

Tank Mix Partner	Crops						
	Spring wheat	Durum	Winter wheat	Barley	Spring rye	Fall rye	Triticale
2,4-D ester (205 g ae per acre)†	•	•	•	•	•	•	
Bromoxynil†	•	•	•	•		•	•
Bromoxynil + 2,4-D (0.40 L per acre)†*	•	•		•			
Bromoxynil/MCPA Ester†*	•	•	•	•		•	
Curtail M (0.81 L per acre)	•	•		•			
Dichlorprop/2,4-D*	•	•	•	•			
Fluroxypyr + 2,4-D††† (*Attain XC* only), *OcTTain XL*†††	•	•	•	•			
Fluroxypyr + MCPA (*Trophy* only)	•	•		•			
Infinity††	•	•	•	•			
Lontrel (0.11 L per acre) + MCPA Ester (0.38 L per acre - 600 g/L forms)	•	•		•			
MCPA Ester† (0.38 L per acre - 600 g/L forms)	•	•	•	•	•	•	
Prestige XC†††	•	•	•††	•			

† Manufacturers may support different brands of generic products with their product. Check the tralkoxydim product label for specific brands registered.
†† *Liquid Achieve* and *Nufarm Tralkoxydim* only.
††† *Liquid Achieve, Nufarm Tralkoxydim* and *Marengo* only.
*** Tank mixes may result in some temporary initial injury under adverse environmental conditions.**
**** Temporary crop injury can occur if applied prior to the 4 leaf stage. A reduction in wild oats control may occur with this mix.**

DO NOT tank mix tralkoxydim products with herbicides or formulations of herbicides not listed above as loss of grass control may result.

When applying broadleaf herbicides not listed above, in the same field, always apply tralkoxydim first. Apply the broadleaf product no sooner than seven days after application of tralkoxydim.

Insecticides:

- *Matador* (49 mL per acre)
- *Matador* tank mixes with *Bison* may also be combined with bromoxynil or bromoxynil/MCPA Ester products.

Fungicides: None registered.

Fertilizers: None registered.

Note: The above mixes are those listed on the tralkoxydim labels only.

According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 1 hour will reduce control.
- **Restricted Entry Interval:** DO NOT enter treated field for 12 hours.
- **Grazing Restrictions:** Straw from treated grain crops may be fed to livestock. Immature cereal crops may be grazed or cut for hay 16 days after treatment. DO NOT feed or graze forage crops in year of treatment
- **Pre-harvest Interval:** Leave 60 days from application to harvest.
- **Re-cropping Interval:** DO NOT replant treated areas to tame oats or corn for at least 4 weeks after application.
- **Aerial Application:** May be applied by air to cereal crops only. DO NOT apply within 50 m of fish bearing waters and wildlife habitat.
- **Storage:** Store in a dry place. DO NOT freeze.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:
	Terrestrial habitat
Ground*	3
Helicopter	80
Fixed wing aircraft	100

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Refer to 'Method A' in the general section on sprayer cleaning in the introduction.

Hazard Rating:

Caution – Skin and Eye Irritant

Refer to the Introduction for an explanation of the symbols.

Travallas

Herbicide Group
2 - metsulfuron, thifensulfuron
4 - fluroxypyr

Company:
FMC Corporation (PCP#31685)

Formulation:
3 g/L metsulfuron methyl; 30 g/L thifensulfuron methyl; and 150 g/L fluroxypyr formulated as suspension concentrate liquid.
- Container size - 2 x 8 L

Crops, Rates and Staging:
Barley, Wheat (spring, durum): 2 leaf to flag leaf stage (prior to head emergence).

Winter Wheat: In the spring up to the flag leaf stage (prior to head emergence).

Weeds and Staging:
- 0.2 L per acre to control or suppress weeds up to 10 cm tall or wide unless otherwise indicated:
  - Canada thistle (maximum 15 cm and prior to bud)*
  - Cleavers (1 to 9 whorl)
  - Common chickweed (1 to 6 leaf)
  - Corn spurry
  - Cow cockle
  - Dandelion (fall or spring germinating rosettes up to 25 cm)
  - Flixweed
  - Hemp-nettle (1 to 8 leaf)
  - Kochia (except fluroxypyr resistant biotypes)
  - Lamb's-quarters
  - Narrow-leaved hawk's-beard
  - Night-flowering catchfly
  - Redroot pigweed
  - Russian thistle
  - Scentless chamomile (up to 10 cm)
  - Shepherd's-purse (up to 20 cm)
  - Smartweed (lady's-thumb, green)
  - Stinkweed
  - Stork's-bill
  - Volunteer canola (except CLEARFIELD varieties)
  - Volunteer flax
  - Wild buckwheat (1 to 8 leaf)
  - Wild mustard
  - White cockle

  *** Suppression only.**

Maximum ONE APPLICATION per year of *Travallas* or other products containing metsulfuron, thifensulfuron or fluroxypyr.

Application Information:
- **Water Volume:**
  - ***Ground:*** Minimum 22 L per acre.
  - ***Aerial:*** Apply between 10 and 20 L per acre of water
- **Nozzles and Pressure:** Use 30 to 40 psi (210 to 275 kPa) if applying without drift reduction nozzles. Drift reduction nozzles may require higher pressures for proper performance. Select the nozzle and pressure combination that produces of ***ASABE coarse*** droplets while maintaining good coverage of foliage. Keep booms lower than 60 cm from crop canopy.
- **Screens:** Use of 50 mesh screens or coarser are required.

How it Works:
Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
metsulfuron, tribenuron	POST (foliar)	ALS Amino Acid synthesis Inhibitor	Toward growth areas (Symplast)	Broadleaf only	2
fluroxypyr	POST (foliar)	Synthetic Auxin	Moves throughout the plant (Symplast)	Broadleaf only	4

Effects of Growing Conditions:
Application to crops stressed by extreme weather conditions such as frost, hail, saturated soils or drought as well as low fertility, insect damage or disease pressure may result in crop injury and/or reduce weed control. The conditions above as well as wide fluctuations in day/night temperatures or prolonged cool weather may shorten the crop slightly.

Crop and weeds that are growing rapidly produce optimum activity. The optimum temperature range for the best activity is between 12 to 24°C. Activity will be reduced below 8°C and above 27°C.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides:

Tank Mix Partner	Crop			
	Spring Wheat	Durum	Winter Wheat	Barley
Axial 100 EC	•		•	•
Axial + MCPA (rates as below)	•		•	•
MCPA Ester (up to 113 g ae per acre)	•	•	•	•
Puma Advance	•	•		•
Puma Advance + MCPA Ester (rates as above)	•	•		•
Simplicity OD	•	•	•	
Simplicity OD + MCPA Ester (rates as above)	•	•	•	
Traxos	•	•		
Traxos plus MCPA Ester (rates as above)	•	•		
Varro	•	•	•	
Varro plus MCPA Ester (rates as above)	•	•	•	

Insecticides: None registered.

Fungicides:

- ***In Barley and spring wheat (including durum) only:***
  - *Acapela*

Fertilizers: None registered.

Note: The above mixes are those listed on the *Travallas* label only.

According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 2 hours will reduce control.
- **Restricted Entry Interval:** DO NOT enter treated fields for 12 hours.
- **Grazing Restrictions:** DO NOT graze or feed treated crop to livestock within 7 days of application.
- **Pre-harvest Interval:** Leave 60 days between application and harvest.
- **Re-cropping Interval:** Canola, dry beans, faba beans, field corn, field peas, flax, lentils, oats, soybeans, and registered crops may be seeded 10 months after application.
- **Aerial Application:** May be applied by aircraft.
- **Storage:** Store in a cool, dry place in original container. Shake well before using. If frozen, warm gradually to 10°C and shake well to reconstitute component before use.
- **Buffer Zones:**

Crop	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground	1	1	5
Aerial (fixed wing)	1	1	200
Aerial (helicopter)	1	1	175

See the Key to Product Pages in the introduction for an explanation of the different habitats.

*** Buffer zones may be reduced when using drift reduction measures. See the Buffer Zone Calculator on the Pest Management Regulatory Agency website.**

† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

- Spray when winds are under 16 km per hour, but not dead calm.

Tank Cleaning:

Thifensulfuron/tribenuron and/or metsulfuron can cause severe injury to sensitive crops at very low concentrations. Sprayers used to spray Thifensulfuron/tribenuron and/or metsulfuron should be drained and flushed out immediately after use.

Refer to 'Method A' in the general section on sprayer cleaning in the introduction. When mixing with another pesticide with different cleaning measures, those measures should be integrated into 'Method A' (e.g. addition of detergent).

Hazard Rating:

Caution – Skin Irritant

Potential Skin Sensitizer, Contains the Allergen Soy

Refer to the Introduction for an explanation of the symbols.

Traxos

Herbicide Group
1 - pinoxaden, clodinafop

Company:

Syngenta Canada (PCP#29855)

Formulation:

25 g/L pinoxaden and 25 g/L clodinafop propargyl formulated as an emulsifiable concentrate.

- Container sizes - 2 x 10 L, 80 L, 400 L

Crops and Staging:

Spring wheat (including durum) and winter wheat: prior to the emergence of the 4th tiller.

When tank mixing, check broadleaf product description for additional restrictions.

Weeds, Rates and Staging:

0.5 L per acre, no additional adjuvant required.

For control of:

Weed	Stage
Barnyard grass, Persian darnel	1 to 5 leaves prior to tillering
Foxtail (green, yellow)	1 to 5 leaves, maximum 2 tillers
Volunteer canaryseed, volunteer oats, wild oats, proso millet	1 to 6 leaves, maximum 3 tillers

Optimum yield response occurs when weeds are controlled in early stages.

Maximum of ONE APPLICATION per year of *Traxos* or other products containing pinoxaden.

Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Application Information:

- **Water Volume:**
  - ***Ground:*** Minimum 20 L up to 40 L per acre.
  - ***Aerial:*** Minimum 12 L per acre.
- **Nozzles and Pressure:** 40 to 45 psi (275 to 310 kPa) when using conventional 80° or 110° flat fan stainless steel nozzles tilted forward at an angle of 45°. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage of ***ASABE coarse*** droplets.
- **Screens:** Use 50 mesh nozzle screens.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
pinoxaden, clodinafop	POST (foliar)	ACCase Lipid synthesis inhibitor	Toward growth areas (Symplast)	Grasses only	1

Effects of Growing Conditions:

Warm, moist growing conditions promote active weed growth and enhance activity. Weeds hardened off by environmental stress such as cold weather, drought or excessive heat may not be adequately controlled.

Tank Mixes:

Herbicides:

- *Buctril M** (label rates)
- *Curtail M* (0.6 to 0.81 L per acre)
- *Infinity* (0.33 L per acre)
- MCPA 600 ester (0.28 to 0.37 L per acre)
- *Mextrol 450M* (0.5 L per acre)
- *Pulsar* (80 acres per case)
- *Pulsar* (80 acres per case) + MCPA 600 ester (0.23 L per acre)
- *Trophy* (20 acres per case)
  - Refer to the broadleaf herbicide label for crop staging and other information.

Fungicides:

- *Tilt* (0.1 L* to 0.2 L per acre).

Fertilizers: None registered.

*** Aerial application approved.**

Note: The above mixes are those listed on the *Traxos* label only.

According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 1 hour may reduce control.
- **Restricted Entry Interval:** DO NOT enter treated fields for at least 12 hours.
- **Grazing Restrictions:** DO NOT graze or harvest treated crops for forage within 7 days of application.
- **Pre-harvest Interval:** Leave at least 60 days from application to harvest.
- **Re-cropping Interval:** No restrictions in the year following treatment.
- **Storage:** Store in a cool, dry, ventilated are away from food or feed. Avoid ignition sources. If frozen, thaw and shake well before using.
- **Aerial Application:** May be applied by air.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground	1	0	1
Aerial by airplane or helicopter	1	0	15

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance is measured from the downwind edge of the boom to sensitive areas.

Sprayer Cleaning:

Refer to 'Method A' in the general section on sprayer cleaning in the introduction.

Hazard Rating:

Warning – Skin Irritant

Refer to the Introduction for an explanation of the symbols.

TraxosTwo

This product is a prepackaged tank mix of TraxosTwo Grass (equivalent to Traxos) and TraxosTwo Broadleaf (equivalent to OcTTain). Information listed is restricted to Crops, Weeds, Rates and Tank mixes. For other detailed restrictions and general information on the component products see the product pages listed above.

Herbicide Group
1 - pinoxaden, clodinafop
4 - fluroxypyr, 2,4-D

Company:
Syngenta Canada

Formulation:
The *TraxosTwo* package contains the following components:

***TraxosTwo Grass Component* (PCP#31674):** 25 g/L pinoxaden and 25 g/L clodinafop-propargyl formulated as an emulsifiable concentrate.
- Container sizes - 10 L, 80 L

***TraxosTwo Broadleaf Component* (PCP#31673):** 90 g/L fluroxypyr plus 360 g/L 2,4-D LV ester formulated as an emulsifiable concentrate.
- Container sizes - 9 L, 72 L

Crops and Staging:
Spring wheat (including durum): 4 leaf stage up to the emergence of the 4th tiller.

Rates:
***TraxosTwo Grass*:** 0.5 L per acre
***TraxosTwo Broadleaf*:** 0.45 L per acre

Weeds and Staging:
Weeds controlled by *Traxos* plus the weeds controlled by *OcTTain XL*.

See component products for more information on restrictions, application details and handling. Unless indicated differently above use the most limiting restrictions across all components for the mix.

Triallate

Herbicide Group 15 (formerly Group 8) - triallate

Company:

Gowan Canada *(Avadex Liquid EC, Avadex MicroActiv)*
Rath Holdco Inc. *(Yieldshield Resiliant Soilsorb)*

Formulation:

***Avadex Liquid EC* (PCP#16759), *RHI Triallate 480 EC* (PCP# 34670):** 480 g/L triallate formulated as an emulsifiable concentrate.

- Container sizes - 2 x 10 L, 115 L, 946 L

Avadex MicroActiv* (PCP#25112), *Yieldshield Resiliant Soilsorb, (PCP# 34574), 10% triallate formulated as a granular.

- Container sizes:
  - *Avadex MicroActiv* - 22.7 kg, 451.3 kg
  - *Yieldshield Resiliant Soilsorb*- 454 k

Crops, Rates and Application Timing:

***Avadex Liquid EC and RHI Triallate 480 EC* Rates – Spring Treatment**

Crop	Application Timing	Rate (L per acre)	
		Organic Matter	
		4 percent or less	Greater than 4 percent
Spring and durum wheat	Before seeding*	1.0	1.2
	After seeding	1.2	1.4
Barley	Before seeding and after seeding	1.2	1.4
Buckwheat†	Before seeding	1.0	1.4
Canola, flax** yellow and brown mustard, oriental mustard (condiment and oilseed types)	Before seeding	1.4	1.9
Field pea	Before seeding	1.4	1.4

*** DO NOT apply this product before seeding wheat in soils with 4 percent or less organic matter (brown, dark brown or grey wooded soils) where discers are to be used for seeding. If an air seeder is to be used, it must be equipped with a depth control device to ensure accurate seed placement, otherwise crop injury may occur.**
****Excluding Solin (low linolenic acid flax).**
†Note: This use is registered under the User Requested Minor Use Label Expansion (URMULE) program, the manufacturer assumes no responsibility for herbicide performance. Users of this product do so at their own risk.

Triallate 10% Granular Rates – Fall Treatment

Crop	Rate (kg per acre)		
	Organic Matter		
	Less than 2 percent*	2 to 4 percent	Greater than 4 percent
Spring and durum wheat	4.5	5.7	6.9
Barley, canaryseed††, chickpea** and lentil **	4.5	5.7	6.9
Canola, flax†, yellow and brown mustard, Oriental mustard (condiment and oilseed types), field pea	5.7	6.9	8.9

*** Fall treatments conducted under minimum tillage are not recommended on soils with less than 2 percent organic matter.**
****Avadex MicroActiv only**
† Excluding Solin (low linolenic acid flax).
†† Including hairless varieties for human consumption *Avadex MicroActiv* only.

Triallate 10% granular Rates – Spring Treatment

Crop	Application Timing**	Rate (kg per acre)	
		Organic Matter	
		4 percent or less*	Greater than 4 percent
Spring and durum wheat	Before seeding***	4.5	5.7
	After seeding	5.7	6.9
Barley, canaryseed††, chickpea††† and lentil†††	Before seeding and after seeding (barley and canayseed only)	5.7	6.9
Canola, flax†, yellow and brown mustard, Oriental mustard (condiment and oilseed types), field pea	Before seeding	6.9	8.9

*** Minimum tillage treatments must be applied to fields with at least 2 percent organic matter.**
**** Minimum tillage treatments must be applied 10 to 14 days before seeding or incorporating. For minimum tillage treatments on spring and durum wheat, apply 5.7 kg per acre on soils with 4 percent organic matter or less and 6.9 kg per acre on soils with greater than 4 percent organic matter.**
***** DO NOT apply this product before seeding wheat in soils with 4 percent or less organic matter (brown, dark brown or grey wooded soils) where discers are to be used for seeding. If an air seeder is to be used, it must be equipped with a depth control device to ensure accurate seed placement, otherwise crop injury may occur.**
† Excluding Solin (low linolenic acid flax).
†† Including hairless varieties for human consumption *Avadex MicroActiv* only.
††† Avadex MicroActiv only

Seedling Forage Legumes (under-seeded only):
Apply recommended rates for the companion crop.

- Alfalfa
- Bird's-foot trefoil
- Clover (alsike, red, sweet)

Weeds and Staging:

For control of wild oats prior to their emergence (pre-emergent).

Application Information:

- **Water/Liquid Fertilizer Volume (*Avadex Liquid EC and RHI Triallate 480 EC* only):** 36 L per acre.
- **Nozzles and Pressure (*Avadex Liquid EC* and *RHI Triallate 480 EC* only):** maximum 30 psi (200 kPa) when using conventional flat fan nozzles. Use a combination of nozzles and pressure designed to deliver thorough, even coverage of ***ASABE medium*** droplets
- **Direct Seeding Systems (minimum tillage systems)**
  - Triallate 10% granular herbicides may be applied in the fall or spring into standing stubble. If excessive crop residue exists at the time of application, a vigorous harrowing prior to application can be used to ensure that the herbicide granules make adequate contact with the soil. Under zero-till conditions it is recommended incorporation be conducted with suitable implement such as heavy harrow that allows for shallow incorporation while maintaining a uniform concentrated layer that provides adequate wild oats control.
  - Low disturbance seeding systems will not disturb the soil enough to control emerged weeds; therefore, a pre-seeding burnoff treatment using a herbicide such as glyphosate may be necessary. Ensure that cereals are seeded at least 1.25 cm (1/2 inch) below the treated layer.
    - ***Fall Application:***
      - Applications of Triallate 10% granular granules should be made to standing stubble. DO NOT apply to smooth, hard packed soils that may allow granules to drift. If excessive crop residue exists at the time of application, a vigorous harrowing prior to application should be conducted to ensure the granules are in good contact with the soil. Apply after October 1 when the soil begins to cool (less than 4°C) and 3 weeks prior to soil freeze-up. Incorporation using harrow operation following application in the fall is recommended but can be performed in the spring before seeding.
    - ***Spring Application:***
      - Applications of Triallate 10% granular granules should be applied and incorporated using harrow operation in spring 10 to 14 days before seeding.

- **Conventional Tillage Systems**
  - ***Fall Application:***
    - Apply Triallate 10% granular granules to fields that are in good working condition, without excessive crop residue. Heavy crop residue or lumpy, wet fields may require tillage prior to application. Apply *Avadex MicroActiv* after September 15 until soil freeze-up. Incorporation using a harrow operation following application in the fall is recommended. Only one incorporation is required in the fall. The second incorporation may be done in the fall (before soil freeze-up) or in the spring.
  - ***Spring Application***
    - Apply Triallate to fields that are in good working condition, without excessive crop residue. Heavy crop residue or lumpy, wet fields may require tillage prior to application. Triallate applications require two incorporations, with the second incorporation at right angles to the first. Incorporation using a harrow operation following application is recommended. Using a seeder that provides soil disturbance equivalent to a cultivator may replace one of the incorporations. The first incorporation should be completed within 48 hours of application and the second incorporation should be delayed an additional 48 hours or more.
    - The liquid formulation must be incorporated into soil that is free of lumps or crop residue. Liquid formulations should be applied to fields with 30 percent or less residue cover. Heavy crop residue or lumpy, wet fields may require tillage prior to application. The liquid formulation is recommended for spring use because soils are left in an erosion prone state if the liquid is fall-applied. The first incorporation of the liquid formulation should be completed as soon as possible after spraying, while the second incorporation may be done any time prior to crop emergence. Incorporation using a harrow operation following application is recommended.
    - Ensure that cereals are seeded at least 1.25 cm (1/2 inch) below the treated layer.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
triallate	PPI (soil active)	Lipid Synthesis Inhibitor (Non-ACCase)	Little movement in plant (Apoplast)	Wild oats	15

Effects of Growing Conditions:

Reduced control may result if prolonged cool conditions or dry soil conditions prevail at the time weeds are emerging. If conditions are dry or wild oats germinate from below the treated zone, the weeds may emerge, but will usually be controlled. Thinning of wheat can occur under conditions of heavy rainfall or if cold soil conditions persist as the crop emerges.

DO NOT apply to fields where crop residue has been burned in the previous 12 months. Efficacy will be reduced.

Tank Mixes:

Herbicides: *Avadex* liquid may be tank mixed with liquid formulations of trifluralin for control of wild oats, green and yellow foxtail in wheat and barley. Apply after seeding but prior to crop emergence. Consult the recommendations for trifluralin for rates in different soil types.

Insecticides: None registered.

Fertilizer: *Avadex Liquid EC and RHI Triallate 480 EC* alone, or tank mixed with liquid formulations of trifluralin, may be tank mixed with sprayable liquid fertilizer. Compatibility of the herbicide and sprayable liquid fertilizer should be checked. Follow the instructions on the herbicide label prior to adding the herbicide to the spray tank.

According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** At least 0.5 inches (1.5 cm) within 2 weeks of application in the spring is required for maximum performance of the spring treatment.
- **Restricted Entry Interval:** DO NOT enter treated fields for at least 12 hours.
- **Grazing Restrictions:** DO NOT graze the treated crop or use as hay or feed prior to crop maturity or in year of treatment.
- **Re-cropping Interval:** DO NOT seed tame oats the year after treatment.
- **Aerial Application:**
  - *Avadex Liquid EC and RHI Triallate 480 EC*: DO NOT apply by air
  - *Avadex MicroActiv*: Granular formulations may be applied by air with attachments designed for applying low volumes of granules.
- **Storage:** DO NOT freeze liquid formulations. Store granular formulations in a cool, dry place.

- **Buffer Zones:** (Liquid formulations only)

Application method	Buffer Zones (metres†) Required for the Protection of:			
	Aquatic Habitats of Depths			Terrestrial habitat
	Less than 1 m	1 to 3 m	Greater than 3 m	
Ground only*	5	2	1	5

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance is measured from the downwind edge of the boom to sensitive areas.

Sprayer Cleaning:
Refer to 'Method C' in the introduction for *Avadex Liquid EC and RHI Triallate 480 EC*.

Hazard Rating:
Warning – Poison (Liquid Formulation)
Warning – Contains the Allergen Soy (Liquid and Granular), Skin and Eye Irritant (Granular Formulation)
Refer to the Introduction for an explanation of the symbols.

Triallate + Trifluralin

Herbicide Group
3 - trifluralin
15 (formerly Group 8) - triallate

Company:
Gowan Canada (*Fortress MicroActiv* - PCP#19521)
Rath Holdco Inc.(*Yieldshield Resiliant XP Soilsorb* - PCP#34566)

Formulation:
10% triallate and 4% trifluralin formulated as a granular.
- Container sizes - 22.7 kg, 454 kg

Crops and Staging:
Prior to planting wheat (spring and durum), barley, canola, flax (not including Solin - low linolenic acid flax), mustard.
Pre-plant incorporated: In fall after September 15 until soil freeze-up or in the spring prior to seeding crop.
Surface application: Apply in the fall after October 1 and when soil temperature is less than 4°C at a depth of 2 inches (5 cm). Incorporation using a harrow operation is recommended. Incorporation can be delayed until the following spring.
Some wheat and barley injury may be noted on eroded knolls.
DO NOT apply *Fortress MicroActiv* to fields:
- after snowfall
- with heavy crop residue.

Weeds and Staging:
Pre-emergent control of:
- Foxtail (green, yellow)
- Wild oats

Suppression of:
- Kochia
- Lamb's-quarters
- Redroot pigweed
- Russian thistle
- Wild buckwheat

Rates:

Fall Treatment

Crop	Rate (kg per acre)			
	Organic Matter			
	Less than 2 percent	2 to 4 percent	4 to 6 percent	Greater than 6 percent
Wheat	N.R.*	4.4	5.7	5.7**
Barley	4.4	5.7	5.7	6.9
Canola, flax†, mustard	5.7	5.7	5.7	6.9

*** N.R. - Not Recommended.**
**** For fall incorporated applications (not surface) apply 6.88 kg per acre when organic matter exceeds 8 percent.**
† Excluding Solin (low linolenic acid flax).

Spring Treatment

Crop	Rate (kg per acre)			
	Organic Matter			
	Less than 2 percent	2 to 4 percent	4 to 6 percent	Greater than 6 percent
Wheat	N.R.*	N.R.*	4.4	5.7
Barley	N.R.*	4.4	5.7	6.9
Canola, flax†, mustard	5.7	5.7	6.9	6.9

*** N.R. - Not Recommended.**
† Excluding Solin (low linolenic acid flax).

Application Information:

- May be applied in the fall with or without a fall tillage operation, or in the spring as a pre-plant incorporated treatment. Before application of this product, the soil must be in good working condition. Application to a field that is wet, lumpy, rough or ridged will result in reduced weed control and promote crop thinning.
- *Fall Surface Application:* Where fields are prone to water and/or wind erosion, and tillage is therefore undesirable, fall surface application should be made within 3 weeks of soil freeze-up, when the soil begins to cool (less than 4°C), which typically begins on or around October 1. Application can be made to standing stubble or to previously worked fields with incorporation delayed until spring. Incorporation using a harrow operation is recommended. For best results on heavy wild oats infestations, use the incorporated treatment.
- *Fall Incorporated Application: Fortress MicroActiv* must be applied after September 15 and before soil freeze-up. Application prior to September 15 may result in reduced weed control. Granular *Yieldshield Resiliant XP Soilsorb* should be applied when the average soil temperature at the 5 cm depth is 4 degrees C or less and within 3 weeks of soil freeze up. Initial incorporation may be completed within 24 hours of application. Incorporation using a harrow operation is recommended. The second incorporation may be done in the fall (prior to soil freeze-up) or in the spring. Fall incorporation is not recommended on soils where a lack of crop residue cover combined with the required incorporation operation could result in soil erosion.
- *Spring Application:* Can be applied before seeding but must be incorporated within 24 hours of application. The second incorporation must be delayed at least 48 hours after the first and may be performed at any time prior to crop emergence. Incorporation using a harrow operation is recommended.
- ***Incorporation:***
  - Applications require two incorporations, with the second incorporation at right angles to the first. Seeding with a seeder that provides soil disturbance equivalent to a cultivator may replace one incorporation. Incorporate to a maximum depth of 2 inches (5 cm) by setting disk or cultivator implements to cut a maximum of 3 inches (7.5 cm) into the soil.
  - Mixing the product to greater depths will dilute the herbicide, decrease wild oats control, and may cause injury to cereals. If the second incorporation is conducted after seeding, it should be done with harrows or other suitable tillage equipment adjusted so as not to disturb the seed. Harrowing does not provide effective in-corporation if compact soil prevents penetration of harrow teeth, if crop residue accumulates in the harrow sections, or if the harrows bounce.
- ***Seeding Requirements:*** Accurate seeding depth control is critical. Thinning of wheat and barley has been known to occur when seeding depth has been inadequate. Ensure that cereals are seeded below the treated layer (2 to 3 inches or 5 to 7.5 cm). DO NOT seed deeper than 3 inches (7.5 cm). To ensure an even crop stand, increase the usual seeding rate of wheat or barley by 10 percent, especially if soil conditions are cold or dry. See product label for more information.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
trifluralin	PPI (Soil active)	Mitosis Inhibitor/cell division	Little movement in plant (Apoplast)	Broadleaf & grass	3
triallate	PPI (soil active)	Lipid Synthesis Inhibitor (Non-ACCase)	Little movement in plant (Apoplast)	Wild oats	8

Effects of Growing Conditions:

Crop injury can occur on fields where *Fortress MicroActiv* has been applied and heavy rainfall or cold weather occur after seeding but prior to crop emergence. Seeding under warm soil conditions (greater than 10°C and generally after May 15) will ensure optimum crop germination and emergence and will reduce the risk of crop injury. Very dry conditions in spring or prolonged cool soil temperatures at time of wild oats germination will result in reduced control.

Poor results may be expected from incomplete incorporation due to wet, cloddy soil or heavy crop residues. Ridges left at seeding may disrupt the treated layer and allow weed escapes.

Restrictions:

- **Rainfall:** Moisture is required for activation. Rainfall of at least 0.6 inches (1.5 cm) within 2 weeks of seeding is required to ensure optimum results.
- **Restricted Entry Interval:** DO NOT enter treated fields for at least 12 hour
- **Grazing Restrictions:** DO NOT graze or cut treated crops for livestock feed prior to crop maturity.
- **Re-cropping Interval:** These products will leave a residue in the soil. Oats, canaryseed, and small seeded forage grasses may be injured if planted within 24 months of application. DO NOT apply on land to be sown to wheat if the land has been treated with trifluralin since June 1 of the previous year.
- **Aerial Application:** May be applied by airplane with attachments designed for applying low volumes of granules.

Hazard Rating:

Warning – Contains the Allergen Soy

May Cause Skin and Eye Irritation

Refer to the Introduction for an explanation of the symbols.

Tribenuron

Herbicide Group 2 - tribenuron

Company:

FMC Corporation (*Express SG*)
AgraCity (*MPOWER Extra*)
UPL AgroSolutions Canada (*Inferno WDG*)*
ADAMA Canada (*Involve 50 WDG*)
Albaugh (*Cleat*)
Sharda Cropchem (*Tribe 75 WDG*)
Viking (*Viking Tribenuron*)
*** Note:** *This product is no longer manufactured but inventories still remain in distribution. This product may be removed from future editions.*

Formulation:

***Express SG* (PCP#28262):** 50% tribenuron methyl, formulated as a water soluble granule (WSG).
- Container size - 486 g

***Involve 50 WDG* (PCP#33852):** 50% tribenuron formulated as a water dispersible granule (WDG).
- Container size - 480 g

75% WDG formulations (*MPOWER Extra* – PCP#33143, *Inferno WDG* – PCP#30838, *Cleat* – PCP#33327, *Tribe 75 WDG* – PCP# 34345, *Viking Tribenuron* (PCP#34738):
75% tribenuron methyl, formulated as a water dispersible granule (WDG).
- Container sizes:
  - *Inferno WDG, MPOWER Extra and Viking Tribenuron* - 320 g
  - *Cleat* - 324 g
  - *Involve* - 480 g
  - *Tribe 75 WDG* - 80 g

All products are purchased alone but must be used accordingly in combination with a registered tank mix herbicide.

Crops and Staging:

$^{\Delta}$ NOTE: Injury to pulse crops, forage grasses and forage legumes may occur on coarse-textured soils, low in organic matter (less than 3 percent), or in fields with variable soils, gravely areas, sandy areas or eroded knolls. Avoid planting pulse crops in soils containing more than 50 percent sand.

*** Note:** ***Since these uses are registered under the User Requested Minor Use Label Expansion (URMULE) program, the manufacturer assumes no responsibility for herbicide performance. Those who apply these uses do so at their own risk.***

Tribenuron + glyphosate:
- ***In the fall (post-harvest) or spring (leave a minimum of 24 hours) prior to the seeding of:***
  Field Crops:
  - Barley
  - Canary seed (birdseed only)††
  - Dry bean$^{\dagger\dagger\Delta}$
  - Faba bean$^{\dagger\dagger\Delta}$
  - Lupin$^{\dagger\dagger\Delta}$
  - Oats††
  - Pea$^{\dagger\dagger\Delta}$
  - Soybean$^{\dagger\dagger\Delta}$
  - SU tolerant canola (*Cleat* only)
  - Wheat (spring, durum, winter††)

  Forage Crops for Forage and Seed Production*$^{\dagger\Delta}$:
  - Alfalfa
  - Alsike clover
  - Bromegrass (meadow, smooth, hybrid)
  - Creeping red fescue
  - Crested wheatgrass
  - Meadow fescue
  - Red clover (forage and seed production)
  - Sainfoin
  - Slender wheatgrass
  - Tall fescue
  - Timothy
  - Yellow sweet clover

  ***Allow at least 24 hours between application and seeding.**
- ***In the fall prior to the seeding of:***
  - *The crops listed above plus:*
    - Canola†
    - Flax†
    - Field corn†
    - Lentil$^{\dagger\Delta}$
- ***Fallow:***
  - Allow 10 days between application and tillage (fallow).

Post Emergent on Range and Pasture††: *Express SG* or *Involve 50WDG* plus non-ionic surfactant at 0.2 L per 100 L of spray solution. Stage according to weeds.

Tribenuron tolerant sunflower (eg. *ExpressSun SU7* variety): *Express SG* only plus non-ionic surfactant at 0.2 L per 100 L of spray solution or *Hasten Adjuvant* at 0.5 L per 100 L of spray solution from 2 to 8 leaf stage.

Tribenuron + 2,4-D ester:

- ***Fallow***
- ***Wheat (spring and durum), barley†††:*** 3 leaf up to emergence of the flag leaf.

† ***Express SG* only.**
†† ***Express SG* and *Involve 50 WDG* only.**

Weeds, Rates and Staging,

Pre-seeding application and fallow mixed with glyphosate♦:

- **Express SG *or* Involve 50WDG *at 6 grams per acre or 75% WDG tribenuron formulations at 4 grams per acre plus glyphosate (any brand) at 180 g ae per acre (see glyphosate pages for equivalent product rates.)***
  - *Weeds controlled by glyphosate products at the rates above plus:*
    - Canada thistle (rosettes)**
    - Cow cockle *
    - Dandelion (up to 6 inches)
    - Narrow-leaved hawk's-beard
    - Scentless chamomile†**
    - White cockle (rosettes)†**
    - Volunteer canola (including glyphosate tolerant varieties)***

  † ***Express SG* only.**

Fallow♦:

- **Express SG *or* Involve 50WDG *at 6 grams per acre or 75%WDG tribenuron formulations at 4 grams per acre plus 2,4-D ester 170 g (6 oz.) ae per acre (e.g. 0.24 L per acre LV 700 formulation):***
  - *Weeds controlled by 2,4-D ester 170 g (6 oz.) ae per acre plus:*
    - Flixweed♦♦
    - Stinkweed♦♦

Post-emergent in barley and spring wheat (including durum):

- **Involve 50WDG *at 6 g per acre or* Inferno WDG and MPOWER Extra *only at 4 grams per acre plus 2,4-D ester 170 g (6 oz.) ae per acre (e.g. 0.24 L per acre LV 700 formulation);***
  - *Weeds controlled by 2,4-D plus the following weeds up to 4 inches (10 cm) unless otherwise indicated:*
    - Annual sunflower
    - Canada thistle (top growth)
    - Cow cockle
    - Redroot pigweed
    - Wild buckwheat (1 to 3 leaf)**

Post-emergent for control of the emerged weeds below in rangeland and pasture only:

- **Express SG *or* Involve 50WDG *only at 6 grams per acre♦♦♦ at the early bud – pre-bloom stage:***
  - Tall buttercup
  - Narrow-leaved hawk's-beard
- **Express SG *or* Involve 50WDG *only at 12 grams per acre♦♦♦***
  - *The weeds listed above plus:*
    - Dandelion
    - Common tansy
    - White cockle

Post-emergent in Tribenuron Tolerant Sunflowers:

- **Express SG *only at 6 grams per acre plus* Hasten NT *adjuvant at 0.5L per 100L of spray solution or a non-ionic surfactant such as* Agral 90 *or* AgSurf*, at 0.2% v/v (2 L per 1000 L of water) will control:***
  - Lamb's-quarters (up to 9 leaf)
  - Wild buckwheat** (up to 6 leaf)

  *** Up to the 3 leaf stage.**
  **** Suppression only.**
  ***** Up to 6 inches.**
  ♦ Allow 10 days between treatment and tillage.
  ♦♦ Fall rosettes and spring seedlings.
  ♦♦♦ Addition of a non-ionic surfactant at 0.2 L per 100 L of spray solution is required.

Tribenuron may degrade if left in the sprayer for an extended period. Apply within 24 hours of mixing.
Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Application Information:

- **Water Volume:** 22 to 40 L per acre.
- **Nozzles and Pressure:** Use appropriate pressure for nozzle. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage of ***ASABE medium*** droplets or larger.
- **Screens:** Use a 50 mesh or coarser screen and filter system.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
tribenuron	POST (foliar)	ALS Amino Acid synthesis Inhibitor	Toward growth areas (Symplast)	Broadleaf only	2

Effects of Growing Conditions:

Warm, moist growing conditions promote active weed growth and enhance the activity of tribenuron. Weeds hardened off by environmental stress such as cold weather, drought or excessive heat may not be adequately controlled.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides:

- ***Prior to seeding registered field crops (all products unless otherwise indicated):***
  - Must be mixed with glyphosate
- ***Prior to seeding wheat (spring, durum, winter), barley, oats, dry bean, fababean, field pea, lupin and soybean:***
  - *Aim* + glyphosate (*Express SG* only)
- ***Prior to seeding wheat (spring and durum) (Express SG only):***
  - *Authority 480*
- ***Prior to seeding wheat (spring or winter, NOT durum), soybean and field pea (Express SG only):***
  - *Focus* + glyphosate
- ***Prior to seeding faba bean, field pea, soybean (Express SG only):***
  - *Authority 480* + glyphosate.
- ***Fallow:*** All products
  - Must be mixed with either glyphosate or 2,4-D ester
  - *Aim* + glyphosate (*Express SG* only)
- ***In spring wheat (including durum) and barley (Inferno WDG and MPOWER Extra only):***
  - 2,4-D ester (170 g ae/acre)
- ***Tribenuron Tolerant Sunflowers (Express SG only):***
  - *Assure II* plus *Merge* (0.5 to 1.0 L per 100 L solution) or *Suremix* (0.5 L per 100 L solution) adjuvants
  - Clethodim (*Select, Centurion, Shadow RTM*) plus *Amigo* (0.5 L per 100 L solution)
  - *Poast Ultra* plus *Hasten* Adjuvant (0.5 L per 100 L solution).

Note: The above mixes are those listed on the tribenuron labels only.

According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Adding ingredients in the correct order is critical for optimum performance. Check product labels for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 6 hours may reduce control. Check with product manufacturers for specific recommendations.
- **Restricted Entry Interval:** DO NOT enter treated fields for 12 hours.
- **Grazing Restrictions:**
  - ***75% WDG formulations:*** DO NOT graze treated crops within 30 days of application.
  - ***Express SG:*** Forage may be grazed immediately following application.
- **Pre-harvest Interval:**
  - ***75% WDG formulations:*** Leave 60 days between spraying and harvest of cereals.
  - ***Express SG:*** Leave 70 days between spraying and harvest of sunflower.
- **Re-cropping Interval:** There are no restrictions one year after treatment.
  - ***75% WDG formulations:*** Canola, flax, lentils and alfalfa may be planted 2 months after application.
  - ***Express SG* and *Involve 50 WDG* only:** All registered crop options may be seeded in the spring following a fall application. Canola, flax, and field corn may be planted 2 months after application or in the spring following a fall application (contact FMC for information on timing as it applies to tolerance on canola, lentil and field corn).
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store in a cool, dry place. May be frozen.
- **Buffer Zones:**
  - Handheld or backpack sprayers do not require a buffer zone.

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Fallow, preseed, range and pasture	0	0	3
Tribenuron tolerant sunflowers	1	0	4

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance is measured from the downwind edge of the boom to sensitive areas.

Sprayer Cleaning:

Tribenuron can cause severe injury to sensitive crops at very low concentrations. Sprayers used to spray Tribenuron should be flushed out immediately after use. Refer to 'Method A' in the general section on sprayer cleaning in the introduction.

This ammonia rinse process should be done twice for the WDG formulations. See the labels of the various products for specific instructions. The addition of detergent may improve cleanout, especially when mixing with other products.

Hazard Rating:

***Express SG, Involve 50WDG* and *Viking Tribenuron*:**

Warning – Eye Irritant

Potential Skin Sensitizer

***MPOWER Extra* and *Inferno WDG*:**

Caution – Eye and Skin Irritant

All products:

Warning – Contains the Allergens Milk and Sulfites

Refer to the Introduction for an explanation of the symbols.

Tridem

Herbicide Group
2 - pyroxsulam, florasulam
4 - fluroxypyr

Company:

Corteva Agriscience

Formulation:

The *Tridem* package contains the following components:

***Tridem A* (PCP#33290):** 21.5% pyroxsulam formulated as a water dispersible granule.

- Container sizes - 0.84 kg, 5.04 kg

-plus-

***Tridem B* (PCP#33440):** 5 g/L florasulam and 100 g/L fluroxypyr formulated as a suspension concentrate.

- Container sizes - 2 x 8.1 L, 97.2 L

-plus-

Bindem Utility Modifier:

- Container sizes - 2.4 L, 2 x 7.1 L

Crops and Staging:

Spring wheat, durum wheat, winter wheat: 3 leaf to just prior to flag leaf emergence

Weeds and Staging:

- **Grass weeds controlled (1 to 6 leaf, prior to 4th tiller):**
  - Wild oats†
  - Japanese brome††
- **Broadleaf weeds controlled:**
  The 'susceptible' broadleaf weeds controlled by 2,4-D (see 2,4-D page) plus:
  - Cleavers◆
  - Chickweed
  - Cow cockle
  - Hemp-nettle*
  - Kochia◆
  - Narrow-leaved hawk's-beard*
  - Redroot pigweed*
  - Shepherd's-purse
  - Smartweed
  - Sow-thistle (annual, perennial)*
  - Stinkweed
  - Stork's-bill (1 to 8 leaf)
  - Volunteer canola◆◆
  - Volunteer flax
  - Wild buckwheat

*** Suppression only.**
† For low wild oats populations (less than 75 plants per square metre).
†† For control of Japanese brome from the 1 leaf to 4 leaf, 2 tiller stage under good growing conditions.
◆ Including Group 2 resistant biotypes.
◆◆ Except CLEARFIELD varieties.

Rates:

Tridem A: 21 grams per acre
Tridem B: 405 mL per acre
When tank mixed with 2,4-D 700 ester and MCPA ester at rates in the 'Tank Mix' section below, additional surfactant is NOT required; however, Bindem Utility Modifier *included in the case is required at 60 mL per acre.*

Application Information:

- **Water Volume:**
  - ***Ground only:*** 20 to 40 L per acre.
- **Nozzles and Pressure:** Use appropriate pressure for nozzle. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage of ***ASABE coarse*** droplets or larger.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
pyroxsulam	POST (foliar)	ALS Amino Acid Inhibitor	Toward growth areas (Symplast)	Broadleaf and grass	2
florasulam	POST (foliar) with little soil activity	ALS Amino Acid Inhibitor	Toward growth areas of plant (Symplast)	Broadleaf only	2
fluroxypyr	POST (foliar)	Synthetic Auxin	Throughout the plant (Symplast)	Broadleaf only	4

Effects of Growing Conditions:

DO NOT apply to registered crops that are stressed by severe weather conditions (frost, drought or water saturated soil) as crop injury may result. Reduced activity will occur when temperatures are below 8°C or above 27°C. Frost 3 days before or after application may reduce weed control and crop tolerance.

Tank Mixes:

Herbicides:
- 2,4-D Ester 700 (215 to 250 mL per acre)
- MCPA Ester 600 (185 mL to 360 mL per acre)

Fungicides:
- *Stratego 250EC*
- *Tilt 250 E*

Fertilizers: None registered.
Insecticides: None registered.
Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Rainfast within 2 hours of application.
- **Preharvest Interval:** DO NOT harvest the treated crop for grain within 60 days of application.
- **Restricted Entry Interval:** DO NOT enter treated fields for at least 12 hours.
- **Grazing:** DO NOT graze for 7 days or silage/hay for 30 days following application.
- **Re-cropping Interval:** Fields previously treated with *Tridem* can be seeded the following year to wheat, barley, canola, corn, dry common beans, flax, lentils, mustard (brown, oriental and/or yellow) oats, peas, potatoes (except seed potatoes), soybeans, or sunflower.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store in original containers in a secure, dry, well ventilated, heated storage.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:	
	Aquatic Habitats of Depths	Terrestrial habitat*
Ground only*	1	2

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Refer to the combination of 'Method A' and 'Method B' found in the general sprayer cleaning section in the introduction. Let solution stand for an extended period for better results. Flush sprayer system with water before reuse. See the label for product specific cleaning details.

Hazard Rating:

Warning – Eye and Skin Irritant
Refer to the Introduction for an explanation of the symbols.

Trifluralin

Herbicide Group 3 - trifluralin

Company:

Gowan Canada (*Treflan Liquid EC, Treflan MicroActiv*)
Nufarm Agriculture (*Rival*)
Loveland Products Canada (*Bonanza*)
Rath Holdco Inc. (RHI Trifluralin 480 EC, Yieldshield Respectra Soilsorb)
Sharda Cropchem Limited (*Bonita, Thrill*)

Formulation:

***Bonanza 480 EC* (PCP#28289):** 480 g/L trifluralin formulated as an emulsifiable concentrate.
- Container sizes - 9.45 L, 205 L

***Bonanza 10G* (PCP#22744):** 10% trifluralin formulated as a granular.
- Container sizes - 22.7 kg, 500 kg bags

***Rival EC* (PCP#18612):** 500 g/L trifluralin formulated as an emulsifiable concentrate.
- Container sizes - 2 x 9 L

***Rival 10G* (PCP#18926):** 10% trifluralin formulated as a granular.
- Container sizes - 454 kg bags

***Treflan Liquid EC* (PCP#23933):** 480 g/L trifluralin formulated as an emulsifiable concentrate.
- Container sizes - 9.45 L, 115 L

Treflan MicroActiv* (PCP#21742)*: 10% trifluralin formulated as a granular.
- Container size - 454 kg bags

***RHI Trifluralin 480 EC* (PCP# 34590):** 480 g/l trifluralin formulated as an emulsifiable concentrate
- Container size - 9.45 L

***Yieldshield Respectra Soilsorb* (PCP# 34572):** 10% trifluralin formulated as a granular
- Container size - 454 kg

***Thrill* (PCP#34592):** 480 g/L trifluralin formulated as an emulsifiable concentrate
- Container size

***Bonita* (PCP#34924):** 10% trifluralin formulated as a granular.
- Container size - 22.7 kg

Crops and Staging:

Certain formulations are not registered for all the crops listed here. Refer to the specific product label for details. All products are for pre-plant incorporated use only.

Fallow use in the brown soil zone of Saskatchewan, or fall application in all soil zones. (Granular products only): Spring wheat (including durum). Apply to fallow fields in May, June, or July for weed control during both years of a fallow-wheat rotation, or in the fall (September or October) or spring prior to seeding.

DO NOT apply following harvest when the previous crop was treated with another trifluralin product (*Treflan*, *Rival* or *Bonanza* products). This includes application the previous summer or fall. DO NOT apply trifluralin following harvest or to fallow when the previous year's crop was an oilseed, barley or pulse crop treated with a deep incorporated, spring or fall applied trifluralin product.

Green and Yellow Foxtail Control in Cereals:
- Liquids applied in spring only (after seeding but prior to crop emergence) - spring wheat (including durum), barley. Granulars applied in fall only (after September 1 but before freeze-up) - spring wheat (including semi-dwarf and durum).

Broadleaf and Grassy Weed Control in other crops:

- ***Spring applied liquid or granular formulations:***
  - Canola, pea, sunflower, safflower (liquid formulations), dry bean*, mustard, faba bean, alfalfa, sainfoin, sweet clover, soybean, forage legumes (cicer milk-vetch, seedling alsike clover, red clover, bird's-foot trefoil).
- ***Fall applied granular formulations:*** Canola, pea, sunflower, dry bean, mustard, faba bean, soybean, barley, lentils and flax.
- ***Trifluralin liquids only:*** prior to planting shelterbelt transplants (elm, caragana, green ash, Scots pine).

* *RHI Trifluralin 480 EC, Thrill* - black, white or kidney only

Weeds:

Fallow use in the brown soil zone of Saskatchewan or fall application in all soil zones (Granular products only):

- ***Fallow Year:***
  - Barnyard grass
  - Cow cockle
  - Green foxtail
  - Lamb's-quarters
  - Persian darnel
  - Redroot pigweed
  - Russian thistle*
  - Wild buckwheat
  - Wild oats
- ***Crop Year:***
  - Green foxtail
  - Lamb's-quarters
  - Wild buckwheat*
  - Wild oats*

  *** Suppression only**

Green and Yellow Foxtail Control in Cereals:

- Foxtail (green, yellow)

Broadleaf and Grassy Weed Control in other crops:

- Barnyard grass
- Brome (downy, Japanese)
- Chickweed
- Cow cockle
- Foxtail (green, yellow)
- Knotweed
- Lamb's-quarters
- Persian darnel
- Pigweed
- Purslane
- Wild buckwheat*
- Wild oats†*

*** Some plants may escape herbicide treatment but are not competitive with the crop.**

† Suppression only with *Treflan Liquid EC* and *Bonanza 480 EC*.

Rates and Staging:

Fallow use in the brown soil zone of Saskatchewan (granular products only):

- DO NOT apply to sandy soils with less than 1 percent organic matter. Application to severely eroded knolls is not recommended. DO NOT apply to wet soils, soils in poor working condition, soils which contain more than 8 percent organic matter, or soils subject to prolonged periods of flooding.
- Granules may be applied to fallow fields or following harvest, provided crop residues or green growth do not interfere with cultivation (prevent soil mixing).
- Over-application caused by overlapping, improper calibration or non-uniform application may result in reduced crop stand, delayed development or reduced yields.

	Rate (kg per acre)		
Soil Organic Matter (percent)	1 to 3 percent	4 to 8 percent	2 to 8 percent
May	3.85	4.5	
June	3.25	3.85	
July	2.65	3.25	
September to October			2.23*

*** Control of green foxtail only, on soils between 2 to 8 percent organic matter.**

- During the fallow year, susceptible weeds may not be fully controlled until after the second fallow operation has established a uniform layer of treated soil. Control of wild oats in the crop year may be variable depending on wild oats population as well as soil and climatic conditions. Some wild buckwheat may escape but its growth will be slowed and result in limited competition to the wheat crop.

Pre-emergent control of green and yellow foxtail:

- ***Liquids:***

Product	**Rates (L per acre)**	
	Light and Medium Soil Texture	**Heavy Soil Texture**
Rival EC	**0.49 to 0.57 L**	**0.65 L**
Treflan Liquid EC, Bonanza 480 EC, RHI Trifluralin 480 EC, Thrill	**0.49 L**	**0.69 L**

- ***Granular products (wheat only):***
  - 2.23 kg per acre in all soil textures with 2 to 8 percent organic matter.

Broadleaf and grassy weed control in other crops:

- For use in canola, pea, sunflower, dry bean, mustard, faba bean, seedling alfalfa (spring only), seedling sweet clover (spring only), soybean.

Product	Soil Type			
	Light soils with less than 6 percent organic matter		Medium to heavy soils with 6 to 15 percent organic matter	
	Spring	Fall	Spring	Fall
Rival EC	0.65 L/acre	0.89 L/acre*	0.89 to 1.13 L/acre	1.13 to 1.37 L/acre*
Bonita, Rival 10G	3.43 kg/acre**	4.45 kg/acre	4.45 to 5.67 kg/acre**	5.67 to 6.88 kg/acre
Treflan Liquid EC, RHI Trifluralin 480 EC, Thrill	0.69 L/acre	0.93 L/acre*	0.93 to 1.21 L/acre	1.21 to 1.37 L/acre*
Bonanza 10G , Treflan Microactiv	Not registered	4.45 kg/acre	Not registered	5.67 to 6.88 kg/acre
Bonanza 480 EC	0.69 L/acre	0.93 L/acre*	0.93 L/acre	1.17 L/acre*

*** Although liquid formulations are registered for fall application, this use is not recommended as tillage requirements before and after application will predispose fields to erosion.**
**** Spring applications of granular formulations are recommended for Manitoba only.**

For use in barley (fall only), apply:

Product	Soil Type					
	2 to 4 percent organic matter		4 to 6 percent organic matter		6 to 10 percent organic matter	
	Light Soil Texture*	Medium to Heavy Soil Texture**	Light Soil Texture*	Medium to Heavy Soil Texture**	Light Soil Texture*	Medium to Heavy Soil Texture**
Rival 10G, Bonanza 10G, Treflan Microactiv, Yieldshield Respectra Soilsorb, Bonita	3.44 kg/acre	3.44 kg/acre	4.45 kg/acre	4.45 kg/acre	4.45 kg/acre	5.67 kg/acre

*** Light textured soils can be defined as sandy to sandy-loam.**
**** Medium to heavy textured soils can be defined as loam to clay.**

For use in flax or lentils (fall only), apply:

Product	Soil Type			
	Soils with 2 to 6 percent organic matter		Soils with 6 to 15 percent organic matter	
	Light Soil Texture*	Medium-Heavy Soil Texture**	Light Soil Texture*	Medium-Heavy Soil Texture**
Rival 10G, Bonanza 10G, Treflan Microactiv, Yieldshield Respectra Soilsorb, Bonita	4.45 kg/acre	4.45 to 5.6 kg/acre***	5.67 kg/acre	5.67 to 6.88 kg/acre
Bonanza 480 EC	0.93 L/acre	0.93 L/acre	1.17 L/acre	1.17 L/acre
Treflan Liquid EC, RHI Trifluralin 480 EC, Thrill	0.93 L/acre	1.21 L/acre	1.21 L/acre	1.21 to 1.38 L/acre
Rival EC	0.89 L/acre	1.13 L/acre	1.89 L/acre	1.13 to 1.38 L/acre

*** Light textured soils can be defined as sandy to sandy-loam.**
**** Medium to heavy textured soils can be defined as loam to clay.**
***** Rates vary among products. Refer to product label for specific information.**

Application:

Liquid Formulations:

- ***Water Volume:*** **Minimum 40 L per acre.**
- ***Nozzles and Pressure:*** Maximum 40 psi (275 kPa) when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage of ***ASABE medium*** droplets or larger.

Dry Granular Formulations: Use equipment capable of metering granular herbicides and applying in an even layer over the surface of the soil. Close applicator lid after filling to avoid prolonged exposure to direct sunlight.

Incorporation:

Fallow use in the brown soil zone of Saskatchewan:

- Apply granules to the soil surface and incorporate immediately, in the same operation if possible. DO NOT delay incorporation more than 24 hours after application. Use a deep tillage cultivator, field cultivator or disc implement set to work 2 to 3 inches (5 to 8 cm) deep, and operating at 8 to 10 km per hour. Granules should not be incorporated when soil is crusted, lumpy or too wet for good mixing action.
- ***May to July:*** A second incorporation at the same depth and at an angle to the first should be done when weed growth requires it. Wait at least one week before making the second incorporation. After completing two fallow incorporations, additional operations with a rod weeder, shallow tillage or fall herbicide application may be required to control remaining weed growth.
- ***September to October:*** A second incorporation may be done in the fall a minimum of 3 days later. Alternatively, to conserve crop residues cover through the winter, the second incorporation can be completed in the spring at the same depth and at an angle to the first incorporation. When both incorporations take place in the fall, shallow spring tillage should be completed in the spring. If a discer or air seeder is used for seeding, separate spring tillage may not be necessary.
    - *NOTE: Fall application is not recommended on soils where a lack of crop residue cover combined with the required incorporation would leave the soil vulnerable to erosion.*
- ***Spring (In the year of seeding):*** Apply granules and incorporate immediately, in the same operation if possible. DO NOT delay the first incorporation longer than 24 hours after application. The second incorporation must be delayed a minimum of 3 days following the first incorporation. When applied to cold soils, wait 14 days before making second incorporation. The second incorporation should be done at an angle to the first incorporation, and at the same depth. If a discer or air seeder is used for seeding, the seeding operation can be used as the second incorporation.

Green and yellow foxtail control in cereals:

- ***Liquid formulations:*** Apply and incorporate in spring just after seeding. Incorporate to a depth of 1 to 1.5 inches (2 to 4 cm) into a bare soil free of crop residues (80 percent black when viewed from above) using diamond or tine type harrows operated at a speed of 6 miles per hour (9 km per hour). Incorporate twice, with the second incorporation at right angles to the first. The first incorporation should be performed immediately in the same direction of application. Both incorporations should be done within 24 hours of application. When tank mixing liquid formulations with *Avadex BW*, follow the same incorporation procedure.
- ***Granular formulations:*** May be applied to standing or pre-worked stubble. Very heavy trash fields should be worked prior to application to allow product penetration to the soil surface. Incorporate with cultivators or disc implements only. Perform the first tillage operation within 24 hours of application. Incorporate at a working speed of 5 to 8 miles per hour (8 to 13 km per hour) and to a depth of 2 to 3 inches (5 to 8 cm). Wait a minimum of 5 days, then incorporate a second time at right angles to the first. This second incorporation may be delayed until the following spring. Subsequent working should be no deeper than 2 to 3 inches (5 to 8 cm).

Broadleaf and grassy weed control in other crops:

- Granular formulations are recommended for use in fall or spring as a pre-plant incorporated treatment on broadleaf crops listed on the product label. The liquid formulations should be used only on soils free of lumps and relatively free of crop residues (75 percent black) and are recommended only for spring use. Granular formulations may be applied to standing or pre-worked stubble. Very heavy crop residues should be worked prior to application to allow product penetration to the soil surface. DO NOT use liquid or formulations of trifluralin as a pre-plant incorporated treatment in barley, as severe injury will result. Only the fall applications of granular formulations are registered for use as pre-plant incorporated treatments in barley. For fall application of granular formulations, work the chemical into the soil between September 1 and freeze-up. Use a discer or field cultivator (vibrating shank-type). Disc implements are preferred on stubble. Set equipment to cut at 3 to 4 inches (8 to 10 cm) depth. The initial incorporation should be done within 24 hours of application.
  The second incorporation should be done at right angles to the first. The second incorporation may be delayed until spring, except when planting barley, flax or lentils; for these crops both incorporations must be done in fall. Delay the second incorporation 5 days for better weed control. This will allow greater release of the chemical onto soil particles and assure more even distribution. Fall application of granular trifluralin on flax, lentils or barley is not recommended on soils prone to erosion, as the 2 fall incorporations necessary in these crops may leave soils vulnerable to wind or water erosion.
- For spring application of liquid and granular formulations, work the chemical into the soil prior to seeding by setting the implement at 3 to 4 inches (8 to 10 cm) cutting depth. The first incorporation must be done within 24 hours of application. The second incorporation must be done at right angles to the first. If incorporating granular trifluralin, delay the second incorporation for 3 days after the first to achieve better weed control.

Seeding:

Fallow use in the brown soil zone of Saskatchewan:

- Allow soil to warm before seeding to reduce risk of injury to crop. Place seed 1.25 to 2.5 inches (3 to 6 cm) deep. If spring seedbed preparation is required, set cultivator 2 inches (5 cm) deep. To reduce the risk of wheat injury, use good quality seed and agronomic practices that will promote good growing conditions. Avoid deep seeding, loose seedbeds and seeding into cold soils. If extended dry periods were present after a fallow application, a 10 percent increase in seeding rate is recommended.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
trifluralin	PPI (Soil active)	Mitosis Inhibitor/ cell division	Little movement in plant (Apoplast)	Broadleaf & grass	3

Effects of Growing Conditions:

Prolonged drought conditions after a May to July application to fallow may result in higher levels of trifluralin in the soil at the time of seeding.

Injury to flax, barley, wheat or lentils may occur if soil and weather conditions are not conducive to rapid crop emergence (cold or dry soils at the time of seeding and crop emergence).

To minimize crop injury, seed into a firm, moist seed bed using a seeder with good depth control and on row packing. Plant barley no deeper than 2 inches (5 cm). Plant cereals, lentils and flax no deeper than 1.5 inches (4 cm).

Less than acceptable weed control will result if dry conditions prevail at the time of weed emergence.

Rainfall has no direct effect on products' activity. Flooding (3 to 5 days) will cause rapid breakdown of the product resulting in reduced weed control. Flooding for 3 weeks or more will result in total breakdown of the product resulting in loss of weed control.

Tank Mixes:

Herbicides:

- ***Soybeans:***
  - *Sencor* (*Treflan Liquid EC, RHI Trifluralin 480 EC* only).

Fertilizers: Liquid product may be applied with liquid fertilizer as a carrier. Before the herbicide is added to the tank, compatibility of the herbicide to liquid fertilizer should be tested following instructions on the herbicide container. Trifluralin liquids may be blended with dry bulk fertilizers (DO NOT mix with nitrate fertilizers). Check label for blending instructions.

Insecticides: None registered.

Fungicides: None registered.

According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** No restriction. Flooding may reduce weed control.
- **Restricted Entry Interval:** Wait at least 12 hours before entering treated fields.
- **Grazing Restrictions:** DO NOT graze the treated crops or cut for feed prior to crop maturity.
- **Re-cropping Interval:** Oat, canaryseed, and small-seeded grasses may be affected the year after treatment. Corn is sensitive at higher rates of application. Damage to wheat can occur if the crop is seeded into land that has been treated during the previous 21 months with trifluralin products and has received abnormally low amounts of precipitation. Damage is worse if conditions are not conducive to rapid emergence of the wheat (for example, if the crop is seeded deep or if soil conditions remain cool during emergence). Damage tends to be greater on fields treated with granular formulations.
- **Aerial Application:** DO NOT apply by air.
- **Storage:**
  - Granular formulations must be stored in a cool, dry location, out of sunlight.
  - ***Rival EC:*** DO NOT store below 5°C.
  - ***Treflan Liquid EC, Bonanza 480 and Advantage RHI Trifluralin 480 EC:*** DO NOT freeze. Crystallization of the active ingredient may occur at less than 5°C. To reconstitute, bring temperature to 15°C and shake well until no crystals are visible. This should be done before adding to the spray tank.
- **Buffer Zones:** (liquid formulations only)

Crop	Buffer Zones (metres†) Required for the Protection of*:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Field crops	80	10	1
Shelterbelts, woody crops	120	20	1

See the Key to Product Pages in the introduction for an explanation of the different habitats.

*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**

† Distance is measured from the downwind edge of the boom to sensitive areas.

Sprayer Cleaning:
Refer to 'Method B' in the general section on sprayer cleaning in the introduction for liquid formulations only.

Hazard Rating:
***Bonanza 480 EC, RHI Trifluralin 480 EC*:**

Warning – Poison

Warning – Eye and Skin Irritant

All products: Potential Skin Sensitizer

Refer to the Introduction for an explanation of the symbols.

Tundra

Herbicide Group
1 - fenoxaprop
6 - bromoxynil
27 - pyrasulfotole

Company:
Bayer (PCP#29367)

Formulation:
46 g/L of fenoxaprop-p-ethyl, 87.5 g/L of bromoxynil and 15.5 g/L of pyrasulfotole formulated as an emulsifiable concentrate.
- Container sizes - 8.1 L, 129.6 L, 405 L

Crops and Staging:
Application beyond the maximum rates provided below may result in crop injury.

Crop	Stage
Barley, spring wheat (including durum)	1 to 6 leaves on the main stem plus 3 tillers

Weeds, Rates and Staging:
Apply at the 3 to 4 leaf stage for optimum control. Optimum weed control and yield response occurs when weeds are removed before the crop tillers.

Apply 0.81 L per acre to control:

Grass weeds from the 1 to 6 leaf stage up to emergence of 3rd tiller:
- Barnyard grass
- Foxtail (green and yellow)
- Wild oats

Broadleaf weeds from the 1 to 6 leaf stage unless otherwise indicated:
- Canada fleabane (up to 10 cm)*
- Canada thistle† (up to 30 cm)
- Chickweed
- Cleavers (1 to 3 whorls)
- Cleavers (4 to 6 whorls)*
- Dandelion† (up to 25 cm across††)
- Flixweed (up to 10 cm)
- Hemp-nettle
- Kochia (up to 10 cm)
- Narrow-leaved hawk's-beard (up to 10 cm and before bolting)
- Pale smartweed
- Ragweed (common)
- Redroot pigweed
- Round-leaved mallow†
- Russian thistle (up to 10 cm)
- Shepherd's-purse
- Sow-thistle (annual, perennial†)
- Stinkweed
- Stork's-bill (up to 8 leaf)***
- Volunteer canola**
- Wild buckwheat
- Wild mustard

† Suppression only.
†† Spring seedlings and over-wintered rosettes.
*** Add 200 g of active ammonium sulfate per acre (202 grams per acre of 99 percent dry; 0.5 L per acre of 40 percent liquid; or 0.4 L per acre of 49 percent solution).**
**** Including all herbicide tolerant varieties.**
***** Only when mixed with 2,4-D ester and ammonium sulphate.**

DO NOT apply *Tundra* or other products containing fenoxaprop, pyrasulfotole or bromoxynil more than once in the same year.

Application Information:
- **Water Volume:**
  - ***Ground:*** 18.9 L per acre. Use higher water volumes for dense crop/weed canopies.
  - ***Aerial:*** 11.4 L per acre.
- **Nozzles and Pressure:** Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE medium*** classification droplets. Low drift nozzles may require higher pressures for proper performance.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
fenoxaprop	POST (foliar)	ACCase Lipid Synthesis Inhibitor	Toward areas of growth (Symplast)	Grass only	1
bromoxynil	POST (foliar)	PSII Inhibitor/ Membrane disruptor	Little (apoplast)	Broadleaf only	6
pyrasulfotole	POST (foliar)	HPPD Pigment Inhibitor	Some – both foliar & root (Apoplast) – Somewhat systemic (has soil residues)	Broadleaf only	27

Effects of Growing Conditions:

Crop injury may result if applied to a crop that is stressed by severe weather conditions, frost, low fertility, drought, water-saturated soil, disease or insect damage. Weeds growing under adverse environmental conditions such as drought will be less susceptible to *Tundra*. Under stressed conditions and/or heavy crop canopy, early application will result in improved weed control.

Tank Mixes:

Herbicides:

- 2,4-D ester (113 g ae per acre) plus ammonium sulphate (see "Weeds, Rates and Staging:" above)

Fungicides: None registered.
Insecticides: None registered.
Fertilizers: DO NOT mix with fertilizers other than those indicated above.
According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 1 hour may reduce control.
- **Restricted Entry Interval:** DO NOT enter treated areas for 24 hours.
- **Grazing Restrictions:** DO NOT graze or cut cereal crops for hay, within 25 days of application.
- **Pre-harvest Interval:** Leave 65 days from application to harvest.
- **Re-cropping Interval:** Alfalfa, barley, canaryseed, canola, corn (Manitoba only), flax, oats, potato, soybean (Manitoba only), sunflower, tomato (Manitoba only), and wheat (spring, and durum) may be planted the season following application. Field pea may be grown the following year in all black, grey-wooded and dark brown soil zones. DO NOT plant field pea the season following *Tundra* use in the brown soil zone where soil pH is above 7.5 and precipitation was less than 125 mm from June 1st until September 1st of the year of application.
- **Aerial Application:** May be applied by air.
- **Storage:** Store in a dry controlled temperature facility. DO NOT freeze. Shake before using if stored for longer than one year.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground *	3	1	10
Fixed wing aircraft	20	5	375
Helicopter	20	3	225

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Refer to 'Method A' in the general section on tank mixing in the introduction.

Hazard Rating:

Caution – Poison

Danger – Corrosive to Eyes and Skin

Warning – Eye Irritant

Potential Skin Sensitizer

Refer to the Introduction for an explanation of the symbols.

Ultra Blazer

Herbicide Group 14 - acifluorfen

Company:

UPL AgroSolutions Canada (PCP#32330)

Formulation:

240 g/L acifluorfen present as a sodium salt and formulated as a solution.

- Container size - 2 x 10 L jug

Crops and Staging:

Soybean: from the 1 to 3 trifoliolate leaf stage. DO NOT apply before the first trifoliolate leaf stage of the soybean. DO NOT apply to soybeans grown on sand or loamy sand soils.

Weeds and Staging:

***Ultra Blazer* applied at 0.5 L per acre plus *Assist* adjuvant at 0.5 L per 100 L of spray solution will control:**

Weed	Maximum Leaf Stage
Common ragweed	8
Redroot pigweed	4

***Ultra Blazer* applied at 1.0 L per acre** will control the weeds above plus the following weeds at the maximum leaf stages listed:**

Weed	Maximum Stage
Canada thistle*	Pre-bud
Cocklebur	4 leaf
Common milkweed*	-
Field bindweed*	-
Hedge bindweed*	-
Lamb's-quarters	2 leaf
Nightshade (eastern black)	6 leaf
Redroot pigweed	6 leaf
Smartweed (including lady's-thumb)	8 leaf
Wild mustard	10 leaf

*** Top growth control only. The plant will grow back from underground roots.**

**** DO NOT add *Assist* adjuvant with the 1.0 L per acre rate as crop injury will result.**

Refer to the product label for complete mixing instructions for this product and its mixes. A general mixing guide can be found in the introduction.

Application Information:

- **Water Volume:** No specific water volume is provided on the label but a minimum of 81 L per acre is implied by the adjuvant rates on the label. Good coverage of weed foliage is required for proper control.
- **Nozzles and Pressure:** Use nozzles and pressure designed to deliver thorough, even coverage with ***ASABE medium*** droplets.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
acifluorfen	POST (foliar)	PPO Inhibitor/ Membrane disruptor	Little movement due to rapid cell leakage (Symplast)	Broadleaf only	14

Effects of Growing Conditions:

Soybeans may exhibit speckling, bronzing and/or leaf burn. The trifoliolate leaf emerging at the time of application may be distorted. Soybeans usually outgrow these conditions and continue to grow at a normal rate with no adverse effect on vigour, maturity, or crop yield. It is important to have good spray coverage on the weeds as *Ultra Blazer* works mainly by contact action. Failure to follow the suggested application rate and timing may result in unsatisfactory control.

Tank Mixes:

Herbicides:

- *Ultra Blazer* (0.5 L per acre) plus *Basagran Forté* (0.5 L per acre)
- *Ultra Blazer* (0.255 L per acre) plus *Basagran** or *Basagran Forté* (0.71 L per acre) depending on predominant weed species present.
  - See label for details.

    *** Add *Assist* adjuvant at 0.5 L per 100 L of spray solution for *Basagran* tank mix only.**

Fertilizers: None registered. DO NOT add fertilizers to the spray mixture.

Insecticides: None registered.

Fungicides: None registered.

Note: The above mixes are those listed on the *Ultra Blazer* label only.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 6 hours may reduce weed control.
- **Restricted Entry Interval:** DO NOT enter treated fields for 12 hours.
- **Pre-harvest Interval:** No specific preharvest interval is indicated on the label.
- **Grazing Restrictions:** DO NOT graze the treated crop or cut for hay.
- **Re-cropping Interval:** The label has no restriction on crops that may be planted the following season.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** DO NOT freeze.
- **Buffer Zones:** Leave a buffer of 15 metres from the last spray pass and sensitive upland areas such as other crops, pastures, rangeland, woodlots or shelterbelts.

Sprayer Cleaning:

Refer to 'Method B' in the general section on sprayer cleaning in the introduction. Sprayers may require cleaning after several tank loads to remove any excessive oil buildup on the inside of the sprayer.

Hazard Rating:

Caution – Poison

Danger – Corrosive to Eyes

Warning – Causes Skin Irritation

Avoid contact with skin. Harmful if inhaled.

Refer to the Introduction for an explanation of the symbols.

Valtera / Chateau

Herbicide Group 14 - flumioxazin

Company:
Valent Canada, Inc. Distributed by Nufarm Agriculture

Formulation:
***Valtera WDG* (PCP#29230)*; *Chateau WDG* (PCP#29231)*:** 51.1% flumioxazin formulated as a water dispersible granule.
- Container sizes:
  - *Valtera WDG* - 2 x 4.54 kg
  - *Chateau WDG* - 4 x 1.13 kg

***Chateau EZ* (PCP#34036); *Valtera EZ* (PCP#33523):** 479.2 g/L flumioxazin formulated as a suspension concentrate.
- *Chateau EZ* - 4 x 910 mL
- *Valtera EZ* - 2 x 4.8 L

** **Note:** This product is no longer manufactured but inventories still remain in distribution. This product may be removed from future editions.*

Crops, Rates, and Staging:
Maximum ONE APPLICATION per year of *Valtera* or *Chateau* or other products containing flumioxazin.
Pre-seed or pre-emergent:
Spring Application:

Crop	Product	WDG Rate (g per acre)		EZ Rate (mL per acre)	
		Soil Type		Soil Type	
		Coarse soil	Medium soil	Coarse soil	Medium soil
Potato***	*Chateau* only	42.5	42.5	45	45
Soybean*, field corn**	*Valtera* only	56.7	85.0*	60	90
Chickpea, field pea, lentil**, spring wheat (NOT including durum)**, sunflower†	*Valtera* only	56.7	56.7	60	60
Established dormant alfalfa‡ grown for seed and hay or other forage	*Valtera* only	113.0	113.0	120	120
Non-crop use – bare ground application§	*Valtera, Chateau, Payload*	113.0	170.0	120.6	181.3

Fall Application:

Crop	Product	WDG Rate (g per acre)		EZ Rate (mL per acre)	
		Soil Type		Soil Type	
		Coarse soil	Medium soil	Coarse soil	Medium soil
Soybean, field corn	*Valtera* only	56.7	85.0	60	90
Chickpea, field pea, lentil (small red, large green), spring wheat (NOT including durum)**	*Valtera* only	56.7	85.0	60	90
Established dormant alfalfa‡ grown for seed and hay or other forage	*Valtera* only	113.0	113.0	120	120

*** May cause crop injury. Seed soybean at least 1.5 inches (4 cm) deep.**
**** Seed wheat and lentil at least 1 inch (2.5 cm) deep. Apply *Valtera* a minimum of 7 days prior to seeding spring wheat, lentils and field corn. Apply to minimum till soils only.**
***** Potatoes (*Chateau* only): Apply after hilling. A minimum of 2 inches (5 cm) of soil must cover the vegetative portion of the potato or crop injury may result.**
† Apply *Valtera* a minimum of 30 days prior to planting.
‡ Apply to dormant alfalfa with maximum of 15 cm (6 inches) of new growth to minimize crop injury. Application will result in burning of green leaves. *NOTE: Since this use has been registered under the 'User Requested Minor Use' program, the manufacturer assumes no responsibility for herbicide performance or injury.* ***Use of Valtera WDG on dormant alfalfa is entirely at the risk of the user.***
§ DO NOT apply to farm paths or roadways or areas with dusty surfaces where dust may blow onto nearby crops as injury may result to those crops.

If weeds are emerged, apply *Valtera* in a mix with a foliar herbicide (see tank mix section).

***Harvest Aid* (*Valtera* only):** Apply 42.5 to 56.7 grams *Valtera WDG* per acre or 45 to 60 mL per acre *Valtera EZ* per acre when crops are physiologically mature to dry green weed material. Add metholated seed oil (MSO) at 1 L per acre or a non-ion surfactant such as *Nufarm Enhance* at 0.125 to 0.25 L per 100 L of spray solution.

- Chickpea, dry bean, faba bean, field pea, lentil – a minimum of 80 percent of the pods are yellow to tan in colour and 20 percent are yellow in colour. Wait at least 5 days with *Valtera WDG* and 8 days with *Valtera EZ* before harvesting.
- Wheat – 30 percent or less grain moisture. Wait at least 10 days before harvesting.
- Sunflower – 35 percent or less grain moisture. Wait at least 5 days before harvesting.

Weeds and Rates:

Apply prior to crop and weed emergence.

***Chateau WDG* applied at 42.5 grams per acre or *Chateau EZ* applied at 45 mL per acre** provides *suppression* of the following weeds:**

- Canada fleabane
- Kochia
- Lamb's-quarters
- Nightshade (Eastern black, hairy)
- Pigweed (green, redroot)
- Ragweed, common

***Valtera WDG* applied at 56.7 to 85.0 grams per acre or *Valtera EZ* applied at 60 to 90 mL per acre provides *control* of the weeds above plus:**

- Annual sow-thistle
- Cleavers*
- Common chickweed
- Dandelion
- Green foxtail*
- Palmer amaranth
- Russian thistle†*
- Volunteer canola* (all varieties)
- Waterhemp
- Wild buckwheat*

***Valtera WDG* and *Payload* applied at 113 to 170 grams per acre or *Valtera EZ* applied at 120.6 to 181.3 mL per acre provides extended control of the weeds above.**

*** Suppression.**
**** Rate for *Chateau* in potato only.**
† *Valtera EZ* only.

DO NOT apply on soils with > 5 percent organic matter, or fine soils. Soils such as clay, clay loam, silty clay or silty clay loam are considered fine textured soils. DO NOT apply to soils composed of more than 90 percent sand and gravel.

The duration of residual control may be reduced at lower rates. Spray within 6 hours of mixing. When applying *Valtera EZ/Chateau EZ* by itself a surfactant is not required.

Application Information:

- **Water Volume:**
  - ***Preseed or pre-emergent:*** Minimum 40 L per acre (recommended by manufacturer).
  - ***Harvest Aid:*** 57 to 113 L per acre.
- **Nozzles and Pressure:** Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE medium*** droplets.
- **Screens:** The use of 50 mesh screens is recommended.
- DO NOT perform any tillage operations after application otherwise weed control will be reduced. When applied prior to seeding crops must be direct seeded with minimum disturbance systems.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
flumioxazin	PRE (surface) with residual soil activity, Pre-harvest	PPO Inhibitor/ Membrane disruptor	*PRE:* Upward in plant (Apoplast) *Preharvest:* Little movement due to rapid cell leakage (Symplast)	Broadleaf only	14

Effects of Growing Conditions:

Rainfall is required to activate flumioxazin in the soil. Crop injury may occur when soils are wet and cool following application or soils are poorly drained. Severe injury may occur with flooded soils. Newly emerging foliage can be temporarily injured by heavy rain splashing treated soil on leaves. Heavy crop residues may reduce weed control.

Irrigation: If rainfall is not received after application, 5 to 10 mm of irrigation may be applied to improve weed control activity.
DO NOT apply irrigation to wheat after emergence until the main head is fully emerged.

Tank Mixes:

The following mixes are for *Valtera (WDG* and *EZ)* only.

Herbicides:

- ***Soybean, wheat or bare ground:***
  - Glyphosate (IPA or K salts) 180 to 486 g ae per acre (spring or fall).
    Note: DO NOT mix when applying prior to soybean with *Dual II Magnum* or *Frontier Max* herbicides or injury could occur.
- ***Field pea and chickpea and lentils:***
  - Glyphosate (IPA or K salts) 180 to 360 g ae per acre.
- ***Havest-aid Applications only:***
  - Glyphosate (IPA or K salts) at preharvest rates.

Fertilizers: None registered.

Fungicides: None registered.

Insecticides: None registered.

Note: The above mixes are those listed on the *Valtera* (*WDG* and *EZ*) labels only.

Apply mixes according to the most restrictive use limitations for either product.

According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Rain or irrigation shortly after application is required for activation. If rainfall does not occur, irrigation with at least 5 mm of water is recommended before ground crack occurs.
- **Restricted Entry Interval:** DO NOT re-enter treated fields for 12 hours.
- **Grazing Restrictions:**
  - ***Alfalfa:*** DO NOT harvest or graze within 25 days of application.
  - ***Field corn:*** DO NOT permit livestock to graze fields within 93 days after application. DO NOT harvest greenfeed or silage within 93 days after application.
  - ***Soybeans:*** DO NOT harvest as greenfeed or permit livestock to graze fields within 21 days after application. DO NOT cut hay/fodder wthin 50 days after application.
  - ***Wheat:*** DO NOT harvest as greenfeed or permit livestock to graze fields within 26 days after application. DO NOT cut hay/fodder within 52 days after application.
  - ***All other crops:*** DO NOT graze, cut or feed treated crops to livestock.
- **Pre-harvest Interval:**
  - ***Desiccation:*** Leave 5 days between application and harvest. Leave 7 days to harvest if mixing with glyphosate.
- **Re-cropping Interval:**
  - ***Valtera Chateau:***

WDG Rate (g per acre)	EZ Rate (mL per acre)	Crops	Re-cropping Interval
42.5 to 56.7 (for harvest aid uses)	45 to 60 (for harvest aid uses)	Winter wheat	7 days
56.7	60	Soybean, field corn, chickpea, field pea	Immediately
		Sunflowers, durum	30 days
		Spring wheat, lentils (small red and large green varieties)	7 days
		Winter wheat	4 months
		Barley	3 months
		Sorghum, dry common beans**, and canola	9 months
		Alfalfa	11 months
		All other crops not listed*	12 months*

WDG Rate (g per acre)	EZ Rate (mL per acre)	Crops	Re-cropping Interval
85	90	Soybean, field corn, chickpea, field pea	Immediately
		Sunflowers	2 months
		Spring wheat	7 days
		Winter wheat	4 months
		Barley	3 months
		Lentils (small red and large green varieties)	6 months
		Sorghum, dry common beans**	9 months
		Alfalfa, and canola	11 months
		All other crops not listed**	12 months*

*** Also requires that a successful bioassay be completed following the given recropping interval.**
**** Note: Not all varieties of dry beans have been tested for recrop tolerance. Test new varieties of dry beans on a small area before attempting large acreages.**

- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store in a cool, dry place. DO NOT freeze.
- **Buffer Zones:**

Crops	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Potato, Dry bean desiccation	2	1	5
Chickpea, field pea, soybean, Spring wheat	3	1	10
Bare Ground uses	5	2	25

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance is measured from the downwind edge of the boom to sensitive areas.

Sprayer Cleaning:

Refer to 'Method A' in the general section on sprayer cleaning in the introduction. See product label for further information.

Hazard Rating:

Valtera WDG:

Caution – Poison

Chateau EZ, Valtera EZ:

No specific hazard statement.

Equipment	Maximum amount handled per day of	
	Valtera WDG or *Payload* (kg per day)	*Valtera EZ* (L per day)
Groundboom - open cab	61	63
Groundboom - closed cab (with activated carbon filter)		114
Right-of-way - sprayer	7.0	9.0
Mechanically - pressurized handgun	1.2	2.5
Backpack/manually - pressurized handwand	0.315	0.8

Refer to the Introduction for an explanation of the symbols.

Vanquish

Herbicide Group 4 - dicamba

Company:
Syngenta Canada Inc. (PCP#26980)

Formulation:
Dicamba, present as the diglycolamine salt.
- Container size – 2 x 10 L

Crops and Staging:
Non-cropland areas such as roadsides, hydro, pipeline and railway rights-of-way, airports, military bases, wasteland and turf.

Weeds Rates and Staging:
Weeds Controlled:

***Vanquish* at 507 mL per acre controls the top growth of:**
- Absinthe
- Canada thistle
- Perennial sow-thistle
- Leafy spurge
- Povertyweed
- Scentless chamomile

***Vanquish* at 931 mL per acre controls:**
- Perennial sow-thistle
- Common ragweed
- English daisy
- Goldenrod
- Tansy ragwort
- Canada thistle
- Field bindweed
- Top growth of curled dock
- False ragweed
- Giant ragweed

***Vanquish* at 1.86 L per acre controls:**
- Diffuse knapweed
- Goat's beard
- Ground cherry
- Pasture sage
- Povertyweed
- Sheep sorrel
- Thyme-leafed spurge

***Vanquish* at 3.72 L per acre controls:**
- Baby's breath
- Fringed sagebrush
- And top growth control of:
- Bracken fern
- Perennial cinquefoil
- Russian knapweed

Broadleaf Weed Control:
Vanquish herbicide can be used alone or in tank-mixes with 2,4-D amine or 2,4-D ester in 40 to 80 L per acre water when weeds are actively growing. For poison ivy control use 226 L per acre water.
- Poison ivy - 688 mL per acre *Vanquish* plus 890 mL per acre 2,4-D amine (500g/L)
- Wild carrot - 850 mL per acre *Vanquish*

Brush control:
Apply *Vanquish* tankmixes in spring or early summer to coniferous and deciduous brush species (after the leaves have fully expanded).
For best results and ease of application, cut brush or trees over 2m in height and treat regrowth when it develops.

Stem Foliage:
- Apply to foliage and stems to the point of runoff. Complete coverage is essential for effective control.
- Use of a tank-mix with 2,4-D ester herbicide may improve control of balsam poplar as well as other species when they are under drought stress, especially under periods of hot, dry weather.

***Vanquish* at 2.1 L per 1000 L water plus 4.0 L 2,4-D amine (500g/L formulation) or 3.3 L of 2,4-D ester (600g/L formulation):**
- Alder
- Aspen poplar
- Cherry
- Wild rose
- Western snowberry
- Wolf willow

***Vanquish* at 4.0 L per 1000 L water plus 8.0 L per 1000 L water of 2,4-D amine (500g/L formulation) or 6.63 L per 1000 L water of 2,4-D ester (600g/L formulation)**
- Balsam poplar
- Basswood
- Birch
- Elm
- Hickory
- Vine maple
- Black cottonwood
- Bur oak
- Red Oak
- Tamarack
- Pine
- White Cedar
- Spruce
- Balsam Fir

Broadcast Ground Treatment:
Apply in sufficient diluent to wet all foliage.
- Water volume of 89 to 134 L per acre.

1.7 L per acre *Vanquish* plus 3.24 L per acre of 2,4-D amine (500g/L formulation) or 2.67 L per acre of 2,4-D ester (600g/L formulation.
- White (paper) birch
- Willow
- Aspen poplar

Roadside Vegetation Control: *Vanquish* herbicide can be used in a tank-mix with glyphosate for annual vegetation control on 1 to 2 meter wide roadside shoulders. *Vanquish* herbicide tank-mixes with glyphosate and 2,4-D amine herbicide offer a broader spectrum of total control of roadside vegetation.

Directions:
Apply 0.505 to 1.01 L per acre in tank-mix with 303 mL to 405 mL pre acre of glyphosate (360 g ae/L formulation).
Apply 121 mL per acre in a tank-mix with 486 mL per acre 2,4-D amine (500g/L formulation) and 303 to 405 mL per acre glyphosate (360 g ae/L formulation). Refer to the glyphosate label for the appropriate rate for specific weed control and for additional precautions and application instructions.

Application Information:
Water Volume:
- **Ground:** Please see rates above.
- **Aerial:** no less than 34 L per acre water.

How it Works:
Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
dicamba	POST (foliar)	Synthetic auxin	Throughout the plant (Symplast)	Broadleaf only	4

Effects of Growing Conditions:
Apply in the morning or late in the evening when air temperature is between 10 and 25°C for best results.

Tank Mixes:
Herbicides: as noted above
Fungicides: None registered.
Insecticides: None registered.
Fertilizers: None registered.

Restrictions:
- **Rainfall:** Avoid applying this product when heavy rain is forecasted.
- **Grazing:** DO NOT permit lactating dairy animals to graze fields within 7 days after application. DO NOT harvest forage or cut hay within 30 days after application. Withdraw meat animals from treated fields at least 3 days before slaughter.
- **Aerial Application:** May be applied by aircraft for labelled uses: Aspen poplar & White (paper) birch 1.7 L per acre *Vanquish* plus 3.23 L per acre 2,4-D amine (500g/L formulation) or 2.67 L per acre 2,4-D ester (600g/L formulation)
- **Buffer Zones for uses in Non-Cropland and Turf using ASAE Coarse Applications:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground*	1	1	20
Fixed wing aircraft	45	30	800
Helicopter	30	20	525

See the Key to Product Pages for an explanation of the different habitats.
*** Buffer zones can be reduced by 70% when using shrouds and by 30% when using cones mounted less than 12 inches from the crop canopy.**
† Distance is measured from the downwind edge of the boom to sensitive areas.

Sprayer Cleaning:
See the label for product specific cleaning details.
Hazard Rating:
Caution – Poison
Refer to the Introduction for an explanation of the symbols.

Varro

Herbicide Group 2 - thiencarbazone

Company:
Bayer (PCP#29070)

Formulation:
10 g/L thiencarbazone-methyl formulated as a suspension concentrate.
- Container size - 2 x 8 L

Crops and Staging:
Spring wheat (including durum):
- 1 to 6 main stem leaf stage to a maximum of 3 tillers, and before the first node can be felt in the stem. Under drought conditions, do not apply if there is >35 days between seeding and spraying, as drought hastens crop development.

Winter wheat:
- Spring or fall application from 1 to 6 main stem leaf stage and before the first node can be felt in the stem. DO NOT apply after the presence of the first node as crop injury may occur.

Weeds and Staging:
Grass weeds controlled from 1 to 6 main stem leaves and prior to the emergence of the 3rd tiller unless otherwise indicated:
- Barnyard grass
- Foxtail (green and yellow†)
- Japanese brome† **
- Persian darnel†
- Volunteer canaryseed *
- Wild oats

Broadleaf weeds controlled at the 1 to 6 leaf stage unless otherwise indicated:

*** Up to the emergence of the 2nd tiller.**
**** Prior to tillering.**
† Suppression only.

Rates:
0.2 L per acre
Add ammonium sulphate on spring wheat only for improved weed control. Add 200 grams active ammonium sulphate per acre (202 grams per acre of 99 percent dry; 0.5 L per acre of 40 percent liquid or 0.4 L per acre of 49 percent solution) to the tank before adding other components.
DO NOT add ammonium sulphate to applications on durum wheat.
For improved weed control in durum wheat add either *Agral 90* or *AgSurf* at 0.25 L per 100 L.

Application Information:
- **Water Volume:**
  - ***Ground:*** 20 to 40 L per acre. Use higher water volumes for dense canopies.
  - ***Aerial:*** Minimum 11.3 L per acre.
- **Nozzles and Pressure:**
  - ***Ground:*** For conventional flat fan nozzles use a pressure of 30 to 50 PSI (207 to 345 kPa). Angle nozzles forward 45 degrees for better coverage. Low drift nozzles may require higher pressures for proper performance.
  - ***Aerial:*** Minimum 43 PSI (300 kPa).

  For either ground or aerial, use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE medium*** droplets.

How it Works:
Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
thiencarbazone	POST (foliar)	ALS Amino Acid Synthesis Inhibitor	Toward areas of growth (Symplast)	Broadleaf & grass	2

Effects of Growing Conditions:
DO NOT apply to crops or weeds that are stressed (frost, low fertility, drought or flooding, disease or insect damage) as crop injury or reduced weed control may result. Under drought conditions DO NOT apply to spring or durum wheat if the time from seeding to spraying exceeds 35 days or if temperatures will be 3°C or lower within 3 days of application (before or after).

Tank Mixes:

Add ammonium sulphate to the tank first then *Varro* then the tank mix partner.
Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides:

- ***Wheat (including spring, durum, winter):***
  - *Infinity*
  - *Thumper*
- ***Spring Wheat (including durum):***
  - 2,4-D ester (129 g ae per acre)
  - *Buctril M*
  - *Infinty FX*
  - MCPA Ester (0.23 L per acre – 600 grams per L form)
- ***Spring Wheat (NOT including durum):***
  - *Curtail M* (0.61 L per acre)*
  - *Frontline XL*
  - *Refine SG*
  - *Refine SG* + 2,4-D ester (rates above)
  - *Refine SG* + MCPA Ester (rates above)

Fungicides: None registered.
Insecticides: None registered.
Fertilizers: None registered.
Note: The above mixes are those listed on the *Varro* label only.

According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product..

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 1 hour may reduce control.
- **Restricted Entry Interval:** DO NOT enter treated field for 12 hours.
- **Grazing Restrictions:** Must not be grazed within 7 days or cut for livestock feed within 30 days of treatment.
- **Pre-harvest Interval:** DO NOT harvest grain or straw within 60 days of application for spring and durum wheat or within 72 days of application to winter wheat.
- **Re-cropping Interval:** Alfalfa, barley, canaryseed, canola, chickpea, dry bean, field corn, flax, lentil, mustard, oats, pea, soybean, sunflower, timothy, and wheat (durum, spring) may be seeded the year following application.
- **Aerial Application:** May be applied by air.
- **Storage:** Store in a cool, dry place. Keep from freezing. Shake well before using.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground*	1	0	1
Fixed wing aircraft	1	0	30
Helicopter	1	0	30

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Refer to 'Method A' in the general section on sprayer cleaning in the introduction. If mixing with other pesticides, combine this method with the method indicated for the tank mix partner.

Hazard Rating:

Warning – Eye and Skin Irritant

Refer to the Introduction for an explanation of the symbols.

Varro FX

Herbicide Group
2 - thiencarbazone
4 - fluroxypyr

Company:
Bayer

Formulation:
***Varro FX* (PCP#34848):** 5 g/L thiencarbazone-methyl + 118 g/L fluroxypyr formulated as an emulsifiable concentrate.

Crops and Staging:
Spring Wheat:
1 to 6 leaves on main stem, plus 3 tillers but PRIOR to jointing (presence of first node)
Winter Wheat:
Apply either in the fall or the spring when the majority of the plants have 1 leaf to full tillering, but PRIOR to jointing (presence of the first node)

Weeds and Staging:
Weeds Controlled:
- Wild oats
- Green foxtail
- Barnyard grass
- Yellow foxtail*
- Persian darnel*
- Volunteer canary seed
- Japanese brome**
- Cleavers, 1 to 9 whorls
- Common chickweed, 1-4 leaf
- Hemp nettle
- Kochia, 2-8 leaf
- Lamb's quarters
- Pale smartweed
- Redroot pigweed
- Round-leaved mallow,*
- Russian thistle*, up to 10 cm tall
- Stinkweed
- Stork's-bill*, 1-8 leaf
- Volunteer canola***
- Wild buckwheat
- Wild mustard
- Volunteer flax****, up to 12 cm

* Suppression only
** Control of spring germinated Japanese brome. Suppression of overwintered Japanese brome. Best results are obtained after a pre-seed or burndown application with glyphosate herbicide.
*** Non ALS tolerant.
**** Including biotypes resistant to Group 2 herbicides that inhibit the ALS enzyme.

Rate:
0.4 L per acre
Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the Introduction.

Application Information:
- **Water Volume:**
  - ***Ground:*** Minimum 18.9 L per acre
  - ***Aerial:*** Minimum 11.3 L per acre
- **Nozzles and Pressure:**
  - ***Ground:*** For conventional flat fan nozzles use a pressure of 30 to 50 PSI (207 to 345 kPa). Angle nozzles forward 45 degrees for better coverage. Low drift nozzles may require higher pressures for proper performance.
  - ***Aerial:*** Minimum 43 PSI (300 kPa). For either ground or aerial, use a combination of nozzles and pressure designed to deliver thorough, even coverage with ASABE medium droplets.

How it Works:
Refer to How Do Herbicides Work in the Weed Control Introduction section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
Thiencarbazone	POST (foliar)	ALS Amino Acid Synthesis Inhibitor	Towards regions of growth (Symplast)	Broadleaf & Grass	2
Fluroxypyr	POST (foliar)	Synthetic auxin	Moves through the plant (symplast)	Broadleaf only	4

Effects of Growing Conditions:
DO NOT apply to crops or weeds that are stressed (frost, low fertility, drought or flooding, disease or insect damage) as crop injury or reduced weed control may result. Under drought conditions DO NOT apply to spring or durum wheat if the time from seeding to spraying exceeds 35 days or if temperatures will be 3°C or lower within 3 days of application (before or after).

Tank Mixes:

Herbicides:

- ***In spring wheat:***
  - *Curtail M** at 0.6 to 0.8 L per acre.
- ***In spring and winter wheat:***
  - *Infinity* at 0.34 L per acre.
  - *Thumper* at 0.4 L per acre.
  - *Buctril M* at 0.4L per acre.
  - MCPA ester* at 142 to 227 grams a.e. per acre.
  - *2,4-D ester** at 136 to 227 grams a.e. per acre.
  - *Barricade SG* at 12 grams per acre (plus one of the labelled adjuvants).
  - *Barricade SG* at 12 grams per acre + MCPA Ester 500 or MCPA Ester 600 at 0.23 L per acre or 0.19 L per acre.
  - *Refine SG* at 12 grams per acre (plus one of the labelled adjuvants.)
  - *Refine SG* at 12 grams per acre + MCPA Ester at 113 to 227 grams a.e. per acre.
  - *Refine SG* at 12 grams per acre + 2,4-D Ester at 160 to 214 grams a.e. per acre.

***Refer to tank mix partner for weed/rate chart**

Note: the above Tank Mixes are those listed on the *Varro FX* label only.

According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Restrictions:

- **Rainfall:** 1 hour.
- **Re-entry:** DO NOT re-enter treated fields for 12 hours.
- **Pre-harvest Interval:** DO NOT harvest spring wheat for grain or straw within 60 days of application. DO NOT harvest winter wheat for grain or straw within 72 days of application.
- **Grazing:** : DO NOT graze the treated crops or cut for forage within 7 days or cut for hay within 30 days of application.
- **Re-cropping:** the following crops can be planted 10 months after application – alfalfa, barley, canola, corn, dry beans, flax, lentils, mustard, oats, field peas, soybeans, sunflowers, rye, timothy, triticale (spring and winter), wheat (spring, winter, durum)
- **Aerial Application:** May be applied by aircraft.
- **Storage:** : Store in a cool, dry place. DO NOT store at temperatures below -20˚C. If frozen, allow to thaw and agitate thoroughly prior to use. Shake well before using. Store this product away from food or feed.
- **Buffer Zones:**

Application method	Crop		Buffer Zones (metres†) Required for the Protection of:				
			Aquatic Habitats of Depths		Estuarine/Marine Habitats of Depths:		Terrestrial habitat
			Less than 1 m	Greater than 1	Less than 1 m	Greater than 1	
Field sprayer	Spring and winter wheat		1	1	1	1	3
Aerial	Spring and winter wheat	Fixed wing	1	1	1	1	55
		Rotary wing	1	1	1	1	55

See the Key to Product Pages in the introduction for an explanation of the different habitats. The spray buffer zones for this product can be modified based on weather conditions and spray equipment configuration by accessing the Spray Buffer Zone Calculator on the Pesticides portion of the Canada.ca website.

† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Refer to 'Method A' in the general section on sprayer cleaning in the Introduction. If mixing with other pesticides, combine this method with the method indicated for the tank mix partner.

Hazard Rating:

Skin, eye, and respiratory irritant.
Refer to the Introduction for an explanation of the symbols.

Velocity m3

Herbicide Group
2 - thiencarbazone
6 - bromoxynil
27 - pyrasulfotole

Company:
Bayer (PCP#29584)

Formulation:
5 g/L thiencarbazone-methyl, 31.3 g/L pyrasulfotole and 175 g/L bromoxynil formulated as a suspension concentrate
- Container sizes - 8.1 L, 129.6 L

Crops and Staging:
Spring wheat (including durum):
- 1 to 6 main stem leaf stage to a maximum of 3 tillers, and before the first node can be felt in the stem. Under drought conditions, do not apply if there is >35 days between seeding and spraying, as drought hastens crop development.

Winter wheat:
- Spring or fall from 1 to 6 leaf stage and before the first node can be felt in the stem. DO NOT apply after the first node is detectable in the stem as crop injury may occur.

Weeds and Staging:
Grass weeds controlled from 1 to 6 main stem leaves and prior to the emergence of the 3rd tiller:
- Barnyard grass
- Foxtail (green and yellow†)
- Canaryseed
- Persian darnel†
- Wild oats
- Japanese brome†

Broadleaf weeds controlled at the 1 to 6 leaf stage unless otherwise indicated:
- Canada fleabane (seedlings 1 to 10 cm)*
- Canada thistle (up to 30 cm)†
- Common chickweed
- Cleavers (1 to 3 whorls)
- Cleavers (4 to 6 whorls)*
- Dandelion (up to 25 cm diameter)†
- Flixweed (up to 10 cm)
- Hemp-nettle
- Kochia (up to 10 cm)
- Lamb's-quarters
- Narrow-leaved hawk's-beard (up to 10 cm and prior to bolting)
- Pale smartweed
- Pigweed, redroot
- Ragweed (common, giant†*)
- Round-leaved mallow
- Russian thistle (up to 10 cm)
- Shepherd's-purse
- Sow-thistle (annual, perennial†)
- Spreading atriplex (1 to 10 leaf)†*
- Stinkweed
- Stork's-bill (1 to 8 leaf)**
- Volunteer canola (all varieties)
- Wild buckwheat
- Wild mustard

† Suppression only.
*** Add ammonium sulphate as per the "Rates:" section below.**
**** Only when mixed with 2,4-D ester + ammonium sulphate (see Tank Mixes).**

Rates:
0.405 L per acre

Add ammonium sulphate on spring wheat only for improved weed control or when tank mixing with 2,4-D or MCPA. Add 200 grams active ammonium sulphate (202 grams per acre of 99 percent dry; 0.5 L per acre of 40 percent liquid or 0.4 L per acre of 49 percent liquid). If using an ammonium sulphate product with a different concentration, adjust the rate accordingly.

DO NOT add ammonium sulphate to applications on durum wheat.

DO NOT apply *Velocity m3* or other products containing thiencarbazone, pyrasulfotole or bromoxynil more than once in the same year.

Application Information:
- **Water Volume:**
  - ***Ground:*** 20 to 40 L per acre. Use higher water volumes for dense canopies.
  - ***Aerial:*** Minimum 11.4 L per acre.
- **Nozzles and Pressure:**
  - ***Ground:*** For conventional flat fan nozzles use a pressure of 30 to 50 PSI (207 to 345 kPa). Angle nozzles forward 45 degrees for better coverage. Low drift nozzles may require higher pressures for proper performance.
  - ***Aerial:*** Minimum 43 PSI (300 kPa).

  For either ground or aerial, use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE medium*** droplets.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
thiencarbazone	POST (foliar)	ALS Amino Acid Synthesis Inhibitor	Toward areas of growth (Symplast)	Broadleaf & grass	2
bromoxynil	POST (foliar)	PSII Inhibitor/ Membrane disruptor	Little (apoplast)	Broadleaf only	6
pyrasulfotole	POST (foliar)	HPPD Pigment Inhibitor	Some – both foliar & root (Apoplast) – Somewhat systemic (has soil residues)	Broadleaf only	27

Effects of Growing Conditions:

DO NOT apply to crops or weeds that are stressed (frost, low fertility, drought or flooding, disease or insect damage) as crop injury or reduced weed control may result.

DO NOT apply to spring or durum wheat under conditions where the time from seeding to spraying exceeds 35 days or if temperatures will be 3°C or lower within 3 days of application (before or after).

Tank Mixes:

Herbicides:

- 2,4-D ester (113 g ae per acre) plus ammonium sulphate* (see Rates).
  *** add ammonium sulphate on spring wheat (NOT durum) only.**

Fungicides: None registered.
Insecticides: None registered.
Note: The above mixes are those listed on the *Velocity m3* label only.
According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 1 hour may reduce control.
- **Restricted Entry Interval:** DO NOT enter treated field for 24 hours.
- **Pre-harvest Interval:** DO NOT harvest grain or straw within 60 days of application to spring and durum wheat or within 72 days of application to winter wheat.
- **Grazing Restrictions:** Must not be cut for livestock feed within 30 days or grazed by livestock within 25 days of treating the crop.
- **Re-cropping Interval:** Alfalfa, barley, canaryseed, canola, field corn (Manitoba only), flax, soybean (Manitoba only), tame oats, and wheat (durum, spring) may be seeded the year following application. Field pea may be grown the following year in all black, grey-wooded and dark brown soil zones. DO NOT plant field pea the season following *Velocity m3* use in the brown soil zone where soil pH is above 7.5 and precipitation was less than 125 mm from June 1st until September 1st of the year of application.
- **Aerial Application:** May be applied by air.
- **Storage:** Store in a cool, dry place. Keep from freezing. This product is combustible. DO NOT store near heat or open flame.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground*	1	1	5
Fixed wing airplane	10	1	375
Helicopter	10	1	225

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:
Refer to 'Method A' in the general sprayer cleaning section in the introduction.

Hazard Rating:
Warning – Poison

Danger – Corrosive to Eyes

Skin Irritant, Potential Skin Sensitizer

Refer to the Introduction for an explanation of the symbols.

Velpar DF CU

Herbicide Group 5 - hexazinone

Company:
Tessenderlo Kerley Inc. (PCP#25225)

Formulation:
75% hexazinone formulated as a water dispersible granule.
- Container size - 2 kg

Crops and Staging:
Established alfalfa for forage and seed (established 18 months or longer). Apply in late fall prior to freeze-up when alfalfa is dormant or in early spring before alfalfa growth resumes. If burning or irrigation is to be carried out, do not apply until these operations have been completed.

Crop injury may occur in fields where alfalfa root growth has been restricted by hard pans or other physical barriers to root growth.

Weeds, Rates and Staging:
Application stage is dictated by the crop dormancy listed above.

Apply a minimum of 0.272 kg per acre to control:
- Dandelion
- Sow-thistle
- Quackgrass

Apply 0.544 kg per acre to control:
- *The weeds above plus:*
  - Narrow-leaved hawk's-beard
  - Scentless chamomile

Use the lower rate on medium-textured soils with low organic matter.

DO NOT apply *Velpar DF CU* to:
- soil that is frozen
- Soil with less than 1 percent organic matter content
- Soil that is gravely/rocky, sandy or has exposed subsoil

Application Information:
- **Water Volume:** 81 L per acre.
- **Nozzles and Pressure:** 30 to 40 psi (200 to 275 kPa) when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE coarse*** droplets.

How it Works:
Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
hexazinone	PRE (surface) soil active	PSII Inhibitor/ Membrane disruptor	Upward soil applied (Apoplast)	Broadleaf & grass	5

Effects of Growing Conditions:
Adequate soil moisture is required for activation of the product.

Tank Mixes:
None registered.

Restrictions:

- **Rainfall:** Rainfall is beneficial for activation of the product.
- **Restricted Entry Interval:** DO NOT re-enter treated fields for 48 hours.
- **Grazing Restrictions:** Leave 30 days between application and grazing harvesting for feed (hay or greenfeed).
- **Re-cropping Interval:** Leave 2 years of between treating alfalfa and the seeding of a crop. A field bioassay is required after 2 years to determine which crops are safe to grow.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** May be frozen.
- **Buffer Zones:**
  Buffers are not required for hand-held and backpack applications.

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground*	1	1	5

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

No specific cleaning procedures are indicated on the label. Based on products with similar chemistry, 'Method B' found in the general sprayer cleaning section in the introduction or a commercial spray sprayer cleaning product, may provide adequate cleaning. Contact the manufacturer for more information.

Hazard Rating:

Danger – Corrosive to Eyes

Caution – Poison

Caution – Skin Irritant

Warning – Contains the Allergen Milk

Refer to the Introduction for an explanation of the symbols.

Voraxor

Herbicide Group 14 - trifludimoxazin & safluenacil

Company:
BASF Canada

Formulation:
The *Voraxor* package contains the following components:
***Voraxor* (PCP#33968):** 125 g/L trifludimoxazin plus 250 g/L saflufenacil formulated as a suspension concentrate.
- Container size - 1.56 L

***Merge* (PCP#24702):** surfactant blend/solvent.
- Container size - 2 x 8.1 L

Crops and Staging:
Always add *Merge* at 0.2 to 0.4 L per acre.

Crop	Staging	Rate (mL per acre)
Lentils* , canaryseed, oats, fall rye and triticale	Pre-seed or pre-emergent	19.5
Field corn and soybeans	Pre-seed or pre-emergent	19.5 to 40.5
Wheat (durum, spring and winter), barley, peas (dried field), chickpeas and faba beans	Pre-seed or pre-emergent	19.5 to 58
Chemfallow	Apply to actively growing weeds less than 15 cm in height	19.5 to 29

*** Lentils are more susceptible to injury on coarse textured (sandy or gravely) and low organic matter soils. Lentils will typically grow out of injury symptoms, and yield will not be impacted at recommended rates under normal growing conditions.**

Weeds, Rates and Staging:
Apply at 19.5 to 29 mL per acre provides rapid burndown control of broadleaf weeds listed below (up to 8-leaf except where indicated).
Weeds controlled:
- Canada fleabane
- Cleavers (up to 4-whorls)*
- Hemp nettle (4 leaf)
- Kochia (up to 15 cm)*
- Lamb's-quarters*
- Narrow-leaved hawk's-beard (up to 8 cm)
- Redroot pigweed*
- Round-leaved mallow
- Russian thistle (up to 15 cm)
- Shepherd's-purse
- Stinkweed*
- Volunteer canola (all varieties)*
- Wild buckwheat*
- Wild mustard*

*** *Voraxor* applied at a rate of 41.5 to 58 mL per acre will suppress of secondary flushes.**

Application Information:
- **Water Volume:**
  - ***Ground:*** 20 to 40 L per acre. Higher water volumes require for dense weed stands. Weed control improves with the amount of coverage.
- **Nozzles and Pressure:** Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE medium*** droplets by ground. Low drift nozzles may require higher pressures for proper performance. DO NOT apply in periods of dead calm.

How it Works:
Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
saflufenacil	POST (foliar) with slight soil activity	PPO Inhibitor/ Membrane disrupter	Little movement due to rapid cell leakage (Symplast)	Non-selective broadleaf	14
trifludimoxazin	PRE (soil active) and POST (foliar)	PPO Inhibitor/ Membrane disrupter	Little movement due to rapid cell leakage (Symplast)	Selective broadleaf and grasses	14

Effects of Growing Conditions:
Warm, moist growing conditions promote active weed growth. Weeds hardened off by environmental stress such as cold weather, drought or excessive heat may not be adequately controlled.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.
Note: *crop injury may occur in lentil when saflufenacil (see* Heat*) is used in conjunction with certain soil applied/soil active herbicides. Consult with the manufacturer for more guidance.*

Herbicides:

- ***Prior to emergence of all registered crops:***
  - Glyphosate
- ***Prior to the emergence of corn, lentils, peas, chickpeas, faba beans and soybeans:***
  - *Zidua**
  - *Zidua** plus glyphosate

  *** DO NOT apply *Voraxor* or *Zidua SC* to lentils at rates higher than 19.5 or 49 mL per acre, respectively, or crop injury may occur. Crop seeds must be planted 2.5 cm deep.**

Fungicides: None registered.
Insecticides: None registered.
Fertilizers: None registered.
Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Rainfall shortly after product application can result in slight injury to the crop.
- **Restricted Entry Interval:** DO NOT re-enter treated fields for 12 hours.
- **Pre-harvest Interval:** None.
- **Grazing Restrictions:** Field corn forage and silage, soybeans, field peas and lentils for feed or grazing - 60 days. Wheat and barley forage and hay for feed or grazing - 30 days.
- **Re-cropping Interval:** Following a spring application plant registered crops only. Plant back crops in case of crop failure** - barley, dry field peas, lentils, field corn, soybean, wheat (spring, winter, durum), or when applied after August 1.
  After 3 months after application - winter wheat.
  **** Rate restrictions above apply. A second application cannot be made in the rescue crop.**
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Prevent from freezing. If the product freezes, allow to thaw at room temperature for 24 hours and agitate well prior to use. Store in original container in a cool, secure and well-ventilated area separately from fertilizer, feed or food.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground*	2	1	5

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Refer to 'Method B' in the general sprayer cleaning section in the introduction. Let solution stand for an extended period for better results. See the label for product specific cleaning details. Refer to the tank mix partner's product label for any additional cleaning instructions.

Hazard Rating:

Caution – Possible Skin Irritant

Caution – Eye Irritant

Refer to the Introduction for an explanation of the symbols.

Voraxor Complete

This product is a prepackaged tank mix of Voraxor and Zidua SC. Information listed is restricted to Crops, Weeds, Rates and Tank mixes. For other detailed restrictions and other general information on the component products see the product pages listed above.

Herbicide Group
14 – trifludimoxazin, saflufenacil
15 - pyroxasulfone

Company:
BASF Canada

Formulation:
The *Voraxor Complete* package contains three components:
***Voraxor* (PCP#33968):** 125 g/L trifludimoxazin plus 250 g/L saflufenacil formulated as a suspension concentrate
- Container size - 1.56 L

***Zidua SC* (PCP#32542):** 500 g/L pyroxasulfone formulated as a suspension concentrate.
- Container size - 3.89 L

-plus-
***Merge* (PCP#24702):** 50% Surfactant blend plus solvent 50% formulated as a surfactant
- Container size - 2 x 8.1 L

Crops and Staging:
Apply prior to seeding or after seeding but prior to crop emergence.
Add products to the spray tank in the following order: *Zidua SC, Voraxor*, glyphosate, *Merge* adjuvant. If foaming occurs, add an anti-foaming agent.

Crop	Rates (mL per acre)		
	Voraxor	*Zidua SC*	*Merge*
Field pea, field corn, soybeans, chickpeas and faba beans	19.5 to 40.5	49 to 97	200 to 400
Lentil	19.5	49	200 to 400

Field corn, lentils, chickpeas, faba beans and field peas must be planted 2.5cm deep to reduce risk of injury. Soybeans must be planted at least 4 cm deep to reduce risk of injury.

Weeds and Staging:
Broadleaf weeds controlled by *Voraxor* plus the broadleaf and grass weeds controlled by *Zidua SC* at the rates above. Foliar stages are indicated on the *Voraxor* page.

Tank Mixes:
Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.
Note: Crop injury may occur in lentil when *Voraxor Complete* is used in conjunction with certain soil applied/soil active herbicides. Consult with the manufacturer for more guidance.
Herbicides:
Pre- seed, pre-emergence: *Voraxor Complete* must be tank mixed with glyphosate 0.5 to 1 L per acre of 360 g/L equivalent. *Merge* (200 to 400 mL per acre) is **always** required.
Fungicides: None registered.
Insecticides: None registered.
Fertilizers: None registered.
Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:
- **Re-cropping:** In the event of crop failure, only labeled crops may be seeded on fields treated with Voraxor Complete (rate restrictions apply). Winter wheat may be seeded 3 months following application. Barley, canola, dry common beans, peas (dried field), flax, field corn, lentils, mustard, soybean, wheat (spring, durum) may be seeded the year following application.

See component products for more information on restrictions, application details and handling. Unless indicated differently above use the most limiting restrictions across all components for the mix.

Zidua SC

Herbicide Group 15 - pyroxasulfone

Company:
BASF Canada (PCP#32542)

Formulation:
500 g/L pyroxasulfone formulated as a suspension concentrate.
- Container size - 2 x 4.05 L

Crops, Rates and Staging:
Field corn: Pre-plant (up to 30 days), pre-emergence or post-emergent up to 4 leaf
Herbicide-tolerant soybean: Pre-plant, pre-emergence

	Rate per acre by soil texture			
	Coarse	Medium-Fine soil		Fine
		OM ≤ 3%	3% < OM < 7%	
Corn and soybean rates	101 mL/acre	134 mL/acre	169 mL/acre	200 mL/acre

Soil Textures:

Coarse	Medium	Medium-Fine	Fine
Sand Loamy sand Sandy loam	Loam Silt loam Silt	Sandy clay loam Sandy clay Silty clay loam	Silty clay Clay loam Clay

DO NOT apply *Zidua SC* on peat or muck soils and soils with 7 per cent or more organic matter content.

Field peas, faba beans and chickpeas: Pre-plant, pre-emergence at 49 to 97 mL per acre, fall application 73-97 mL per acre.
Lentils: Pre-plant, pre-emergence at 49 to 73 mL per acre, fall application 73 to 97 mL per acre.
Potatoes: After planting and hilling, before crop emergence at 49 to 97 mL per acre.
Sunflowers: Preplant or pre-emergence at 49 to 97 mL per acre.
Herbicide tolerant soybeans: Early post emergence at 73 mL per acre.

Weeds, Rates and Staging:
For corn or herbicide-tolerant soybeans for the pre-emergent control of the following weeds:
Grasses:
- Barnyard grass
- Foxtail (green, yellow)
- Ryegrass (Italian)

Broadleaf Weeds:
- Redroot pigweed
- Waterhemp

Suppression of the following weeds at the lentil, field pea or potato rates above:
- Foxtail (green, yellow)
- Lamb's quarters
- Waterhemp
- Kochia
- Redroot pigweed
- Wild oats

Maximum ONE APPLICATION per season of Zidua SC *or other products containing pyroxasulfone.*
All applications require rainfall for proper activation. (See "Effects of Growing Conditions")
Refer to the product label for complete mixing instructions for this product and its mixes. A general guide to mixing can be found in the introduction.

Application Information:
- **Water Volume:** Minimum of 40 L per acre.
- **Nozzles and Pressure:** Consult nozzle manufacturers' recommendations for spray pressure for specific nozzles.
- **Screens:** Use a 50 mesh filter screen.

How it Works:
Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
pyroxasulfone	PRE (surface) with residual soil activity	Long-chain Fatty Acid Inhibitor	Little movement (Symplast)	Broadleaf & grass	15

Effects of Growing Conditions:

Applications to crops under stress due to either inadequate or excess of moisture for normal crop development, cool and hot temperatures, sodic soils, poorly drained soils, hail damage, flooding, pesticide injury, mechanical injury or widely fluctuating temperatures may result in crop injury.

Tank Mixes:

Herbicides:

- ***Field corn:***
  - *Aatrex Liquid 480* (0.85 to 1.25 L per acre)
  - Glyphosate (Pre-seed or pre-emergence only. Glyphosate present as IPA, DA or K+ salt.)
- ***Soybean:***
  - Glyphosate (Pre-seed or pre-emergence only. Glyphosate present as IPA, DA or K+ salt.)
- ***Potatoes:***
  - Glyphosate
  - *Sencor 480 DF*
  - Glyphosate + *Sencor 480 DF*

Note: The above mixes are those listed on the *Zidua* label only.
According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Moisture is necessary to activate the active ingredient pyroxasulfone in soil for weed control.
- **Restricted Entry Interval:** DO NOT enter treated fields for 12 hours.
- **Re-cropping Interval:** In the event of crop failure, only labelled crops may be planted in fields treated with *Zidua* (rate restrictions apply). Winter wheat may be planted 4 months following application. For spring applications of *Zidua*, sunflowers, field corn, soybeans, chickpea, faba beans, lentil, field peas, spring wheat (including durum), barley, oats, flax, potato, and canola can be planted the season after application. When *Zidua* is applied in the fall, fields can be planted the following season to all labelled crops, except peanuts. When total seasonal application rates exceed 97 mL per acre, corn, soybean, chickpea, lentil, field peas, flax and potato may be planted the following season.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store in original containers in cool, dry, well-ventilated location away from food or feed.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground *	5	3	1

See the Key to Product Pages in the introduction for an explanation of the different habitats.
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Refer to 'Method B' in the general sprayer cleaning section in the introduction. Let solution stand for an extended period for better results. Flush sprayer system with water before reuse. See the label for product specific cleaning details.

Hazard Rating:

Warning – Contains the Allergen Soy
Refer to the Introduction for an explanation of the symbols.

Plant Growth Regulators

Plant growth regulators (PGRs) are chemicals that alter hormonal activity in a plant to modify plant growth and development. Depending on the compound and the plant, PGRs can modify plant growth by affecting shoot growth, branching, flowering, colour of fruit, root growth, leafing and leaf fall, as well as many other uses. PGRs are generally used to improve lodging resistance, promote fruit ripening, and to stimulate flowering in horticulture crops.

Effect of Lodging on Cereal Crops

Yield loss due to lodging depends on cultivar susceptibility to lodging, growth stage, severity of lodging, as well as wind and rain events. The greatest yield loss occurs when lodging happens within 20 days after anthesis. Prior to anthesis, lodged plants are able to right themselves by node bending. Lodging can reduce yield by interfering with photosynthesis and carbohydrate movement in the plant, and due to difficulty harvesting and more unthreshed heads. Grain quality in lodged plants can also be reduced by lower test weight and increased sprouting.

Types of Plant Growth Regulators

There are two main groups of PGRs used on cereal crops: ethylene releasing compounds and gibberellin inhibitors. These PGRs are intended to produce plants with shorter, thicker and stronger stems, and they may be another management tool to reduce lodging.

How Will a Crop Respond to PGR Application?

PGR's are intended to increase crop standability and harvestability by reducing cell elongation and stem length. Plant hormones can affect other hormones, so it is possible for PGRs to have secondary or unintended effects such as increased root growth, increased resistance to environmental stress, or delayed senescence. The effects of PGRs are not well known, there have been reports of PGRs resulting in stem elongation, positively or negatively affecting yield, and increased tiller growth which could increase or decrease yield.

Response to PGRs can be crop species and cultivar specific. Wheat is known to be most responsive to chlromequat chloride, followed by barley with an intermediate response, while oats are the least responsive. Not all cultivars show similar height and lodging responses to PGR application, but more research is needed to identify which cultivars are most likely to have a positive response.

PGRs are most useful in environments where lodging risk is high and the crop has a high yield potential. Consider PGRs in high yielding environments where moisture is abundant and high levels of nitrogen have been applied.

Application Timing

Applying PGRs as the correct time is critical. Before using a PGR, read the label to ensure that you are familiar with the correct stage of application and how to stage a crop correctly.

Manipulator 620

Plant growth regulator

Company:
Taminco US Inc. (PCP#31462); Distributed by Belchim Crop Protection Canada

Formulations:
620 g/L chlormequat chloride formulated as a solution.
- Container sizes - 2 x 10 L, 859 L

Crops, Rates and Stages:
Apply *Manipulator 620* when risk of lodging is high.
Note: as of January 1, 2025 www.keepitclean.ca indicates that the use of this product on certain crop types may have market access concerns. Please see introduction for more information AND *consult potential grain buyers before using this product*.

Crop*	Application	Rate (L per acre)	Stage
Barley, oats	Single Application	0.93	from 1 tiller to flag leaf collar visible
	Split Application	0.46	first application from 1 tiller to beginning of stem elongation, second application from 1 node to flag leaf collar visible
Spring wheat (including durum)	Single Application	0.7	from 1 tiller to flag leaf collar visible
	Split Application	0.3 – First application 0.4 – Second application	from 1 tiller to beginning of stem elongation from 1 node to flag leaf collar visible
Winter wheat	Single Application	0.7	from 1 tiller to flag leaf collar visible
	Split Application	0.4 – First Application 0.3 – Second Application	from 1 tiller to beginning of stem elongation from 1 node to flag leaf collar visible

*** May be applied to crops under-seeded to clover or grasses. DO NOT apply later than just before flag leaf emergence.**
DO NOT exceed 0.7 L of *Manipulator 620* per acre in a single year for wheat or 0.92 L per acre for oats and barley.

Application Information:
- **Water Volume:**
  - ***Ground:*** Minimum 40 L per acre.
  - ***Aerial:*** Minimum 20 L per acre.
- **Nozzles and Pressure:** Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE medium*** droplets. Boom height must be 60 cm or less above the crop.

How it Works:
Manipulator 620 affects the production of plant hormones responsible for cell elongation resulting in plants with shorter, thicker stems.

Effects of Growing Conditions:
DO NOT apply *Manipulator 620* to crops under stress from drought, excess moisture or nutrient deficiency. Best results from early morning or evening application.
Applications of *Manipulator 620* may be made under normal seasonal temperatures down to 1° Celsius. DO NOT apply during frost.

Tank Mixes:
None registered.
DO NOT use in a tank mixture with liquid nitrogen fertilizer.

Restrictions:
- **Rainfall:** Within 2 hours may reduce effectiveness. Avoid application when heavy rain is forecast.
- **Restricted Entry Interval:** DO NOT re-enter treated fields for 12 hours.
- **Grazing Restrictions:** DO NOT graze treated crops or cut for hay.
- **Pre-harvest Interval:** DO NOT apply later than just before flag leaf emergence.
- **Re-cropping Interval:** No restrictions the year after application.
- **Aerial Application:** May be applied by air.
- **Storage:** DO NOT freeze.

- **Buffer Zones:**

Application method	Crops	Buffer Zones (metres†) Required for the Protection of:
		Terrestrial habitat
Ground	All crops	1
Aerial (fixed wing)	Wheat (winter, spring and durum)	10
	Barley, oats	15
Aerial (helicopter)	Wheat (winter, spring and durum)	10
	Barley, oats	10

See page 43 for an explanation of the different habitats.
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:
Refer to the general section on sprayer cleaning.

Hazard Rating:
Danger – Poison
Refer to the introduction for an explanation of the symbols.

Moddus

Plant growth regulator

Company:
Syngenta Canada

Formulations:
***Moddus* (PCP#33930):** 11.3% trinexapac-ethyl formulated as an emulsifiable concentrate.
- Container size - 2 x 10 L

Crops and Stages:
Moddus aids in the growth and lodging management of wheat, barley and oats and the growth of perennial ryegrass grown for seed.

Crop	Application	Rate (L per acre)	Stage
Spring wheat (including durum) and	Single Application	0.34 to 0.42	BBCH 30 to 39 (pseudo stem erection to ligule of last leaf visible). Due to risk of injury to the crop, avoid overlapping and DO NOT apply to wheat that is environmentally stressed.
	Split Application	0.17 to 0.21	Make the first application at BBCH 21 to 24 (main shoot and a maximum 4 tillers). Make the second application at BBCH 37 to 39 (flag leaf just visible to ligule of last leaf visible). Due to risk of injury to the crop, avoid overlapping and DO NOT apply to wheat that is environmentally stressed.
Oats	Single application	0.34	BBCH 30 to 39 (pseudo stem erection to ligule of last leaf visible). Due to risk of injury to the crop, avoid overlapping and DO NOT apply to oats that are environmentally stressed.
	Split Application	0.17	Make the first application at BBCH 21 to 24 (main shoot and a maximum 4 tillers). Make the second application at BBCH 37 to 39 (flag leaf just visible to ligule of last leaf visible). Due to risk of injury to the crop, avoid overlapping and DO NOT apply to oats that are environmentally stressed.

Crop	Application	Rate (L per acre)	Stage
Winter wheat	Single Application	0.34 to 0.42	BBCH 30 to 39 (beginning of stem elongation to flag leaf stage). Optimal application timing is at BBCH 30 to 32 (stem elongation up to 2 nodes detectible in stem). Use the higher rate in varieties that are more prone to lodging and in fields that are intensively managed (i.e., high fertility, high seeding rate). DO NOT apply past BBCH 39 (ligule of last leaf visible).
Barley	Single Application	0.42	Optimal application timing is at BBCH 30 to 32 (stem elongation up to 2 nodes detectible in stem). DO NOT apply past BBCH 39 (ligule of last leaf visible). Due to risk of injury to barley, avoid overlapping and DO NOT apply to barley that is environmentally stressed.
	Split Application	0.21	Make the first application at BBCH 21 to 24 (main shoot and a maximum 4 tillers). Make the second application at BBCH 37 to 39 (flag leaf just visible to ligule of last leaf visible).
Perennial ryegrass (turf type only) grown for seed	Single Application	0.69 to 1.38	Before or during stem elongation stage of development (BBCH 30 to 37). **NOTE:** Although this product is effective at any time in this growth stage the BEST timing is early, BBCH 32 (second node on the main stem is detectable). DO NOT apply to perennial ryegrass that is environmentally stressed. DO NOT apply to forage type perennial ryegrass.

Note: Due to risk of injury to the crop, avoid overlapping and DO NOT apply to crops that are or could become stressed, such as by low fertility, high temperatures, drought, frost or diseased or insect-damaged.
Environmental conditions, crop management, and cultural practices that affect plant growth and vigour will influence the response of the crop to MODDUS Plant Growth Regulator applications.

Application Information:

- **Water Volume:**
  - ***Ground:*** Minimum 40 L per acre
  - ***Aerial:*** Minimum 20 L per acre (wheat, oats and barley only)
- **Nozzles and Pressure:**
  - ***Ground:*** Use a hydraulic nozzle with 80° or 110° drift reducing flat fan (e.g. those with a pre-orifice or turbulence chamber) or air induction nozzles with up to. DO NOT use flood type nozzles, controlled droplet application equipment, spray foils or hollow cone nozzles. Use a combination of volume and pressure recommended by the nozzle manufacturer to achieve no finer than ***ASAE medium*** droplets.
- **Screens:** Use 50 mesh or coarser line strainers and screens or 80 mesh with air induction nozzles.

How it Works:

Moddus Plant Growth Regulator aids in the growth and lodging management of wheat, barley and oats and the growth of perennial ryegrass grown for seed.

Effects of Growing Conditions:

NOTE: Due to risk of injury to the crop, avoid overlapping and DO NOT apply to crops that are stressed or could become stressed following application, such as by low fertility, high temperatures, drought, frost or diseased or insect-damaged. Environmental conditions, crop management, and cultural practices that affect plant growth and vigour will influence the response of the crop to *Moddus* Plant Growth Regulator applications.

Tank Mixes:

None registered.
It is important to check the physical compatibility of tank mixes containing *Moddus* using a jar test following the WAMLEGS mixing order with proportionate amounts of mix partners and water, before mixing in the spray tank.
In some cases, tank mixing a pest control product, such as *Moddus*, with another pest control product or a fertilizer can result in biological effects that could include, but are not limited to, reduced efficacy or increased host crop injury.

Restrictions:

- **Rainfall:** Within 3 hours may reduce effectiveness.
- **Restricted Entry Interval:** DO NOT re-enter treated fields for 12 hours.
- **Grazing Restrictions:** Cereals – forage and hay – 30 days; cereals – grain and straw – harvest at maturity; perennial ryegrass for seed production – 50 days.
- **Pre-harvest Interval:** None indicated. Harvest at maturity.
- **Re-cropping Interval:** Wheat, barley and oats (0 days); all other feed and food crops (30 days).
- **Aerial Application:** Wheat, oats and barley may be applied by air. DO NOT apply by air to perennial ryegrass.
- **Storage:** Keep in original container, tightly closed, during storage. Store this product away from food or feed. Store in a cool, dry, well ventilated area and out of the reach of children and animals.
- **Buffer Zones:** None given. Avoid contact with non-target plants. Avoid overspraying water bodies or sensitive habitat.

Sprayer Cleaning:

Refer to 'Method C' in the general section on sprayer cleaning.

Hazard Rating:

Warning – Eye Irritant

Refer to the introduction for an explanation of the symbols.

Plant Disease Control

Integrated Plant Disease Management

Cereal Leaf Diseases

Cereal leaf diseases affect both the yield and quality of cereals. The following management practices are recommended for effective control of leaf diseases in all cereal crops.

- **Scouting:** Scout fields prior to, during, and following flag leaf emergence to check for disease levels. Flag and upper leaves are responsible for 50 per cent or more of grain-fill.
- **Crop Rotation:** Rotate crop types [e.g. cereal (wheat)/oilseed/cereal(barley)/pulse] to reduce the build-up of disease inoculum in crop residue. If at all possible, DO NOT seed the same crop in back to back years. When a short rotation is absolutely necessary, seed in the second year a variety that is more resistant to an anticipated disease problem.
- **Resistant Varieties:** Provincial crop/seed guides provide a comprehensive listing of the performance of adapted varieties, including their resistance status to specific diseases.
- **Foliar Fungicides:** Foliar fungicides, applied at the proper time in accordance with manufacturers' Pesticide Product labels, can control cereal leaf diseases and help to attain target yields. The greatest benefit occurs when disease pressure is high or with varieties that have poor resistance.
- **Spraying Practices:** Foliar fungicides should be applied preventively, before disease is well-established in a crop and already causing crop loss. Good spray coverage with minimal drift is essential. Ideally, the best time to spray is when the wind is light, humidity is above 60 per cent and air temperature is between 10 and 25°C.

Ergot of Cereals

Ergot is a fungal disease that affects most cereals and grasses in Canada. Ergot bodies contain toxic alkaloids; they should never be consumed by humans or fed to animals. Ergot is a particularly damaging disease of rye, and has also been observed sporadically over the years on cereals and grasses in the prairie provinces. After an ergot outbreak, crop residue and soil become contaminated with a higher load of ergot bodies, placing nearby grasses and cereal crops at greater risk of infection in the following seasons. This risk increases further when cool, moist weather conditions promote ergot spore production and/or when cereals experience an extended period of flowering or an induction of floret sterility due to any of a variety of agronomic or environmental factors. Once ergot is present, little can be done to control the disease in the field, so prevention is important. Planting seed contaminated with ergot bodies can potentially spread disease to previously clean fields and there are no seed treatments registered; therefore only clean, healthy seed should be used. During the field season, nearby grasses may be mowed to remove additional hosts. Prior to harvest, fields should be scouted to determine where ergot has developed, such as headlands, and those areas should be harvested separately. Viability of ergot bodies decreases after one to two years.

Fusarium Head Blight of Cereals

Fusarium head blight (FHB) causes a reduction in yield as a result of floret sterility and the loss of light weight cereal kernels during combining. More important is the effect on grain quality and food safety due to production of mycotoxins, including deoxynivalenol (DON) and vomitoxins. In Manitoba, FHB occurs throughout all crop regions and will damage wheat crops whenever environmental conditions favour the disease. In Saskatchewan, FHB has been established in eastern regions for several years, but occurs across the province, particularly in wet years.

- **Field Management of FHB:** Weather is by far the greatest factor in development of FHB. The disease is most likely to develop when the plants are flowering, temperatures range from 15 to 30°C and high moisture is continuous for 48 to 60 hours. If conditions remain warm and moist, the pathogen can continue to sporulate and spread to other kernels or heads. Under these optimum conditions, crop management has little impact on FHB outbreaks. Production practices, which lead to reduced tillering and shortened flowering duration, could reduce the risk period of FHB infection.
- **Crop Rotation and Crop Selection:** A break of at least one year – preferably two years – is advised between cereal, grass and corn production. In fields of wheat on wheat stubble, the incidence of FHB was about one and a half times higher than in fields of wheat planted into pulse crop residue. Regardless of the rotation, producers should consider planting cereals that are less susceptible to FHB. Results from previous years show that durum and soft white wheat varieties are more susceptible than hard red spring wheat varieties. Barley is more resistant than wheat, and oat is more resistant than either wheat or barley. Refer to provincial seed guides for FHB disease ratings for each variety. Planting two or more varieties of wheat with differing flowering times or varying planting dates will help reduce the risk of infection. Susceptible crops should not be planted on infected corn stubble. Corn trash is slower to decompose than cereal trash, and acts as a source of inoculum for a much longer time period.

Late Blight of Potatoes

One of the major threats to Manitoba and Saskatchewan's potato industry is the fungal disease late blight. At present, there is no fungicide registered for use on potatoes that is capable of eradicating the fungus from infected plants. As a result, producers are forced to adopt preventive management to control this disease. One of the main components of this strategy is the application of fungicides at specified spray intervals. This interval varies with the type of fungicide used. Shortening or lengthening of this interval should be based on current weather conditions and the status of the disease in the crop.

In Manitoba, potato producers can make use of a weather-based late blight risk forecasting program. The purpose of this program is to predict when environmental conditions are most conducive to disease development and issue warnings based on those parameters.

Accurate weather monitoring and scouting techniques are very important for achieving the most effective use of fungicides. Combining precise weather forecasting with spray interval scheduling may lower input costs for the farmer and lead to a more productive, higher quality crop. These weather monitoring systems monitor key environmental variables, such as relative humidity, temperature, leaf wetness and precipitation.

The following practices are recommended for effective disease management:

- **Scouting:** To effectively schedule preventative fungicide applications and eliminate unnecessary fungicide use, local weather forecasts should be used to identify conditions conducive to disease development. Scout fields regularly to identify diseases and pests that may be developing. Low areas in rolling or hilly fields and in wind-protected areas near trees lines should be specially checked.
- **Crop Varieties:** *(There are no known commercial resistant varieties currently available in Canada)*. Where practical, the use of short season varieties may help reduce the period of use for fungicides.
- **Healthy Seed:** Obtain seed from sources with effective disease management practices. The use of certified seed is legislated in Manitoba and Saskatchewan. Grade seed carefully while cutting and discard suspicious looking tubers and seed pieces.
- **Cull Clean-up:** Avoid leaving tubers, including debris or slivers from seed cutting, in cull piles for any length of time. Follow a program of sanitation for storage facilities and equipment to eliminate sources of the disease. Dispose of cull piles in an approved manner so they DO NOT serve as a source of disease inoculum for future infections. Dispose by burying, using a cover, spreading out on the field over winter, or feeding to livestock.
- **Sanitation:** Follow a program of sanitation for storage facilities and equipment to eliminate sources of disease. Sanitation consists of cleaning and disinfecting all equipment, storage, and tools that contact potatoes from seeding through harvest and storage. Since most disinfectants are inactivated by soil and plant debris, it is essential that equipment and storage is thoroughly cleaned with a pressure washer or steam cleaner with detergent before disinfectant is applied. Treated surfaces should remain wet for at least 20 minutes for the disinfectant to destroy disease organisms.
- **Cultural Practices and Rotation:** Use proper cultural practices including a one in four-year potato crop rotation; proper hilling to reduce disease and greening in tubers; manage irrigation to avoid an excess or deficit of soil moisture; schedule irrigation throughout the day so it is not extending the natural dew period and prolonging leaf wetness; if late blight is discovered destroy hot spots of infected fields; control weed hosts (especially nightshades) and remove and destroy volunteer potatoes. Use appropriate weed control practices in rotational crops to control those weeds that may be hosts of diseases in potatoes.
- **Foliar Fungicides:** Preventative fungicide applications are most effective in controlling late blight. Follow product label guidelines for most efficient and safe use of products. Labels of newly registered products also provide information on resistance management. In this context – medium to high risk of resistance fungicides (e.g. Group 7 – boscalid and Group 11 – strobilurins) should be rotated or mixed with low risk fungicides (e.g. mancozeb (M3) and chlorothalonil (M5)).
- **Farm Visits:** The following recommendations are provided to prevent the spread of potato diseases from field to field or between farms. All people serving the potato industry should use these sanitary practices.
  1. Contact the grower for permission to enter fields and other facilities on the farm.
  2. Keep your vehicle clean and whenever possible, avoid driving your vehicle into fields or potato handling areas.
  3. Carry a boot brush and a supply of disinfectant in your vehicle at all times. Quaternary ammonia (General Storage Disinfectant) is recommended as it is also registered for bacterial ring rot disinfection.
  4. Wear coveralls or other protective outerwear that can be discarded or disinfected regularly.
  5. Clean, washable, footwear is recommended and rubber boots are preferred.
  6. Clean, wash, and disinfect your boots thoroughly on arrival at each field/farm/storage shed and before leaving.
  7. Remove dirty outerwear, including boots before entering your vehicle.
  8. Any tools to be used during the farm call (potato forks, shovels, soil probes, knives, etc.) should be cleaned and disinfected before and after use.
  9. Maintain a detailed logbook of field/farm/storage shed visits.

Canola Diseases

Sclerotinia stem rot has been one of the most prominent diseases affecting canola in Manitoba and Saskatchewan for the past 25 years. An important factor for disease development is environmental conditions. The disease is much more widespread and severe during wet years. Fungicide applications are an important element in controlling the development and spread of sclerotinia stem rot. Fungicide spray decisions are based on soil moisture, weather conditions, crop stage and density, and disease history. The Sclerotinia resting bodies (sclerotia) require moist soil conditions for up to 10 days for germination to occur and the spore-bearing structures (apothecia) to form. Usually these conditions DO NOT occur until the crop canopy closes. The spores released from the apothecia utilize the canola petals as a food source and fall into the canola canopy where they infect plants. Lesions form up and down the stem, wilting leaves and eventually killing the plant. Fungicide should be applied between the 20 to 50 per cent flower stages to protect the petals from being colonized by the spores.

Blackleg caused by *Leptosphaeria maculans* affects canola and most crucifer field and vegetable crops. After many years of low incidences, due to resistant canola varieties grown in the prairie provinces, the disease is gaining importance again. High frequency of canola in crop rotations, accompanied by changes in the pathogen populations, has led to higher incidences and severities in some fields. For an effective control, a four-year crop rotation is highly recommended.

Clubroot is a soil-borne disease caused by a microbe, *Plasmodiophora brassicae*. Clubroot affects the roots of cruciferous field crops such as canola, mustard, and camelina, as well as

cruciferous vegetables and weeds. Clubroot has become a significant problem for canola growers in some areas of Alberta and the pathogen has been detected in Saskatchewan and Manitoba. Clubroot is a regulated pest in Saskatchewan under *The Pest Control Act*. Currently there is no provincial legislation that regulates clubroot in Manitoba.

Invasion of the interior of the host roots alters hormone balance and leads to increased cell division and growth, resulting in clubroot galls. These deformed roots have a reduced ability to absorb water and nutrients leading to stunting, wilting, yellowing, premature ripening and shrivelling of seeds. The cause of these above-ground symptoms can be confirmed by digging up suspect plants to check roots for gall formation. Clubroot affects canola yield and quality to a similar degree as other diseases affecting water and nutrient uptake, and its impact depends on soil conditions and the growth stage of the crop when infection occurs. Spore germination, infection and disease development are favoured by warm soils, high soil moisture and low soil pH; however, the disease can still occur under conditions outside of the optimum parameters. Infected roots will eventually disintegrate, releasing resting spores into the soil, which may then be transported by wind, water erosion, animals/manure, shoes/clothing, vehicles/tires or earth tag on agricultural or industrial field equipment. Resting spore numbers will decline over time when non-host crops are grown, but a small proportion can survive in soil for up to 20 years. Clubroot is primarily a soil-borne disease; it does not infect seed but it may be found in soil attached to seed or other plant parts. There are currently no seed treatments or foliar fungicides registered for control of clubroot on canola. The following best practices are recommended for prevention and management of clubroot:

1. Plant susceptible crops, including resistant varieties, no more than once every four years. Although crop rotation will not prevent the introduction of clubroot to fields that are free of the pathogen, it will restrict clubroot development by limiting the increase of clubroot resting spores and preventing the increase of clubroot inoculum, as well as help alleviate the impact of other plant pathogens.
2. Scout crops regularly and carefully.
   - Identify suspicious above-ground symptoms including wilting, stunting, yellowing and premature ripening of canola or other susceptible crops.
   - Field entrances and approaches are likely to be contaminated with clubroot spores first. Therefore, symptoms will often appear there first.
   - Confirm cause of above ground symptoms by checking the roots for galls.
   - Send sample of symptomatic plants into a commercial lab for confirmation of diagnosis.
3. Practice good sanitation by restricting movement of potentially contaminated soil to non-contaminated regions.
   - For Saskatchewan and Manitoba producers, this means restricting entry into their fields of vehicles, field machinery or oil rig equipment with earth tag from infested regions unless it has been properly sanitized. Ask questions about where the equipment is from and what sanitation measures have been used before the equipment left the infested area, dealer or auction site.
   - Cleaning steps may include: removal of crop debris and soil, washing of equipment with a power washer using hot water or steam and misting with disinfectant (1 to 2 per cent bleach solution), followed by an additional rinse with water.
   - Other agricultural products, which could carry soil, should be carefully checked for excess soil and if possible be from clubroot free areas.

For more information on clubroot, visit **www.clubroot.ca**, **www.saskatchewan.ca**, or **www.gov.mb.ca/agriculture**.

Pulse Crop Diseases

There are a variety of pulse crops produced in Manitoba and Saskatchewan including field pea, field bean, lentil, chickpea and soybean. Pulse crops are adapted to different regions and will require unique agronomic and disease management practices. Some diseases will attack all pulse crops, e.g. sclerotinia (white mould) and seedling/root rots caused by *Aphanomyces euteiches, Pythium, Rhizoctonia, Fusarium* and *Botrytis* species. Some diseases may occur on more than one type of pulse crop, but the pathogen species infecting each is often specific to that crop. This is the case for the ascochyta blights, powdery mildews and anthracnose. It is important to source information on pulse disease control from grower organizations such as the Saskatchewan Pulse Growers (**www.saskpulse.com**), Manitoba Pulse & Soybean Growers (**www.manitobapulse.ca**), provincial specialists, and field diagnostic guides. Most foliar diseases are favoured by warm, moist conditions and lush crop canopies, but root rots and powdery mildew can be present in dry years as well. In general, pulse disease management will need to include the following practices:

- **Use of clean seed and seed treatments:** Plant certified seed or seed that has been tested at an accredited lab and known to have high germination and zero or acceptable levels of seed-borne disease. Seed treatments will help protect seed and seedlings from low levels of seed-borne and soil-borne pathogens.
- **Crop Rotation:** It is important to keep at least three years between the same type of pulse crop to allow for the breakdown of crop residue on which disease pathogens survive. Longer rotations may be required for *Aphanomyces euteiches*, due to long-lived resting spores in the soil. Since there are diseases that affect more than one type of pulse crop, it is still important to maintain at least two years between different pulse crops.
- **Crop Varieties with Disease Resistance:** Refer to provincial seed guides for varieties adapted to your region. When available, choose varieties with disease resistance.
- **Scouting and Foliar Fungicide Application:** Begin crop scouting at the vegetative stages for aggressive diseases such as ascochyta blight in chickpea. Scout for other foliar diseases at early bloom, e.g. ascochyta blight and anthracnose in lentil. It is too late to apply fungicide to control sclerotinia (white mould) once symptoms are observed, and/or the canopy has closed, so forecasting to determine risk is necessary.
  - Use foliar fungicides only when disease risk and potential loss are significant. Rotate fungicides or use tank mixes from different fungicide groups to prevent development of resistant pathogen populations.

Effects of Weather

DO NOT apply foliar fungicides during periods of dead calm or when winds are gusty. Avoid application immediately after a rainfall and delay spraying if rainfall is imminent. Contact fungicides are always more sensitive to wash-off by rainfall than systemic fungicides, because their mode of action relies on drying on the leaf surface. Failure of a contact fungicide to dry on the leaf surface may result in a loss in efficacy. Systemic fungicides are less sensitive than contact fungicides, but still need sufficient drying time and be fully absorbed by plants prior to rainfall. Consult the label or product manufacturers for rainfast period for individual products.

Pathogen Resistance (Insensitivity) Management

Any fungal pathogen population may contain strains naturally insensitive to a fungicide and other fungicides within the same Group. A gradual or total loss of disease control may occur over time if these fungicides are used repeatedly in the same fields. Other resistance mechanisms that are not linked to site of action but specific for individual chemicals, such as enhanced metabolism, may also exist.

To delay fungicide resistance/insensitivity:

- Where possible, rotate the use of a fungicide, (and others within the same Group) with different Groups that control the same pathogens.
- Where possible, tank mix fungicides with a high risk of developing insensitivity with other fungicides from a different Group.
- DO NOT apply more than the maximum number of applications listed on the label. Avoid consecutive sprays of a fungicide, or other fungicides in the same Group, in a season.
- Fungicide use should be based on an integrated pest management (IPM) program that includes scouting and accurate recording related to pesticide use and crop rotation. An IPM program also considers cultural, biological and other chemical control practices.
- Monitor treated fungal populations for signs of fungicide insensitivity. If disease continues to progress after treatment with a product, DO NOT increase the use rate. Discontinue use of the product and switch to another fungicide with a different target site of action.
- Contact your local regional crops specialist or certified crop advisor for any additional pesticide management and/or IPM recommendations for specific crops and disease problems in your area.

Fungicide Modes of Action

Why are fungicides needed?

- Control of disease during crop establishment.
- Increase productivity of crop (photosynthesis) and/or reduce blemishes.
  - Maintain yield and/or market value.
- Improve storage life and quality of harvested plants / grain / produce.
  - Prevent spoilage and/or production of mycotoxins.

How do fungicides work?

There are several ways to define 'mode of action':

- ***Timing:***
  - Preventative: fungicide must be present on plant surface before the pathogen and repeated applications are required to protect new growth.
  - Curative: pathogen may already be present (post-infection, pre-symptom kick-back activity).
  - Eradicant: (post-symptomatic activity).
  - Inhibitive: prevents spore germination or sporulation.
- ***Placement:***
  - Contact (AKA protectant): immobile – must come in direct contact with the pathogen.
  - Systemic (AKA penetrant): mobile – can move within plant.
- ***Movement:***
  - Intra-plant Movement: within crop via vapour phase or redistribution by rain.
  - Passive Absorption – by diffusion.
  - Apoplastic Movement: xylem-mobile; move within free space and cell walls, upward through the transpiration stream (with water).
  - Symplastic Movement: phloem-mobile (common characteristic of herbicides and insecticides but very few fungicides).
- ***Spectrum:***
  - General, Non-specific, or Broad Spectrum: fungicide affects pathogen in multiple ways.
  - Specific or Narrow Spectrum: fungicide targets a specific metabolic site in pathogen or against critical enzyme or protein. Genetic changes or naturally insensitive fungi have a greater chance to overcome the fungicidal effect (resistance/insensitivity).
- ***Composition:***
  - Inorganic Fungicides: sulfur or metal ions such as copper.
  - Organic Fungicides: contain carbon atoms.
  - Biopesticides: suppressing pest populations using naturally occurring organisms or natural products derived from plants.
- ***Biochemistry:***
  - Primary basis to classify fungicides, developed by Fungicide Resistance Action Committee (FRAC) using their general Mode of Action on fungi, and their chemistry.
    - All fungicides within a group share a common mode of action and resistance mechanism.
    - Fungicides within a group may have different chemical structures.
    - Resistance management strategies required wherever resistance is known or there is a risk of resistance development
    - See Table 1.

Table 1. Fungicide Groups Based on Biochemical Mode of Action (FRAC)

Mode of Action Target	Chemical Group & Chemical Name	Resistance Risk	Foliar Fungicide Products Registered in Saskatchewan/Manitoba	Seed Treatment Products Registered in Saskatchewan/Manitoba
A. Nucleic Acid Synthesis	4. Phenyl Amides	High	*Ridomil Gold/Bravo*, Ridomil Gold SL/Bravo*, Ridomil Gold 480EC, Ridomil Gold 480SL*	*Allegiance FL, Apron Advance*, Apron Maxx RTA*, Belmont 2.7FS, Cruiser Maxx Corn*, Cruiser Vibrance Quattro*, Dividend Extreme Fungicide*, EverGol Energy*, Helix Vibrance*, Insure Cereal FX4*, Insure Pulse*, Interest Forte*, Lixar PRO*, Maxim Quattro*, NipsIt SUITE Cereals OF Seed Protectant*, Obex*, Prosper EverGol*, Rancona Trio*, Raxil PRO*, Raxil PRO SHIELD*, Sharda METEB 11ST*, Staxan*, Telex Fungicide, Teraxxa F4*, Trilex Component B, Trilex EverGol*, Trilex EverGol SHIELD*, Vibrance Maxx RFC/RTA*, Vibrance Maxx RFC with INTEGO Solo , Vibrance Quattro*, Vibrance Total*, Vayantis IV*, VIKING Grimstad, Zeltera Pulse Co-pack*, Zeltera Pulse**
B. Cytoskeleton and motor proteins	1. Methyl Benzimidazole Carbamates	High	None	*Apron Advance*, Cruiser Maxx Corn*, Maxim Quattro*, Mertect SC, Senator PSPT, Tibet 50 SC , Vibrance Total**
	22. Benzamide	Low to Medium	*Gavel 75DF**	*INTEGO Solo Fungicide, Vibrance Maxx RFC with INTEGO Solo*, Zeltera Pulse Co-pack*, Zeltera Pulse**
C. Respiration	7. Carboxamides	Medium	*Aprovia Top*, Cabil, Cantus WDG Fungicide, Cotegra*, Delaro Complete*, Dyax*, Elatus*, Fontelis, Kenja 400SC, Lance AG*, Lance WDG Fungicide, MIRAVIS Ace*, MIRAVIS Bold, MIRAVIS Duo*, Miravis Era*,MIRAVIS Neo 300SE*, Miravis Star*, Nexicor, Priaxor*, Prosaro PRO*, Sercadis, Shaft Fungicide, Trivapro* , Velum Rise*	*Cruiser Vibrance Quattro*, Emesto Silver*, EverGol Energy*, Helix Vibrance*, Insure Cereal FX4*, Insure Pulse*, Prosper EverGol*, Rancona V RS, Rancona Trio*, Saltro, Teraxxa F4*, Trilex Component A, Trilex EverGol*, Trilex EverGol Shield*, Vayantis IV*, Vibrance 500FS, Vibrance Maxx RFC/RTA*, Vibrance Maxx RFC with INTEGO Solo*, Vibrance Quattro*, Vibrance Total*, Vibrance Ultra Potato*, Vitaflo 280*, Vitaflo Fungicide*, Vitaflo SP Fungicide*, Zeltera Pulse Co-pack*, Zeltera Pulse**
	7. Pyridinyl Ethylbenzamide		*Luna Tranquility*, Proline Gold*, Velum Prime*	
	11 Strobilurins	High	*Acapela, Azoxystrobin, Azoshy 250 SC, AZteroid FC, Cerefit A, Custodia*, Delaro 325 SC*, Delaro Complete*, Dyax*, Elatus*, Emissarius, Evito 480, Fungtion SC*, Gauntlet, Headline EC, MPOWER Spade, Lance AG*, Maxentis*, MIRAVIS Neo*, Nexicor*, Preach, Priaxor*, Pyraclostrobin, Quadris, Quadris Top*, Quasi, Quasimodo*, Quilt*, Raclos, Razor, Reason 500SC, Spaxor, Tanos*, TopNotch*, Tornado PRO*, Trivapro*, Twinline*, Veltyma*, Viatude*, VIKING Azoxystrobin, VIKING Pyraclostrobin, VIKING Vaasa, Zetigo PRM*, Zolera FX**	*AZteroid FC, Cruiser Maxx Corn*, Insure Cereal FX4*, Insure Pulse*, Maxim Quattro*, Obex*, Prosper EverGol*, Stadium*, Teraxxa F4*, Trilex Component A, Trilex EverGol*, Trilex EverGol SHIELD*, VIKING Grimstad*, Zeltera Pulse Co-pack*, Zeltera Pulse**
	21. Cyano-imidazole	Medium to High	*Ranman 400SC, Zetigo PRM**	None
	29. 2,6-Dinitroanilines	Low	*Allegro 500F, Downforce AG*	None
	45. Triazolopyrimidyl- amine	Medium to High	*Zampro**	None

Table 1. Fungicide Groups Based on Biochemical Mode of Action (FRAC) *continued*

Mode of Action Target	Chemical Group & Chemical Name	Resistance Risk	Foliar Fungicide Products Registered in Saskatchewan/Manitoba	Seed Treatment Products Registered in Saskatchewan/Manitoba
D. Amino Acid & Protein Synthesis	9. Anilino-pyrimidine	Medium	*Luna Tranquility*, Scala SC*	None
E. Signal Transduction	12. Phenylpyrroles	Low to Medium	*Miravis Star**	*Apron Advance*, Apron Maxx RTA*, Cruiser Maxx Corn*, Cruiser Maxx Potato Extreme*, Cruiser Vibrance Quattro*, Helix Vibrance*, Maxim D*, Maxim MZ PSP*, Maxim PSP, Maxim Quattro*, Stadium*, Vayantis IV*, Vibrance Maxx RFC/RTA*, Vibrance Maxx RFC with INTEGO Solo*, Vibrance Quattro*, Vibrance Total**
F. Lipid / Membrane Synthesis & Cell Wall Degradation	BM 02 (44). *Bacillus amyloliquefacien,* synonyms for *Bacillus amyloliquefaciens* are *Bacillus subtilis* and *B. subtilis* var. *amyloliquefaciens* (previous taxonomic classification)	Low	*Serenade OPTI, Serenade SOIL, Double Nickel LC, Double Nickel 55, SERIFEL*	None
	49. Oxysterol binding protein homologue inhibitors (OSBPI)	Medium to High	*Orondis Ultra**	*Lumisena*
G. Sterol Biosynthesis	3. Demethylation Inhibitors	Medium	*Advantage Prothioconazole 480 SC, Advantage Prothio +Teb 250 EC, Advantage Tebuconazole 250, Aprovia Top*, Bumper 432 EC, Caramba, Cerefit B, Cevya, Custodia*, CO-OP Pivot, Cotegra*, Delaro Complete*, Delaro 325 SC*, Duplex, Fitness, Fullback 125SC, Fungtion SC*, Gauntlet, Holdfast, Hornet 432 F, Joust, Maxentis*, MIRAVIS Ace*, MIRAVIS Duo*, Miravis Era*, MIRAVIS Neo*, Modo, Nexicor*, Orius 430 SC, Palliser, Pavise 480SC, Pivot 418EC, Princeton, Proline 480SC, Proline GOLD*, Propel, Propi Super 25 EC, Prosaro PRO*, Prosaro XTR, Quadris Top*, Quash SC, Quasimodo*, Quilt*, Rambler, RevyPro, Roxar, Shalimar, Soraduo, Soratel, Spaxor, Sphaerex, StarPro, Taj, Tebbie, TILMOR 240 EC, Tilt 250E, Toledo 250EW, TopNotch*, Tornado, Tornado PRO*, Trivapro*, Twinline*, Veltyma*, Viatude*, VIKING Propiconazole, VIKING Prothioconazole, VIKING Tebuconazole , VIKING Tromso, VIKING Vaasa, Zolera FX**	*Cruiser Maxx Potato Extreme*, Cruiser Vibrance Quattro*, Dividend Extreme Fungicide*, Emesto Silver*, EverGol Energy*, Helix Vibrance*, Insure Cereal FX4*, Interest Forte*, Lixar PRO*, Maxim D*, NipsIt SUITE Cereals, OF Seed Protectant*, Rancona V RS, Rancona Trio*, Raxil PRO*, Raxil PRO Shield*, Sharda METEB 11 ST*, Stadium*, Staxan*, Teraxxa F4*, Vibrance Quattro*, Vibrance Ultra Potato**
H. Cell Wall Biosynthesis	40. Carboxylic Acid Amides (CAA)	Low to Medium	*Forum, Orondis Ultra*, Revus, Zampro**	*Vibrance Ultra Potato**
U. Unknown	17. Tetrazolyloximes	Not known		*Vayantis IV* , Vibrance Total**
	27. Cyanoacetamide- oximes	Low to Medium	*Curzate, Tanos**	None
	33. Phosphonates	Low	*Confine Extra, Phostrol, Rampart*	*Confine Extra, Rampart*
	NC. (Not classified) and diverse	Not known	*Contans WG, OxiDate FC, Regalia Maxx*	*Heads Up Plant Protectant, StorOx*

Table 1. Fungicide Groups Based on Biochemical Mode of Action (FRAC) ***continued***

Mode of Action Target	Chemical Group & Chemical Name	Resistance Risk	Foliar Fungicide Products Registered in Saskatchewan/Manitoba	Seed Treatment Products Registered in Saskatchewan/Manitoba
M. Multi-Site Contact Activity	M1. Inorganic copper	Low	*Copper products, Corbanza, Cueva, HyCop, Parasol FL, Parasol WG*	None
	M3. Dithiocarbamates		*Rainshield, Gavel 75DF*, Mancozeb, Manzate Pro-Stick, Manzate Max, Penncozeb 75DF, Penncozeb 80WP*	*Maxim MZ PSP*, ST16, Vitaflo 280*, Vitaflo Fungicide*, Vitaflo SP Fungicide**
	M4. Phthalimides		None	*Agrox FL*
	M5. Chloronitriles		*Bravo 500, Bravo Zn, Chlorothalonil, Echo 720, Echo 90DF, Echo NP, Ridomil Gold/Bravo*, Ridomil Gold SL/Bravo**	None

***Products contain more than one active ingredient and appear in more than one group.**

Foliar Fungicide Tables*

*** All foliar fungicide tables should be used only in consultation with the product labels. In case of any conflict, instructions on the label prevail.**

Table 2. Foliar Fungicides for Disease Control in Potatoes

FUNGICIDES	Page	Black Dot	Botrytis Grey Mould / Botrytis Vine Rot	Brown Leaf Spot	Early Blight	Late Blight	Late Blight Tuber Rot / Tuber Blight	Pythium Leak	Pink Rot	Rhizoctonia Canker, Black Scurf, Stolon Canker, and Stem Rot	Silver Scurf	Sclerotinia stem rot
Acapela	547				•	•						•
Allegro 500F	583					•						•
Aprovia Top	550			3	•							
Azoshy 250 SC	551	•			•	•				2	2	
Azteroid	553									2	•	
Bravo 500	561		•		•	•						
Bravo Zn	561		•		•	•						
Cabil	556				•							
Cantus WDG Fungicide	556				•							
Cevya	560	3		3	•							
Copper (Copper 53W, Copper Spray)	563				•	•						
Corbanza	563				•	•						
Cueva	563				•	•						
Curzate	566					1						
Diplomat 5SC	574				4							
Dithane Rainshield	594				•	•						
Double Nickel LC / Double Nickel 55	575				•					•		•
Downforce AG	583					•						•
Echo 90DF / Echo 720	561		•		•	•						
Elatus	579									•	•	
Emissarius	551	•			•	•				2	2	
Evito 480	581	•			3	•				•	•	
Forum	585					•	•					
Gavel 75 DF	587				•	•						
Headline EC	628				•	•						
HyCop	563				•	•	•					
Lance WDG	544				•	•						
LifeGard WG	592				3	3						3
Luna Tranquility	593	4		•	•							•
Manzate Pro-Stick	594				•	•						
Manzate Max	594				•	•						
MIRAVIS Duo	599		3	•	•							3
MPOWER Spade	628				•	•						
Orondis Ultra	605					•						
OxiDate FC	606		3	•								•
Parasol FL	563				•	•	•					
Parasol WG	563				•	•	•					
Penncozeb 75 DF	594				•	•						
Penncozeb 80WP	594				•	•						
Phosphorous acid (Confine Extra, Rampart)	607					•			•			
Phostrol	608			3	3	•	•		2,3		•	
Preach	628				•	•						
Quadris	551	•			•	•				2	2	
Quadris Top	634	4		4	•							4
Quash SC	635				•							3
Quasi	551	•			•	•				2	2	
Ranman 400SC	639					•	•					
Reason 500SC	640				1	1						
Raclos	628				•	•						
Razor	551	•			•	•				2	2	
Revus	642					•						
Ridomil Gold/Bravo, Ridomil Gold SL/Bravo	644		•		•	•	•	3	3			
Ridomil Gold 480EC, Ridomil Gold 480SL	644								2			
Scala SC	633				1							
Sercadis	647				•					•		•
Serifel	650				3					2		
Serenade OPTI	648				3							3
Serenade SOIL	649							2	2	2		
Shaft Fungicide	554				•	•						
Shape	633				1							
Tanos	653				•	•						

Table 2. Foliar Fungicides for Disease Control in Potatoes *continued*

FUNGICIDES	Page	Black Dot	Botrytis Grey Mould / Botrytis Vine Rot	Brown Leaf Spot	Early Blight	Late Blight	Late Blight Tuber Rot / Tuber Blight	Pythium Leak	Pink Rot	Rhizoctonia Canker, Black Scurf, Stolon Canker, and Stem Rot	Silver Scurf	Sclerotinia stem rot
Velum Prime	662	•			•							
Veltyma	661	•		3	•							
Velum Rise	663	2			2					•		
VIKING Pyraclostrobin Fungicide	628				•	•						
Zampro	665					•	•					

Note: Before using any pesticide on potatoes, consult the list of Agricultural Pesticides Approved for Use, available from Simplot Canada and McCain Foods (Canada).
• Fungicide registered against the disease. Review and follow the label before application
1. Must not be used alone, only as a tank mix (consult individual labels). 2. In-furrow treatments (suppression only). 3. Suppression only (foliar application).
4. Suppression only.

Table 3. Foliar Fungicides for Disease Control in Wheat and Barley

		WHEAT									BARLEY									
FUNGICIDES	Page	Suppression of Fusarium Head Blight	Suppression of Ergot (*Claviceps purpurea*)	Powdery Mildew (*Blumeria graminis*)	Leaf Rust (*Puccinia recondita* f. sp. *tritici*)	Stem Rust (*Puccinia graminis* f. sp. *tritici*)	Stripe Rust (*Puccinia striiformis*)	Septoria Leaf Blotch Complex	Spot Blotch	Tan Spot (*Pyrenophora tritici-repentis*)	Suppression of Fusarium Head Blight	Suppression of Ergot (*Claviceps purpurea*)	Net Blotch (*Pyrenophora teres*)	Powdery Mildew (*Blumeria graminis*)	Leaf Rust (*Puccinia hordei*)	Stem Rust (*Puccinia graminis* f. sp. *tritici/secalis*)	Stripe Rust (*Puccinia striiformis*)	Scald (*Rhynchosporium secalis*)	Septoria Leaf Blotch Complex	Spot Blotch (*Cochliobolus sativus*)
Acapela	547			•	•		•	•		•			•	•			•	•	•	
Advantage Prothioconazole 480 SC	622	•			•			1*		•	•		•					•		•
Advantage Prothio +Teb 250 EC	619	•		•	•	•	•	•		•	•		•	•	•	•	•	•	•	•
Advantage Tebuconazole 250	654	•		•	•	•	•	1*		•			•	•	•	•	•	•	•	•
Bravo ZN / Bravo ZNC	561	•						1*		•										
Bumper 432 EC	613			•	•	•	•	1*		•			•	•	•	•		•	•	•
Caramba	557	•		•	•	•	•	•	•	•	•		•	•	•		•	•		•
Cerefit	559			•	•	•	•			•			•	•	•	•		•		•
CO-OP Pivot	613			•	•	•	•	1*		•			•	•	•	•		•	•	•
Custodia	567				•	•	•	•		•			•		•	•	•		•	•
Delaro 325 SC	569			•	•	•	•	•		•			•	•	•	•	•	•		
Delaro Complete	571			•	•	•	•	•		•			•	•	•	•	•	•		
Duplex	619	•									•									
Echo NP/Echo 90WSP	561	•						1*		•										
Evito 480	581			•	•	•	•	•		•			•	•	•	•	•			
Fitness	613			•	•	•	•	1*		•			•	•	•	•		•	•	•
Folicur	654	•		•	•	•	•	1*		•			•	•	•	•	•	•	•	•
Fungtion SC	636				•		•	•		•			•		•		•	•	•	
Headline EC	628			•	•		•	•	•	•			•				•	•		•
Holdfast	622	•			•			1*		•	•		•					•		•
Hornet 432 F	654	•		•	•	•	•	1*		•			•	•	•	•	•	•	•	•
Joust	622	•			•			1*		•	•		•					•		•
MIRAVIS Ace	596	•	•	•	•	•	•	•		•	•	•	•	•	•	•		•	•	•
Miravis Era	600	•			•			•		•	•		•					•		•
MIRAVIS Neo 300SE	601				•		•	•	•	•			•				•	•	•	•
Modo	613			•	•	•	•	1*		•			•	•	•	•		•	•	•
MPOWER Spade	628			•	•		•	•	•	•			•				•	•		•
Nexicor	604			•	•		•	•	•	•			•				•	•		•
Orius 430 SC	654	•		•	•	•	•	1*		•			•	•	•	•	•	•	•	•
Palliser	654	•		•	•	•	•	1*		•			•	•	•	•	•	•	•	•
Pavise 480SC	622	•			•			1*		•	•		•					•		•
Pivot 418EC	613			•	•	•	•	1*		•			•	•	•	•		•	•	•
Priaxor	609			•	•		•	•	•	•			•				•	•		•
Preach	628			•	•		•	•	•	•			•				•	•		•
Princeton	613			•	•	•	•	1*		•			•	•	•	•	•	•	•	•
Proline 480SC	622	•			•			1*		•	•		•					•		•
Propel	613			•	•	•	•	1*		•			•	•	•	•		•	•	•
Propi Super 25 EC	613			•	•	•	•	1*		•			•	•	•	•		•	•	•
Prosaro PRO	618	•	•	•	•	•	•	1*	•	•	•	•	•	•	•	•	•	•	•	•
Prosaro XTR	619	•		•	•	•	•	1*		•	•		•	•	•	•	•	•	•	•
Quasimodo	616				•		•	•		•			•		•		•	•	•	
Quilt	636				•		•	•		•			•		•		•	•	•	
Raclos	628			•	•		•	•	•	•			•				•	•		•
Roxar	646	•				•	•	•		•										
Regalia Maxx	641							•												
Rambler	622	•			•			1*		•	•		•					•		•
Shalimar	619	•		•	•	•	•	1*		•	•		•	•	•	•	•	•	•	•
Soraduo	619	•									•									
Soratel	622	•			•			1*		•	•		•					•		•
Sphaerex	651	•	•	•	•	•	•	•	•	•	•	•	•	•	•		•	•		•
Spaxor	626			•	•	•	•	•	•	•			•				•	•		•
StarPro	619	•		•	•	•	•	1*		•	•		•	•	•	•	•	•	•	•
Taj	622	•			•			1*		•	•		•					•		•

Table 3. Foliar Fungicides for Disease Control in Wheat and Barley *continued*

		WHEAT									BARLEY									
FUNGICIDES	Page	Suppression of Fusarium Head Blight	Suppression of Ergot (*Claviceps purpurea*)	Powdery Mildew (*Blumeria graminis*)	Leaf Rust (*Puccinia recondita* f. sp. *tritici*)	Stem Rust (*Puccinia graminis* f. sp. *tritici*)	Stripe Rust (*Puccinia striiformis*)	Septoria Leaf Blotch Complex	Spot Blotch	Tan Spot (*Pyrenophora tritici-repentis*)	Suppression of Fusarium Head Blight	Suppression of Ergot (*Claviceps purpurea*)	Net Blotch (*Pyrenophora teres*)	Powdery Mildew (*Blumeria graminis*)	Leaf Rust (*Puccinia hordei*)	Stem Rust (*Puccinia graminis* f. sp. *tritici/secalis*)	Stripe Rust (*Puccinia striiformis*)	Scald (*Rhynchosporium secalis*)	Septoria Leaf Blotch Complex	Spot Blotch (*Cochliobolus sativus*)
Tebbie	654	•		•	•	•	•	1*		•			•	•	•	•	•	•	•	•
TILMOR 240 EC	657	•		•	•	•	•	1*		•			•	•	•	•	•	•	•	•
Tilt 250E	613			•	•	•	•	1*		•			•	•	•	•		•	•	•
Toledo 250EW	654	•		•	•	•	•	1*		•			•	•	•	•	•	•	•	•
TopNotch	616				•		•	•		•			•		•		•	•	•	
Tornado Pro	632				•	•	•	•		•			•	•	•	•	•	•	•	•
Trivapro	658				•	•	•	•		•			•		•	•	•	•	•	
Twinline	660	•		•	•		•	•	•	•	•		•				•	•		•
VIKING Drobak	632				•	•	•	•		•			•	•	•	•	•	•	•	•
VIKING Propiconazole	613			•	•	•	•	1*		•			•	•	•	•		•	•	•
VIKING Pyraclostrobin Fungicide	628			•	•		•	•	•	•			•				•	•		•
VIKING Prothioconazole	622	•			•			1*		•	•		•					•		•
VIKING Tebuconazole	632	•		•	•	•	•	1*		•			•	•	•	•	•	•	•	•
VIKING Tromso	619	•		•	•	•	•	1*		•	•		•	•	•	•	•	•	•	•
Viking Vaasa	626			•	•	•	•	•	•	•			•				•	•		•
Zetigo PRM	666				•		•	•		•			•					•		

Refer to product pages and labels for application information as well as expectations for control vs suppression.

[1.] Septoria/Stagonospora leaf blotch complex: *some products include glume blotch in wheat.

Table 4. Foliar Fungicides for Disease Control in Oat, Rye and Triticale

		OATS						RYE						TRITICALE					
FUNGICIDES	Page	Suppression of Fusarium Head Blight	Suppression of Ergot (*Claviceps purpurea*)	Powdery Mildew (*Blumeria graminis*)	Crown Rust (*Puccinia coronata*)	Stem Rust (*Puccinia graminis* f. sp. *tritici*)	Septoria Leaf Blotch Complex	Suppression of Fusarium Head Blight	Powdery Mildew (*Blumeria graminis*)	Leaf Rust (*Puccinia recondita* f. sp. *tritici*)	Scald (*Rhynchosporium secalis*)	Stripe Rust (*Puccinia striiformis*)	Septoria Leaf Blotch Complex	Suppression of Fusarium Head Blight	Powdery Mildew (*Blumeria graminis*)	Leaf Rust (*Puccinia recondita* f. sp. *tritici*)	Stem Rust (*Puccinia graminis* f. sp. *secalis*)	Stripe Rust (*Puccinia striiformis*)	Septoria Leaf Blotch Complex
Acapela	539			•	•				•	•	•	•	•		•	•		•	•
Advantage Prothioconazole 480 SC	622				•			•		•		•		•		•	•	•	
Advantage Prothio +Teb 250 EC	619				•									•		•	•	•	
Advantage Tebuconazole 250	654				•	•	•												
Bumper 432 EC	613				•		•												
Caramba	557	•			•		•	•	•	•		•			•	•	•	•	•
Cerefit	559				•		•												
Co-Op Pivot	613				•		•												
Custodia	567				•	•	•												
Delaro Complete	571				•	•	•										•		
Delaro 325 SC	569				•	•	•										•		
Evito 480	581				•	•	•		•	•		•	•		•	•	•	•	•
Fitness	613				•		•												
Folicur	654				•	•	•												
Fungtion SC	636				•		•						•						•
Headline EC	628				•				•	•									
Holdfast	622				•			•		•		•		•		•	•	•	
Hornet 432 F	654				•	•													
Joust	622				•														
MIRAVIS Ace	596	•	•		•		•												
Miravis Era	600	•						•						•					
MIRAVIS Neo 300SE	601				•		•				•	•	•						•
Modo	613				•		•												
MPOWER Spade	628								•	•									
Nexicor	604				•		•		•	•						•		•	•
Orius 430 SC	654				•	•													
Palliser	654				•	•												•	
Pavise 480SC	622				•			•		•		•		•		•	•	•	
Pivot 418EC	613				•		•												
Preach	628				•				•	•									
Priaxor	609				•				•	•					•	•		•	•
Princeton	613				•		•												
Proline 480SC	622				•			•		•		•		•		•	•	•	
Propel	613				•		•												
Propi Super 25 EC	613				•		•												
Prosaro PRO	618	•	•		•	•	•												
Prosaro XTR	619				•	•	•												
Quasimodo	616				•		•				•		•						•
Quilt	636				•		•				•	•	•						•
Raclos	628				•				•	•									
Rambler	622				•														
Regalia Maxx	641																		
Soratel	622				•														
Spaxor	651				•														
Sphaerex	651	•	•		•		•	•	•	•		•		•	•	•		•	
Taj	622				•			•		•		•		•		•	•	•	
Tebbie	654				•	•	•												
TILMOR 240 EC	657				•	•	•												
Tilt 250E	613				•		•												

Table 4. Foliar Fungicides for Disease Control in Oat, Rye and Triticale ***continued***

		OATS						RYE						TRITICALE					
FUNGICIDES	Page	Suppression of Fusarium Head Blight	Suppression of Ergot (*Claviceps purpurea*)	Powdery Mildew (*Blumeria graminis*)	Crown Rust (*Puccinia coronata*)	Stem Rust (*Puccinia graminis* f. sp. *tritici*)	Septoria Leaf Blotch Complex	Suppression of Fusarium Head Blight	Powdery Mildew (*Blumeria graminis*)	Leaf Rust (*Puccinia recondita* f. sp. *tritici*)	Scald (*Rhynchosporium secalis*)	Stripe Rust (*Puccinia striiformis*)	Septoria Leaf Blotch Complex	Suppression of Fusarium Head Blight	Powdery Mildew (*Blumeria graminis*)	Leaf Rust (*Puccinia recondita* f. sp. *tritici*)	Stem Rust (*Puccinia graminis* f. sp. *secalis*)	Stripe Rust (*Puccinia striiformis*)	Septoria Leaf Blotch Complex
Toledo 250EW	654				•	•	•												
TopNotch	616				•		•				•		•						•
Tornado	632				•	•	•												
Trivapro	658				•	•	•						•				•		•
Twinline	660				•			•	•	•				•	•	•		•	•
VIKING Prothioconazole	622				•														
VIKING Propiconazole	613				•		•												
VIKING Pyraclostrobin	626								•	•									
VIKING Tebuconazole	632				•	•	•												
Viking Vaasa	626				•														

Refer to product pages and labels for application information as well as expectations for control vs suppression.

Table 5. Foliar fungicides for Disease Control in Millet, Corn and Canaryseed*

		MILLET	CORN						CANARYSEED
FUNGICIDES	Page	Suppression of Fusarium Head Blight	Ear rot (*Fusarium/Giberella* spp.)	Northern Leaf Blight (*Setosphaeria turcica*)	Common Rust (*Puccinia sorghi*)	Eye Spot (*Aureobasidium zeae*)	Grey Leaf Spot (*Cercospora zeaemaydis*)	Tar spot (*Phyllachora maydis*)	Suppression of Septoria Leaf Mottle (*Septoria triseti*)
Acapela	547			•				•	
Advantage Prothioconazole 480 SC	622	•	•	•	•	•	•		
Azoshy 250 SC	551				•				
Bumper 432 EC	613			•	•				•
Caramba	557		•						
Co-Op Pivot	613			•	•				•
Delaro Complete	571			•	•	•	•	•	
Delaro 325 SC	569			•	•	•	•		
Emissarius	551				•				
Evito 480	581			•	•		•		
Fitness	613			•	•				•
Fungtion SC	636			•	•				
Headline EC	628				•		•		
Holdfast	622	•	•	•	•				
Joust	622		•	•	•	•	•		
MIRAVIS Neo 300SE	601		•	•	•	•	•	•	
Modo	613			•	•				•
MPOWER Spade	628				•		•		
Pavise 480SC	622	•	•	•	•	•	•		
PREACH	628				•		•		
Pivot 418 EC	613			•	•				•
Priaxor	609			•	•	•	•		
Princeton	613			•	•				•
Proline 480 SC	622	•	•	•	•	•	•		
Propel	613			•	•				•
Propi Super 25 EC	613			•	•				•
Quadris	551				•				
Quasi	551				•				
Quilt	636			•	•				
Raclos	628				•		•		
Rambler	622		•				•		
Soratel	622		•	•	•	•	•		
Taj	622	•	•				•		
Tilt 250E	613			•	•				•
Trivapro	658			•	•		•		
Veltyma	661			•	•	•	•	•	
VIKING Prothioconazole	622		•				•		
VIKING Propiconazole	613			•	•				•
VIKING Pyraclostrobin	626				•		•		
Zolera FX	668			•	•		•		

***Refer to product pages and labels for application information as well as expectations for control vs suppression.**

Table 6. Foliar Fungicides for Disease Control in Pulse Crops*

		CHICKPEA					FIELD PEA							LENTIL					FABA BEAN					DRY BEAN				
FUNGICIDES	Page	Ascochyta Blight (*Ascochyta rabiei*)	Anthracnose (*Colletotrichum truncatum*)	Grey Mould (*Botrytis cinerea*)	Powdery Mildew (*Erysiphe* spp.)	White Mould (*Sclerotinia sclerotiorum*)	Ascochyta Complex (1)	Anthracnose (*Colletotrichum truncatum*)	Downy Mildew (*Peronospora viciae*)	Grey Mould (*Botrytis cinerea*)	Powdery Mildew (*Erysiphe pisi*)	White Mould (*Sclerotinia sclerotiorum*)	Early season root rot (*Aphanomyces euteiches, Pythium ultimum*)	Anthracnose (*Colletotrichum truncatum, C. lentis*)	Ascochyta Blight (*Ascochyta lentis*)	Grey Mould (*Botrytis cinerea*)	Powdery Mildew (*Microsphaera* spp.)	White Mould (*Sclerotinia sclerotiorum*)	Ascochyta Blight (*Ascochyta fabae*)	Anthracnose (*Colletotrichum truncatum*)	Botrytis Grey Mould (*Botrytis* spp.) / Chocolate Spot	Powdery Mildew (*Microsphaera* spp.)	White Mould (Sclerotinia sclerotiorum)	Anthracnose (*Colletotrichum truncatum, C. lindemuthianum*)	Botrytis Grey Mould (*Botrytis cinerea*)	Powdery Mildew (*Microsphaera* spp.)	Rust (*Uromyces appendiculatus*)	White Mould (*Sclerotinia sclerotiorum*)
Acapela	542					•	•					•		•	•			•					•	•				•
Advantage Prothioconazole 480 SC	622	•													•													
Allegro 500F	583																							•				•
Azoshy 250 SC	551	•	•				•	•			•			•	•			•	•	•				•				
Bravo ZN	561	•					•							•	•													
Bravo ZNC	561	•					•							•	•													
Bumper 432 EC	613																										•	
Co-Op Pivot	613																										•	
Copper 53W	563																							•				
Cotegra	565	•		•		•	•					•		•		•		•					•					•
Cueva	563				•		•				·						•									•	•	
Delaro Complete	571	•	•	•	•	•	•			•	•	•		•	•	•		•	•		•		•	•	•			•
Delaro 325 SC	569	•		•		•	•			•		•		•	•	•		•			•							
Downforce AG	583																							•				•
Dyax	577	•				•	•				•	•		•	•			•	•				•	•		•	•	•
Echo NP/Echo 90WSP	561	•					•							•	•													
Elatus	579	•				•	•	•			•	•		•	•			•	•	•			•	•				•
Emissarius	551	•	•				•	•			•			•	•			•	•	•				•				
Fitness	613																										•	
Fungtion SC	636				•		•				•			•			•					•				•		
Gauntlet	588													•	•			•										
Headline EC	628	•					•		•		•			•	•				•			•		•		•	•	
Holdfast	622	•													•			•										
Joust	622	•													•													
Kenja 400SC	589					•						•						•					•					•
LALSTOP Contans WG	590																											•
Lance AG (co-pack of *Lance WDG* and *Headline EC*)	591	•		•		•	•		•	•	•			•	•	•		•										
Lance WDG Fungicide	544	•		•		•	•			•					•	•		•					•					•
Maxentis	595						•					•		•	•			•										
MIRAVIS Neo 300SE	601	•	•		•	•	•	•			•	•		•			•	•	•		•	•	•	•				
MPOWER Spade	628	•					•		•		•			•	•				•			•		•		•	•	
Parasol WG	563																							•				
Pavise 480SC	622	•													•													
Phostrol	608												•															
Pivot 418 EC	613																										•	
Preach	628	•					•		•		•			•	•				•			•		•		•	•	
Priaxor	609	•		•		•	•		•		•	•		•	•	•		•	•		•	•	•	•		•	•	
Princeton	613																									•	•	
Proline 480 SC	622	•		•										•	•	•		•										
Proline Gold	612	•				•	•					•		•	•			•	•				•	•				•
Propel	613				•						•						•					•				•	•	
Propi Super 25 EC	613				•						•						•					•				•	•	
Quadris	551	•	•				•	•			•			•	•			•	•	•				•				
Quash SC	635	•				•					•	•			•			•										•
Quasi	551	•	•				•	•			•			•	•				•	•				•				
Quilt	636				•		•				•			•			•					•		•		•		
Raclos	628	•					•		•		•			•	•				•			•		•		•	•	
Rambler	622	•		•										•	•	•		•										
Razor	551	•	•				•	•			•			•	•			•	•	•				•				
RevyPro	643	•		•	•	•	•			•	•	•		•	•	•		•	•		•		•	•	•			•
Serenade OPTI	648			•		•				•		•				•		•							•			•
Serenade SOIL	649			•		•				•		•				•		•							•			•
Shaft Fungicide	554	•		•		•	•			•					•	•		•					•					•
Spaxor	651	•					•							•	•				•			•		•		•	•	
Soratel	622	•					•					•			•			•										

Table 6. Foliar Fungicides for Disease Control in Pulse Crops* *continued*

		CHICKPEA					FIELD PEA							LENTIL					FABA BEAN					DRY BEAN				
FUNGICIDES	Page	Ascochyta Blight (*Ascochyta rabiei*)	Anthracnose (*Colletotrichum truncatum*)	Grey Mould (*Botrytis cinerea*)	Powdery Mildew (*Erysiphe* spp.)	White Mould (*Sclerotinia sclerotiorum*)	Ascochyta Complex (1)	Anthracnose (*Colletotrichum truncatum*)	Downy Mildew (*Peronospora viciae*)	Grey Mould (*Botrytis cinerea*)	Powdery Mildew (*Erysiphe pisi*)	White Mould (*Sclerotinia sclerotiorum*)	Early season root rot (*Aphanomyces euteiches, Pythium ultimum*)	Anthracnose (*Colletotrichum truncatum, C. lentis*)	Ascochyta Blight (*Ascochyta lentis*)	Grey Mould (*Botrytis cinerea*)	Powdery Mildew (*Microsphaera* spp.)	White Mould (*Sclerotinia sclerotiorum*)	Ascochyta Blight (*Ascochyta fabae*)	Anthracnose (*Colletotrichum truncatum*)	Botrytis Grey Mould (*Botrytis* spp.) / Chocolate Spot	Powdery Mildew (*Microsphaera* spp.)	White Mould (Sclerotinia sclerotiorum)	Anthracnose (*Colletotrichum truncatum, C. lindemuthianum*)	Botrytis Grey Mould (*Botrytis cinerea*)	Powdery Mildew (*Microsphaera* spp.)	Rust (*Uromyces appendiculatus*)	White Mould (*Sclerotinia sclerotiorum*)
Taj	622	•													•			•										
Tilt 250E	613				•						•						•					•				•	•	
Topnoth	616							•			•	•		•	•		•	•						•		•		•
VIKING Prothioconazole	622	•		•										•	•	•		•										
VIKING Propiconazole	613				•						•						•					•				•	•	
VIKING Pyraclostrobin	626	•					•		•		•			•	•				•			•		•		•	•	
Viking Vaasa	626	•					•							•	•				•			•		•		•	•	
Zetigo PRM	666	•		•		•	•	•		•	•	•		•	•	•		•			•		•					
Zolera FX	668					•	•				•	•		•	•			•		•			•	•				•

*** Refer to product pages and labels for application information as well as expectations for control vs suppression.**

[1.] Ascochyta Complex in field pea may include *Mycosphaerella pinodes, Ascochyta pisi*, and *Phoma medicaginis* var. *pinodella*. Refer to product page and label for more information.

Table 7. Foliar Fungicides for Disease Control in Oilseed Crops*

		CANOLA			MUSTARD 1*			FLAX		SUNFLOWER		SOYBEAN						
FUNGICIDES	Page	Alternaria Black Spot (*Alternaria* spp.)	Blackleg (*Leptosphaeria maculans*)	Sclerotinia Stem Rot (*Sclerotinia sclerotiorum*)	Alternaria Black Spot (*Alternaria* spp.)	Blackleg (*Leptosphaeria maculans*)	Sclerotinia Stem Rot (*Sclerotinia sclerotiorum*)	Pasmo (*Septoria linicola*)	Sclerotinia Stem Rot (*Sclerotinia sclerotiorum*)	Rust (*Puccinia helianthi*)	Sclerotinia Stem/Head Rot (*Sclerotinia sclerotiorum*)	Phomopsis stem blight (*Phomopsis/Diaporthe* spp.)	Anthracnose (*Colletotrichum truncatum*)	Brown Spot (*Septoria glycines*)	Cercospora Leaf Spot (*Cercospora kikuchii*)	Powdery Mildew (*Microsphaera diffusa*)	White mould (*Sclerotinia sclerotiorum*)	Frogeye leaf spot (*Cercospora sojina*)
Acapela	547			•				•			•			•			•	•
Advantage Prothioconazole 480 SC	622			•			•		•		•							•
Advantage Tebuconazole 250	654															•		•
Allegro 500F	583																•	
Azoshy250 SC	551	•	•	•											•	•		
Bumper 432 EC	613		•															•
CO-OP Pivot	613		•															•
Cotegra	565			•			•					•		•			•	•
Cueva	563															•		•
Custodia	567																	•
Delaro Complete	571											•		•			•	•
Delaro 325 SC	569											•		•			•	•
Double Nickel LC/Double Nickel 55	575																•	
Downforce AG	583																•	
Dyax	577	•	•	•				•	•	•				•			•	•
Elatus	579											•		•	•	•		
Evito 480	581			•			•		•									•
Emissarius	551	•	•	•											•	•		
Fitness	613		•															•
Fullback 125SC	568													•	•			•
Fungtion SC	636		•										•			•		
Gauntlet	588	•		•														
Holdfast	622			•			•		•		•							•
Headline EC	628	•	•		•	•		•		•								•
Joust	622			•			•		•		•							•
LALSTOP Contans WG	590			•							•						•	
Lance AG (co-pack of *Lance WDG* and *Headline EC*)	591	•		•	•		•											
Lance WDG Fungicide	544	•		•	•		•				•							
Maxentis	595			•													•	
MIRAVIS Bold	598			•														
MIRAVIS Neo 300SE	601												•			•	•	•
Miravis Star	603			•														
Modo	613		•															•
MPOWER Spade	628																	•
Nexicor	604		•															
Pavise 480SC	622			•			•		•		•							•
Pivot 418 EC	613		•															•
Preach	628	•	•		•	•		•		•								•
Priaxor	609	•	•	•	•	•	•	•	•	•				•			•	•
Princeton	613		•															•
Proline 480 SC	622			•			•		•	•	•							•
Proline Gold	612			•														
Propel	613		•				1*								•	•		•
Propi Super 25 EC	613		•												•	•		•
Quadris	551	•	•	•											•	•		
Quash SC	635			•						•	•							
Quasi	551	•	•	•											•	•		
Quilt	636		•										•			•		•
Raclos	628	•	•		•	•		•		•								•
Rambler	622			•			•		•		•							•
Razor	551	•	•	•											•	•		
Serenade OPTI	648			•			•		•					•			•	•
Serenade SOIL	649			•										•			•	•
Soratel	622			•			•		•									•
Shaft Fungicide	554	•		•	•		•				•							
Spaxor	651																	•

Table 7. Foliar Fungicides for Disease Control in Oilseed Crops* *continued*

		CANOLA			MUSTARD 1*			FLAX		SUNFLOWER		SOYBEAN						
FUNGICIDES	Page	Alternaria Black Spot (*Alternaria* spp.)	Blackleg (*Leptosphaeria maculans*)	Sclerotinia Stem Rot (*Sclerotinia sclerotiorum*)	Alternaria Black Spot (*Alternaria* spp.)	Blackleg (*Leptosphaeria maculans*)	Sclerotinia Stem Rot (*Sclerotinia sclerotiorum*)	Pasmo (*Septoria linicola*)	Sclerotinia Stem Rot (*Sclerotinia sclerotiorum*)	Rust (*Puccinia helianthi*)	Sclerotinia Stem/Head Rot (*Sclerotinia sclerotiorum*)	Phomopsis stem blight (*Phomopsis/Diaporthe* spp.)	Anthracnose (*Colletotrichum truncatum*)	Brown Spot (*Septoria glycines*)	Cercospora Leaf Spot (*Cercospora kikuchii*)	Powdery Mildew (*Microsphaera diffusa*)	White mould (*Sclerotinia sclerotiorum*)	Frogeye leaf spot (*Cercospora sojina*)
Taj	622			•			•		•		•							•
Tebbie	654															•		•
Tilt 250E	613		•												•	•		•
Toledo 250EW	654															•		•
Topnotch	616												•			•	•	•
Tornado	632															•		•
Trivapro	658												•			•		
Veltyma	661											•		•	•			•
Viatude	664			•										•			•	•
VIKING Propiconazole	613		•												•	•		•
VIKING Prothioconazole	622			•			•		•		•							•
VIKING Pyraclostrobin	626																	•
VIKING Tebuconazole	632															•		•
Viking Vaasa	626																	•
Zetigo PRM	666	•	•	•														

*** Refer to product pages and labels for application information as well as expectations for control vs suppression.**
1* Some products are registered for use on only specific mustard types. Refer to label for details.

Table 8. Foliar Fungicides for Disease Control in Special Crops and Forages

		ALFALFA FOR SEED					NON-GRASS ANIMAL FEED		SEED GRASSES		TIMOTHY	CORIANDER	CARAWAY		HEMP	
Fungicides	Page	Blossom Blight (*Botrytis cinerea / Sclerotinia sclerotiorum*)	Common Leaf Spot (*Pseudopeziza medicaginis*)	Leaf Spot (*Leptosphaerulina trifolii/ briosiani*)	Spring Black Stem (*Phoma medicaginis*)	Sclerotinia Stem Rot (*Sclerotinia trifoli•orum/sclerotiorum*)	Common Leaf Spot (*Pseudopeziza medicaginis*)	Blossom Blight (*Sclerotinia sclerotiorum*)	Leaf and Stem Rusts (*Puccinia* spp.)	Powdery Mildew (*Erysiphe graminis*)	Purple Eye Spot (*Cladosporium phlei*)	Blossom Blight	Ascochyta Blight (*Ascochyta* sp.)	Blossom Blight	White Mold (*Sclerotinia sclerotiorum*)	Grey mold (*Botrytis cinerea*)
Acapela	547	•	•						•							
Azoshy 250 SC	551											•				
CO-OP Pivot	613										•					
Delaro 325 SC	569	•														
Dyax	577	•	•													
Double Nickel LC/ Double Nickel 55	575														•	•
Emissarius	551											•				
Fitness	613										•					
Fontelis	584					•										
Headline EC	628		•						•	•	•					
Lance AG (co-pack of *Lance WDG* and *Headline EC*)	591	•	•	•	•											
Lance WDG fungicide	544	•	•	•	•								•	•		
Lifegard WG	592														•	•
MPOWER Spade	628		•						•	•	•					
Pivot 418 EC	613										•					
Preach	628		•						•	•	•					
Priaxor	609	•	•				•	•	•	•						
Propel	613										•					
Propi Super 25 EC	613										•					
Quadris	551											•		•		
Quasi	551											•				
Raclos	628		•						•	•	•					
Razor	551											•		•		
Serenade SOIL	649	•														
Shaft Fungicide	554	•	•	•	•											
Tilt 250E	613										•					
VIKING Propiconazole	613										•					
VIKING Pyraclostrobin	626		•						•	•						

Refer to product pages and labels for application information as well as expectations for control vs suppression.

Acapela

Fungicide Group 11

Company:
Corteva Agriscience (PCP#30470)

Formulation:
250 g/L picoxystrobin formulated as a suspension concentrate.
- Container sizes – 115.2L drum

Crops, Diseases, Rates and Timing:

Crop	Diseases	Application Rate (per acre)	Application Timing
Chickpea, dry bean, faba bean	Suppression of white mould (*Sclerotinia sclerotiorum*) Control of anthracnose (*Colletotrichum lindemuthianum*) in dry bean	350 mL	Make initial application at early bloom and follow with second application 7 to 10 days later at full bloom.
Field pea	Suppression of mycosphaerella blight (*Mycosphaerella pinodes*)	240 to 350 mL	Begin applications prior to disease development and continue on a 7 to 14 day interval. Use higher rate and shorter interval when disease pressure is high.
	Suppression of white mould (*Sclerotinia sclerotiorum*)	350 mL	Make initial application at early bloom and follow with second application 7 to 10 days later at full bloom.
Lentil	Control of anthracnose (*Colletotrichum truncatum*), ascochyta blight (*Ascochyta lentis*)	240 to 350 mL	Begin applications prior to disease development and continue on a 7 to 14 day interval. Use higher rate and shorter interval when disease pressure is high.
	Suppression of white mould (*Sclerotinia sclerotiorum*)	350 mL	Make initial application at early bloom and follow with second application 7 to 10 days later at full bloom.
Wheat	Control of leaf rust (*Puccinia recondita*)	120 mL	Begin application prior to disease development. For early application apply at Zadok's stage 12-36.
	Suppression of tan spot (*Pyrenophora tritici-repentis*), Septoria leaf blotch (*Septoria tritici*)		
	Control of leaf rust (*Puccinia recondita*), stripe rust (*Puccinia striiformis*), septoria leaf blotch (*Septoria tritici*), powdery mildew (*Erysiphe graminis*), tan spot (*Pyrenophora tritici-repentis*)	175 to 350 mL	Begin applications prior to disease development and continue on a 7 to 14 day interval. Use higher rate and shorter interval when disease pressure is high. For optimizing yield and flag leaf disease control, apply *Acapela* at Zadok's stage 39-41 (flag leaf out stage).
Barley	Control of scald (*Rhynchosporium secalis*)	120 mL	Begin application prior to disease development. For early application apply at Zadok's stage 12-36.
	Suppression of septoria leaf blotch (*Septoria tritici*), net blotch (*Pyrenophora teres*)		
	Control of septoria leaf blotch (*Septoria tritici*), powdery mildew (*Erysiphe graminis*), stripe rust (*Puccinia striiformis*), net blotch (*Pyrenophora teres*), scald (*Rhynchosporium secalis*)	175 to 350 mL	Begin applications prior to disease development and continue on a 7 to 14 day interval. Use higher rate and shorter interval when disease pressure is high. For optimizing yield and flag leaf disease control, apply *Acapela* at Zadok's stage 39-41 (flag leaf out stage).
Oats	Control of powdery mildew (*Erysiphe graminis*), stripe rust (*Puccinia striiformis*), crown rust (*Puccinia coronata* f.sp. *avenae*)	175 to 350 mL	Begin applications prior to disease development and continue on a 7 to 14 day interval. Use higher rate and shorter interval when disease pressure is high. For optimizing yield and flag leaf disease control, apply *Acapela* at Zadok's stage 39-41 (flag leaf out stage).

Crop	Diseases	Application Rate (per acre)	Application Timing
Rye	Control of scald (*Rhynchosporium secalis*), leaf rust (*Puccinia recondita*)	120 mL	Begin application prior to disease development. For early application apply at Zadok's stage 12-36.
	Suppression of septoria leaf blotch (*Septoria tritici*)		
	Control of leaf rust (*Puccinia recondita*), stripe rust (*Puccinia striiformis*), septoria leaf blotch (*Septoria tritici*), powdery mildew (*Erysiphe graminis*), scald (*Rhynchosporium secalis*)	175 to 350 mL	Begin applications prior to disease development and continue on a 7 to 14 day interval. Use higher rate and shorter interval when disease pressure is high. For optimizing yield and flag leaf disease control, apply *Acapela* at Zadok's stage 39-41 (flag leaf out stage).
Triticale	Control of leaf rust (*Puccinia recondita*)	120 mL	Begin application prior to disease development. For early application apply at Zadok's stage 12-36.
	Suppression of septoria leaf blotch (*Septoria tritici*)		
	Control of leaf rust (*Puccinia recondita*), stripe rust (*Puccinia striiformis*), septoria leaf blotch (*Septoria tritici*), powdery mildew (*Erysiphe graminis*)	175 to 350 mL	Begin applications prior to disease development and continue on a 7 to 14 day interval. Use higher rate and shorter interval when disease pressure is high. For optimizing yield and flag leaf disease control, apply *Acapela* at Zadok's stage 39-41 (flag leaf out stage).
Corn (field corn, sweet corn, seed popcorn)	Control of northern leaf blight (*Setosphaeria turcica, Exserohilum turcicum*)	215 to 325 mL	Begin applications prior to disease development and continue on a 7 to 14 day interval. Use higher rate and shorter interval when disease pressure is high.
	Suppression of tar spot *(Phyllachora maydis)* in corn	325 mL	
Soybean	Control of brown spot (*Septoria glycines*); frogeye leaf spot (*Cercospora sojina*)	175 to 350 mL	Begin applications prior to disease development and continue on a 7 to 14 day interval. Use higher rate and shorter interval when disease pressure is high.
	Suppression of white mould (*Sclerotinia sclerotiorum*)	350 mL	Initial preventative application at 100% bloom (1 flower blooming on all plants) and follow with second application 7 to 10 days later at full bloom.
Canola	Control of sclerotinia stem rot (*Sclerotinia sclerotiorum*)	325 to 485 mL	Apply at 20 to 50% bloom prior to disease development. Under high disease pressure, make a second application of another fungicide from a different fungicide group, 7 to 14 days later. Use the higher rate or shorter interval when disease pressure is high.
Flax	Control of pasmo (*Septoria linicola*)	240 to 355 mL	Begin application prior to disease development or 7 to 10 days after flower initiation (roughly 20% bloom) and continue on a 7 to 14 day interval. Use higher rate and shorter interval when disease pressure is high.
Potatoes	Early blight and white mould Late blight	240 to 400 mL 180 to 400 mL	Begin applications prior to disease development and continue on a 7 to 10 day interval. Use higher rate and shorter interval when disease pressure is high.
Sunflower	Control of Alternaria leaf spot, stem canker, black stem	240 to 350 mL	Begin applications prior to disease development and continue on a 7 to 10-day interval. Use higher rate and shorter interval when disease pressure is high.
	Suppression of Sclerotinia head and stem rot	325 to 400 mL	
Alfalfa	Common leaf spot (*Pseudopeziza medicaginis*) and Stemphylium leafspot (*Stemphylium botryosum*)	178 to 365 mL	Begin applications in the spring at green-up and once 1 to 3 new leaves have grown after each cutting. Initiate applications prior to disease development and no later than 14 days prior to cutting. Use higher rate and shorter interval when disease pressure is high.
Grass grown for seed	Yellow Rust (*Puccinia striiformis* f. sp. *poae*)	178 to 365 mL	Begin applications prior to disease development and continue on a 7 to 14 day interval. Use higher rate and shorter interval when disease pressure is high.

Application Information:

- **Water Volume:** Use sufficient water to obtain thorough coverage of plants.
  - ***Ground:*** minimum 45 L per acre.
  - ***Aerial:*** minimum 20 L per acre.

How it Works:

The active ingredient picoxystrobin is a broad spectrum strobilurin fungicide and is to be used as a preventative application when environmental conditions are favorable for disease development. Picoxystrobin has curative and locally systemic activity. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:

Herbicides: *Travallas* spring wheat (including durum) and barley.
Insecticide: *Delegate* on corn
According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Restrictions:

- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Maximum number of applications:**
  - ***Dry legumes and canola*** – DO NOT exceed 1 application before switching to a fungicide with a different mode of action; maximum season use rate is 700 mL per acre.
  - ***Cereal grains, soybean*** – Make no more than 2 sequential applications of *Acapela* Fungicide before switching to a fungicide with a different mode of action registered for the same use.
  - ***Corn*** – Make no more than 2 sequential applications of *Acapela* Fungicide before switching to a fungicide with a different mode of action registered for the same use.
  - ***Flax*** – DO NOT exceed 1 application before switching to a fungicide with a different mode of action; maximum season use rate is 700 mL per acre.
  - ***Potatoes*** – DO NOT exceed 2 application before switching to a fungicide with a different mode of action; maximum season use rate is 1100 mL per acre.
  - ***Sunflowers*** – Make no more than 2 sequential applications of *Acapela* Fungicide before switching to a fungicide with a different mode of action registered for the same use.
  - ***Alfalfa and grass grown for seed*** – DO NOT exceed 2 sequential applications before switching to a fungicide with a different mode of action registered for the same use. Maximum seasonal use rate is 1100 mL per acre.
- **Grazing:**
  - ***Grass grown for seed*** – The harvest of forage is permitted immediately after a single application. The cutting of hay is permitted immediately following multiple applications. Maximum seasonal use rate is 1100 mL per acre.
- **Preharvest interval:**
  - ***Dry legumes and soybean*** – 14 days
  - ***Cereal grains*** – 45 days (7 days for forage, 14 days for hay)
  - ***Corn*** – 7 days
  - ***Canola*** – 28 days
  - ***Flax*** – 28 days
  - ***Potatoes*** – 3 days
  - ***Sunflowers*** – 7 days
  - ***Alfalfa*** – 14 days
  - ***Grass grown for seed*** – 0 days
- **Restricted Entry Interval:** DO NOT re-enter treated areas within 12 hours of application.
- **Re-cropping:** Crops that are on the product label may be replanted immediately after harvest. All other crops – 10 months following last application of picoxystrobin.
- **Storage:** Store product in original container only, away from other pesticides, fertilizer, food or feed. Not for use or storage in or around the home. Keep container closed. To prevent contamination, store this product away from food or feed.
- **Environment:** Observe prescribed buffer zones. Minimize off-target drift to reduce the effects on beneficial insects at the field boundary. DO NOT apply to areas prone to run-off and delay spraying if heavy rainfall is forecast.

Hazard Rating:

None listed.
Refer to the Introduction for an explanation of the symbols.

Aprovia Top

Fungicide Group 7, 3

Company:
Syngenta Canada (PCP#31526)

Formulation:
78 g/L benzovindiflupyr and 117 g/L difenoconazole formulated as an emulsifiable concentrate.
- Container size – 4 x 3.78 L

Crops, Diseases, Rates and Timing:

Crop	Diseases	Application Rate (per acre)	Application Timing
Potato	Control of early blight (*Alternaria solani*) Suppression of brown spot (*Alternaria solani*)	260 to 390 mL	Begin applications prior to disease development and continue throughout the season on a 7 to 14 day interval. For early blight, use the high rate and short application interval under high disease pressure. Make no more than two consecutive applications before switching to a non-Group 7 and 3 fungicide.

Application Information:
- **Water Volume:**
  - ***Ground:*** Use a minimum water volume of 60 L per acre
  - ***Aerial:*** Use a minimum water volume of 20 L per acre

How it Works:
The active ingredient benzovindiflupyr is a succinate dehydrogenase inhibitor (SDHI) fungicide with broad spectrum activity. The active ingredient difenoconazole is a demethylation inhibitor (DMI) fungicide. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information..

Tank Mixes:
None registered.

Restrictions:
- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Maximum number of applications:** DO NOT make more than 2 applications by air or more than 4 applications by ground. If applications are made by one method (ground or air), all consecutive applications must be made by the same method. It is not acceptable to mix aerial and ground applications in the same calendar year.
- **Grazing:** No restrictions listed.
- **Preharvest interval:** 14 days.
- **Restricted Entry Interval:** DO NOT re-enter treated areas within 12 hours of application.
- **Re-cropping:** There is no plant back restriction for potatoes, tuberous and corm vegetables, fruiting vegetables, cucurbit vegetables and plants in the rapeseed sub group. A plant back restriction of 60 days is required for cereals (wheat, barley, oats, rye, triticale) and corn. A plant back restriction of 6 months (180 days) is required for all other crops intended for food and feed.
- **Storage:** Keep in original container, tightly closed, during storage. Store in a cool, dry, well-ventilated area away from feed and foodstuffs and out of the reach of children and animals. To prevent contamination, store this product away from food or feed.
- **Environment:** Toxic to aquatic organisms and non-terrestrial plants. Observe buffer zones outlined in the label.

Hazard Rating:
Danger Poison – Eye Irritant

Refer to the Introduction for an explanation of the symbols.

Azoxystrobin

Fungicide Group 11

Quasi, Quadris, Azoshy 250 SC, Emissarius, Razor 250 SC,VIKING Azoxystrobin

Company:

UAP Canada (*Emissarius* – PCP # 33729)
Syngenta Canada (*Quadris* – PCP#26153)
Sharda Crop Chem Canada (*Azoshy 250 SC* – PCP#32263)
AgraCity Crop & Nutrition Ltd. (*Quasi* – PCP#33807)
Viking Crop Production Partners Inc. (*VIKING Azoxystrobin Fungicide* – PCP # 34771)
Albaugh (*Razor* – PCP#34408)

Formulation:

250 g/L azoxystrobin formulated as a flowable suspension or emulsifiable concentrate.

- Container sizes – *Azoshy 250 SC* (4 x 3.78 L case); *Emissarius* (4 x 3.78 L case); *Quadris* (4 x 3.78L); *Quasi* (8L; 100L; 1,000L); *Razor* (4 x 3.79 L); *VIKING Azoxystrobin* (2 X 8 L, 120 L, 1000 L)

Crops, Diseases, Rates and Timing:

Crop	Diseases Controlled	Application Rate (per acre)	Application Timing
Dry bean	Anthracnose (*Colletotrichum lindemuthianum*), ascochyta blight (*Ascochyta* spp.)	200 mL	Apply before disease is established and no later than onset of flowering; make second application 10 to 14 days later.
Chickpea, faba bean	Ascochyta blight (*Ascochyta* spp.), anthracnose (*Colletotrichum* spp.)	200 mL	Apply before disease is established and no later than onset of flowering; make second application 10 to 14 days later.
Lentil	Anthracnose (*Colletotrichum truncatum*), ascochyta blight (*Ascochyta lentis*) Suppression of white mould (*Sclerotinia sclerotiorum*)*	200 mL	Apply before disease is established and no later than onset of flowering; make second application 10 to 14 days later.
Field pea	Mycosphaerella blight (*Mycosphaerella pinodes*), powdery mildew (*Erysiphe pisi*), anthracnose (*Colletotrichum* spp.), ascochyta blight (*Ascochyta* spp.)	200 mL	Apply before disease is established and no later than onset of flowering; make second application 10 to 14 days later.
Soybean	Powdery mildew (*Microsphaera diffusa*), cercospora leaf spot (*Cercospora kikuchii*)	200 mL	Apply at the R1 to R3 stage, or when 5% disease in the field; make second application 14 days later.
Canola	Blackleg (*Leptosphaeria maculans*)	200 mL	Apply at the 2 to 6 leaf stage.
	Sclerotinia stem rot (*Sclerotinia sclerotiorum*)	280 to 400 mL	Apply at early bloom (prior to 30% bloom). This timing will also suppress alternaria black spot. Use the higher rate if there is a history of sclerotinia infection in the area and when conditions favour development.
	Alternaria black spot (*Alternaria brassicae, A. raphani*)	200 mL	Apply at pod stage (90% petal fall).
Corn	Rust (*Puccinia sorghi*)	180 mL	Apply before disease is established and make second application 7 to 14 days later.
Coriander (for seed production)** and caraway (for caraway *Quadris* and *Razor* only)**	Blossom blight (*Aureobasidium* spp.)	180 to 450 mL	Apply once prior to disease establishment. Use higher rate if a high disease pressure is present.

Crop	Diseases Controlled	Application Rate (per acre)	Application Timing
Potato	Early blight (*Alternaria solani*)	200 to 320 mL	Apply prior to disease development and repeat on a 7 to 14 day interval. Use the higher rate if extending treatment interval to 14 days. Apply in alternation with fungicides with a different mode of action. If late blight becomes established, discontinue use of azoxystrobin and use alternative fungicides.
	Late blight (*Phytophthora infestans*)	320 mL	
	Rhizoctonia stem rot, stolon canker, black scurf (*Rhizoctonia solani*), silver scurf (*Helminthosporium solani*)	4 to 6 mL per 100 m of row	Apply once as an in-furrow spray in 20 to 56 L/acre water at planting. Mount the spray nozzle so that spray is directed into the furrow as a 15 to 20 cm band just before the seed is covered. DO NOT apply by air.
	Black dot (*Colletotrichum coccodes*)	200 to 320 mL	Apply on a 7 to 14 day interval prior to disease development. Use the high rate and short application interval under high disease pressures.

***Suppression of white mould in lentils for *Quadris* only**
****DO NOT apply by air for coriander and caraway. Follow instructions on the labels for other uses.**

Application Information:

- **Water Volume:**
  - ***Ground:*** Use sufficient water volume to obtain adequate coverage. Use minimum 40 L per acre. In-furrow treatment in 20 to 56 L per acre.
  - ***Aerial:*** Use minimum of 18 L per acre. Ensure uniform application.

How it Works:

The active ingredient azoxystrobin is a methoxyacrylate compound (strobilurin) with broad spectrum contact and systemic activity. To be used as a preventative and curative fungicide application. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:

Follow the further instructions provided on products labels for all tank mixes indicated below prior to mixing and application.
Insecticides: For legumes and field corn, *Quasi, Quadris* and *Azoshy 250 SC* may be tank-mixed with *Matador 120EC* insecticide.
For control of potato diseases and insects, *Quasi, Quadris, Azoshy 250 SC, Emissarius, Razor 250 SC,* and *VIKING Azoxystrobin Fungicide* can be tank-mixed with *Actara 240* insecticide.
Consult each label for pests controlled, appropriate timing, precautions, and specific application instructions.
Fungicides: For the control of early blight of potato, *Quasi, Quadris, Azoshy 250 SC, Razor 250 SC* and *VIKING Azoxystrobin Fungicide* may be tank-mixed with *Bravo 500*. For control of Rhizoctonia stem, stolon canker and black scurf in potato, *Quasi, Quadris, Azoshy 250 SC, Emissarius, Razor 250 SC* and *VIKING Azoxystrobin Fungicide* can be tank-mixed with *Ridomil Gold 480EC* or *Ridomil Gold 480 SL*. Follow the instructions on the label. For control of ascochyta blight in chickpea, *Quasi, Quadris, Azoshy 250 SC, Razor 250 SC*, and *VIKING Azoxystrobin Fungicide* must be tank-mixed with *Bravo 500*. *Quasi, Quadris, Azoshy 250 SC, Emissarius, Razor 250 SC* and *VIKING Azoxystrobin Fungicide* may be tank-mixed with *Tilt 250E* in legumes (including soybean), wheat and barley.

- **Note:** According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Restrictions:

- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Maximum number of applications:**
  - ***Coriander and caraway*** – DO NOT exceed 1 application of this product per season.
  - ***Bean, canola, chickpea, corn, lentil, pea, soybean*** – DO NOT exceed 2 applications of this product per season.
  - ***Potato*** – DO NOT exceed 3 applications of this product per season.
- **Grazing:** DO NOT feed dried pea vines to livestock.
- **Preharvest interval:**
  - ***Canola*** – 30 days
  - ***Coriander and caraway*** – 21 days
  - ***Corn*** – 7 days
  - ***Legumes*** – 15 days
  - ***Potatoes*** – 1 day

- **Restricted Entry Interval:** DO NOT re-enter treated areas until residues have dried.
- **Re-cropping:** DO NOT plant broadleaf or root crops within 30 days of application. DO NOT plant cereals within 45 days of application.
- **Storage:** Store in a cool, dry, well-ventilated area. DO NOT store below 0°C.
- **Environment:** This product is toxic to fish and aquatic organisms. Observe buffer zones outlined in the label.

Hazard Rating:

None.
Other precautions: May irritate eyes.
Refer to the Introduction for an explanation of the symbols.

AZteroid FC

Fungicide Group 11

Company:

Vive Crop Protection distributed by UAP Canada (PCP#34742)

Formulation:

390 g/L azoxystrobin formulated as a suspension concentrate.

- Container size – 4 x 3.78L case

Crops, Diseases, Rates and Timing:

Crop	Disease / Pest	Rate	Crop stage and other timing information
Potato	Control of Silver Scurf (*Helminthosporium solani*)	2.56 – 3.85 mL per 100 m of row	At planting directly into the furrow before seed is covered.
	Suppression of Rhizoctonia stem rot, stolon canker, black scurf (*Rhizoctonia solani*)		

Application Information:

- **Water Volume:**
  - ***Ground:*** Apply using minimum water volume of 20 to 56 L/ acre.
  - ***Do not apply by air.***

How it Works:

The active ingredient azoxystrobin is a methoxyacrylate compound (strobilurin) with broad spectrum contact and systemic activity. To be used as a preventative and curative fungicide application.

Tank Mixes:

None registered.
According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Restrictions:

- **Maximum number of applications:** Do not exceed one application of this product per season.
- **Re-entry:** 12 hours after application.
- **Storage:** Do not store below zero degrees Celsius. Store in original containers only. Keep container closed when not in use. Store in a cool, dry place, and do not expose to heat. Store this product away from food or feed.
- **Environment:** Toxic to aquatic organisms. Azoxystrobin is persistent and may carry over. It is recommended that this product not be used in areas treated with any products containing azoxystrobin during the previous season. To reduce runoff from treated areas into aquatic habitats avoid application to areas with a moderate to steep slope, compacted soil, or clay. Avoid application when heavy rain is in forecast. Contamination of aquatic areas as a result of runoff may be reduced by including a vegetative strip between the treated area and the edge of the water body. This product demonstrates the properties and characteristics associated with chemicals detected in groundwater. The use of this product in areas where soils are permeable, particularly where the water table is shallow, may result in groundwater contamination.

Hazard Rating:

None listed.

Boscalid

Fungicide Group 7

Company:

BASF Canada (*Lance WDG* – PCP#27495)
Sharda CropChem (*SHAFT* Fungicide – PCP#34642)

Formulation:

SHAFT Fungicide: 70% boscalid formulated as wettable granule.

- Container size – 2 x 2.83 kg per case

Lance WDG: 70% boscalid formulated as a water dispersible granular.

- Container size – 2 x 2.83 kg per case

Crops, Diseases, Rates and Timing:

(Ground, Aerial, and Pivot or Sprinkler Irrigation Applications)

Crop	Diseases	Application Rate (per acre)	Application Timing
Alfalfa (seed production only)	Control of blossom blight *(Sclerotinia sclerotiorum, Botrytis cinerea)*, common leaf spot *(Pseudopeziza medicaginis)*, spring black stem *(Phoma medicaginis)*, leaf spot *(Leptosphaerulina briosiani)*	170 g	Apply at 20 to 50% flowering. Apply every 7 to 14 days if disease persists, or weather conditions are favourable for disease development.
Canola, mustard (oilseed and condiment)	Control of sclerotinia stem rot *(Sclerotinia sclerotiorum)*	140 g	Apply at 20 to 50% flowering. Apply a second time 7 to 14 days later up to full bloom if disease persists, or weather conditions are favourable for disease development.
	Control of black spot *(Alternaria brassicae* and *A. raphani)*	140 g	Apply at late flowering to early green pod.
Dry bean, faba bean	Control of white mould *(Sclerotinia sclerotiorum)*	225 to 310 g	Apply at 20 to 50% flowering. Apply a second time 7 to 14 days later if disease persists, or weather conditions are favourable for disease development. Use the higher rate to obtain extended protection and maximum yield benefit.
Potato	Control of early blight (*Alternaria solani*)	70 to 125 g	Apply prior to disease development and at 14 days intervals. DO NOT make more than 4 applications per season.
	Control of late blight (*Phytophthora infestans*)		*Boscalid* must be tank mixed with a group M fungicide following label directions for control of late blight. Apply prior to disease development.
Birdsfoot trefoil grown for seed production (*Lance WDG* only)*	Suppression of crown and stem rot (*Sclerotinia trifoliorum*)	170 g	Apply at early flowering stage to suppress crown rot/stem rot. Apply a second time 7-14 days later if disease persists, or weather conditions are favourable for disease development.

***For use on birdsfoot trefoil, BASF Canada has not fully assessed performance (efficacy) and/or crop tolerance (phytotoxicity) under all environmental conditions or for all crop varieties when used in accordance with the label. The user should test the product on a small area first, under local conditions and using standard practices, to confirm the product is suitable for widespread application.**

(Ground Application Only)

Crop	Diseases	Application Rate (per acre)	Application Timing
Field pea**	Control of ascochyta blight *(Ascochyta* spp.*)*, mycosphaerella blight *(Mycosphaerella pinodes)*, grey mould *(Botrytis cinerea)*	170 g	Apply at the beginning of flowering. Apply a second time 7 to 14 days later if disease persists, or weather conditions are favourable for disease development.

****DO NOT apply by air**

(Ground and Aerial Applications)

Crop	Diseases	Application Rate (per acre)	Application Timing
Chickpea***, lentil	Control of ascochyta blight *(Ascochyta* spp.*)*, white mould *(Sclerotinia sclerotiorum)*, grey mould *(Botrytis cinerea)*	170 g	Apply at the beginning of flowering. Apply a second time 7 to 14 days later if disease persists, or weather conditions are favourable for disease development.
Caraway (Lance WDG only)	Suppression of blossom blight (*Botrytis cinerea, Sclerotinia sclerotiorum*), ascochyta blight (*Ascochyta* spp.)	170 g	Apply at 20 to 50% flowering. Apply a second time 7 to 14 days later if disease persists, or weather conditions are favourable for disease development.
Sunflower	Suppression of sclerotinia head rot *(Sclerotinia sclerotiorum)*, leaf spot *(Alternaria helianthi)*	140 to 260 g	Apply at early flower for optimal disease suppression. Use the higher rate when disease pressure is high or there is a history of high disease in the field.

*****Do not apply by pivot or sprinkler irrigation.**

Application Information:

- **Water Volume:**
  - ***Ground:*** Use a minimum water volume of 40 L per acre and ensure thorough coverage of foliage.
  - ***Aerial (registered for all crops but field pea):*** Use a minimum water volume of 16 L per acre and ensure thorough coverage of foliage.
  - ***Pivot and Sprinkler Irrigation:*** DO NOT exceed 0.64 cm (1/4 inch) or 25,700 L per acre. Apply only through sprinkler systems including centre pivot, lateral move, end two, side (wheel) roll, traveler, big gun, solid set, or hand move irrigation systems.

How it Works:

The active ingredient boscalid is a carboxamide (SDHI) fungicide with systemic activity. To be used as a preventative application when environmental conditions are favourable for disease development. Refer to"Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:

Insecticides: For control of corn borer in succulent beans, *Lance* can be tank-mixed with *Matador 120 EC* at 37 mL per acre.
Fungicides: For the control of ascochyta blight on chickpea, *Lance* at rate of 140 to 170 grams per acre should be applied with 160 to 240 mL per acre *Headline EC*.

Restrictions:

- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Maximum number of applications:**
  - ***Sunflower*** – DO NOT exceed 1 application of this product per season.
  - ***Canola, mustard, dry bean, chickpea, lentil, pea and birdsfoot trefoil*** – DO NOT exceed 2 applications of this product per season.
  - ***Alfalfa*** – DO NOT exceed 3 applications of this product per season.
- **Grazing:** All crops except alfalfa and Birdsfoot trefoil (grown for seed) can be grazed or fed to livestock unless product label directs otherwise. DO NOT cut treated birdsfoot trefoil fields for hay/forage.
- **Preharvest interval:**
  - ***Beans, canola, chickpea, lentil, pea and Birdsfoot trefoil*** – 21 days
  - ***Alfalfa*** – not applicable
- **Restricted Entry Interval:** DO NOT re-enter treated area for 12 hours after application or until dry.
- **Re-cropping:** A plant back restriction of 14 days is required for all crops not on the label.
- **Storage:** Store in a cool, dry, locked, well-ventilated area without a floor drain.
- **Environment:** DO NOT apply to any body of water. Avoid drifting of spray onto any body of water or other non-target areas. Specified buffer zones should be observed

Hazard Rating:

Caution Poison – Potential Skin Sensitizer

Warning – Eye Irritant

Refer to the Introduction for an explanation of the symbols.

Cantus WDG Fungicide

Fungicide Group 7

Company:
BASF Canada (PCP#30141)
Sharda CropChem (*Cabil Fungicide* – PCP#34638)

Formulation:
70% boscalid formulated as a water dispersible granule.
- Container size – 4 x 2.83 kg

Crops, Diseases, Rates and Timing:

Crop	Diseases	Application Rate (per acre)	Application Timing
Potato	Early blight (*Alternaria solani*)	70 to 130 g	Apply prior to disease development and at 14 day intervals if conditions continue to favour disease development.

Application Information:
- **Water Volume:**
  - ***Ground:*** Use a minimum water volume of 40 L per acre and ensure thorough coverage of foliage.
  - ***Aerial:*** Use a minimum water volume of 16 L per acre and ensure thorough coverage of foliage.
  - ***Pivot and Sprinkler Irrigation:*** DO NOT exceed 0.64 cm (1/4 inch) or 25,700 L per acre. Apply only through sprinkler systems including centre pivot, lateral move, end two, side (wheel) roll, traveler, big gun, solid set, or hand move irrigation systems. The system must contain functional valves to prevent water source contamination from backflow.

How it Works:
The active ingredient boscalid is a carboxamide (SDHI) fungicide with systemic activity. It inhibits spore germination, mycelia growth and sporulation of the fungus on the leaf surface. To be used as a preventative application when environmental conditions are favourable for disease development. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:
None registered.

Restrictions:
- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Maximum number of applications:** 4 applications per season on potatoes.
- **Grazing:** No restriction listed.
- **Preharvest interval:** 30 days
- **Restricted Entry Interval:** DO NOT re-enter treated area for 12 hours after application or until dry.
- **Re-cropping:** A plant back restriction of 14 days is required for all crops not on the label.
- **Storage:** Store in a cool, dry, locked, well-ventilated area without a floor drain.
- **Environment:** Toxic to aquatic organisms and non-target terrestrial plants. DO NOT apply to areas where runoff is likely to occur, or near any body of water. Avoid drifting of spray onto any body of water or other non-target areas. Specified buffer zones should be observed.

Hazard Rating:
Caution Poison – Potential Skin Sensitizer

Warning – Eye Irritant

Refer to the Introduction for an explanation of the symbols.

Caramba*

Fungicide Group 3

***NOTE:** This product is no longer manufactured but product still remains in the distribution system. This product may be removed from future editions.

Company:

BASF Canada (PCP#29767)

Formulation:

90 g/L metconazole formulated as an emulsifiable concentrate.

- Container sizes – Case (2 x 8.1 L); 128 L drum; or 400 L tote

Crops, Diseases, Rates and Timing:

Crop	Diseases Controlled	Application Rate (per acre)*	Application Timing
Wheat	Control of leaf rust (*Puccinia recondita*), stripe rust (*Puccinia striiformis*), stem rust (*Puccinia graminis*), powdery mildew (*Erysiphe graminis f. sp. tritici*), tan spot (*Pyrenophora tritici-repentis*), septoria leaf blotch (*Septoria tritici*) Suppression of spot blotch (*Cochliobolus sativus*)	200 to 280 mL	Apply prior to disease development or at the onset of disease.
	Suppression of fusarium head blight (*Fusarium* spp.)	400 mL	Apply prior to development of the disease when environmental conditions are favourable for disease development. Apply within the time period when at least 75% of the heads on the main stem are fully emerged to when 50% of the heads on the main stem are in flower.
Barley	Control of net blotch (*Pyrenophora teres*), scald (*Rhynchosporium secalis*), leaf rust (*Puccinia hordei*); stripe rust (*Puccinia striiformis*), powdery mildew (*Erysiphe graminis*); Suppression of spot blotch (*Cochliobolus sativus*)	200 to 280 mL	Apply prior to disease development or at the onset of disease.
	Suppression of fusarium head blight (FHB) (*Fusarium* spp.)	400 mL	Apply prior to development of the disease when environmental conditions are favourable for disease development. Apply between full head emergence and up to 3 days after full emergence of main stem heads.
Oat	Control of crown rust (*Puccinia coronata*), septoria leaf blotch (*Septoria avenae*)	200 to 280 mL	Apply prior to disease development or at the onset of disease.
	Suppression of fusarium head blight (*Fusarium* spp.)	400 mL	Apply prior to development of the disease when environmental conditions are favourable for disease development. Apply within the time period when at least 75% of the heads on the main stem are fully emerged to when 50% of the heads on the main stem are in flower.
Corn*	Suppression of fusarium (*Fusarium graminearum*) and gibberella (*Gibberella zeae*) ear rots	400 mL	Apply when the crop is between silking and silk browning stage for maximum suppression. Ensure silk coverage for optimum efficacy.

Crop	Diseases Controlled	Application Rate (per acre)*	Application Timing
Rye	Control of leaf rust (*Puccinia recondita*), stripe rust (*Puccinia striiformis*), powdery mildew (*Erysiphe graminis*)	200 to 280 mL	Apply prior to disease development or at the onset of disease.
	Suppression of fusarium head blight (*Fusarium* spp.)	400 mL	Apply prior to development of the disease when environmental conditions are favourable for disease development. Apply within the time period when at least 75% of the heads on the main stem are fully emerged to when 50% of the heads on the main stem are in flower.
Triticale	Control of leaf rust (*Puccinia recondita*), stripe rust (*Puccinia striiformis*), stem rust (*Puccinia graminis*), powdery mildew (*Erysiphe graminis f. sp. tritici*), tan spot (*Pyrenophora tritici-repentis*), septoria leaf blotch (*Septoria tritici*); Suppression of spot blotch (*Cochliobolus sativus*)	200 to 280 mL	Apply prior to disease development or at the onset of disease.

***A case can treat 40 acres after heading (suppression of FHB) or 60 to 80 acres before heading (leaf disease). A drum can treat 320 acres after heading (suppression of FHB) or 460 to 640 acres before heading (leaf disease).**
***Corn includes field corn, sweet corn, popcorn and seed production corn.**

Application Information:

- **Water Volume:**
  - ***Ground:*** minimum 40 L per acre.
  - ***Aerial:*** minimum 20 L per acre.
  - Consult nozzle manufacturers for specific nozzle and pressure recommendations.

How it Works:

The active ingredient, metconazole, is a broad spectrum triazole demethylation inhibitor (DMI) fungicide with systemic activity. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:

None listed.

Restrictions:

- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Maximum number of applications:**
  - ***Wheat, oat, rye, barley, corn*** – DO NOT exceed 1 application of this product per season.
- **Grazing:** All crops can be grazed or fed to livestock.
- **Preharvest interval:**
  - ***Wheat, barley, oat, rye*** – 30 days
  - ***Field corn grain*** – 20 days
  - ***Sweet Corn*** – see label harvesting restrictions
- **Restricted Entry Interval:**
  - ***Wheat, barley, oat, rye*** – DO NOT re-enter treated areas within 12 hours of application.
  - ***Corn*** – DO NOT re-enter treated area for 12 hours or up to 3 days depending on re-entry activity (see label instructions).
- **Re-cropping:** A plant back interval of 35 days is required for all crops not listed on the label.
- **Storage:** Store in original tightly closed container. Protect from freezing.
- **Environment:** Avoid run-off from treated areas into aquatic areas. Toxic to aquatic organisms, non-target terrestrial plants and small wild animals.

Hazard Rating:

Warning – Eye Irritant
Check label for first-aid information.

Refer to the Introduction for an explanation of the symbols.

Cerefit

Fungicide Group 3, 11

Company:
Corteva Agriscience (*Cerefit A* – PCP#33522, *Cerefit B* – PCP#33348)

Formulations:
The *Cerefit* package contains 2 components.
Cerefit A – 250 g/L picoxystrobin formulated as a suspension concentrate.
- Container size – 5.3 L

Cerefit B – 435 g/L propiconazole formulated as an emulsifiable concentrate.
- Container size – 3.5 L

Crops, Diseases, Rates and Timing:

Crop	Diseases	Application Rate (per acre)	Application Timing
Barley	Control of leaf and stem rust, net blotch, powdery mildew, scald, septoria leaf spot, spot blotch	132.5 mL/acre – *Cerefit A,* 87.5 mL/acre – *Cerefit B*	For early application, apply at first sign of disease, usually at the beginning of stem elongation (G.S. 12-36). For late application, apply at flag leaf (G.S. 39-41). DO NOT apply after flowering (Feekes 10.5 or Zadoks 59).
Oats	Control of crown rust, septoria leaf blotch	132.5 mL/acre – *Cerefit A,* 87.5 mL/acre – *Cerefit B*	For early application, apply at first sign of disease, usually at the beginning of stem elongation (G.S. 12-36). For late application, apply at flag leaf (G.S. 39-41). DO NOT apply after flowering (Feekes 10.5 or Zadoks 59).
Wheat	Control of leaf and stem rust, powdery mildew, glume blotch, septoria leaf spot, stripe rust, tan spot	132.5 mL/acre – *Cerefit A,* 87.5 mL/acre – *Cerefit B*	For early application, apply at first sign of disease, usually at the beginning of stem elongation (G.S. 12-36). For late application, apply at flag leaf (G.S. 39-41). DO NOT apply after flowering (Feekes 10.5 or Zadoks 59).

Application Information:
- **Water Volume:**
  - ***Ground:*** 40 to 80 L per acre.
  - ***Aerial:*** 20 L per acre.

Application Tips: Good coverage is essential for effective disease control. *Cerefit* should be applied as a preventative disease control measure. Established diseases are more difficult to control and may have already reduced crop vigor.

How it Works:
The active ingredient propiconazole is a triazole fungicide with broad spectrum systemic activity. The active ingredient picoxystrobin is a broad spectrum strobilurin fungicide and is to be used as a preventative application when environmental conditions are favorable for disease development. Picoxystrobin has curative and locally systemic activity. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:
None registered.

Restrictions:
- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Maximum number of applications:** DO NOT exceed 2 applications of this product per season.
- **Grazing:** May be grazed 7 days after application
- **Preharvest interval:**
  - ***Wheat, barley and oats harvested for grain*** – 45 days
  - ***Forage harvest*** – 7 days
  - ***Greenfeed/hay*** – 14 days
- **Restricted Entry Interval:** DO NOT re-enter treated areas within 12 hours of application.
- **Re-cropping:** Crops that appear on the label may be replanted immediately after harvest, all other crops may be planted 10 months after the last application of *Cerefit*.
- **Storage:** Store in original container in a secured, dry storage area. Prevent cross-contamination with other pesticides and fertilizer. Keep away from food and feed.

- **Environment:** Toxic to aquatic organisms and non-target terrestrial plants. Observe prescribed buffer zones. Minimize off-target drift to reduce the effect on beneficial insects at the field boundary. DO NOT apply to areas prone to runoff and delay application if heavy rainfall is forecast.

Hazard Rating:

Cerefit A: None listed
Cerefit B:

Caution – Poison

Warning – Eye and Skin Irritant, Potential Skin Sensitizer

Refer to the Introduction for an explanation of the symbols.

Cevya

Fungicide Group 3

Company:

BASF (PCP#33405)

Formulations:

400 g/L mefentrifluconazole formulated as a suspension concentrate.

- Container size – 4 L

Crops, Diseases, Rates and Timing:

Crop	Diseases	Application Rate (per acre)	Application Timing
Potato	Control of early blight (*Alternaria solani*)		Begin applications prior to disease development. Apply an additional application at an interval of 7 to 14 days if disease persists or weather conditions are favourable. DO NOT apply more than 500 mL/acre per year.
	Suppression of black dot (*Colletotrichum coccodes*), brown spot (*Alternaria alternata*)		

Application Information:

- **Water Volume:**
  - ***Ground:*** Minimum water volume of 40 L per acre.
  - ***Aerial:*** Minimum water volume of 20 L per acre.

How it Works:

The active ingredient mefentrifluconazole is a triazole fungicide with broad spectrum systemic activity. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information..

Tank Mixes:

None registered.

Restrictions:

- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Field Sprayer Application:** DO NOT apply during periods of dead calm. Avoid application of this product when winds are gusty. DO NOT apply with spray droplets smaller than the ***ASAE medium*** classification. Boom height must be 60 cm or less above the crop or ground.
- **Aerial Application:** DO NOT apply during periods of dead calm. Avoid application of this product when winds are gusty. DO NOT apply when wind speed is greater than 16 km per hour at flying height at the site of application. DO NOT apply with spray droplets smaller than the ***ASAE medium*** classification. Reduce drift caused by turbulent wingtip vortices. Nozzle distribution along the spray boom length MUST NOT exceed 65 percent of the wing- or rotorspan.

Hazard Rating:

Warning – Contains the Allergen Soy

Potential Skin Sensitizer
Refer to the Introduction for an explanation of the symbols.

Chlorothalonil

Bravo Zn/Bravo ZNC/Echo NP/Echo 90WSP

Fungicide Group M5

Company:

Syngenta Canada (*Bravo Zn* – PCP#28900, *Bravo ZNC* – PCP#33515)
UAP (*Echo NP* – PCP#33479, *Echo 90WSP* – PCP#33519)

Formulations:

Bravo Zn – 500 g/L chlorothalonil formulated as a suspension.
- Container size – 450 L

Bravo ZNC – 500 g/L chlorothalonil formulated as a suspension.
- Container size – 2 x 10 L case

Echo 90WSP – 90% chlorothalonil formulated as water dispersible granule sealed within a water-soluble bag.
- Container size – 10 kg (20 x 500 g)

Echo NP – 720 g/L chlorothalonil formulated as a suspension.
- Container size – 2 x 9.46 L case

Crops, Diseases, Rates and Timing:

Crop	Diseases	Application Rate (per acre)			Application Timing
		Bravo Products	*Echo NP*	*Echo 90WSP*	
Wheat	Control of tan spot (*Pyrenophora tritici-repentis*), septoria glume blotch, septoria leaf blotch (*Septoria tritici*)	600 to 1000 mL	405 to 690 mL	320 to 570 g	Begin application at flag leaf emergence; repeat 10 to 14 days later when heads are visible. A third application when heads are fully emerged may be necessary.
	Suppression of fusarium head blight (*Fusarium* spp.)	800 to 1000 mL	570 to 690 mL	450 to 570 g	For suppression of fusarium head blight apply at early flowering (before flowering has started in the majority of tillers) and before the beginning of weather favouring disease.
Pea	Control of mycosphaerella blight (*Mycosphaerella pinodes*)	800 to 1200 mL	570 to 850 mL	450 to 690 g	Begin application at early flowering and repeat 10 days later at early pod set or mid-flowering if necessary. Make a third application 10 to 14 days after the second application at pod fill should conditions remain favourable for disease.
Lentil	Control of ascochyta blight (*Ascochyta lentis*), anthracnose (*Colletotrichum truncatum*)	800 to 1600 mL	570 to 1130 mL	450 to 890 g	For one application only, apply at early flowering. For two applications: apply first before flowering when bud formation is evident; apply second at early to mid-flowering 10 to 14 days after the first application but before rows close in.
Chickpea	Control of ascochyta blight (*Ascochyta rabiei*)	1200 to 1600 mL for first application; 800 to 1200 mL for subsequent applications.	850 to 1130 mL for first application; 570 to 850 mL for subsequent applications.	690 to 890 g for first application; 450 to 690 g for subsequent applications.	Make first application at very early flowering and remaining applications at 10 day intervals.

Crop	Diseases Controlled	Application Rate* (per acre)				Application Timing
		Bravo 500	*Bravo Zn*	*Echo 720*	*Echo 90DF/ 90WSP*	
Potato	Late blight (*Phytophthora infestans*)	480 to 1000 mL	480 to 1000 mL	320 to 690 mL	280 to 530 g	Begin application when plants are 6 to 8 inches (15 to 20 cm) high or when disease threatens. Repeat applications at 7 to 10 day intervals or as necessary to maintain disease control. *Under high disease pressure, use higher rate and shorter spray intervals.
	Early blight (*Alternaria solani*)	640 to 1000 mL	640 to 1000 mL	445 mL	370 to 530 g	
	Botrytis vine rot (*Botrytis cinerea*)	640 to 1000 mL	640 to 1000 mL	445 mL	370 to 530 g	

Application Information:

- **Water Volume:** Volume will vary with crop and amount of plant growth. Use sufficient water to obtain adequate coverage of foliage.
  - ***Ground:*** Spray volume will usually range from 90 to 640 L per acre for dilute sprays and 20 to 40 L per acre for concentrate sprays. Applicators treating potato fields must use groundboom equipment with an enclosed cab.
    - ***Chickpea*** – 90 L per acre. Ground application only.
  - ***Aerial:*** Use minimum of 12 L per acre. DO NOT apply *Bravo ZNC* using aerial application equipment.

  Note: when using *Bravo ZNC* or *Echo NP,* mixers and loaders cannot handle more than 340 kg a.i. chlorothalonil (680 L) per person per day.

How it Works:

The active ingredient chlorothalonil is a chloronitrile fungicide with multi-site contact activity. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:

DO NOT combine with pesticides, surfactants or fertilizers unless prior use has shown the combination is physically compatible and non-injurious under your conditions of use.

Fungicides: For control of early blight in potato, *Bravo 500* may be tank-mixed with 200 mL per acre *Quadris*. DO NOT apply sequential applications of this tank-mix and DO NOT exceed 3 tank-mix applications per season. DO NOT apply to potatoes later than 2 days before harvest. For control of early blight, late blight, and botrytis vine rot in potato and for suppression of storage rots, pythium leak and pink rot, in potato *Bravo Zn* may be tank mixed with 80 mL per acre *Ridomil Gold 480 EC* or *Ridomil Gold 480 SL*.

Herbicides: On lentils, DO NOT apply in combination with *Poast* herbicide and *Merge* surfactant or within 48 hours of the application of *Poast* and *Merge*.

Restrictions:

- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Maximum number of applications:**
  - ***Lentil*** – DO NOT exceed 2 applications of this product per season.
  - ***Wheat, pea, chickpea*** – DO NOT exceed 2 applications of this product per season. **Note: *Bravo ZNC* maximum 2 applications per season.**
  - ***Potato* (Echo 90DF)** – DO NOT exceed 3 applications of this product per season. **Note: *Bravo ZNC* and *Echo NP* not registered on potatoes.**
- **Grazing:** DO NOT graze treated areas. DO NOT feed straw from treated crops to livestock.
- **Preharvest interval:**
  - ***Potato*** – 1 day
  - ***Lentil*** – 48 days
  - ***Chickpea*** – *Bravo 500* – 14 days, *Echo 720* – 48 days
  - ***Wheat*** – 30 days
  - ***Pea*** – 32 days
- **Restricted Entry Interval:** DO NOT re-enter treated area within 48 hours of application. If required, and at least 4 hours have passed since application, individuals may re-enter treated area for short-term tasks not involving hand labour. Long pants, long-sleeved shirt, and chemical resistant gloves must be worn.
- **Re-cropping:** None.
- **Storage:** DO NOT store near feed or food stuffs. Store in a cool, dry, ventilated place. Protect from excessive heat.
- **Environment:** DO NOT apply if weather conditions favour drift from area being treated. DO NOT contaminate lakes, streams or ponds. Observe a buffer zone of 100 m for aerial applications and 15 m for ground applications to protect aquatic systems.

Hazard Rating:

Caution – Poison

Warning – Causes Severe Eye Damage

Refer to the Introduction for an explanation of the symbols.

Copper

Fungicide Group M1

Copper 53W/Copper Spray/Cueva/Parasol WG/Corbanza/HyCop/Parasol FL

Company:

Sharda CropChem (*HyCop* – PCP#34645)
Sharda CropChem (*Corbanza* – PCP#34558)
W. Neudorff GmbH KG (*Cueva* – PCP#31825), Distributed by Belchim Crop Protection Canada
Loveland Products Canada, (*Copper 53W* – PCP#09934, *Copper Spray* – PCP#19146)
Nufarm Agriculture Inc. (*Parasol WG* – PCP#29063)
Nufarm Agriculture Inc. (*Parasol FL* – PCP#25901)

Formulations, Crops, Diseases, Rates and Timing:

Product		*Copper 53W*	*Copper Spray* and *Corbanza*	*Cueva*	*Parasol WG* and *HyCop*	*Parasol FL*
Formulation and Container Size		53% tribasic copper sulphate (wettable powder). 10 kg	50% copper oxychloride (wettable powder). 10x2 kg	Copper as 1.8% copper octanate (solution). 1-1000L	50% elemental copper as copper hydroxide (wettable granule). 10 kg	24.4% elemental copper, present as copper hydroxide. 2 x 10 L
Crop	Disease	Application Rate and Timing				
Potato	Septoria leaf spot *(Septoria lycopersici)*	-	-	Use a 0.5% to 2% solution, applied at 190 to 380 L/acre. Apply 2 weeks before disease normally appears (make use of predictive disease models if available) and repeat using 5 to 10 day intervals.	-	-
	Early blight *(Alternaria solani)*	2.2 kg/acre Apply when plants are 5 to 7 inches (12 to 18 cm) tall. Repeat at 7 day intervals.	1.6 kg/acre Apply when plants are 4 to 8 inches (10 to 20 cm) tall. Repeat at 7 to 10 day intervals or as per indicated on label.		0.44 to 1.0 kg/ acre Apply when plants are 6 inches (15 cm) tall. Apply combined with 0.7 to 0.9 kg of mancozeb (80%)/acre, at 7 to 10 day intervals. Strictly follow the labels of both products.	0.3 to 0.7 L/acre. Apply when plants are 6 inches (15 cm) tall. Apply combined with 0.7 to 0.9 kg of mancozeb (80% active)/acre at 7 to 10 day interval
	Late blight *(Phytophthora infestans)*					
	Tuber blight *(Phytophthora infestans)*	-	-	-	1.36 kg/acre (vine kill). Apply with a desiccant recommended on the label at vine kill or alone after vine kill, prior to harvest.	1.0 L/acre (vinekill). Apply with desiccant at vine kill or alone after vine kill, prior to harvest.

Crop	Disease	Application Rate and Timing				
Dry bean	Anthracnose (*Colletotrichum truncatum*)	2.2 kg/acre. Apply prior to disease development or at the onset of disease	-	-	*(Parasol WG only)* 0.9 to 1.3 kg/acre. Apply prior to disease development or at the onset of disease	
	Downy mildew (*Phytophthora phaseoli*)		-	-	-	
	Common bacterial blight *(Xanthomonas campestris pv. phaseoli)*, halo blight *(Pseudomonas syringae pv. phaseolicola)*			Use a 0.5% to 2% solution, applied at 190 to 380 L/acre. Apply 2 weeks before disease normally appears (make use of predictive disease models if available). Re-apply using 5 to 10 day intervals.		
Dry bean, soybean, field pea, lentil and chickpea	Ascochyta blight *(Ascochyta pisi)*, brown spot *(Pseudomonas syringae pv. syringae)*, powdery mildew *(Erysiphe* spp.*)*, rust *(Uromyces appendiculatus)*					

Application Information:

- **Ground:** Follow the instructions on the label for each of the product. Use enough water to ensure thorough coverage. As noted on the labels, 400 L per acre (*Copper 53W* and *Copper Spray*); boom height must be 60 cm or less above the crop or ground (*Cueva*).
- **Aerial:** DO NOT apply by air

How it Works:

The active ingredients containing copper are inorganic fungicides with contact activity. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Restrictions:

- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Maximum number of applications:**
  - ***Cueva:*** DO NOT exceed 15 applications per year.
  - ***Bean (Parasol WG)*** – DO NOT exceed 6 applications per season.
  - ***Potato (Parasol WG and Parasol FL)*** – DO NOT exceed 10 applications per season.
  - ***Potato (HyCop)*** – DO NOT exceed 8 applications per season.
- **Grazing:** No restrictions listed.
- **Preharvest interval:** DO NOT apply within three days of harvest or as indicated on label.
- **Restricted Entry Interval:**
  - ***Copper 53W, Copper Spray, HyCop, Parasol FL, and Parasol WG*** – DO NOT re-enter treated areas within 48 hours of application
  - ***Cueva*** – 4 hours
- **Re-cropping:** No restrictions listed.
- **Storage:** Store in original container in a cool, dry, well ventilated area. To prevent contamination store this product away from food or feed. Protect from freezing. Keep away from heat, fire, and sparks. Store out of reach of children and animals.
- **Environment:** DO NOT apply or allow to drift onto streams or any body of water. To reduce runoff from treated areas into aquatic habitats avoid application to areas with a moderate to steep slope, compacted soil, or clay. Avoid application when heavy rain is forecast. Contamination of aquatic areas as a result of runoff may be reduced by including a vegetative strip between the treated area and the edge of the water body.
- **Toxicity:** Toxic to birds, small wild mammals and aquatic organisms (indicated on *Cueva* label).

Hazard Rating:

Copper 53W, Copper Spray: Warning – Poison

Parasol WG and Parasol FL: Caution – Poison

Refer to the Introduction for an explanation of the symbols.

Cotegra

Fungicide Group 3, 7

Company:

BASF Canada (PCP#32530)

Formulation:

250 g/L boscalid and 150 g/L prothioconazole formulated as a suspension concentrate.

- Container size – 2 x 9.8 L per case

Crops, Diseases, Rates and Timing:

Crop	Diseases	Application Rate (per acre)	Application Timing
Canola (including rapeseed and oriental mustard)	Control of sclerotinia stem rot (*Sclerotinia sclerotiorum*)	240 to 280 mL	Apply *Cotegra* at 20 to 50% flowering. Select the use rate based on relative disease pressure. Use the high rate when risk for disease development is high (e.g. narrow host rotation with disease history and high potential for inoculum). Apply a second application 7 to 14 days if disease persists or weather conditions are conducive for disease development.
Chickpeas	Suppression of white mould (*Sclerotinia sclerotiorum*) and Grey mold (*Botrytis cinerea*); Control of Ascochyta blight (*Ascochyta rabiei*)	280 mL	Apply Cotegra at the beginning of flowering or at the onset of disease symptoms. Apply a second application 7 to 14 days if disease persists or weather conditions are conducive for disease development.
Dry bean; faba bean	Suppression of white mould (*Sclerotinia sclerotiorum*)	400 mL	Apply *Cotegra* at 20 to 50% flowering. Apply a second application 7 to 14 days if disease persists or weather conditions are conducive for disease development.
Field Peas	Control of Mycosphaerella blight (*Mycosphaerella pinodes*) and Ascochyta blight (*Ascochyta pinodes*) at high rate; suppression at low rate. Suppression of white mould (*Sclerotinia sclerotiorum*) at high rate.	240-280 mL	Apply Cotegra at the beginning of flowering or at the onset of disease symptoms. Apply a second application 7 to 14 days if disease persists or weather conditions are conducive for disease development.
Lentils	Control of anthracnose (*Colletrotrichum lentis*) including biotypes resistant to Group 11 fungicides at high rate; suppression at low rate. Suppression of white mould (*Sclerotinia sclerotiorum*) and suppression of Grey mold (*Botrytis cinerea*) at high rate.	240-280 mL	Apply Cotegra at the beginning of flowering or at the onset of disease symptoms. Apply a second application 7 to 14 days if disease persists or weather conditions are conducive for disease development.
Soybean	Control of frogeye leaf spot (*Cercospora sojina*), pod and stem blight (*Diaporthe phaseolorum*) Suppression of white mould (*Sclerotinia sclerotiorum*), brown spot (*Septoria glycines*)	280 mL	Apply *Cotegra* prior to disease development when conditions are favourable for disease development or at the onset of disease symptoms. Apply a second application 7 to 14 days if disease persists or weather conditions are conducive for disease development.

Application Information:

- **Water Volume:**
  - ***Ground:*** Use a minimum water volume of 40 L per acre and ensure thorough coverage of foliage.
  - ***Aerial:*** Use a minimum water volume of 20 L per acre and ensure thorough coverage of foliage.

How it Works:
The active ingredient boscalid is a carboxamide (SDHI) fungicide with systemic activity. The active ingredient prothioconazole is a triazole fungicide with broad-spectrum systemic activity. To be used as a preventative application when environmental conditions are favourable for disease development. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:
None registered.

Restrictions:
- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Maximum number of applications:**
  - ***Canola, mustard, dry bean, chickpea, lentil, pea, soybean*** – DO NOT exceed 2 applications of this product per season.
- **Grazing:** All crops can be grazed or fed to livestock 7 days after application.
- **Preharvest interval:**
  - ***Beans, chickpea, lentil, pea, soybean*** – 21 days
  - ***Canola, rapeseed, and oriental mustard*** – 36 days
- **Restricted Entry Interval:** DO NOT re-enter treated area for 24 hours after application.
- **Re-cropping:** A plant back restriction of 14 days is required for all crops not on the label. 30 days for all crops NOT on the label.
- **Storage:** Store the leftover product in original tightly closed container. Protect from freezing. Store in a cool, dry, locked, well-ventilated area without a floor drain.
- **Environment:** Toxic to aquatic organisms. Observe buffer zones and DO NOT apply to any body of water or where runoff is likely to occur.

Hazard Rating:
Caution – Poison

Refer to the Introduction for an explanation of the symbols.

Curzate

Fungicide Group 27

Company:
Corteva Agriscience (PCP#26284)

Formulation:
60% cymoxanil formulated as a dry flowable.
- Container size – 1.8 kg

Crops, Diseases Timing:
Control of late blight *(Phytophthora infestans)* in potato. Initial applications should start when local conditions indicate that late blight is imminent. Make additional applications at 5 to 7 day intervals; however, at least 20 days must pass between the second and third application.

Rate:
Apply *Curzate* at 90 grams per acre
-plus-
Manzate DF or *Manzate Pro-Stick* at 540 grams to 650 grams per acre.

Application Information:
- **Water Volume:**
  - ***Ground:*** Utilize sufficient water to obtain thorough coverage – 80 to 400 L per acre.
  - ***Aerial:*** Apply by air with a minimum water volume of 20 L per acre.

How it Works:
The active ingredient cymoxanil is a cyanoacetamide-oxime fungicide with locally systemic activity. To be used as a preventative, curative and inhibitive (antisporulant) fungicide application. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:
DO NOT use *Curzate* alone. Use only in a tank mix with *Dithane Rainshield*, *Manzate DF* or *Manzate Pro-Stick*.

Restrictions:

- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Maximum number of applications:** DO NOT exceed 4 applications of this product per season.
- **Grazing:** No restrictions listed.
- **Preharvest interval:** 8 days
- **Restricted Entry Interval:** DO NOT re-enter treated areas within 24 hours of application.
- **Re-cropping:** No restrictions listed.
- **Storage:** Store product in original container in a secure, dry area away from food or feed. Protect against humid air and water. Not for use or storage in or around the home. Keep container tightly closed.
- **Environment:** A buffer zone of 50 m is required between the down-wind edge of the boom and sensitive aquatic habitats such as ponds, lakes, rivers, streams, and wetlands. DO NOT contaminate these habitats when cleaning and rinsing equipment or containers. DO NOT clean sprayer near well or water source or near desirable vegetation.

Hazard Rating:

Danger – Poison

Caution – Eye Irritant

Refer to the Introduction for an explanation of the symbols.

Custodia

Fungicide Group 3, 11

Company:

Adama Canada (PCP#33672)

Formulation:

200 g/L of Tebuconazole and 120 g/L of Azoxystrobin formulated as a suspension concentrate.

- Container size – 10.08 L

Crops, Diseases, Rates and Timing:

Crop	Diseases	Application Rate (per acre)	Application Timing
Wheat (spring, winter, durum)	Leaf rust, Stem rust, Stripe rust, Septoria leaf blotch, Tan spot	190-250 mL/ac	Apply *Custodia®* to leaf foliage at the first sign or very early stage of disease, up to the end of the flowering period. Use of the higher rate should be considered when weather conditions are conducive to heavy disease development.
Barley	Net blotch, Spot blotch, Leaf rust, Stem rust, Stripe rust, Septoria leaf blotch, Tan spot	190-250 mL/ac	Apply *Custodia®* to leaf foliage at the first sign or very early stage of disease. Use of the higher rate should be considered when weather conditions are conducive to heavy disease development.
Oats	Crown rust, stem rust, septoria leaf blotch	190 mL/ac	Apply *Custodia®* to leaf foliage at the first sign or very early stage of disease.
Soybean	Frogeye leaf spot	190-250 mL/ac	Apply *Custodia®* at the very early stages of disease development. Use of the higher rate should be considered when weather conditions are conducive to heavy disease development or when heavy disease pressure is present.

Application Information:

- **Water Volume:**
  - ***Ground:*** minimum 40 L per acre.
  - ***Aerial:*** minimum 20 L per acre.

How it Works:

The active ingredient azoxystrobin is a methoxyacrylate compound (strobilurin) with broad spectrum contact and systemic activity. To be used as a preventative and curative fungicide application. The active ingredient tebuconazole is a triazole demethylation inhibitor (DMI) fungicide with systemic broad-spectrum activity. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:

None registered.
According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Restrictions:

- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Maximum number of applications:** Do not apply more than once per year.
- **Grazing:** DO NOT graze or feed green forage to livestock prior to 6 days after treatment. Straw cut after harvest may be fed or used for bedding.
- **Preharvest interval:**
  - ***Mature grain*** – 36 days.
  - ***Forage and hay*** – 6 days
- **Restricted Entry Interval:** DO NOT re-enter treated areas within 12 hours of application.
- **Re-cropping:** No restrictions listed.
- **Storage:** Store above 5°C in original, tightly closed container. DO NOT ship or store near food, feed, seed and fertilizers. Store in a cool, dry, locked, well-ventilated area without a floor drain. Keep from freezing.
- **Environment:** This product is toxic to birds, small wild animals, aquatic organisms, and non-target plants. This product demonstrates the properties and characteristics associated with chemicals detected in ground water. The use of *Custodia* foliar fungicide in areas where soils are permeable, particularly where the water table is shallow, may results in ground water contamination. To reduce runoff from treated areas in to aquatic habitats avoid application to areas with a moderate to steep slope, compacted soil or clay. Avoid application when heavy rain is forecast. Contamination of aquatic areas as a results of runoff may be reduced by including a vegetative strip between the treated area and the edge of the water body.

Hazard Rating:

Caution – Poison

Refer to the Introduction for an explanation of the symbols.

Delaro 325 SC

Fungicide Group
3, 11

Company:
Bayer (PCP#31533)

Formulation:
175 g/L of prothioconazole and 150 g/L of trifloxystrobin formulated as a suspension concentrate.
- Container size – 7.1 L

Crops, Diseases, Rates and Timing:

Crop	Diseases Controlled	Application Rate (per acre)	Application Timing
Wheat (spring, durum)	Septoria leaf blotch (*Septoria tritici*), Powdery mildew (*Erysiphe graminis*), Tan spot (*Pyrenophora tritici-repentis*), Leaf rust (*Puccinia triticina*), Stem rust (*Puccinia graminis*), Stripe rust (*Puccinia striiformis*)	230 mL	Apply preventatively or at the very early stages of disease development, from 4 leaf to flag leaf, but prior to head emergence.
Barley	Net blotch (*Pyrenophora teres*), Scald (*Rhynchosporium secalis*), Leaf rust (*Puccinia hordei*), Stem rust (*Puccinia graminis*), Stripe rust (*Puccinia striiformis*), Powdery mildew (*Erysiphe graminis*)		
Oats	Crown rust (*Puccinia coronata*), Leaf blotch (*Septoria avenae*), Stem rust (*Puccinia graminis*)	230 mL	Apply preventatively or at the very early stages of disease development, from 4 leaf to flag leaf, but prior to head emergence.
Triticale	Stem rust (*Puccinia graminis*), Scald (*Rhynchosporium secalis*)		
Wheat (winter)	Septoria leaf blotch (*Septoria tritici*), Powdery mildew (*Erysiphe graminis*), Tan spot (*Pyrenophora tritici-repentis*), Leaf rust (*Puccinia triticina*), Stem rust (*Puccinia graminis*), Stripe rust (*Puccinia striiformis*)	177 to 230 mL	
Faba bean	Grey mould and chocolate spot (*Botrytis cinerea*), white mould (*Sclerotinia sclerotiorum*)	356 mL	Begin fungicide applications at the beginning of flowering or at first sign of disease.
Field Peas	Mycosphaerella blight *(Mycosphaerella pinodes)*, ascochyta blight *(Ascochyta pisi)*, white mould *(Sclerotinia sclerotiorum)*, grey mould *(Botrytis cinerea)*	356 mL	Apply at the first sign of disease. When disease pressure is high or when agronomic or weather conditions are conducive to disease development, make a second application 10 to 14 days later. Use shorter intervals for best protection.
Chickpea	Ascochyta blight *(Ascochyta rabiei)*, white mould *(Sclerotinia sclerotiorum)*, grey mould *(Botrytis cinerea)*		
Lentils	White mould *(Sclerotinia sclerotiorum)*, ascochyta blight *(Ascochyta lentis)*, grey mould *(Botrytis cinerea)*, anthracnose *(Colletotrichum truncatum)*		
Soybean	Brown spot *(Septoria glycines)*, phomopsis stem blight *(Phomopsis longicolla)*, white mould *(Sclerotinia sclerotiorum)*, frogeye leaf spot *(Cercospora sojina)*	230 mL	Apply preventatively or at the first signs of disease from early flowering (R1) to complete pod fill (R5). When disease pressure is high or when agronomic or weather conditions are conducive to disease development, make a second application 10 to 14 days later. Continue applications as needed on a 10 to 14 day interval.

Crop	Diseases Controlled	Application Rate (per acre)	Application Timing
Corn	Common rust (*Puccinia sorghi*), eye spot (*Aureobasidium zeae*), Northern corn leaf blight (*Setosphaeria turcica; anamorph Exserohilum turcicum*), grey leaf spot (*Cercospora zeae-maydis*)	230 mL	Apply at first sign of disease. When disease pressure is high or when agronomic or weather conditions are conducive to disease development, make a second application 10 to 14 days later.
Alfalfa for seed production only (minor use registration	Blossom blight (*Sclerotinia sclerotiorum, Botrytis cinerea*)	356 mL	Begin fungicide applications at the beginning of flowering or at first sign of disease. When disease pressure is high or when agronomic or weather conditions are conducive to disease development make a second application 10 to 14 days later.

Application Information:

- **Water Volume:**
  - ***Ground:*** minimum 40 L per acre.
  - ***Aerial:*** minimum 20 L per acre.

How it Works:

The active ingredient prothioconazole is a triazole fungicide with broad spectrum systemic activity. The active ingredient trifloxystrobin is a strobilurin fungicide with broad spectrum preventative activity. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:

None registered.
According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Restrictions:

- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Maximum number of applications:** DO NOT exceed 2 applications of *Delaro 325 SC* per season in field pea, chickpea, lentil, soybean, winter wheat and corn. DO NOT exceed 1 application of *Delaro 325 SC* per season in barley, oats, triticale, spring wheat and durum.
- **Grazing:** No restrictions listed.
- **Preharvest interval:**
  - ***Wheat, barley, oats, triticale*** – 45 days
  - ***Field pea, chickpea, lentil*** – 30 days
  - ***Field corn, popcorn*** – 30 days
  - ***Soybean*** – 20 days
  - ***Sweet corn*** – 14 days
  - ***Flax*** – 36 days
- **Restricted Entry Interval:** DO NOT re-enter treated areas within 12 hours of application.
- **Re-cropping:** Crops listed on label, corn, cereals and sugarbeet may be planted immediately following last application. DO NOT plant any other crops within 30 days of application of *Delaro 325 SC*.
- **Storage:** Store this product away from food or feed. Keep away from fire or open flame or other sources of heat. DO NOT store at temperatures below freezing. If stored for 1 year or longer, shake well before using. Store away from feed, seed, fertilizer, plant and foodstuffs. DO NOT store in or around the home. Keep in original container during storage.
- **Environment:** Toxic to aquatic organisms and non-target terrestrial plants. DO NOT contaminate irrigation or drinking water supplies or aquatic habitats by cleaning of equipment or disposal of wastes. DO NOT apply to areas where runoff is likely to occur.
- Rainfast 1 hour.

Hazard Rating:

Caution – Eye Irritant

Potential Skin Sensitizer
Refer to the Introduction for an explanation of the symbols.

Delaro Complete*

Fungicide Group 3, 7, 11

***NOTE:** As of January 1, 2025, www.keepitclean.ca indicates that the use of this product on certain crop types may have market access concerns. Please see pg. 12 for more information AND consult potential grain buyers before using this product.

Company:

Bayer (PCP#34095)

Formulation:

176.2 g/L Prothioconazole, 154 g/L Trifloxystrobin, and 128 g/L Fluopyram as suspension concentrate

- Container size – 7.1 L jug (20ac/jug), 113.8 L drum (320 ac/drum)

Crops, Diseases, Rates and Timing:

Crop	Diseases	Application Rate (per acre)	Application Timing
Lentils, chickpeas, field peas, dry beans, faba bean	Control of white mould (*Sclerotinia sclerotiorum*), grey mould (*Botrytis cinerea*), aschochyta blight (*Ascochyta spp.*), anthracnose in dry bean (*Colletotrichum lindemuthianum*), anthracnose in lentil (*Colletotrichum lentis*), mycosphaerella blight in field pea (*Mycosphaerella pinodes*), powdery mildew (*Erysiphe pisi*), chocolate spot in Faba bean (*Botrytis cinerea*)	356mL	Begin fungicide applications preventatively, at the beginning of flowering or at first sign of disease. When disease pressure is high or when agronomic or weather conditions are conducive to disease development, make a second application 7 to 14 days later. Within the stated interval range, use shorter intervals for best protection. Ensure that the area to be treated is covered uniformly. Good spray coverage and canopy penetration are important for best results.
Soybean	Control of frogeye leaf spot (*Cercospora sojina*), brown spot (*Septoria glycines*), phomopsis stem blight (*Phomopsis longicolla*) Suppression of charcoal rot (*Macrophomina phaseolina*), and white mould (*Sclerotinia sclerotiorum*)	237mL	Begin fungicide applications preventatively or at the first signs of disease from early flowering (R1) to complete pod fill (R5). When disease pressure is high or when agronomic or weather conditions are conducive to disease development, make a second application 10 to 14 days later.
Corn (sweet corn, field corn, popcorn, including corn grown for seed)	Control of common rust (*Puccinia sorghi*), southern corn rust (*Puccinia polysora*), eye spot (*Aureobasidium zeae,* syn. *Kabatiella zeae*), northern corn leaf blight (*Setosphaeria turcica,* syn. *Exserohilum turcicum*), grey leaf spot (*Cercospora zeae-maydis*), tar spot (*Phyllachora maydis*)	237mL	Apply DELARO COMPLETE when disease first appears and re-apply after 7-14 days if favourable conditions for disease development persist. DO NOT apply DELARO COMPLETE with an adjuvant in corn. Do not apply more than 2 applications of DELARO COMPLETE per crop year. To limit the potential for development of disease resistance to these fungicide classes do not make more than 2 applications of DELARO COMPLETE or any Group 11 or Group 7 containing fungicide before rotating with a fungicide from a different Group.

Crop	Diseases	Application Rate (per acre)	Application Timing
Winter Wheat	Control of septoria leaf blotch (*Septoria tritici*), powdery mildew (*Erysiphe graminis*), tan spot (*Pyrenophora tritici-repentis*), leaf rust (*Puccinia triticina*), stem rust (*Puccinia graminis*), stripe rust (*Puccinia striiformis*)	189mL to 237mL	DELARO COMPLETE should be applied as a preventative disease control measure or at the very early stages of disease development. This could occur anytime during tillering or stem elongation. Typically, one application from the tillering up to flag leaf emergence is required. A second application may be made if needed. DO NOT apply within 14 days of the first treatment. DELARO COMPLETE must be applied prior to head emergence. Timing of Application: Single application: 4-leaf stage up to flag leaf (GS 14-47). Two applications: First application: 4-leaf stage to flag leaf stage. Second application: not within 14 days of the first application and prior to head emergence.
Wheat (spring and durum)	Control of septoria leaf blotch (*Septoria tritici*), powdery mildew (*Erysiphe graminis*), tan spot (*Pyrenophora tritici-repentis*), leaf rust (*Puccinia triticina*), stem rust (*Puccinia graminis*), stripe rust (*Puccinia striiformis*)	237mL	DELARO COMPLETE should be applied as a preventative disease control measure or at the very early stages of disease development. Typically this application will occur from tillering up to flag leaf emergence.
Barley	Control of net blotch (*Pyrenophora teres*), scald (*Rhynchosporium secalis*), leaf rust (*Puccinia hordei*), stem rust (*Puccinia graminis*), stripe rust (*Puccinia striiformis*), powdery mildew (*Erysiphe graminis*)		
Oats	Control of crown rust (*Puccinia coronata*), septoria leaf blotch (*Septoria avenae*), stem rust (*Puccinia graminis*)		
Triticale	Control of stem rust (*Puccinia graminis*), scald (*Rhynchosporium secalis*)	237mL	

Application Information:

- **Water Volume:**
  - ***Ground:*** 40 Litre/acre.
  - ***Air:*** 20 Litre/acre.
- For application in dry shelled pea and bean, *Delaro Complete* should be thoroughly dispersed prior to the addition of a Non-Ionic Surfactant. *Delaro Complete* may be used with a registered Non-Ionic Surfactant, such as Agral 90 or Ag-Surf, at 0.125% vol/vol.

How it Works:

The active ingredient prothioconazole is a triazole fungicide with broad-spectrum systemic activity. Trifloxystrobin is a strobilurin fungicide with broad spectrum preventative activity. The active ingredient fluopyram is a carboxamide fungicide with systemic activity. Fluopyram is highly plant mobile and works to disrupt disease spore germination.

Tank Mixes:

Follow the product label. When tank mixes are permitted, consult the labels of the tank-mix partners and observe the largest (most restrictive) spray buffer zone of the products involved in the tank mixture and apply using the coarsest spray (ASAE) category indicated on the labels for those tank mix partners.

Restrictions:

- **Maximum number of applications:** maximum 2 application per season.
- **Rainfall:** Avoid application when heavy rain is in forecast.
- **Pre-harvest Intervals:** see table below.
- **Grazing:** see table below.
- **Re-entry:** 12 hours after application (see table below).

Crop	Pre Harvest Interval (days)	Pre-Grazing Interval (days)	Re-entry
Soybean	20	n/a	12 hours
Dried shelled pea and bean	30	7	12 hours
Field corn, popcorn	14 (grain)	14 (forage, stover)	12 hours (including mechanical detasseling of corn)
Sweet corn	14 (ears)	14 (forage, fodder)	12 hours; (14 days for manual detasseling of corn)
Spring and durum wheat, barley, oats, triticale	45	30 (grazing/forage) 45 (hay, straw, grain)	12 hours
Winter wheat	45	**1 application:** 30 (grazing/forage) 45 (hay, straw, grain) **2 applications:** Do not allow livestock to graze within the treated area and do not harvest	12 hours

- **Re-cropping interval:** Treated areas may be replanted with any crop specified on the label as soon as practical after the last application. For all other crops, do not plant back within 30 days of last application.
- **Storage:** Store this product away from food or feed. Do not contaminate water, food, or feed by storage or disposal. Do not store below freezing. Keep away from direct sunlight. If stored for 1 year or longer, shake well before using. Store the tightly closed container away from feeds, seeds, fertilizer, plants and foodstuffs. Do not use or store in or around the home. Keep the product in the original container during storage.
- **Environment:** Toxic to birds. Toxic to aquatic organisms and non-target terrestrial plants. Observe spray buffer zones. Toxic to certain beneficial arthropods (which may include predatory and parasitic insects, spiders, and mites). Minimize spray drift to reduce harmful effects on beneficial arthropods in habitats next to the application site such as hedgerows and woodland. DO NOT contaminate irrigation or drinking water supplies or aquatic habitats by cleaning of equipment or disposal of wastes.

Hazard Rating:

Eye irritant, Skin Sensitizer, Lung Irritant

Diplomat 5SC Fungicide

Fungicide Group 19

Company:
Belchim Crop Protection Canada Inc. (PCP # 32918)

Formulations:
Polyoxin D Zinc Salt, 5.0% as formulated as Suspension Concentrate
- Container size: 4 x 5L

Crops, Diseases, Rates and Timing:

Crop	Diseases controlled	Application Rate (per acre)	Application Timing
Potatoes	Suppression of Early blight *(Alternaria solani)*	221 – 375 mL/acre	Begin as a preventative application when conditions favour disease development and continue on a 7-14 day interval as needed to maintain suppression. Do not apply by air.

Application Information:
- **Water Volume:**
  - **Ground:** Apply as a foliar spray in sufficient water to provide thorough coverage of foliage.
  - Do not apply by air.

How it Works
Polyoxin D zinc salt stops the growth of susceptible fungal pathogens by interfering with their cell wall growth.

Tank Mixes:
None registered.

Restrictions:
- **Maximum number of applications:** Do not apply more than 61 g a.i./acre/season
- **Rainfall:** Avoid application when heavy rain is forecast.
- **Pre-harvest Intervals:** 0 days
- **Re-entry:** Until sprays have dried
- **Re-cropping interval:** n/a
- **Storage:** Store in the original container in a dry location away from food or feed
- **Environment:** To reduce runoff from treated areas into aquatic habitats avoid application to areas with a moderate to steep slope, compacted soil, or clay. Avoid application when heavy rain is forecast. Contamination of aquatic areas as a result of runoff may be reduced by including a vegetative strip between the treated area and the edge of the water body.

Hazard Rating:
None listed.
Potential Skin Sensitizer

Double Nickel LC/Double Nickel 55

Fungicide Group 44

Company:

Distributed by UAP *(Double Nickel LC; Double Nickel 55)*

Formulations:

***Double Nickel LC* (PCP#31887):** 1 x 10^{10} *Bacillus amyloliquefaciens* strain D747 spores/mL (minimum) formulated in an aqueous suspension.

- Container size – 2 x 9.46 L and 1,000 L

***Double Nickel 55* (PCP#31888):** 5 x 10^{10} *Bacillus amyloliquefaciens* strain D747 spores/g formulated in a water dispersible granule.

- Container size – 4 x 2.27 kg

Crops, Diseases, Rates and Timing:

Crop	Diseases Controlled	Application Rates		Application Timing
		Double Nickel LC (L/acre)	*Double Nickel 55* (kg/acre)	
Potato	White mould *(Sclerotinia sclerotiorum)*	0.4 to 2 L	0.08 to 0.4 kg	Begin preventative foliar application when conditions are favorable for disease development. Repeat application every 3 to 10 days if the favorable conditions for disease development persist. Apply when disease pressure is low or newly emerged plants.
	White mould *(Sclerotinia sclerotiorum)*	2 to 5* L	0.4 to 1* kg	Use higher rate (*) when disease pressure is moderate to high or when environmental conditions or plant stage is conducive to rapid disease development
	Early blight *(Alternaria solani)*	1 to 4 L	0.2 to 0.8 kg	Begin foliar application on onset of crop cover to formation of tuber. Repeat application every 3 to 10 days if the favorable conditions for disease development persist.
	Black scurf *(Rhizoctonia solani)*	0.4 to 2 L	0.08 to 0.4 kg	Apply in soil at the time of planting, following the instructions for Banded/in-furrow application
Soybean	White mould *(Sclerotinia sclerotiorum)*	1 to 4 L	0.2 to 0.8 kg	Begin foliar application from early flowering to pod set. Repeat application every 3 to 10 days if the favorable conditions for disease development persist.

Crop	Diseases Controlled	Application Rates		Application Timing
		Double Nickel LC (L/acre)	*Double Nickel 55* (kg/acre)	
Hemp	Suppression of white mold (*Sclerotinia sclerotiorum*), grey mold (*Botrytis cinerea*)	1 to 2 L	0.2 to 0.4 kg	Growth stage: From planting/ transplanting until maturity and harvest. Begin applications preventatively when conditions are favorable for onset of disease. Ensure full spray coverage. White mold: Repeat application every 3 to 14 days for as long as conditions favor disease development. Grey mold: Repeat application every 3 to 11 days for as long as conditions favor disease development. Under moderate to high disease pressure, or when environmental conditions and plant stage are conducive to rapid disease development, use higher label rates (2.02 L/ac), or apply more frequently (every 3 to 7 days). Lower rates (1.01 L/ac) may be applied under low disease pressure or to smaller (e.g. newly-emerged or transplanted plants and cuttings).

Application Information:

- **Foliar:** Mix in sufficient volume of water to achieve thorough coverage of the crop canopy with minimal runoff.
- **For control of early blight, black scurf in potato and white mould in soybean:** Apply lower rate under low disease pressure or to smaller, newly emerged plants. Higher rates may be applied when disease pressure is moderate to high or when environmental conditions and plant stage are conducive to rapid disease development. Apply more frequently (3 to 7 days) or rotate with other fungicides for improved performance.
- **Soil application:** Apply by banded/in-furrow application. Mix the required amount of product in water and apply as banded spray (10 to 15 cm wide) or seedrow drench centered over the furrow. Apply directly over the seeds in the furrow just before seeds are covered with soil. Refer to the product labels for the table with application rates for different row spacing's.

How it Works:

The active ingredient, Bacillus amyloliquefaciens strain D747, is a beneficial bacterium with broad spectrum activity. B. amyloliquefaciens colonizes the plant surfaces preventing establishment of disease-causing fungi and bacteria.

Tank Mixes:

None registered.

Restrictions:

- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Maximum number of applications:** Can be applied every 3 to 10 days as long as conditions favor disease development.
- **Grazing:** No restrictions listed.
- **Pre-harvest Interval:**
  - ***Hemp*** – 3 to 4 weeks
- **Restricted Entry Interval:** DO NOT re-enter treated areas within 4 hours of application.
- **Re-cropping:** No restrictions listed.
- **Storage:** Store in original container away from children and direct sunlight, at 4 to 25˚C for up to two years. DO NOT contaminate feed/food.
- **Environment:** To reduce runoff into aquatic habitats, avoid application when heavy rain in forecast. Runoff can also be reduced by including a vegetative strip between the treated area and edge of water body.

Hazard Rating:

Possible eye irritant and may cause sensitization.

Dyax

Fungicide Group 7, 11

Company:
BASF Canada (PCP#32746)

Formulation:
250 g/L of fluxapyroxad and 250 g/L of pyraclostrobin formulated as a suspension concentrate.
- Container size – 2 x 9.6 L

Crops, Diseases, Rates and Timing:

Crop	Diseases	Application Rate* (per acre)	Application Timing
Chickpea	Control of ascochyta blight (*Ascochyta rabiei*) Suppression of white mould (*Sclerotinia sclerotiorum*)	160 mL	Apply at the onset of symptoms and prior to row closure at the beginning of flower. DO NOT make sequential applications of *Dyax*.
Lentil	Control of anthracnose (*Colletotrichum truncatum*) and ascochyta blight (*Ascochyta lentis*) Suppression of white mold (*Sclerotinia sclerotiorum*)	120 to 160 mL/acre	Apply at the onset of symptoms and prior to row closure at the beginning of flower.
Faba bean	Ascochyta blight suppression (*Ascochyta* spp.), white mold suppression (*Sclerotinia sclerotiorum*)	120 to 160 mL	Apply at the beginning of flowering or at the onset of symptoms.
Field pea	Control of Mycosphaerella blight (*Mycosphaerella pinodes*), powdery mildew (*Erysiphe pisi*; high rate only), ascochyta blight (*Ascochyta pinodes*), white mold suppression (*Sclerotinia sclerotiorum*)	120 to 160 mL/acre	Apply at the onset of symptoms and prior to row closure at the beginning of flower.
Dry bean	Control of anthracnose (*Colletotrichum lindemuthianum*), powdery mildew (*Erysiphe* spp.) and rust (*Uromyces appendiculatus*)	160 mL	Apply at the beginning of flowering.
	Suppression of white mould *(Sclerotinia sclerotiorum*)	240 mL to 320 mL	
Soybean	Suppression of septoria brown spot (*Septoria glycines*), frogeye leaf spot (*Cercospora sojina*), white mould (*Sclerotinia sclerotiorum*)	120 to 160 mL/acre	Apply prior to disease development when conditions are favourable for disease development.
Canola	Control of Blackleg (*Leptosphaeria maculans*); Suppression of Sclerotinia stem rot (*Sclerotinia sclerotiorum*) and Alternaria black spot (*Alternaria brassicae* and *A. raphani*)	120 to 160 mL/acre	Apply *Dyax* at 20-50% flowering to suppress Sclerotinia stem rot and Alternaria black spot. If disease persists or weather conditions are favourable for disease development, make a second application 10 to 14 days later with a fungicide that contains a different mode of action. Apply *Dyax* at late flowering to early green pod to suppress black spot. Use the high rate under high disease pressure.
Flax	Control of Pasmo (*Septoria linicola*) Suppression of Sclerotinia stem rot (*Sclerotinia sclerotiorum*)	120 to 160 mL/acre	Apply *Dyax* at 20-50% flowering to control pasmo and suppress Sclerotinia stem rot.
Sunflower	Suppression of Leaf rust (*Puccinia helianthi*)	160 mL/acre	Apply *Dyax* at first sign of disease to suppress leaf rust.

Crop	Diseases	Application Rate* (per acre)	Application Timing
Alfalfa for seed production	Control of Common leaf spot (*Pseudopeziza medicaginis*; high rate only) Suppression of Blossom blight (*Sclerotinia sclerotiorum*)	120 to 160 mL/acre	For optimal disease control, apply *Dyax* at the beginning of flowering (10-30% bloom) or at the onset of disease. DO NOT make more than 1 application per year

DO NOT make sequential applications of *Dyax*. If disease persists or weather conditions are favourable for disease development, make a second application 10 to 14 days later, with a fungicide that contains a different mode of action. Use the shorter interval when disease pressure is high.

Application Information:

- **Water Volume:**
  - ***Ground:*** minimum 40 L per acre.
  - ***Aerial:*** minimum 20 L per acre.

How it Works:

The active ingredient fluxapyroxad is a carboxamide (SDHI) fungicide with system activity. The active ingredient pyraclostrobin is a strobilurin fungicide with broad spectrum contact and systemic activity. To be used as a preventative application when environmental conditions are favourable for disease development. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Restrictions:

- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Maximum number of applications:** DO NOT exceed 1 sequential application of this product per season with a maximum of two total applications per season.
- **Grazing:** All crops on this label can be grazed or fed to livestock. Observe the minimum pre-harvest intervals for each crop.
- **Preharvest interval:**
  - ***Field pea, lentil, chickpea, faba bean, dry bean*** – 30 days
  - ***Soybean*** – 21 days
- **Restricted Entry Interval:** DO NOT re-enter treated areas within 12 hours of application.
- **Re-cropping:** Crops listed on label, tuberous and corm vegetables, fruiting vegetables, pome fruits and stone fruits may be planted immediately following last application. A plant-back interval of one year is required for all other crops.
- **Storage:** Store this product away from food or feed.
- **Environment:** Maintain specified buffer zones. Toxic to aquatic organisms, small mammals, and non-target terrestrial plants.

Hazard Rating:

Danger Poison – Skin Irritant

Refer to the Introduction for an explanation of the symbols.

Elatus

Fungicide Group 7, 11

Company:
Syngenta Canada

Formulations:
The Elatus package has 2 components:
- *Elatus A Fungicide* (PCP #31973): 250 g/L azoxystrobin, formulated as a suspension
- *Elatus B Fungicide* (PCP #31977): 100 g/L benzovindiflupyr, formulated as an emulsifiable concentrate

Crops, Diseases, Rates and Timing:

Crop	Diseases	Rate *Elatus A*	Rate *Elatus B*	Application Timing
Chickpea	Ascochyta blight (*Ascochyta* spp.), anthracnose (*Colletotrichum* spp.) Suppression of white mould (*Sclerotinia sclerotiorum*)	200 mL/acre	200 to 300 mL/acre	In pulse crops, the first application must be applied before disease is established and no later than the onset of flowering. A second application can be made 10 to 14 days later, if disease pressure is severe or conditions are conducive to disease development.
Dry bean including faba bean	Ascochyta blight (*Ascochyta* spp.), anthracnose (*Colletotrichum* spp.) Suppression of white mould (*Sclerotinia sclerotiorum*)			
Field pea	Ascochyta blight (*Ascochyta* spp.), anthracnose (*Colletotrichum* spp.), mycosphaerella blight (*Mycosphaerella pinodes*), powdery mildew (*Microsphaera diffusa, Erysiphe pisi, E. polygoni*) Suppression of white mould (*Sclerotinia sclerotiorum*)			
Lentil	Ascochyta blight (*Ascochyta* spp.), anthracnose (*Colletotrichum* spp.) Suppression of white mould (*Sclerotinia sclerotiorum*)			
Potato	Control of silver scurf (*Helminthosporium solani*), rhizoctonia stem canker and rhizoctonia stolon canker (*Rhizoctonia* spp.), black scurf (*Rhizoctonia* solani)	4 to 6 mL/ 100 m row	200 to 300 mL/acre	Apply once as an in furrow spray in 20 to 55 L/acre of water at planting. Mount the spray nozzle so the spray is directed into the furrow as a 15 to 20 cm band just before the seed is covered. DO NOT apply by air.
	Suppression of verticillium wilt (*Verticillium dahlia*)	-	300 mL/acre	
Soybean	Control of cercospora leaf spot (*Cercospora kikuchii*), powdery mildew (*Microsphaera diffusa, Erysiphe pisi, E. polygoni*), septoria brown spot (*Septoria glycines*) Suppression of pod and stem blight (*Diaporthe phaseolorum*)	200 mL/acre	200 to 300 mL/acre	Make first application at the R1 to R3 developmental stage or when there is a 5% disease level in the field. A second application may be made 14 days later, if conditions are conducive to disease development.

As of January 1, 2021, www.keepingitclean.ca indicates that grain from pulse crops treated with this product may have market access concerns. Refer to "Understanding Maximum Residue Limit Statements in the Guide" in the introduction for more information AND *consult potential grain buyers before using this product.*

Application Information:
- If disease pressure is high, use the highest rate and shortest application interval. For best results, use sufficient water volume to provide thorough coverage.
- ***Ground:*** minimum of 40 to 80 L per acre water volume is recommended.
- ***Aerial:*** minimum of 18 L per acre water volume is recommended.
- Use sufficient water to obtain thorough coverage of plants. DO NOT apply under periods of dead calm. Avoid application of this product when winds are gusty.

How it Works:

The active ingredient azoxystrobin is a methoxyacrylate compound (strobilurin) broad spectrum contact and systemic activity with preventative and curative applications. The active ingredient benzovindiflupyr is a succinate dehydrogenase inhibitor (SDHI) fungicide with broad spectrum activity. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:

The Elatus package has 2 components. Add *Elatus A* (SC) and any additional SC formulation mix partners prior to adding *Elatus B* (EC) and any additional EC formulation mix partners.
It is not recommended to combine solid (WG or DF) formulations with liquid tank mix partners within a single batch. Batch mix any WG or DF formulation mix partners before *Elatus A* (SC) and any additional SC formulation mix partners. Any SN or SL formulation mix partners should be added by induction or an additional batch mix after the EC *(Elatus B)* and any additional EC formulation mix partners.

Restrictions:

Note that Elatus contains 2 components with separate labels. Follow the most restrictive precautions, restrictions, and directions found on each of the *Elatus A* and *Elatus B* labels.

- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Maximum number of applications:** DO NOT apply consecutive applications and DO NOT apply more than 2 applications per season.
- **Grazing:** DO NOT feed dried pea vines to livestock.
- **Preharvest interval:** DO NOT apply on pulse crops within 15 days of harvest. DO NOT apply on soybean within 14 days of harvest.
- **Restricted Entry Interval:** DO NOT re-enter fields for 12 hours after application.
- **Re-cropping:** Potatoes, pulse crops (including dried pea and bean subgroup), soybean, fruiting and cucurbit vegetables, cereals (wheat, barley, oat, rye, triticale), corn, and rapeseed (including canola, mustard, flax, and borage) may be planted immediately after last application as long as they are also registered for use with azoxystrobin products. All other crops intended for food and feed may be planted 180 days after last application of *Elatus*.
- **Storage:** Store product in original container only, away from other pesticides, fertilizer, food or feed. Not for use or storage in or around the home. Keep container closed. To prevent contamination, store this product away from food or feed.
- **Environment:** DO NOT use to control aquatic pests. *Elatus A* is extremely phytotoxic to certain apple varieties.
  DO NOT use where spray drift may reach apple trees.

Hazard Rating:

Warning Poison – Corrosive to Eyes and Skin

Refer to the Introduction for an explanation of the symbols.

Evito 480

Fungicide Group 11

Company:
UPL AgroSolutions Canada Inc. (PCP#30408)

Formulation:
480 g/L fluoxastrobin formulated as a suspension.
- Container size – 4.8 L

Crops, Diseases, Rates and Timing:

Crop	Diseases	Application Rate (per acre)	Application Timing
Wheat	Control of leaf rust *(Puccinia triticina, P. hordei)*, tan spot *(Pyrenophora tritici-repentis)*, stripe rust *(Puccinia striiformis)*, stem rust *(Puccinia graminis)* Suppression of septoria leaf blotch *(Septoria tritici)*	59 to 118 mL	Apply preventively and repeat if needed after a 14 to 21 day interval. Use the higher rates and shorter interval when disease pressure is high. Apply prior to disease development from Feekes 5 (Zadok's 30) up to late head emergence at Feekes 10.5 (Zadok's 59).
	Powdery mildew *(Erysiphe graminis)*	74 to 118 mL	
Barley, Rye, Triticale	Leaf rust *(Puccinia triticina, P. hordei)*, stripe rust *(Puccinia striiformis)*, stem rust *(Puccinia graminis)*, net blotch *(Pyrenophora teres)*	59 to 118 mL	Apply preventively and repeat if needed after a 14 to 21 day interval. Use the higher rates and shorter interval when disease pressure is high. Apply prior to disease development from Feekes 5 (Zadok's 30) up to late head emergence at Feekes 10.5 (Zadok's 59).
	Powdery mildew *(Erysiphe graminis)*	74 to 118 mL	
Oat	Crown rust (*Puccinia coronata*) (suppression), stem rust (*Puccinia graminis*), septoria leaf blotch (*Septoria avenae*) (suppression)	59 to 118 mL	Apply preventively and repeat if needed after a 14 to 21 day interval. Use the higher rates and shorter interval when disease pressure is high.
Corn	Common rust, *(Puccinia sorghi)*, grey leaf spot *(Cercospora maydis)* Suppression of northern corn leaf blight (*Setosphaeria turcica;* anamorph: *Exserohilum turcicum*)	59 to 120 mL	Apply preventatively and repeat if needed after 7 to 10 day intervals. Use higher rates and shorter intervals when disease pressure is high.
Canola , borage, flax (seed), camelina, and mustard (seed)	Suppression of sclerotinia stem rot (*Sclerotinia sclerotiorum*)	59 to 118 mL	Apply preventatively at 20% to 50% bloom stage. For optimum results apply prior to petal drop. Follow up with a second application as needed on a 7 to 14 day interval. Use higher rates and shorter interval when disease pressure is high.
Soybean	Control of frogeye leaf spot (*Cercospora sojina*)	59 to 120 mL	Apply preventatively and repeat if needed after a 14 to 21 day interval. Use the higher rate and shorter interval when disease pressure is high.
Potato*	Control of late blight (*Phytophthora infestans*) and black dot (*Colletotrichum coccodes*) Suppression of early blight	112 mL	Apply preventatively and repeat on a 7 day interval. If disease symptoms develop, switch to a fungicide with a different mode of action.
	Black scurf *(Rhizoctonia solani)*	1.55 to 2.33 mL product/ 100 m row	Apply as an in-furrow application or banded application shortly after plant emergence, during herbicide application or cultivation.*
	Silver scurf *(Helminthosporium solani)*	2.33 mL product/ 100 m row	Apply as an in-furrow application or banded application shortly after plant emergence, during herbicide application or cultivation.*

***Consult with product label before application.**

Application Information:

- **Water Volume:**
  - ***Ground:*** Apply in a minimum of 40 L of water per acre.
  - ***Aerial:*** Apply in a minimum of 20 L of water per acre.

How it Works:

The active ingredient fluoxastrobin is a systemic fungicide that works by interfering with respiration in plant pathogenic fungi, and is a potent inhibitor of spore germination and mycelial growth. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:

All Cereals: propiconazole.

- ***Wheat, barley and oat:*** tebuconazole, *Caramba, Proline 480 SC, Prosaro 250 EC*.

Corn: propiconazole (field, seed, sweet), chlorothalonil (sweet corn only).
Soybean: propiconazole, tebuconazole
Potatoes: MUST be tank mixed with chlorothalonil, mancozeb.
Refer to tank mix partner labels for use in directions, restrictions and precautions.

Restrictions:

- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Maximum number of applications:**
  - ***Wheat, barley, corn, oat, rye, triticale, canola, soybean*** – 2 applications per year
  - ***Potatoes*** – 3 applications per year
- **Grazing:** DO NOT apply within 7 days of harvest for hay and forage. If wheat forage will be harvested, make only one application.
- **Preharvest interval:**
  - ***All cereals*** – 40 days
  - ***Canola*** – 21 days
  - ***Potatoes*** – 7 days
  - ***Corn*** – 30 days (grain) or 7 days (sweet)
  - ***Soybean*** – DO NOT apply later than R6 (full seed)
- **Re-cropping:**
  - All crops on the *Evito 480* label (cereals, corn, canola, potato, soybean, dry bean, field pea, faba bean, chickpea, lentil) may be planted immediately following harvest.
  - Alfalfa and forage grasses may be planted following a 30 days plant back interval.
  - Sunflower may be planted following a 180 days plant back interval.
  - For all other crops, DO NOT plant back within one year of the last field application.
- **Storage:** Store in cool, dry place and in such a manner as to prevent cross contamination with other pesticides, fertilizers, food, or feed. Store in original container and out of reach of children, preferably in a locked storage area. *Evito 480* is not affected by freezing.
- **Environment:** Toxic to aquatic organisms. Observe butter zones as specified on the label. To reduce runoff from treated areas into aquatic habitats avoid application to areas with a moderate to steep slope, compacted soil, or clay.

Hazard Rating:

Potential Skin Sensitizer

Fluazinam

Fungicide Group 29

Company:
Syngenta Canada – *Allegro 500F* (PCP#27517),
Sipcam Agro USA, INC distributed by UAP Canada – *Downforce AG* (PCP#34723)

Formulation:
40% fluazinam.
- Container size – 2 x 10 L

Crops, Diseases, Rates and Timing:

Crop	Diseases	Application Rate (per acre)	Application Timing
Potato	Late blight (*Phytophthora infestans*)	160 mL	Begin applications when plants are 15 to 20 cm tall or when conditions favour disease development. Repeat application at 7 to 10 day intervals.
	Sclerotinia stem rot (*Sclerotinia sclerotiorum*)	160 to 240 mL	Begin applications at full bloom. Repeat application intervals of 7 to 10 days.
Dry bean	White mould (*Sclerotinia sclerotiorum*), Anthracnose (*Colletotrichum lindemuthianum*)	240 to 405 mL	For control of white mold make the first application at 10 to 30% bloom (e.g. when 10 to 30% of the plants have at least one (1) open bloom). If needed, a second application may be applied 7 to 10 days later. For control of Anthracnose make first application at 10-30% bloom (e.g. when 10 to 30% of the plants have at least (1) open bloom). If needed, a second application may be applied 10 to 14 days later. Under conditions favorable for severe disease development use the higher rate.
Soybean	White mould (*Sclerotinia sclerotiorum*)	180 to 470 mL	For suppression of white mould use 180 mL rate. For control of white mould use 355 to 470 mL rate. Begin application at the R1 (early bloom) to R2 (full bloom) stage of development and if needed, again 10 to 14 days later at early pod formation (R3).

Application Information:
- **Water Volume:**
  - ***Ground:*** 80 to 240 L per acre. Spray volumes vary with amount of plant growth; apply in sufficient water to obtain adequate coverage of foliage.
  - ***Aerial:*** For potatoes, soybean and dry bean minimum of 18 L per acre.

How it Works:
The active ingredient fluazinam is a pyridinamine fungicide with contact activity. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:
According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Restrictions:
- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Maximum number of applications:**
  - ***Bean and soybean*** – DO NOT exceed 2 applications of this product per season. DO NOT apply more than the maximum seasonal use rate of 809 mL (for bean) and 947 mL (for soybean) per acre during each growing season.
  - ***Potato*** – Make no more than 3 sequential applications of this product before alternating to another fungicide belonging to a different chemical family. DO NOT apply more than the maximum use rate of 1619 mL per acre during each growing season.
- **Grazing:** For soybean, DO NOT allow livestock to graze treated areas. DO NOT feed hay from treated fields to livestock.
- **Preharvest interval:** 14 days (potatoes); 30 days (dry bean). DO NOT apply after growth stage R3, early pod formation in soybean.
- **Restricted Entry Interval:** DO NOT re-enter treated areas within 24 hours of application.
- **Re-cropping:** Can be replanted with potatoes as soon as practical after the last application, 30 days for other root crops and leafy vegetables, and 70 days for all other crops. Fluazinam will carry over, DO NOT use in areas treated with this product during the previous season.

- **Storage:** Store product in a dry place separate from other pesticides, fertilizer, food, and feed.
- **Environment:** DO NOT contaminate aquatic habitats when cleaning and rinsing spray equipment or containers. DO NOT overspray non-target terrestrial or aquatic habitats.

Hazard Rating:

Caution – Poison

Warning – Skin Irritant
Potential Skin Sensitizer

Refer to the Introduction for an explanation of the symbols.

Fontelis

Fungicide Group 7

Company:

Corteva Agriscience (PCP#30331)

Formulation:

200 g/L penthiopyrad formulated as a suspension.

- Container size – 2 x 9.6 L jug

Crops, Diseases, Rates and Timing:

Crop	Diseases	Application Rate (per acre)	Application Timing
Alfalfa	Sclerotinia stem rot *(Sclerotinia sclerotiorum)*	500 to 700 mL	Begin applications prior to disease development and continue on a 7 to 14 day interval. Use higher rate and shorter interval when disease pressure is high.

Application Information:

- **Water Volume:**
  - ***Ground:*** 45 L per acre.
  - ***Aerial:*** 16 L per acre.
- Use sufficient water to obtain thorough coverage of plants. DO NOT apply under periods of dead calm. Avoid application of this product when winds are gusty.

How it Works:

The active ingredient penthiopyrad is a carboxamide fungicide with broad spectrum, locally systemic and curative properties recommended for foliar and soil borne plant diseases. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:

None registered.

Restrictions:

- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Maximum number of applications:** DO NOT exceed two sequential applications of this product before switching to a fungicide with a different mode of action. DO NOT exceed 1.4 L per acre in one season.
- **Grazing:** No restrictions listed.
- **Preharvest interval:** 14 days
- **Restricted Entry Interval:** DO NOT re-enter treated areas until 12 hours after application.
- **Re-cropping:** Crops and crop groups on the *Fontelis* label as well as the following crops may be planted immediately after harvest: canola, cereal grains crop group, corn, cotton, legume vegetables crop subgroup, soybean, sugarbeet, tuberous and corm vegetables and leaves crop subgroup. All other crops cannot be planted until 12 months after the last application.
- **Storage:** Store product in original container only, away from other pesticides, fertilizer, food or feed. Not for use or storage in or around the home. Keep container closed.
- **Environment:** This product is toxic to aquatic organisms. When using *Fontelis,* consult the product label for buffer zones.

Hazard Rating:

Potential Skin Sensitizer

Forum

Fungicide Group 40

Company:
BASF Canada (PCP#32026)

Formulation:
500 g/L of dimethomorph formulated as a suspension concentrate.
- Container size – 2 x 4.5 L

Crops, Diseases, Rates and Timing:

Crop	Diseases	Application Rate (per acre)	Application Timing
Potato	Late blight *(Phytophthora infestans)*	182 mL	Make the first application when disease threatens or when visible signs of disease occur in nearby fields. Apply every 5 to 7 days under high pressure or every 7 to 10 days under low pressure. A minimum interval of 5 days between applications is required.
	Tuber blight *(Phytophthora infestans)*	182 mL	Apply after first desiccation to target stem lesions to reduce tuber blight.

Application Information:
- **Water Volume:**
  - ***Ground:*** Use a minimum water volume of 20 L per acre.
  - ***Aerial:*** Use a minimum water volume of 80 L per acre.

How it Works:
The active ingredient dimethomorph is a carboxylic acid amide fungicide with contact, systemic and antisporulant activity. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:
Fungicides: For resistance management and early blight control *(Alternaria solani)*, *Forum* must be tank-mixed with one of *Dithane DG Rainshield* or *Bravo* at the product label rate.

Restrictions:
- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Maximum number of applications:** DO NOT exceed 3 applications.
- **Preharvest interval:**
  - ***Potatoes*** – 4 days
- **Restricted Entry Interval:** DO NOT re-enter treated areas within 12 hours of application.
- **Re-cropping:** DO NOT plant a new crop in the treated area within 120 days of the last application.
- **Storage:** Store under cool and dry conditions in secure, well-ventilated buildings, away from foodstuffs and animal feed and out of reach of children.
- **Environment:** Toxic to aquatic organisms and mammals. Observe buffer zones outlined in the label.

Hazard Rating:
Danger – Poison

Refer to the Introduction for an explanation of the symbols.

Fullback 125SC

Fungicide Group 3

Company:
FMC of Canada Ltd. (PCP#31679)
Distributed by: Belchim Crop Protection Canada

Formulation:
Flutriafol 125.08 g/L formulated as a suspension concentrate.

Crops, Diseases, Rates and Timing:

Crop	Diseases	Application Rate (per acre)	Application Timing
Soybean	Cercospora blight and leaf spot *(Cercospora kikuchii)*, brown spot *(Septoria glycines)*, frogeye leaf spot *(Cercospora sojina)*	207 to 414 mL	Apply as a broadcast foliar spray to soybean plants in R3 growth stage (early pod fill) or when environmental conditions are favourable for disease development. Apply second application if conditions are conducive for heavy disease development. Use the higher rate and shorter spray interval under severe sustained disease pressure. Spray Interval 14 to 21 days.

Application Information:
- **Water Volume:** minimum 40 L per acre.
- *ASABE medium* droplets. Boom height must be 60 cm or less above the crop.
- DO NOT apply by air

How it Works:
Flutriafol is a demethylation inhibitor with contact and systemic activity. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:
Fullback 125SC may be tank mixed with *Headline EC Fungicide* at the label rates for resistance management. If compatibility is in question, use the compatibility jar test before mixing the entire tank.

Restrictions:
- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Rainfall:** Within 2 hours may reduce effectiveness.
- **Maximum number of applications:** DO NOT apply more than 828 mL per acre per season. DO NOT apply more than 3 applications per growing season. Only one application at 414 mL per acre may be made to any one field during a single growing season. Apply only to soybean harvested for dry seed. Flutriafol is persistent and may carryover. It is recommended that any products containing flutriafol not be used in areas treated with this product during the previous season.
- **Grazing:** DO NOT feed forage or hay to animals or permit animals to graze.
- **Preharvest interval:** DO NOT apply within 21 days of harvest.
- **Restricted Entry Interval:** 12 hours.
- **Re-cropping:** Labeled crops may be planted anytime. Field corn, popcorn may be planted 150 days after application and sweet corn may be planted 200 days after application. All other unlabeled crops may be planted 365 days after application.
- **Storage:** Store unused product in original container in a cool, dry area. DO NOT contaminate water, food or feed by storage, disposal or cleaning of equipment. Shelf life of *Fullback 125 SC* is 3 years.
- **Environment:** DO NOT apply directly to water, or to areas where surface water is present or to intertidal areas below the mean high water mark. See label for more information on ground water contamination and surface water advisory. Avoid application when heavy rain is forecast. Toxic to aquatic organisms and non-target terrestrial plants. Contamination of aquatic areas as a result of runoff may be reduced by including a vegetative strip between the treated area and the edge of the water body.

Hazard Rating:
Potential Skin Sensitizer
Keep out of reach of children and prevent access by unauthorized personnel.

Gavel DF Fungicide

Fungicide Group 22, M3

Company:
Gowan Canada (PCP#26842)

Formulation:
66.7% mancozeb and 8.3% zoxamide formulated as a dry flowable.
- Container size – 13.6 kg

Crops, Diseases Timing:
Control of early blight *(Alternaria solani)* and late blight *(Phytophthora infestans)* in potato. Optimum disease control is achieved when the fungicide is applied in a regularly scheduled preventative spray program. Begin applications at the first sign of disease or when blight is reported in the area. Apply at 0.90 kg per acre (2.25 kg/ha) every 7 days under high disease pressure when either disease is present or environmental conditions favour continued disease development.
Apply at 0.70 kg per acre (1.7 kg/ha) every 7 days under low disease pressure and environmental conditions unfavorable for disease development.

Rate:
Apply at 0.70 to 0.90 kg per acre (1.7 to 2.25 kg/ha).

Application Information:
- Thorough, uniform coverage is essential for good disease control.
- **Water Volume:**
  - ***Ground:*** 18 to 36 L per acre (45 to 90 L/ha). Use 36 L of water per acre under high disease pressure to provide better crop coverage.
  - ***Aerial:*** 18 to 36 L per acre. Use 36 L of water per acre under high disease pressure to provide better crop coverage.

How it Works:
To be used as a preventative fungicide application. The active ingredient zoxamide is a benzamide fungicide with contact activity. The mancozeb component is a dithiocarbamate fungicide with contact activity. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:
This product may be tank mixed with a fertilizer, a supplement, or with registered pest control products, whose labels also allow tank mixing, provided the entirety of both labels, including Directions For Use, Precautions, Restrictions, Environmental Precautions, and Spray Buffer Zones are followed for each product. In cases where these requirements differ between the tank mix partner labels, the most restrictive label must be followed. Do not tank mix products containing the same active ingredient unless specifically listed on the label. In some cases, tank mixing pest control products can result in reduced pesticide efficacy or increased host crop injury. The user should contact Gowan Company at 1-800-960-4318 or information before applying any tank mix that is not specifically recommended on the label.

Restrictions:
- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Maximum number of applications:** DO NOT exceed 6 applications of this product per season.
- **Grazing:** No restrictions listed.
- **Preharvest interval:** 3 days
- **Restricted Entry Interval:** DO NOT re-enter treated areas within 12 hours of application.
- **Re-cropping:** A 30 day plant back interval (PBI) is required for leafy vegetables and root and tuber vegetables. For all other crops not included on the label, the PBI should be 140 days.
- **Storage:** DO NOT allow product to freeze. Keep away from fire and sparks. Store in a cool, dry, well ventilated place away from feed or food.
- **Ground application:** This pesticide is toxic to aquatic organisms. A buffer zone of up to 5 m for application by ground sprayer should be established between the last spray swath and the edge of aquatic systems. Follow product label for further instructions.
- **Aerial application:** A buffer zone of up to 350 m is required between the downwind edge of the boom and the closest edge of sensitive aquatic habitats, follow product label for further instructions.

Hazard Rating:

Caution Poison – Potential Skin Sensitizer

Warning – Eye Irritant

Refer to the Introduction for an explanation of the symbols.

Gauntlet

Fungicide Group 3, 11

Company:

Nufarm Agriculture (PCP# 35045)

Formulation:

150 g/L Azoxystrobin and 150 g/L Prothioconazole formulated as suspension concentrate

- Container size: 10L, 108L

Crops, Diseases, Rates and Timing:

Crop*	Disease**	Rate per acre	Crop stage and other timing information***
Canola	Suppresion of sclerotinia stem rot (*Sclerotinia sclerotiorum*)	400 mL	Apply when the crop is in the early bloom stage (10-50% bloom)
	Alternaria black spot (*Alternaria brassicae*, Alternaria raphanin)		Apply when the crop is at the pod (90% petal fall) stage
Lentil	Ascochyta blight (*Ascochyta lentis*), White mold (*Sclerotinia sclerotiorum*), Mycosphaerella blight (*Mycosphaerella pinodes*), Anthracnose (*Colletotrichum* spp.)	337 mL	Apply at the beginning of flowering or at the first sign of disease. After the initial application, one additional application may be made 10-14 days afterwards if conditions remain favourable for increased disease development. Maximum of two applications per year.

Application information

- Water Volume:
  - Ground: Minimum water volume 40 L/acre
  - Air: Minimum water volume 60 L/acre

How it Works

The active ingredient Prothioconazole is a triazole fungicide with broad-spectrum systemic activity. The active ingredient azoxystrobin is a methoxyacrlate compound (strobilurin) with broad spectrum contact and systemic activity with preventative and curative applications. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:

According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Restrictions:

- Maximum number of applications: Two
- Rainfall: Avoid application when heavy rain is in forecast.
- Pre-harvest Intervals: Lentils: 15 days. Canola: 36 days
- Re-entry: 24 hours
- Grazing: None specific.
- Re-cropping interval: Treated areas may be replanted with any crop specified on the label as soon as practical after the last application. For crops not listed on this label, do not plant back within 30 days of last application.
- Storage: Do not store at temperatures below freezing. Shake well before using if stored for greater than 1 year.

- Environment: Gauntlet is toxic to aquatic organisms. Observe spray buffer zones specified on label. Do not contaminate irrigation or drinking water supplies or aquatic habitats by cleaning of equipment or disposal of wastes. Avoid application to areas where ground runoff is likely to occur. The use of this product may result in contamination of groundwater, particularly in areas where soils are permeable (e.g. sandy soil) and/or the depth to the water table is shallow.

Hazard Rating:
Poison

Kenja 400SC

Fungicide Group 7

Company:
ISK Biosciences Corporation, distributed by Belchim Crop Protection Canada (PCP#31758)

Formulation:
400 g/L isofetamid formulated as a suspension
- Container size – 4 x 4L

Crops, Diseases, Rates and Timing:

Crop	Diseases Controlled	Application Rate (per acre)	Application Timing
Dry bean, faba bean, chickpea, lentil, field pea	Suppression of white mould (*Sclerotinia sclerotiorum*)	0.51 L	Apply at flowering prior to disease development. Can apply a subsequent application 7 to 14 days if disease risk is high and environmental conditions are conducive for disease development. DO NOT apply more than 2 applications of *Kenja 400 SC* per season.

Application Information:
- Thorough, uniform coverage is essential for good disease control.
- **Water Volume:**
  - ***Ground:*** minimum 20 L per acre.

How it Works:
The active ingredient isofetamid is a carboxamide (SDHI) fungicide with system activity. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:
None registered.

Restrictions:
- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Maximum number of applications:** DO NOT exceed 2 applications of *Kenja 400 SC* per season.
- **Grazing:** No restrictions listed.
- **Preharvest interval:** 30 days
- **Restricted Entry Interval:** DO NOT re-enter treated areas within 24 hours of application.
- **Re-cropping:** No restrictions listed.
- **Storage:** Store in a dry, secure place.
- **Environment:** Toxic to birds, small wild animals and aquatic organisms. Avoid application to areas with a moderate to steep slope, compacted soil or clay to reduce runoff. Avoid application when heavy rain is forecast. Contamination of aquatic areas as a result of runoff may be reduced by including a vegetative strip between the treated area and the edge of the water body. Follow buffer zones as per the product label.

Hazard Rating:
None listed.

LALSTOP Contans WG

Fungicide Group
Not classified, bio-fungicide

Company:
UAP (PCP#29066)

Formulation:
Wettable Granules – 5.0% *Coniothyrium minitans* strain CON/M/91-08. Contains minimum of 1 x 10^9 cfu per gram.
- Container size – 20 kg

Crops, Diseases, Rates and Timing:

Crop	Diseases	Application Rate (per acre)	Application Timing
Pre-plant – Soils where canola, sunflower, safflower, dry bean, alfalfa or soybean will be planted	White mould or sclerotinia stem rot (*Sclerotinia sclerotiorum*) and rots caused by *S. minor*	400 to 800 g	Prior to planting of spring crop; three months before the typical onset of sclerotinia stem rot or white mould. In fall, prior to spring planting of susceptible crop. After application to the soil, the product should be incorporated to within 5 cm of the topsoil. Incorporation should take place as soon as possible after application (within 1 week maximum).
		800 to 1600 g	If soil incorporation is to a depth greater than 5 cm, higher rate should be applied.
Postharvest – On harvest residue of susceptible crops		200 to 400 g	Prior to the next soil treatment, the residues of the susceptible crops in rotation can be also treated to help reduce inoculum loads of sclerotia in the field.

Application Information:
- Use sufficient water volumes to give thorough coverage of the soil surface and/or the crop residue (40 liters per acre of water volume).
- DO NOT allow spray mixture to stand overnight or for prolonged periods; should be used within 24 hours of being prepared.
- After incorporation, treated soils should not be disturbed to avoid bringing untreated sclerotia from lower soil depths to the topsoil layer.
- As part of an overall long-term pest management strategy, it is recommended to use other management practices along with *LALSTOP Contans WG* such as in season foliar fungicide applications and proper crop rotations.
- DO NOT apply by air.

How it Works:
The active ingredient, *Coniothyrium minitans*, is a fungus that infects the sclerotia of *Sclerotinia sclerotiorum* and *S. minor*. Infection of sclerotial bodies prevents production of ascospores and mycelial structures that infect plants. Regular use of *LALSTOP Contans WG* in successive years within a long-term management strategy will improve disease control.

Tank Mixes:
DO NOT tank-mix with fungicides or fertilizers. Also, DO NOT tank mix with acids, alkalines or any product that attacks organic materials. Contact UAP for more information on what products are compatible with *Contans WG*.

Restrictions:
- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Maximum number of applications:** No restrictions listed.
- **Grazing:** No restrictions listed.
- **Preharvest interval:** Can be applied up to and including the day of harvest.
- **Restricted Entry Interval:** No restrictions listed.
- **Re-cropping:** No restrictions listed.
- **Storage:** Maximum storage period of one year at 4°C or below. Up to 6 weeks at temperatures between 4°C and 23°C. Store in a dry area inaccessible to children. Store in original container away from food or feed.
- **Environment:** DO NOT apply this product directly to freshwater habitats, estuarine/marine habitats. DO NOT contaminate irrigation or drinking water supplies or aquatic habitats by cleaning of equipment or disposal of wastes.

Hazard Rating:

Caution – Potential Sensitizer

Refer to the Introduction for an explanation of the symbols.

Lance AG*

Fungicide Group 7, 11

***NOTE:** This product is no longer manufactured but product still remains in the distribution system. This product may be removed from future editions.

Lance AG is a co-pack of Lance WDG *and* Headline EC. *Due to the formulation of Lance AG, the range of diseases controlled by Lance AG are not the same as for the individual components. Please refer to the table below. For other detailed information on the component products, please see the product labels from* Lance WDG *and* Headline EC.

Company:

BASF Canada (*Lance WDG Fungicide* – PCP#27495; *Headline EC* – PCP#27322)

Formulations:

Lance AG A Fungicide: 70% boscalid formulated as a water dispersible granular.
Lance AG B Fungicide: 250 g/L of pyraclostrobin formulated as an emulsifiable concentrate.
Case of 2 Split chambered jugs containing 3.3 L *Headline EC (Lance AG* B) and 3.5 kg *Lance WDG (Lance AG* A).

Crops, Diseases, Rates and Timing:

(Ground, Aerial, and Pivot or Sprinkler Irrigation Applications)

Crop	Diseases Controlled	Application Rate (per acre)	Application Timing
Canola (including rapeseed), canola quality *B. juncea* and oilseed/condiment mustard	Control of sclerotinia stem rot *(Sclerotinia sclerotiorum)* Suppression of alternaria black spot (*Alternaria brassicae* and *Alternaria raphani*)	132 mL/acre *Lance AG* (B) and 140 g/acre *Lance AG* (A) (one jug does 25 acres)	Apply at 20 to 50% flowering.
Field Pea	Control of ascochyta blight *(Ascochyta* spp.*)*, mycosphaerella blight *(Mycosphaerella pinodes)*, grey mould *(Botrytis cinerea)*, powdery mildew *(Erysiphe* spp.*)* Suppression of downy mildew (*Peronospora viciae* f. sp. *pisi*)	165 mL/acre *Lance AG* (B) and 175 g/acre *Lance AG* (A) (one jug does 20 acres)	Apply at the beginning of flowering or at the onset of symptoms. In a planned two pass application, product should be sprayed as a second pass 10 to 14 days after first application.
Lentil	Control of anthracnose *(Colletotrichum truncatum)*, ascochyta blight *(Ascochyta lentis)*, white mould *(Sclerotinia sclerotiorum)*, grey mould *(Botrytis cinerea)*	165 mL/acre *Lance AG* (B) and 175 g/acre *Lance AG* (A) (one jug does 20 acres)	Apply at the beginning of flowering or at the onset of symptoms. In a planned two pass application, product should be sprayed as a second pass 10 to 14 days after first application.
Chickpea	Control of ascochyta blight *(Ascochyta lentis)*, white mould *(Sclerotinia sclerotiorum)*, grey mould *(Botrytis cinerea)*	165 mL/acre *Lance AG* (B) and 175 g/acre *Lance AG* (A) (one jug does 20 acres)	Apply at the beginning of flowering or at the onset of symptoms. If diseases persists or weather conditions are favourable for disease, apply a second application 10 to 14 days later with a fungicide that contains a different mode of action.
Alfalfa (for seed production only)	Control of common leaf spot *(Pseudopeziza medicaginis)*, blossom blight *(Sclerotinia sclerotiorum, Botrytis cinerea)*, spring black stem *(Phoma medicaginis)*, leaf spot *(Leptosphaerulina briosiani)*	165 mL/acre *Lance AG* (B) and 175 g/acre *Lance AG* (A) (one jug does 20 acres)	Apply at 10 to 30% bloom or at the onset of symptoms. If diseases persists or weather conditions are favourable for disease development, apply a second application 10 to 14 days later with a fungicide that contains a different mode of action.

***DO NOT apply by air**

Application Information:

- **Water Volume:**
  - ***Ground:*** Use a minimum volume of 40 L per acre and ensure thorough coverage of foliage.
  - ***Aerial:*** Use a minimum volume of 20 L per acre and ensure thorough coverage of foliage.

Restrictions:

- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Maximum number of applications:**
  - ***Alfalfa*** – DO NOT exceed one application of this product per season.
  - ***All other crops*** – DO NOT exceed 2 applications per season and rotate applications with a fungicide that contains a different mode of action.
- **Grazing:** DO NOT feed alfalfa hay or forage to livestock. All other crops on this label can be grazed – follow pre-harvest interval.
- **Preharvest interval:**
  - ***Field pea, lentil, chickpea, faba bean*** – 30 days
  - ***Canola*** – 21 days
  - ***Alfalfa*** – Not applicable
- **Restricted Entry Interval:** DO NOT re-enter treated areas until 12 hours after application.
- **Re-cropping:** All labelled crops and the tuberous and corm vegetables, fruiting vegetables, pome fruits and stone fruits may be planned immediately following the last application. A plant back restriction of 14 days for all other crops not on label.
- **Storage:** Store in a cool, dry, locked, well-ventilated area away from food or feed.
- **Environment:** DO NOT apply to any water body. Toxic to aquatic organisms and non-target terrestrial plants. Observe buffer zones outlined in the label.

Hazard Rating:

Caution Poison – Potential Skin Sensitizer

Warning – Eye Irritant

Refer to the Introduction for an explanation of the symbols.

LifeGard WG

Fungicide Group P 06

Company:

Certis USA, (PCP#32526)

Formulation:

40% *Bacillus mycoides* (isolate J) formulated as a wettable granule. Guarantee – 3 x 10^{10} spores per gram.

- Container size – 20 x 0.454 kg

Crops, Diseases, Rates and Timing:

Crop	Diseases Suppressed	Application Rate	Application Timing
Potato	Suppression of early blight (*Alternaria solani*), late blight (*Phytophthora infestans*)	Apply at a concentration of 0.33g/L of water. The amount of *LifeGard WG* applied will depend on the spray volume used to adequately cover the crop. DO NOT apply less than 28 grams of *LifeGard WG*/acre.	Repeat applications at 7 day intervals.
	Partial suppression of sclerotinia stem rot (*Sclerotinia sclerotiorum*)		Apply at 7 to 14 day intervals. Use the shorter interval when high disease pressure is anticipated.
Hemp and Cannabis (*Cannabis sativa*) for commercial use on plants grown in the field and indoors	Partial suppression of white mold (*Sclerotinia sclerotiorum*); grey mold (*Botrytis cinerea*)	Apply at a concentration of 0.33 g/L of water. DO NOT apply less than 28 g of *LifeGard WG* per acre.	Begin as a preventative spray. Apply at 7 to 14 day intervals when only *LifeGard WG* will be applied. Use the shorter interval when high disease pressure is anticipated. When used as part of a rotational program with fungicides labeled for this use, repeat every 7 to 21 days.

Note: *LifeGard* is most beneficial when applied in alternation with other foliar fungicides that are registered for the specific use/pathogen.

Application Information:

- **Water Volume:**
  - 20 to 100 L per acre. Use water volumes to give good canopy penetration and coverage of plant parts to be protected.

How it Works:

Bacillus mycoides is a bacterium bio-fungicide that works as a host plant defence inducer. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:

None registered.

Restrictions:

- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Maximum number of applications:** No restrictions listed.
- **Grazing:** No restrictions listed.
- **Pre-harvest interval:**
  - ***Hemp*** – 3 to 4 weeks
  - ***Potatoes*** – 0 days
- **Restricted Entry Interval:** 4 hours
- **Re-cropping:** No restrictions listed.
- **Storage:** Store in a dry area inaccessible to children in the original container. Store at or below 25°C for up to 16 months.
- **Environment:** May be toxic to bees. Bees can be exposed to direct treatment, drift or residues on flowering crops or weeds. DO NOT apply to flowering crops if bees are visiting the treatment area. Minimize spray drift to reduce harmful effects on bees in habitats close to the application site. To reduce runoff from treated areas into aquatic habitats, avoid application to areas with a moderate to steep slope, compacted soil or clay. Avoid application when heavy rain is in the forecast. Contamination of aquatic areas as a result of runoff may be reduced by including a vegetative strip between the treated rea and the edge of the water body.

Hazard Rating:

Danger – Eye Irritant, Potential Sensitizer

Refer to the Introduction for an explanation of the symbols.

Luna Tranquility

Fungicide Group 7, 9

Company:

Bayer (PCP#30510)

Formulation:

125 g/L fluopyram and 375 g/L pyrimethanil formulated as a suspension concentrate.

- Container size – 2 x 4.86 L

Crops, Diseases, Rates and Timing:

Crop	Diseases	Application Rate (per acre)	Application Timing
Potato	Control of early blight *(Alternaria solani)*, brown leaf spot *(Alternaria alternata)*	245 mL	Begin fungicide applications preventatively. Continue as needed on a 7 to 14 day interval. When disease pressure is severe, use the shorter intervals.
	Control of sclerotinia stem rot *(Sclerotinia sclerotiorum)* Suppression of black dot *(Colletotrichum coccodes)*	325 mL	

Application Information:

- **Water Volume:**
  - ***Ground:*** Use a minimum water volume of 80 L per acre and ensure thorough coverage of foliage.
  - ***Aerial:*** Use a minimum water volume of 20 L per acre and ensure thorough coverage of foliage.

How it Works:

The active ingredient fluopyram is a carboxamide fungicide with systemic activity. The active ingredient pyrimethanil is an anilinopyrimidine fungicide with contact and systemic activity. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:
None registered.

Restrictions:
- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Maximum number of applications:** DO NOT apply more than 1.3 L per acre of this product per season.
- **Grazing:** No restriction listed.
- **Preharvest interval:** 7 days
- **Restricted Entry Interval:** DO NOT re-enter treated areas until 12 hours after application.
- **Re-cropping:** A plant back restriction of 30 days is required for canola, cereal grains, corn, soybean, dry bean, chickpea, lentil, and alfalfa.
- **Storage:** DO NOT store below freezing. If stored for one year or longer, shake well before using. Store the tightly closed container away from feeds, seeds, fertilizer, plants and foodstuffs. Keep the product in the original container during storage.
- **Environment:** Toxic to aquatic organisms and birds. DO NOT apply directly to water, to areas where surface water is present, or to intertidal areas below the high water mark. Observe buffer zones outlined in the label.

Hazard Rating:
None listed.

Mancozeb

Fungicide Group M3

Dithane Rainshield/Manzate Pro-Stick/Manzate Max/Penncozeb 75 DF/Penncozeb 80WP

Company:
UPL AgroSolutions Canada Inc. (*Manzate Pro-Stick* – PCP#28217; *Manzate Max* – PCP#33299; *Penncozeb 75 DF* – PCP#25397; *Penncozeb 80WP* – PCP#25396), *Dithane Rainshield* – PCP#20553

Formulations:
Dithane Rainshield – 75% mancozeb formulated as a water dispersible granule.
- Container size – 3.5 to 544 kg

Manzate Pro-Stick – 75% mancozeb formulated as a dry flowable.
- Container size – 20 kg

Manzate Max – 480 g/L formulated as a flowable.
- Container size – 10 L, 450 L, 946 L

Penncozeb 75 DF – 75% mancozeb formulated as a wettable granule.
- Container size – 2.5 to 250 kg

Penncozeb 80 WP – 80% mancozeb formulated as a wettable powder. *(Note: Same rates as Penncozeb 75 DF.)*
- Container size – 20 kg

Crops, Diseases, Rates and Timing:

Crop	Diseases Controlled	Application Rate (per acre)	Application Timing
Potato	Early blight *(Alternaria solani)*, late blight *(Phytophthora infestans)*	0.45 to 0.9 kg 0.7 to 1.4 L	Begin applications when plants are 10 to 15 cm high, repeat at 7 to 10-day intervals or shorter only if the label permits. Spray interval may be reduced to 5 to 6 days during periods of wet weather favouring late blight and/or vigorous crop growth. Start with the low rate if disease pressure is low, or plants are small; increase to the maximum rate as foliage develops or disease pressure increases.

Application Information:
- **Water Volume:** Consult with the label. Thorough uniform coverage is essential for good disease control.

How it Works:
The active ingredient mancozeb is a dithiocarbamate fungicide with multi-site contact activity. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:
Fungicides: For late blight control, *Manzate Pro-stick* and *Manzate Max* can be tank-mixed with *Curzate*.

Restrictions:

- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Maximum number of applications is 8.**
- **Grazing:** DO NOT graze or feed treated crop or straw to livestock. DO NOT graze or cut treated alfalfa for hay.
- **Preharvest interval:**
  - ***Potato*** – 3 days
- **Restricted Entry Interval:** DO NOT re-enter treated areas within 12 hours of application.
- **Re-cropping:** No restrictions listed.
- **Storage:** Store in cool, dry, well-ventilated place. Keep away from fire and sparks. Keep *Manzate Max* from freezing.
- **Environment:** Toxic to aquatic organisms. DO NOT contaminate any body of water by direct application, drift or by cleaning equipment.

Hazard Rating:

Warning – Poison

Danger – Eye Irritant

Refer to the Introduction for an explanation of the symbols.

Maxentis

Fungicide Group 3, 11

Company:

Adama Agricultural Solutions Canada Ltd (PCP#34963)

Formulation:

120 g/L Azoxystrobin and 90 g/L Prothioconazole formulated as Emulsifiable Concentrate

- Container size – 2 x 8.45 L jugs, 118.1 L drum

Crops, Diseases, Rates and Timing:

Crop	Disease	Rate/acre	Crop stage and other timing information
Canola	Control of white mould (*Sclerotinia sclerotiorum*)	443 mL	20–50% bloom stage
	Control of blackleg (*Leptosphaeria maculans*)	422 mL	Early application required 2-6 leaf for blackleg
Peas	Control of white mold (*Sclerotinia sclerotiorum*), Suppression of Mycosphaerelle blight (*Mycosphaerella pinodes*)	422 mL	Spray at the beginning of flowering or first sign of disease
Lentils	Control of anthracnose* (*Colletotrichum lentis*), white mould (*Sclerotinia sclerotiorum*), and Ascochyta blight (*Ascochyta lentis*)	422 mL	Spray at the beginning of flowering or first sign of disease
Soybeans	Control of white mould (*Sclerotinia sclerotiorum*)	422 mL	Spray at the beginning of flowering or first sign of disease

*** Including biotypes resistant to Group 11 (strobilurin) fungicides.**

Application Information:

- **Water Volume:**
  - ***Ground:*** Minimum 40 L/ac
  - ***Air:*** Minimum 20 L/ac

How it Works:

This multi-mode fungicide works by combining two synergistic actives which includes the active ingredient azoxystrobin, a methoxyacrylate compound (strobilurin) with broad spectrum contact and systemic activity. To be used as a preventative and curative fungicide application. The other active prothioconazole is a triazole fungicide with broad-spectrum systemic activity. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:
None listed.

Restrictions:
- **Maximum number of applications:** Do not apply more than one application per year on canola and two applications per year on peas, lentils and soybeans.
- **Rainfall:** Avoid application when heavy rain is in forecast.
- **Pre-harvest Intervals:** 36 days canola; 15 days peas, lentils; 20 days soybeans and 30 days forage and hay
- **Grazing:** Forage, hay: 30 days- Grazing or green feed: 6 days- Peas, lentils, soybeans: do not feed dried pea vines to livestock
- **Re-entry:** 24 hrs.
- **Re-cropping interval:** No restrictions.
- **Storage:** Store in the original container in a dry location away from food or feed. Do not freeze.
- **Environment:**
  - Toxic to aquatic organisms, birds, small wild mammals, and non-target terrestrial plants.
  - Azoxystrobin is persistent and will carryover. It is recommended that any products containing azoxystrobin not be used in areas treated with this product during the previous season. This product demonstrates the properties and characteristics associated with chemicals detected in ground water. The use of *Maxentis* in areas where soils are permeable, particularly where the water table is shallow, may result in ground water contamination. To reduce runoff from treated areas into aquatic habitats avoid application to areas with a moderate to steep slope, compacted soil, or clay. Avoid application when heavy rain is forecast. Contamination of aquatic areas as a result of runoff may be reduced by including a vegetative filter strip between the treated area and the edge of the water body.

Hazard Rating:
Danger: corrosive to eyes and skin.

MIRAVIS Ace

Fungicide Group 7, 3

Company:
Syngenta Canada Inc. (PCP#33573)

Formulation:
150 g/L pydiflumetofen and 125 g/L propiconazole formulated as a suspension emulsion.
- Container size – 2 x 8.1 L

Crops, Diseases, Rates and Timing:

Crop	Diseases Controlled	Application Rate (per acre)	Application Timing
Barley	Suppression of fusarium head blight (*Fusarium* spp.), ergot (*Claviceps purpurea*), scald (*Rhynchosporium secalis*)	404 mL	Apply within the range of at least 70% of heads on the main stem fully emerged to 3 days after full head emergence. Application at the timing for fusarium head blight will control leaf diseases that occur later in the season. Application at this timing is not intended to provide curative control of established leaf diseases.
	Control of spot blotch (*Cochliobolus sativus*), net blotch (*Pyrenophora teres*), septoria leaf spot (*Septoria tritici*), leaf rust (*Puccinia hordei*), stem rust (*Puccinia graminis* f. sp. *tritici* and f.sp. *secalis*), powdery mildew (*Erysiphe graminis*)		
Oats	Suppression of fusarium head blight (*Fusarium* spp.), ergot (*Claviceps purpurea*)	404 mL	Apply within the range of at least 75% of heads on the main stem fully emerged to when 50% of the heads on the main stem are flowering. Application at the timing for fusarium head blight will control leaf diseases that occur later in the season. Application at this timing is not intended to provide curative control of established leaf diseases.
	Control of septoria leaf blotch (*Septoria avenae*), crown rust (*Puccinia coronata*)		

Crop	Diseases Controlled	Application Rate (per acre)	Application Timing
Wheat (spring, winter and durum)	Suppression of fusarium head blight (*Fusarium* spp.), ergot (*Claviceps purpurea*)	404 mL	Apply within the range of at least 75% of heads on the main stem fully emerged to when 50% of the heads on the main stem are flowering. DO NOT apply after BBCH 65.
	Control of septoria leaf spot (*Septoria tritici*), septoria glume blotch (*Stagonospora nodorum*), tan spot (*Pyrenophora tritici-repentis*), leaf rust (*Puccinia triticina*), stem rust (*Puccinia graminis* f. sp. *tritici*), stripe rust (*Puccinia striiformis*), powdery mildew (*Erysiphe graminis*)		Application at the timing for fusarium head blight will control leaf diseases that occur later in the season. Application at this timing is not intended to provide curative control of established leaf diseases.

Apply *Miravis Ace* with a non-ionic surfactant at a rate of 0.125% v/v in the spray tank following label.

Application Information:

- **Water Volume:** Thorough uniform coverage is essential for good disease control.
  - ***Ground:*** minimum 40 L per acre.
  - ***Air:*** minimum 20 L per acre.

How it Works:

The active ingredient pydiflumetofen is a N-methoxy-(phenyl-ethyl)-pyrazole-carboxamide, unique within the carboxamide (SDHI) fungicides. The active ingredient propiconazole is a triazole fungicide with broad spectrum activity. Propiconazole is rapidly translocated acropetally through the xylem. Pydiflumetofen moves acropetally slowly through the xylem. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:

None registered.

Restrictions:

- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Maximum number of applications:** DO NOT exceed 1 application of this product per season.
- **Preharvest interval:** Apply no later than BBCH 65 (50% of main heads in flower). 7 days for harvest of forage/hay. Grain/straw can be fed at normal harvest maturity.
- **Restricted Entry Interval:** DO NOT re-enter treated areas within 12 hours of application.

Hazard Rating:

Caution – Eye Irritant

Refer to the Introduction for an explanation of the symbols.

MIRAVIS Bold

Fungicide Group 7

Company:
Syngenta Canada Inc. (PCP#33213)

Formulation:
200 g/L of pydiflumetofen formulated as a suspension concentrate.
- Container size – 2 x 8 L jugs per case

Crops, Diseases, Rates and Timing:

Crop	Diseases Controlled	Application Rate (per acre)	Application Timing
Canola	Sclerotinia stem rot *(Sclerotinia sclerotiorum)*	304 to 405 mL	10 to 50% bloom. Apply the higher rate under higher disease pressure, a subsequent application with an alternate fungicide should be considered.

Application Information:
- **Water Volume:**
  - ***Ground:*** minimum 60 L per acre.
  - ***Air:*** minimum 20 L per acre.

How it Works:
The active ingredient pydiflumetofen is a N-methoxy-(phenyl-ethyl)-pyrazole-carboxamide, unique within the carboxamide (SDHI) fungicides. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:
Add non-ionic surfactant to achieve a final concentration of 0.125% v/v in the spray tank.

Restrictions:
- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Maximum number of applications:** DO NOT exceed 1 application of this product per season.
- **Preharvest interval:** DO NOT apply within 30 days of harvest.
- **Restricted Entry Interval:** DO NOT re-enter treated areas within 12 hours of application.

Hazard Rating:
Warning – Contains the Allergen Sulfites

Refer to the Introduction for an explanation of the symbols.

MIRAVIS Duo

Fungicide Group 7, 3

Company:
Syngenta Canada Inc. (PCP#33206)

Formulation:
75 g/L pydiflumetofen and 125 g/L difenoconazole formulated as a suspension concentrate.
- Container size – 2 x 8 L jugs per case

Crops, Diseases, Rates and Timing:

Crop	Diseases Controlled	Application Rate (per acre)	Application Timing
Potato	Control of Early blight (*Alternaria solani*), Brown spot (*Alternaria alternata*)	405 mL	Apply on a 7 to 14 day interval starting prior disease establishment. If disease pressure if high, use the shortest interval.
	Suppression of White mould (*Sclerotinia sclerotiorum*)	405 mL	Begin applications at 20% bloom. Repeat applications 10 to 14 days later
	Suppression of Botrytis grey mould (*Botrytis cinerea*)	405 mL	Apply on a 7 to 14 day interval, starting prior to disease establishment. If disease pressure is high, use the shortest interval

Application Information:
- **Water Volume:**
  - ***Ground:*** minimum 60 L per acre.
  - ***Air:*** minimum 20 L per acre.

How it Works:
The active ingredient pydiflumetofen is a N-methoxy-(phenyl-ethyl)-pyrazole-carboxamide, unique within the carboxamide (SDHI) fungicides. The active ingredient difenoconazole is a demethylation inhibitor (DMI) fungicide. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:
None registered.

Restrictions:
- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Maximum number of applications:**
  - DO NOT exceed 3 applications of this product per season.
  - DO NOT exceed 2 consecutive applications, before switching to a non-Group 3 and non-Group 7 fungicide.
- **Preharvest interval:** DO NOT apply within 14 days of harvest.
- **Restricted Entry Interval:** DO NOT re-enter treated areas within 12 hours of application.

Hazard Rating:
Warning – Contains the Allergen Sulfites

Refer to the Introduction for an explanation of the symbols.

Miravis Era

Fungicide Group 3, 7

Company:
Syngenta Canada (PCP # 34323 (*Miravis Era A*) and 34168 (*Miravis Era B*))

Formulation:
Miravis Era A: 200 g/L pydiflumetofen formulated as suspension concentrate.
Miravis Era B: 250 g/L prothioconazole formulated as emulsifiable concentrate
- Container size: co-pack case 10.1 L Miravis Era A + 8.1 L Miravis Era B

Crops, Diseases, Rates and Timing:

Crop	Diseases	Application Rate (per acre)	Application Timing
Wheat (spring, winter, durum)	Suppression of Fusarium head blight (*Fusarium graminearum*)	253 mL/acre Miravis Era A + 202 mL/acre Miravis Era B	Apply within the range of at least 75% of heads on the main stem fully emerged to when 50% of the heads on the main stem are flowering.
	Control of leaf Rust (*Puccinia recondita*), Septoria leaf blotch (*Septoria tritici*), and tan spot (*Pyrenophora tritici-repentis*)		Application at the timing for Fusarium head blight will control leaf rust that occurs later in the season. Application at this timing is not intended to provide curative control of established leaf rust.
Barley	Suppression of Fusarium head blight (*Fusarium* spp.)		Apply within the range of at least 70% of heads on the main stem fully emerged to 3 days after full head emergence.
	Control of scald (*Rhynchosporium secalis*), spot blotch (*Cochliobolus sativus*), and net blotch (*Pyrenophora teres*)		Application at the timing for Fusarium head blight will control leaf diseases that occur later in the season. Application at this timing is not intended to provide curative control of established leaf diseases.
Rye, Oats and Triticale	Suppression of Fusarium head blight (*Fusarium graminearum*)		For suppression of fusarium head blight in rye, oats, and triticale, apply within the range of at least 75% of heads on the main stem fully emerged to when 50% of the heads on the main stem are flowering. Application may only be made using ground spray equipment. DO NOT apply by air.

Application Information:
- **Water Volume:**
  - ***Ground:*** minimum 40 L per acre.
  - Apply with a non-ionic surfactant at a rate of 0.125% v/v in the spray tank
  - ***Air:*** minimum 20 L per acre when air application is permitted on the label

How it Works:
The active ingredient pydiflumetofen is a N-methoxy-(phenyl-ethyl)-pyrazole-carboxamide, unique within the carboxamide (SDHI) fungicides. The active ingredient prothioconazole is a triazole fungicide with broad spectrum systemic activity. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information..

Tank Mixes:
Apply with a non-ionic surfactant at a rate of 0.125% v/v in the spray tank

Restrictions:
- **Maximum number of applications:** one application per year.
- **Rainfall:** Avoid application when heavy rain is in forecast.
- **Pre-harvest Intervals:** 30 days

- **Re-entry:** 24 hours
- **Re-cropping interval:** Follow label. 30 days for crops not on label.
- **Storage:** Keep in original container, tightly closed, during storage. Store in a cool, dry, well-ventilated area away from feed and food stuffs, and out of the reach of children and animals.
- **Environment:** Toxic to aquatic organisms and non-target terrestrial plants. Observe buffer zones and other precautions specified on label.

Hazard Rating:

Miravis Era A – warning, contains the allergen sulfites
Miravis Era B – caution, poison eye and skin irritant, potential skin sensitizer

MIRAVIS Neo 300SE

Fungicide Group 7, 11, 3

Company:

Syngenta Canada Inc. (PCP#33391)

Formulation:

75 g/L pydiflumetofen, 100 g/L azoxystrobin and 125 g/L propiconazole formulated as a suspension.

- Container size – 2 x 10.125 L, 97.2 L

Crops, Diseases, Rates and Timing:

Crop	Diseases Controlled	Application Rate (per acre)	Application Timing
Field pea	Powdery mildew (*Erysiphe pisi*)	404 mL	Application must occur before disease is established and no later than full bloom stage, 50% of flowers open (BBCH 65).
	Anthracnose (*Colletotrichum truncatum*), Mycosphaerella blight (*Mycosphaerella pinodes*)	404 to 505 mL	
	Suppression of white mold (*Sclerotinia sclerotiorum*)	505 mL	For suppression of white mold begin application when plants are at first bloom to 10% bloom.
Chickpea	Powdery mildew (*Erysiphe pisi*)	404 mL	Application must occur before disease is established and no later than full bloom stage, 50% of flowers open (BBCH 65). Use the higher rate under higher disease pressure conditions.
	Anthracnose (*Colletotrichum truncatum*)	404 to 505 mL	
	Ascochyta blight (*Ascochyta rabiei*)	505 mL	
	Suppression of white mold (*Sclerotinia sclerotiorum*)	505 mL	For suppression of white mold begin application when plants are at first bloom to 10% bloom
Faba bean	Powdery mildew (*Erysiphe pisi*)	404 mL	Application must occur before disease is established and no later than full bloom stage, 50% of flowers open (BBCH 65).
	Anthracnose (*Colletotrichum truncatum*), Mycosphaerella blight (*Mycosphaerella pinodes*), Chocolate spot (*Botrytis fabae*)	404 to 505 mL	
	Ascochyta blight (*Ascochyta fabae*)	505 mL	
	Suppression of white mold (*Sclerotinia sclerotiorum*)	505 mL	For suppression of white mold begin application when plants are at first bloom to 10% bloom
Lentil	Powdery mildew (*Erysiphe pisi*)	404 mL	Application must occur before disease is established and no later than full bloom stage, 50% of flowers open (BBCH 65).
	Anthracnose (*Colletotrichum truncatum*)	404 to 505 mL	
	Suppression of white mold (*Sclerotinia sclerotiorum*)	505 mL	For suppression of white mold begin application when plants are at first bloom to 10% bloom.
Dry bean	Anthracnose (*Colletotrichum lindemuthianum*)	404 to 505 mL	Apply at the beginning of flowering or prior to disease establishment. Use the higher rate under higher disease pressure conditions.

Crop	Diseases Controlled	Application Rate (per acre)	Application Timing
Lima bean and snap bean	Powdery mildew (*Erysiphe pisi*)	405	Make application at the first sign of disease. DO NOT apply using aerial application equipment.
Soybean	Powdery mildew (*Erysiphe pisi*)	303 to 404 mL	Apply at the beginning of flowering or prior to disease establishment. Where a rate range is specified, use the higher rate under higher disease pressure conditions.
	Anthracnose (*Colletotrichum truncatum*), frogeye leaf spot (*Cercospora sojina*)	404 to 505 mL	
	Suppression of white mold (*Sclerotinia sclerotiorum*)	505 mL	
Barley	Scald (*Rynchosporium secalis*), septoria leaf blotch (*Septoria* spp.), spot blotch (*Cochliobolus sativus*), tan spot (*Pyrenophora tritici-repentis*), net blotch (*Drechslera teres*), stripe rust (*Puccinia striiformis*)	303 mL	Make one application between end of tillering to 50% of heads on main stem emerged (BBCH 29-55).
Oats	Septoria leaf blotch (*Septoria avenae*), crown rust (leaf rust) (*Puccinia coronata*)	303 mL	Make one application between end of tillering to 50% of heads on main stem emerged (BBCH 29-55).
Rye	Scald (*Rynchosporium secalis*), septoria leaf blotch (*Septoria tritici*), tan spot (*Pyrenophora tritici-repentis*), stripe rust (*Puccinia striiformis*)	303 mL	Make one application between end of tillering to 50% of heads on main stem emerged (BBCH 29-55).
Triticale	Septoria leaf blotch (*Septoria tritici*)	303 mL	Make one application between end of tillering to 50% of heads on main stem emerged (BBCH 29-55).
Wheat	Septoria leaf blotch (*Septoria tritici*), spot blotch (*Cochliobolus sativus*), tan spot (*Pyrenophora tritici-repentis*), leaf rust (*Puccinia triticina*), stripe rust (*Puccinia striiformis*)	303 mL	Make one application between end of tillering to 50% of heads on main stem emerged (BBCH 29-55).
Corn	Eye spot (*Aureobasidium zeae*), grey leaf spot (*Cercospora zeae-maydis*), northern corn leaf blight (*Setosphaeria turcica*), anthracnose leaf blight (*Colletotrichum graminicola*)	303 mL	Make the first application at the first sign of disease. A second application can be made 14 days after the first application, when disease pressure is high or when agronomic or weather conditions are conducive to disease development or movement. For season-long control of tar spot a second application may be required. For common rust, use the 404 mL/ac application rate when disease pressure is high or if susceptible hybrids are used. Apply in sufficient water volume to obtain thorough coverage; a minimum spray volume of 81 L/ac and 20 L/ac is recommended for ground and aerial application, respectively.
	Common rust (*Puccinia sorghi*)	303 to 404 mL	
	Suppression of tar spot (*Phyllachora maydis*)	405 mL	
	Suppression of fusarium and gibberella ear rots (*Fusarium* spp. and *Gibberella zeae*)	404 to 505 mL	Apply once from developmental stage of corn between the tip of stigmata visible (silking, BBCH 63) to the stigmata drying (silk browning, BBCH 67). Apply in sufficient water volume to obtain thorough coverage; a minimum spray volume of 81 L/acre and 20 L/acre is recommended for ground and aerial application, respectively.

Application Information:

- **Water Volume:** Thorough uniform coverage is essential for good disease control.
  - ***Ground:*** minimum 40 L per acre, 81 L/acre for corn diseases, review the label before application.
  - ***Air:*** minimum 20 L per acre.

How it Works:
The active ingredient pydiflumetofen is a N-methoxy-(phenyl-ethyl)-pyrazole-carboxamide, unique within the carboxamide (SDHI) fungicides. The active ingredient azoxystrobin is a strobilurin fungicide with broad spectrum activity. The active ingredient propiconazole is a triazole fungicide with broad spectrum activity. Propiconazole is rapidly translocated acropetally through the xylem. Both pydiflumetofen and azoxystrobin move acropetally slowly through the xylem. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information..

Tank Mixes:
None registered.

Restrictions:
- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Maximum number of applications:**
  - ***Corn*** – DO NOT exceed 2 applications of this product per season.
  - ***Field pea, chickpea, faba bean, lentil*** – DO NOT exceed 1 application of this product per season.
- **Pre-harvest Interval:**
  - ***Field pea, chickpea, faba bean, lentil, corn (grain and forage)*** – 30 days
  - ***Sweet corn*** – 14 days
- **Restricted Entry Interval:** DO NOT re-enter treated areas within 12 hours of application.
- **Re-cropping:**
  - ***Oats, rye*** – 45 days
  - ***Potatoes*** – 105 days

Hazard Rating:
Warning – Poison – Eye Irritant

Refer to the Introduction for an explanation of the symbols.

Miravis Star

Fungicide Group 7, 12

Company:
Syngenta Canada Inc (PCP#34841)

Formulation:
150 g/L Fludioxinil and 100 g/L Pydiflumetofen as Suspension Concentrate
- Container size – 8.1 litre

Crops, Diseases, Rates and Timing:

Crop	Diseases Controlled	Application Rate (per acre)	Application Timing
Canola	Sclerotinia stem rot	400 mL	10-50% bloom

Apply with a non-ionic surfactant at a rate of 0.125% v/v in the spray tank.

Application Information:
- **Water Volume:**
  - ***Ground:*** minimum 40 L/ac.
  - ***Air:*** minimum 20 L/ac.

How it Works:
ADEPIDYN (pydiflumetofen) binds strongly to the plant surface and moves rapidly into the leaf surface, forming a reservoir of active ingredient in the waxy layer of the leaf tissue. Once in the plant, it moves slowly into the cells of the leaf and throughout the xylem for even distribution and protection as the plant grows. Fludioxonil is a contact fungicide from group 12 that introduces a highly effective new mode of action against sclerotinia stem rot for resistance management. It inhibits spore germination and germ tube growth thus preventing fungal development on the surface of the plant.

Tank Mixes:
None listed.

Restrictions:

- **Maximum number of applications:** One application per year.
- **Rainfall:** Avoid application when heavy rain is forecast.
- **Pre-harvest Intervals:** 30 days.
- **Re-entry:** 12 hours.
- **Grazing:** No grazing restrictions.
- **Re-cropping interval:** No re-cropping restrictions.
- **Storage:** Store this product away from food or feed. Keep in original container, tightly closed, during storage. Store in heated storage, dry, well-ventilated area away from feed and foodstuffs, and out of the reach of children and animals.
- **Environment:** Toxic to aquatic organisms. Observe spray buffer zones specified on the label under Directions for Use.

Hazard Rating:

Warning, contains the allergen sulfites.

Nexicor

Fungicide Group 7, 11, 3

Company:

BASF Canada (PCP#32678)

Formulation:

30 g/L fluxapyroxad, 200 g/L pyraclostrobin and 125 g/L propiconazole formulated as an emulsifiable concentrate.

- Container size – Case (2 x 8 L), 128 L shuttle

Crops, Diseases, Rates and Timing:

Crop	Diseases Controlled	Application Rate (per acre)	Application Timing
Wheat (all types including durum) Triticale	Leaf rust (*Puccinia recondita*), stripe rust (*Puccinia striiformis*), tan spot (*Pyrenophora tritici-repentis*), septoria leaf spot (*Septoria tritici*), spot blotch (*Cochliobolus sativus*) powdery mildew (*Erysiphe graminis f. sp. tritici*)	200 mL	Fungicide performance is best when *Nexicor* is applied prior to disease development or at the onset of disease. To maximize yield in cereals, it is important to protect the flag leaf from disease. Optimum time to apply a single application of *Nexicor* is immediately after flag leaf emergence (GS 37-39). Apply a maximum of one application of *Nexicor* per season. *Nexicor* may be applied for control of listed foliar diseases and followed with a fungicide that targets Fusarium head blight at anthesis stage (GS 61-65).
Barley	Net blotch (*Pyrenophora teres*), stripe rust (*Puccinia striiformis*), spot blotch (*Cochliobolus sativus*), scald (*Rhynchosporium secalis*)		
Rye	Leaf rust (*Puccinia recondita*), powdery mildew (*Erysiphe graminis f. sp. tritici*)		
Oats	Crown rust (*Puccinia coronate*), septoria leaf blotch (*Septoria avenae*)		
Canola	Blackleg (*Leptosphaeria maculans*)	200 mL	To maximize yield in canola, it is important to protect young seedlings from blackleg infections. Apply *Nexicor* at the 2 to 6 leaf stage. Apply a maximum of one Nexicor application per year.

How it Works:

The active ingredient fluxapyroxad is a SDHI fungicide with systemic activity. The active ingredient pyraclostrobin is a member of the strobilurins class of chemistry used as a broad spectrum fungicide. The active ingredient propiconazole is a triazole fungicide with broad spectrum systemic activity. Best utilized as a preventative application when environmental conditions are favourable for disease development. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:

Herbicides: In Canola, *Nexicor* can be tank mixed with the following herbicides: *Ares* in Clearfield canola, *Liberty Herbicide* (150 SN or 200 SN) in glufosinate ammonium tolerant canola (e.g. *LibertyLink* canola) and, registered glyphosate herbicides in glyphosate tolerant canola (e.g. *Roundup Ready* canola). Review the product labels before mixing.

Restrictions:

- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Maximum number of applications:** DO NOT exceed 1 application of this product per season.
- **Grazing:** All crops can be grazed within 3 days of application.
- **Preharvest interval:** 45 days for cereals; 30 days for canola.
- **Restricted Entry Interval:** DO NOT re-enter treated areas within 12 hours after application.
- **Re-cropping:** The following crops: barley, corn, wheat (all types), oats, triticale, rye, and bluegrasses, fescues and rye grasses (grown for seed production), soybean, canola (including rapeseed) and oilseed/condiment mustard, flax, sunflower, field pea, lentil, chickpea, fababean, dry bean, sugarbeets and alfalfa (grown for seed production), and tuberous vegetables, may be planted immediately following the last application. A plant-back interval of one year is required for all other crops.
- **Storage:** Store in original tightly closed container. Protect from freezing. Store this product away from food or feed.
- **Environment:** Observe buffer zones specified on the label. DO NOT apply on any body of water and prevent cleaning of equipment and reduce risk of runoff from treated areas into aquatic habitats by avoid application to areas with a moderate to steep slope, compacted soil. Toxic to aquatic organisms and non-target terrestrial plants.

Hazard Rating:

Warning – Poison

Skin and Eye Irritant
Refer to the Introduction for an explanation of the symbols.

Orondis Ultra

Fungicide Group 40, 49

Company:

Syngenta Canada (PCP#32805)

Formulation:

250 g/L mandipropamid and 30 g/L oxathiapiprolin formulated as a suspension concentrate.

- Container size – 4 x 3.78 L

Crops, Diseases, Rates and Timing:

Control of late blight (*Phytophthora infestans*) on potato. Begin applications prior to disease development. Continue applications on 7 to 14 day interval. Use higher rate and shorter interval when disease pressure is high.

Rates:

0.16 to 0.24 L per acre.

Application Information:

- **Water Volume:**
  - ***Ground:*** Use a minimum water volume of 40 L per acre.
  - ***Aerial:*** Use a minimum water volume of 18 L per acre.

How it Works:

The active ingredient mandipropamid is a carboxylic acid amide (CAA) fungicide with contact and systemic activity. To be used as a preventative and inhibitive (prevents spore germination) fungicide application. The active ingredient oxathiapiprolin is an oxysterol binding protein homologue inhibitor with activity against diseases caused by oomycete fungi. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:

None registered.

Restrictions:

- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Maximum number of applications:** DO NOT exceed 4 applications of this product per season.
  - ***Maximum number of consecutive applications:*** 2 applications, then switch to a non-Group 49 and 40 fungicide.
- **Grazing:** No restriction listed.
- **Preharvest interval:** 14 days
- **Restricted Entry Interval:** DO NOT re-enter treated areas until 12 hours after application.

- **Re-cropping:** There is no re-cropping restriction for all crops listed on the *Orondis Ultra* label. The re-cropping restriction is 30 days for all other crops and 180 days for legume vegetables except succulent peas.
- **Storage:** Keep in the original container, tightly closed during storage. Store in a cool, dry, well-ventilated area away from feed and foodstuffs and out of the reach of children and animals. To prevent contamination store this product away from food or feed.
- **Environment:** Toxic to aquatic organisms. To reduce runoff into aquatic habitats avoid application to areas with a moderate to steep slope, compacted soil, or clay. Runoff into aquatic habitats may be reduced by including a vegetative strip between the treated area and the edge of the water body.

Hazard Rating:
None listed.

OxiDate FC

Fungicide Group NC

Company:
BioSafe Systems, LLC (PCP#33468)

Formulation:
27% hydrogen peroxide and 2.5% peroxyacetic acid formulated as a liquid.
- Container sizes – 9.5, 19, 28, 113.5, 1041 L

Crops, Diseases, Rates and Timing:

Crop	Diseases Controlled	Application Rate (per acre)	Application Timing
Dry beans	Suppression of bacterial blight (*Xanthomonas campestris* pv. *phaseoli*)	1.0% (v:v)	At the first sign of disease and/or when weather conditions are favorable for disease development. Apply diluted spray to the point of run-off to achieve full and even coverage.
Potato	Suppression of botrytis tan spot (*Botrytis cinerea*)	2.5% (v:v)	Apply at 7 day intervals, depending upon the level of disease pressure.
	White mold (*Sclerotinia sclerotiorum*)		
	Brown leaf spot (*Alternaria alternata*)	1.0 to 2.5% (v:v)	Under severe disease conditions, reduce spray intervals to once every 5 days and use stronger dilution rates.

Application Information:
- **Water Volume:** Thorough uniform coverage is essential for good disease control.
  - ***Ground:*** Apply diluted spray to the point of run-off, a minimum of 100 L per acre.
  - ***Air:*** DO NOT apply using aerial application equipment.

How it Works:
The active ingredients hydrogen peroxide and peroxyacetic acid have contact activity on fungal and bacterial vegetative cells and spores. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:
None registered.

Restrictions:
- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Maximum number of applications:** DO NOT exceed 8 application of this product per season.
- **Pre-harvest Interval:** 0 days
- **Restricted Entry Interval:** DO NOT re-enter treated areas within 4 hours of application.
- **Storage:** DO NOT allow product to become overheated in storage. The high temperature may increase the degradation of the product, which will decrease product effectiveness. Since *OxiDate FC* is a strong oxidizing agent, contact with combustibles may cause fire. Keep containers tightly closed when not in use. To prevent contamination store this product away from food or feed.
- **Storage:** TOXIC to aquatic organisms and non-target terrestrial plants. This product may be toxic to bees and other beneficial insects exposed to direct contact. Avoid application during the crop blooming period. If applications must be made during the crop blooming period, restrict applications to evening when most bees are not foraging. Contamination of aquatic areas as a result of runoff may be reduced by including a vegetative strip between the treated area and the edge of the water body. DO NOT allow effluent or runoff from greenhouses containing this product to enter lakes, streams, ponds or other waters.

Hazard Rating:

Warning – Poison

Danger – Corrosive to Eyes

Danger – Skin Irritant

Refer to the Introduction for an explanation of the symbols.

Phosphorous acid

Rampart/Confine Extra

Fungicide Group 33

Company:

Loveland Products Canada (*Rampart* – PCP #30654)
WinField United Canada (*Confine Extra* – PCP #30648)

Formulation:

53.0% mono- and di-potassium salts of phosphoric acid.

- Container sizes – *Confine Extra* 9.46 to 946 L; *Rampart* 9.46 L

Crops, Diseases, Rates and Timing:

Crop	Diseases Suppressed	Application Rate (per acre)		Application Timing
		Confine Extra	*Rampart*	
Potato*	Late blight *(Phytophthora infestans)*, pink rot *(Phytophthora erythroseptica)*	2 to 4 L	1.2 to 3.2 L	Begin applications when conditions are favourable for disease and continue on a 7 to 14 day interval. Use the higher rate and shorter application interval when disease pressure is moderate to high. Use a maximum of 5 foliar and/or chemigation** applications per growing season.

***Not recommended for use on potatoes intended for seed.**
****Chemigation application for *Confine Extra* only.**

Application Information:

- **Water Volume:**
  - ***Ground:***
    - *Confine Extra* – minimum of 40 L per acre
    - *Rampart* – minimum 120 L per acre
  - ***Aerial:***
    - *Confine Extra* – DO NOT apply by air
    - *Rampart* – minimum of 40 L per acre

How it Works:

The active ingredient mono- and di-potassium salts of phosphorous acid is a phosphonate fungicide with systemic activity to suppress pathogen inoculum. To be used as a preventative fungicide application on harvested tubers. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:

None registered.

Restrictions:

- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Preharvest interval:** DO NOT apply within 1 day of harvest.
- **Restricted Entry Interval:** No restrictions listed.
- **Re-cropping:** No restrictions listed.
- **Storage:** DO NOT store near food or feed.
- **Environment:** DO NOT contaminate irrigation or drinking water supplies or aquatic habitats by cleaning of equipment or disposal of waste.

Hazard Rating:

Caution – Eye Irritant

Refer to the Introduction for an explanation of the symbols.

Phostrol

Fungicide Group 33

Company:

Belchim Crop Protection Canada (PCP#30449)

Formulation:

53.6% mono- and dibasic sodium, potassium, and ammonium phosphites formulated as a liquid flowable.

- Container sizes – 2 x 10 L and 1000 L

Crops, Diseases, Rates and Timing:

Crop	Diseases	Application Rate	Application Timing
Potato	Suppression of pink rot *(Phytophthora erythroseptica)*	2.3 to 4.7 L/acre	In-furrow: Apply in a band at planting directly over the seed pieces prior to row closure.
	Control of late blight *(Phytophthora infestans)*	1.2 to 4.7 L/acre	Foliar applications: For preventative control of late blight and preventative suppression of pink rot begin applications when conditions favouring disease development exist and continue on a 7 to 14 day interval.
	Suppression of pink rot *(Phytophthora erythroseptica)*	2.3 to 4.7 L/acre	
	Suppression of Early Blight (*Alternaria solani*) and Brown Leaf Spot (*Alternaria alternata*)	1.8 to 2.3 L/acre	
	Control of late blight *(Phytophthora infestans)*, pink rot *(Phytophthora erythroseptica)* Suppression of silver scurf *(Helminthosporium solani)*	0.42 L in 2 L water to 1 tonne tubers	Post harvest control: Apply directly to the tubers and ensure complete and even coverage.*
Field pea	Suppression of early season root rot *(Aphanomyces euteiches, Pythium ultimum)*	1.2 L/acre	At crop emergence followed by a second application 14 days later or in-furrow at planting followed by a second application at crop emergence.

***Consult with product label before application.**

Application Information:

- **Water Volume:**
  - ***Ground:***
    - *Potato:* Minimum of 12 L per acre for in-furrow treatment and minimum of 81 L per acre for foliar applications.
    - *Field pea:* Minimum of 40 L per acre.
  - ***Aerial:***
    - *Potato:* Minimum of 20 L per acre

How it Works:

The active ingredient mono- and dibasic sodium, potassium, and ammonium phosphite is a phosphonates fungicide with systemic activity to suppress pathogen inoculum. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:

Pink rot: *Ridomil Gold 480SL* (in-furrow), *Ridomil Gold MZ* and *Ridomil Gold Bravo Twin Pack* (foliar)

Late Blight: May be tank mixed with one of the following fungicides: *Bravo 500, Bravo ZN, Echo 720, Echo 90DF, Ridomil Gold Bravo Twin Pack, Dithane Rainshield, Manzate Pro-Stick, Gavel 75DF, Penncozeb 75DF*

Restrictions:

- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Maximum number of applications:**
  - ***Potato*** – DO NOT exceed 7 applications of this product per season.
  - ***Field pea*** – DO NOT exceed 2 applications of this product per season.
- **Grazing:** DO NOT graze treated fields or feed treated forage to livestock.
- **Preharvest interval:**
  - ***Potato*** – May be applied up to the day of harvest and post harvest.
  - ***Field pea*** – preharvest interval is 21 days.
- **Restricted Entry Interval:** Re-entry interval after application is 12 hours.
- **Re-cropping:** No restriction listed.
- **Storage:** Store in in a cool, dry, secure and well ventilated area. To prevent contamination, store this product away from food or feed. Keep pesticide in original container. Not for use in or around home. DO NOT store near open flame.
- **Environment:** Avoid run-off from treated areas into aquatic areas.
  - To reduce runoff from treated areas into aquatic habitats, avoid application to areas with a moderate to steep slope, compacted soil, or clay.
  - Avoid application when heavy rain is forecast.
  - Contamination of aquatic areas as a result of runoff may be reduced by including a vegetative strip between the treated area and the edge of the water body.
- **Toxicity:** Toxic to aquatic organisms, non-target terrestrial plants and small wild animals.

Hazard Rating:

Caution – Skin Irritant

Refer to the Introduction for an explanation of the symbols.

Priaxor*

Fungicide Group 7, 11

***NOTE:** This product is no longer manufactured but product still remains in the distribution system. This product may be removed from future editions.

Company:

BASF Canada (PCP#30567)

Formulation:

167 g/L of fluxapyroxad and 333 g/L of pyraclostrobin formulated as a suspension concentrate.

- Container size – 2 x 9.6 L

Crops, Diseases, Rates and Timing:

Crop	Diseases	Application Rate (per acre)	Application Timing
Wheat, triticale	Control of tan spot *(Pyrenophora tritici-repentis)*, septoria leaf blotch *(Septoria tritici; S. nodorum)*, leaf rust *(Puccinia recondita)*, spot blotch *(Cochliobolus sativus)*, stripe rust *(Puccinia striiformis)*, powdery mildew *(Erysiphe graminis f. sp. tritici)*	90 to 120 mL	Apply prior to disease development or at the onset of disease symptoms. Applications should be made prior to head emergence. Use the higher rate when disease pressure is high.
Barley	Control of net blotch *(Pyrenophora teres)*, spot blotch *(Cochliobolus sativus)*, scald *(Rhynchosporium secalis)*, stripe rust *(Puccinia striiformis)*		
Rye	Control of leaf rust *(Puccinia recondita)*, powdery mildew *(Erysiphe graminis)*		
Oat	Control of crown rust *(Puccinia coronata)*		
Corn	Control of common rust (*Puccinia sorghi*), Grey leaf spot (*Cercospora zeae-maydis*), Northern leaf blight (*Setosphaeria turcica*), suppression of eye spot (*Aureobasidium zeae*)	120 mL	Apply prior to disease development.

Crop	Diseases	Application Rate (per acre)	Application Timing
Canola (including rapeseed, canola quality *Brassica juncea*) and mustard (oilseed and condiment)	Control of blackleg *(Leptosphaeria maculans)*	90 to 120 mL	Apply at 2 to 6 leaf (rosette) stage. Use the high rate under high disease pressure.
	Control/suppression of black spot *(Alternaria brassicae, A. raphani)*	90 to 120 mL	Apply at 20 to 50% bloom for suppression. For control, apply at early pod stage. Use the high rate under high disease pressure.
	Suppression of sclerotinia stem rot *(Sclerotinia sclerotiorum)*	180 mL	Apply at 20 to 50% bloom.
Chickpea	Control of ascochyta blight *(Ascochyta rabiei)*	120 to 180 mL	Apply at the beginning of flowering or at the onset of symptoms.
	Suppression of white mould *(Sclerotinia sclerotiorum)*, grey mould *(Botrytis cinerea)*	180 mL	Apply at the beginning of flowering.
Lentil	Control of anthracnose *(Colletotrichum truncatum)*	120 mL	Apply at the beginning of flowering or at the onset of symptoms.
	Control of ascochyta blight *(Ascochyta lentis)*	120 to 180 mL	
	Suppression of white mould (Sclerotinia sclerotiorum), grey mould (Botrytis cinerea)	180 mL	Apply at the beginning of flowering.
Faba bean	Control of powdery mildew *(Erysiphe* spp.*)*	120 mL	Apply at the beginning of flowering or at the onset of symptoms.
	Control of ascochyta blight *(Ascochyta* spp.*)*	120 to 180 mL	
	Suppression of white mould *(Sclerotinia sclerotiorum)*, grey mould *(Botrytis cinerea)*	180 mL	Apply at the beginning of flowering.
Field pea	Control of powdery mildew *(Erysiphe pisi)*	120 mL	Apply at the beginning of flowering or at the onset of symptoms.
	Control of mycosphaerella blight *(Mycosphaerella pinodes)*; suppression of downy mildew *(Peronospora viciae* f.sp. *pisi)*	120 to 180 mL	For control of Mycosphaerella blight and suppression of white mould apply at the beginning of flowering. For suppression of downy mildew, apply at the beginning of flowering or at the onset of symptoms.
	Suppression of white mould *(Sclerotinia sclerotiorum)*	180 mL	
Dry bean	Control of anthracnose *(Colletotrichum lindemuthianum)*, powdery mildew *(Erysiphe* spp.*)*, rust *(Uromyces appendiculatus)*	120 mL	Apply at the beginning of flowering.
Soybean	Control of septoria brown spot *(Septoria glycines), frogeye leaf spot (Cercospora sojina)*	97 to 120 mL	Apply prior to disease development when conditions are favourable for disease development. Use the high rate when disease pressure is high.
	Suppression of white mould *(Sclerotinia sclerotiorum)*	180 mL	
Sunflowers	Suppression of leaf rust *(Puccinia helianthi)*	120 mL	Apply at first sign of disease.
Flax	Control of pasmo *(Septoria linicola)*	90 to 120 mL	Apply at 20 to 50% flowering.
	Suppression of sclerotinia stem rot *(Sclerotinia sclerotiorum)*	180 mL	
Alfalfa (for seed production)	Control of common leaf spot *(Pseudopeziza medicaginis)*	120 mL	Apply at the beginning of flowering (10 to 30% bloom) or at the onset of disease.
	Suppression of blossom blight *(Sclerotinia sclerotiorum)*	180 mL	
Bluegrasses; fescues; rye-grasses (for seed production	Control of leaf rust *(Puccinia recondita)*, stem rust *(P. graminis)*; suppression of powdery mildew *(Erysiphe graminis)*	90 to 120 mL	Apply prior to disease development when conditions are favourable for disease development. Use the high rate when disease pressure is high.

Crop	Diseases	Application Rate (per acre)	Application Timing
Non grass animal feeds including: Alfalfa, clover, Sainfoin, trefoil, vetch, crown vetch, milk vetch, and including mixed stands of forages grown for feed	Common leaf spot *(Pseudopeziza medicaginis)*	120 to 180 mL	For optimal disease control, apply at the beginning of flowering (10 to 30% bloom) or at the onset of disease. Make one application per forage cutting for feed (follow preharvest intervals), with a maximum of 2 applications per season.
	Blossom blight *(Sclerotinia sclerotiorum)*	180 mL	

DO NOT make sequential applications of *Priaxor*. If disease persists or weather conditions are favourable for disease development, make a second application 10 to 14 days later, with a fungicide that contains a different mode of action. Use the shorter interval when disease pressure is high.

Application Information:

- **Water Volume:**
  - ***Ground:*** minimum 40 L per acre.
  - ***Aerial:*** minimum 20 L per acre.

How it Works:

The active ingredient fluxapyroxad is a carboxamide (SDHI) fungicide with systemic activity. The active ingredient pyraclostrobin is a strobilurin fungicide with broad spectrum contact and systemic activity. To be used as a preventative application when environmental conditions are favourable for disease development. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:

Herbicides: In Clearfield canola and Clearfield canola quality *Brassica juncea*, *Priaxor* can be tank mixed with *Odyssey*, or *Odyssey* plus *Equinox*. BASF Canada also supports the tank mix of *Priaxor* with *Ares* in Clearfield canola. In Liberty Link canola, *Priaxor* can be tank mixed with *Liberty*. In Roundup Ready canola, *Priaxor* can be tank mixed with glyphosate herbicides.
Fungicides: In canola and mustard, *Priaxor* can be tank mixed with *Lance WDG Fungicide* at 140 grams per acre at 20 to 50 percent bloom to control sclerotinia stem rot and suppress alternaria black spot.

Restrictions:

- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Maximum number of applications:** DO NOT exceed 1 sequential application of this product per season.
  - ***Alfalfa, forage grasses*** – DO NOT exceed 1 application of this product per season.
  - ***Barley, oat, rye, wheat, triticale, corn, soybean, canola, mustard, sunflower, flax, soybean, field pea, lentil, chickpea, faba bean, dry bean*** – DO NOT exceed 2 applications of this product per season.
- **Grazing:** DO NOT feed grass hay or forage to livestock. All other crops on this label can be grazed or fed to livestock.
- **Preharvest interval:**
  - ***Barley, rye, wheat, oat*** – apply no later than the end of flowering
  - ***Field pea, lentil, chickpea, faba bean, dry bean*** – 30 days
  - ***Corn, soybean, canola, sunflower, flax*** – 21 days
  - ***Forage grasses*** – 14 days
  - ***Sweet corn*** – 7 days
  - ***Alfalfa*** – not applicable
- **Restricted Entry Interval:** DO NOT re-enter treated areas within 12 hours of application.
- **Re-cropping:** Crops listed on label, tuberous and corm vegetables, fruiting vegetables, pome fruits and stone fruits may be planted immediately following last application. DO NOT plant any other crops within one year of application of *Priaxor*.
- **Storage:** Store this product away from food or feed.
- **Environment:** Maintain specified buffer zones. Toxic to aquatic organisms, small mammals, and non-target terrestrial plants.

Hazard Rating:

Danger Poison – Skin Irritant

Refer to the Introduction for an explanation of the symbols.

Proline GOLD*

Fungicide Group 3, 7

***NOTE:** As of January 1, 2025, www.keepitclean.ca indicates that the use of this product on certain crop types may have market access concerns. Please see pg. 12 for more information AND consult potential grain buyers before using this product.

Company:
Bayer (PCP#30511)

Formulation:
200 g/L of fluopyram and 200 g/L of prothioconazole formulated as a suspension concentrate.
- Container size – 10.12 L jugs

Crops, Diseases, Rates and Timing:

Crop	Diseases	Application Rate (per acre)	Application Timing
Canola, oriental mustard (Brassica juncea) and Brassica carinata	Control of sclerotinia stem rot (*Sclerotinia sclerotiorum*)	253 mL	Apply when the crop is in the 20 to 50% bloom stage. Best protection will be achieved when the fungicide is applied prior to petals beginning to fall, and it will allow for the maximum number of petals to be protected. Good spray coverage of the plants is essential.
Lentil, Pea, Chickpea, Dry bean, Faba bean	Control of white mold (*Sclerotinia sclerotiorum*), anthracnose in lentils (*Colletotrichum lentis*) including biotypes resistant to Group 11 fungicides	303 mL	Begin fungicide applications preventatively.
	Control of ascochyta blight (*Ascochyta* spp.), mycosphaerella blight (*Mycosphaerella pinodes*), anthracnose in dry bean (*Colletotrichum lindemuthianum*)	202 to 303 mL	

Application Information:
- **Water Volume:**
  - ***Ground:*** minimum 40 L per acre.
  - ***Aerial:*** minimum of 20 L per acre.

How it Works:
The active ingredient fluopyram is a carboxamide fungicide with systemic activity. The active ingredient prothioconazole is a triazole fungicide with broad-spectrum systemic activity. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:
None registered.

Restrictions:
- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Maximum number of applications:** DO NOT exceed 2 applications of this product per season.
- **Grazing:**
  - ***Canola*** – DO NOT allow livestock to graze treated areas, and DO NOT harvest rapeseed forage for feed.
  - ***Lentils, peas, chickpeas*** – DO NOT allow livestock to graze treated areas and DO NOT harvest for forage and hay for 7 days after application.
- **Preharvest interval:**
  - ***Canola*** – 36 days
  - ***Lentils, peas, chickpeas*** – 14 days
- **Restricted Entry Interval:** DO NOT re-enter treated areas within 24 hours of application.

- **Re-cropping:** DO NOT replant to alfalfa for 14 days after application. Crops listed on this label and other crops from crop subgroup 20A (rapeseeds), cereals, corn, soybeans, peanuts, cucurbit vegetables, crops of oilseed crop subgroup 20B (sunflowers), tuberous and corn vegetables and sugarbeets may be rotated anytime following the last application of *Proline GOLD*. All other crops may be replanted 30 days following the last application of *Proline GOLD.*
- **Storage:** Store product in original container only, away from other pesticides, fertilizer, food or feed. Not for use or storage in or around the home. DO NOT store below freezing. If stored for one year or longer, shake well before using.
- **Environment:** This product is toxic to birds and aquatic organisms. Consult the product label for buffer zones.
- **Rainfast:** 1 hour

Hazard Rating:

None listed.

Propiconazole

Fungicide Group 3

Tilt 250E/Bumper 432 EC/Pivot 418 EC/Propel/Propi Super 25 EC/ Fitness*/Co-Op Pivot/Princeton /VIKING Propiconazole*

*NOTE: This product is no longer manufactured but product still remains in the distribution system. This product may be removed from future editions.

Company:

Sharda CropChem (*Propi Super 25 EC* – PCP#32240)
Syngenta Canada (*Tilt 250E* – PCP#19346, *Propel* – PCP#29548)
ADAMA Canada (*Bumper 432 EC* – PCP#28017)
Interprovincial Cooperative Ltd. (*Pivot 418 EC* – PCP#28219)
Loveland Products (*Fitness* – PCP#32639)
Federated Co-operatives Limited (*Co-Op Pivot* – PCP#32986)
Sharda CropChem (*Princeton* – PCP#33840)
AgraCity Crop & Nutrition Ltd. (*Modo* – PCP#34213)
Viking Crop Production Partners Inc. (*VIKING Propiconazole Fungicide* – PCP#34772)

Formulations:

Tilt 250E – 250 g/L propiconazole formulated as an emulsifiable concentrate.
- Container size – 2 x 8 L

Propi Super 25 EC – 250 g/L propiconazole formulated as an emulsifiable concentrate.
- Container size – 2 x 8 L

Bumper 432 EC – 432 g/L propiconazole formulated as an emulsifiable concentrate.
- Container size – 4.8 L

Pivot 418 EC and *Fitness* – 418 g/L propiconazole formulated as an emulsifiable concentrate.
- Container size – 2 x 4.8 L

Propel – 250 g/L propiconazole formulated as an emulsifiable concentrate.
- Container size – 8 L

Co-Op Pivot – 418 g/L propiconazole formulated as an emulsifiable concentrate.
- Container size – 1 to 1,000 L

Princeton – 418 g/L propiconazole formulated as an emulsifiable concentrate.
- Container size – 1 to 1,050 L

Modo – 250 g/L propiconazole formulated as an emulsifiable concentrate.
- Container sizes – 8.1 L, 97 L

VIKING Propiconazole Fungicide – 250 g/L propiconazole formulated as an emulsifiable concentrate.
- Container sizes – 2 X 8.1 L, 97 L"

Crops, Diseases, Rates and Timing:

Crop	Diseases	Application Rates (per acre)		Application Timing
		250 g/L products	418 g/L and 432 g/L products	
Wheat	Suppression of septoria leaf blotch *(Septoria tritici)*, tan spot *(Pyrenophora tritici-repentis)*	100 to 200 mL	60 to 120 mL	Apply with herbicide application at growth stage 12 to 23. If there is a history of high disease pressure in the field and/or field conditions favour disease development use the higher rate.
Wheat	Control of septoria leaf blotch *(Septoria tritici)*, tan spot *(Pyrenophora tritici-repentis)*, septoria glume blotch *(S. tritici)*, stripe rust *(Puccinia striiformis)*, leaf rust *(Puccinia triticina)*, stem rust *(Puccinia graminis)*, powdery mildew *(Erysiphe graminis* f.sp. *tritici)*	200 mL	120 mL	Apply at early stages of disease development (tillering or stem elongation). A second application is recommended if disease pressure continues which can be made up to half-emergence of the head.
Barley	Suppression of net blotch *(Pyrenophora teres)*	100 to 200 mL	60 to 120 mL	Apply with herbicide application at growth stage 12 to 23. If there is a history of high disease pressure in the field and/or field conditions favour disease development use the higher rate.
Barley *continued*	Control of spot blotch *(Cochliobolus sativus)*, net blotch *(Pyrenophora teres)*, scald *(Rhynchosporium secalis)*, leaf rust *(Puccinia hordei)*, stem rust *(Puccinia graminis)*, septoria leaf blotch *(Septoria* spp.*)*, powdery mildew *(Blumeria graminis)*	200 mL	120 mL	Apply at early stages of disease development (tillering or stem elongation). A second application is recommended if disease pressure continues which can be made up to half-emergence of the head.
Oat	Control of septoria leaf blotch *(Septoria avenae)*, crown rust *(Puccinia coronata)*	200 mL	120 mL	
Corn	Control of rust *(Puccinia sorghi)*	200 mL	120 mL	Apply when rust pustules first appear, make second application 14 days later.
	Control of northern leaf blight *(Setosphaeria turcicum)*	100 to 200 mL	60 to 120 mL	Apply when disease first appears. Use higher rate if disease pressure is high.
Canola	Control of blackleg *(Leptosphaeria maculans)*	200 mL	120 mL	Apply during the rosette stage.
Soybean (grown for seed)	Control of frogeye leaf spot (*Cercospora sojina*)	202 to 307 mL	120 to 184 mL	Apply when disease first appears. Under severe disease pressure make a second application 14 days later
Dry bean	Control of rust *(Uromyces* spp.*)*	200 mL	120 mL	Apply at the first sign of disease, make second application 14 to 21 days later.
	Control of powdery mildew *(Erysiphe* spp.*)* ‡	200 mL	-	Apply at the first sign of disease, make second application 14 days later if disease continues.
Lentil, field pea, chickpea, faba bean‡	Control of powdery mildew *(Microsphaera diffusa, Erysiphe pisi, E. polygoni)*	200 mL	--	Apply at the first sign of disease, make second application 14 days later if disease continues.
Soybean	Control of powdery mildew *(Microsphaera diffusa)* ‡, cercospora leaf spot *(Cercospora kikuchii)*	200 mL	--	

Crop	Diseases	Application Rates (per acre)		Application Timing
		250 g/L products	418 g/L and 432 g/L products	
Canaryseed*	Suppression of septoria leaf mottle *(Septoria triseti)*	200 mL	120 mL	Apply at flag leaf emergence.
Timothy*†	Control of purple eyespot *(Cladosporium phlei)*	200 mL	120 mL	Apply at the first sign of disease (usually at the beginning of flowering). Can be applied up to full flowering, spray interval of 14 days.

***Ground application only.**
† Only *TILT 250E, Pivot 418 EC, Propi Super 25 EC, Propel, VIKING Propiconazole Fungicide, Fitness,* and *Co-Op Pivot* are registered for use on this crop.
‡ Only *TILT 250 EC, Propi Super 25 EC VIKING Propiconazole Fungicide* and *Propel* are registered for these uses

Application Information:

- **Water Volume:**
  - ***Ground:*** minimum 80 L per acre.
  - ***Aerial:*** 16 to 20 L per acre.

How it Works:

The active ingredient propiconazole is a triazole fungicide with broad spectrum systemic activity. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:

Review and follow the detailed instructions, restrictions and precautions on products labels before mixing.
Herbicides: In wheat and barley only, propiconazole may be tank-mixed with one of the following: 2, 4-D amine, MCPA amine, *Buctril-M* or *Pardner* and in wheat only, may be applied with *Horizon NG*. In wheat and barley only, *Pivot 418 EC, Co-Op Pivot* and *Fitness* may be tank-mixed with *Logic M* or *Brotex 240*; *Pivot 418 EC, Co-Op Pivot, Bumper 432 EC,* or *Fitness* may be tank-mixed with *Badge* or *Bromotril 240 EC*. In spring wheat and barley only, *Tilt 250E* or *Propel* may be tank-mixed with *Axial 100EC*. Refer to labels for tank-mix precautions.
Fertilizers: *Propiconazole* may be applied with up to 4 kg per acre (9 lb. per acre) of actual nitrogen. The appropriate amount of urea can be dissolved in water and added to the spray tank before adding the fungicide. Excessive nitrogen or application during hot weather may result in crop injury. DO NOT add nitrogen when tank-mixing *propiconazole* with a herbicide.
Insecticides: In field corn, *propiconazole* can be tank- mixed with one of the following: *Matador 120EC/Silencer 120EC*. In legumes, *Tilt 250E* or *Propel* can be tank-mixed with *Matador 120EC*.
In wheat and barley, *VIKING Propiconazole Fungicide* can be mixed with only one of the following: *2,4-D Amine, MCPA Amine, Buctril M, Mextrol 450, Approve,* or *Broadband*. In corn, *VIKING Propiconazole Fungicide* can be mixed with: *Matador* Insecticide. In legume vegetables, *VIKING Propiconazole Fungicide* can be mixed with the following: *Quadris, Matador* Insecticide or *Warrior* Insecticide. In some case, the tank mix should not be applied by aerial application equipment. review and follow the directions for use and precautions on all labels.
Note: According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Restrictions:

- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Maximum number of applications:**
  - ***Wheat, barley, corn, bean, legume, timothy*** – DO NOT exceed 2 applications of this product per season.
- **Grazing:** DO NOT graze animals on treated green crops within 3 days of application. DO NOT feed straw treated with herbicide tank mixes to livestock. DO NOT use treated soybean seed for animal feed.
- **Preharvest interval:**
  - ***Wheat, oat, barley*** – 45 days
  - ***Canola*** – 60 days
  - ***Corn*** – 14 days if tank-mixed with an insecticide
  - ***Soybean*** – 50 days
  - ***Bean*** – 28 days
  - ***Timothy*** – 14 days
- **Restricted Entry Interval:** DO NOT allow entry into treated area until dry or for 12 hours; whichever is greater.
- **Re-cropping:** No restrictions listed.
- **Storage:** DO NOT freeze. Store products away from food or feed.
- **Environment:** Toxic to aquatic organisms. DO NOT contaminate any body of water by direct application, drift or by cleaning equipment.

Hazard Rating:

Warning – Eye and Skin Irritant
Potential Skin Sensitizer

Bumper 432 EC, Pivot 418 EC, Co-Op Pivot: Warning – Poison

Tilt 250 EC, Propel, Propi Super 25 EC: Caution – Poison

Refer to the Introduction for an explanation of the symbols.

Propiconazole + Azoxystrobin

Fungicide Group 3, 11

Company:

ADAMA Canada (*Topnotch* – PCP#31126)
AgraCity Crop & Nutrition Ltd. (*Quasimodo* – PCP#33807, 34213)

Formulation:

Topnotch: 143 g/L of azoxystrobin and 124 g/L of propiconazole as suspension concentrate.
Quasimodo: 250 g/L of azoxystrobin + 250 g/L of propiconazole as emulsifiable concentrate.

Crops, Diseases, Rates and Timing:

Crops	Diseases Controlled	Application Rate (per acre) *Topnotch*	Application Rate (per acre) *Quasimodo*	Application Timing
Wheat	Septoria leaf spot (*Septoria* spp.), tan spot *(Pyrenophora tritici-repentis)*, stripe rust *(Puccinia striiformis)*, wheat leaf rust *(Puccinia triticina)*	214 mL	90 mL *Quasi* + 202 mL *Modo*	Apply once between stem elongation and half head emergence.
Barley	Septoria leaf spot (*Septoria* spp.), net blotch *(Pyrenophora teres)*, scald *(Rhynchosporium secalis)*, barley leaf rust *(Puccinia hordei)*, tan spot *(Pyrenophora tritici-repentis)*, stripe rust *(Puccinia striiformis)*			
Oat	Septoria leaf spot (*Septoria* spp.), net blotch *(Pyrenophora teres)*, crown rust (*Puccinia coronata* var. *avenae*)			
Rye	Septoria leaf spot (*Septoria* spp.), scald *(Rhynchosporium secalis)*, tan spot *(Pyrenophora tritici-repentis)*	214 mL	90 mL *Quasi* + 202 mL *Modo*	Apply once between stem elongation and half head emergence.
Triticale	Septoria leaf spot (*Septoria* spp.), tan spot *(Pyrenophora tritici-repentis)*			
Beans, Field pea, Lentil, Soybean	Mycosphaerella blight, anthracnose, ascochyta blight (lentils only)	310 to 620 mL	-	Make the first application at the first sign of disease. Apply the high rate only under conditions of high disease pressures. A second application 14 days later may be needed if conditions persist.
	Powdery mildew, white mold (suppression only)	310 mL		

Application Information:

- **Water Volume:**
  - ***Ground:*** minimum 40 L per acre.
  - ***Aerial:*** minimum 18 L per acre.
- DO NOT apply during periods of dead calm.
- DO NOT apply aerially when wind speed is greater than 16 km per hour.
- Good spray coverage and canopy penetration are important for best results.

How it Works:

Topnotch is composed of two active ingredients; azoxystrobin and propiconazole. Both active ingredients have systemic activity and this mixture can be used for broad spectrum coverage and preventative purpose. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:

None registered.

According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Restrictions:

- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Maximum number of applications:** DO NOT exceed the total number of applications of *Topnotch* per season per crop as stated in label.
- **Preharvest interval:**
  - ***Cereals and straw*** – 45 days
  - ***Forage and hay*** – 30 days
- **Restricted Entry Interval:** DO NOT re-enter treated areas within 12 hours of application.
- **Re-cropping:** A plant back interval of 105 days is required for all crops not listed in this label. Oat and rye may be planted 45 days after application.
- **Storage:** Store in original tightly closed container in a cool dry, well ventilated area away from feed and foodstuffs. DO NOT store below 0˚C.
- **Environment:** Avoid run-off from treated areas into aquatic areas. Toxic to aquatic organisms, certain beneficial insects and may leach to ground water. Avoid application when heavy rain in forecast.
- **Grazing Restrictions (Topnotch):** Do not graze pea vines. 30 days for all other crops.

Hazard Rating:

Caution Poison – Eye and Skin Irritant

Refer to the Introduction for an explanation of the symbols.

Prosaro PRO*

Fungicide Group 3, 7

***NOTE:** As of January 1, 2025, www.keepitclean.ca indicates that the use of this product on certain crop types may have market access concerns. Please see pg. 12 for more information AND consult potential grain buyers before using this product.

Company:

Bayer (PCP#34093)

Formulation:

200 g/L prothioconazole, 100 g/L tebuconazole and 100 g/L fluopyram formulated as a suspension concentrate.

- Container sizes – 6 L, 97 L

Crops, Diseases, Rates and Timing:

Crop	Diseases	Application Rate (per acre)*	Application Timing
Barley	Control of net blotch (*Pyrenophora teres*), spot blotch (*Cochliobolus sativus*), scald (*Rhynchosporium secalis*), septoria leaf blotch (*Septoria passerinii*), leaf, stem and stripe rusts (*Puccinia hordei, P. graminis, P. striiformis*), powdery mildew (*Blumeria graminis* syn. *Erysiphe graminis*)	304 mL	For suppression of Fusarium head blight and ergot, apply *Prosaro PRO* as a preventative spray within the time period when 70 to 100% of the barley main stem heads are fully emerged, to 3 days after full head emergence. Application at this timing will also control the listed leaf diseases.
	Suppression of Fusarium head blight (*Fusarium graminearum* syn. *Gibberella zeae*), ergot (*Claviceps purpurea*)		
Oats	Control of stem rust (*Puccinia graminis*), stagonospora (*Septoria*), leaf blotch and black stem (*Stagonospora avenae* syn. *Septoria avenae*), crown rust (*Puccinia coronata*)		Leaf and Stem Diseases: Apply as a preventive foliar spray when the earliest disease symptoms appear on the leaves and stems. Fields should be observed closely for early disease symptoms, particularly when susceptible varieties are planted and/or under prolonged conditions favorable for disease development. For suppression of fusarium head blight and ergot, apply as a preventative spray within the time period from when at least 75% of the oat panicles on the main stem are fully emerged to when 50% of the panicles on the main stem are in flower.
	Suppression of Fusarium head blight (*Fusarium graminearum* syn. *Gibberella zeae*), ergot (*Claviceps purpurea*)		
Wheat (spring, winter and durum), triticale (spring and winter)	Control of rusts – leaf, stem and stripe (*Puccinia triticina, P. graminis, P. striiformis*), leaf and glume blotch (*Septoria tritici, Stagonospora nodorum*), tan spot (*Pyrenophora tritici-repentis*), powdery mildew (*Blumeria graminis* syn. *Erysiphe graminis*), spot blotch (*Cochliobolus sativus*)	304 mL	For suppression of Fusarium head blight and ergot, apply as a preventative spray within the time period from when at least 75% of the wheat heads on the main stem are fully emerged to when 50% of the heads on the main stem are in flower. Optimal application timing is when first flowers emerge on the main heads. Application at this timing will also control the listed leaf diseases.
	Suppression of Fusarium head blight (*Fusarium graminearum* syn. *Gibberella zeae*), ergot (*Claviceps purpurea*)		

***A registered non-ionic surfactant must be used with this product (such as *Agral 90* or *AgSurf*) at 0.125% v/v.**

Application Information:

- **Water Volume:**
  - ***Ground:*** minimum 40 L per acre.
  - ***Aerial:*** minimum 20 L per acre.

How it Works:

The active ingredients prothioconazole and tebuconazole are triazole fungicides with broad spectrum systemic activity. The active ingredient fluopyram is a carboximide (SDHI) fungicide with systemic activity. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:
None registered.

Restrictions:
- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Maximum number of applications:** DO NOT apply more than once per season.
- **Preharvest interval:** DO NOT apply within 36 days of harvest.
- **Restricted Entry Interval:** DO NOT re-enter treated areas until 12 hours after application.
- **Re-cropping:** Treated areas may be replanted with any crop specified on this label and soybean as soon as practical after the last application. For all other crops, observe a 120 days re-cropping interval.
- **Storage:** Store this product away from food or feed. DO NOT contaminate water, food, or feed by storage or disposal. DO NOT store below freezing. If stored for 1 year or longer, shake well before using. Store the tightly closed container away from feeds, seeds, fertilizer, plants and foodstuffs. DO NOT use or store in or around the home. Keep the product in the original container during storage.
- **Environment:** Toxic to birds, small wild mammals, aquatic organisms, and non-target terrestrial plants. Observe spray buffer zones. See label for specific details on buffer zones. DO NOT apply directly to water or to areas where surface water is present. DO NOT contaminate irrigation or drinking water supplies or aquatic habitats by cleaning of equipment or disposal of wastes.

Hazard Rating:
Keep out of reach of children.

Prothioconazole and Tebuconazole

Fungicide Group 3

Company:
Bayer (*Prosaro XTR* – PCP#32824)
Albaugh (*StarPro* – PCP#34349)
Adama Canada (*Soraduo A* – PCP#34367; *Soraduo B* – PCP#34368)
Loveland Products Canada Inc distributed by Nutrien Ag Solutions (*Duplex A* – PCP#35153; *Duplex B* – PCP#35154)
Sharda CropChem (*Shalimar* – PCP#34357)
Viking Crop Production Partners Inc. (*VIKING Tromso Fungicide* – PCP#34794)
Advantage Crop Protection Inc. (*Advantage Prothio +Teb 250 EC* – PCP#34975)

Formulation:
Prosaro XTR: 125 g/L prothioconazole and 125 g/L tebuconazole, formulated as an emulsifiable concentrate.
- Container sizes – 6.5 L, 104 L tote

StarPro, Shalimar* and *Advantage Prothio +Teb 250 EC: 125 g/L prothioconazole and 125 g/L tebuconazole, formulated as an emulsifiable concentrate.
- Container size: 2 x 6.5 L

VIKING Tromso Fungicide: 125 g/L prothioconazole and 125 g/L tebuconazole, formulated as an emulsifiable concentrate.
- Container size: 2 X13 L, 104 L, 625 L

Soraduo: The Soraduo package contains 2 components. *Soraduo A* – 250 g/L Prothioconazole formulated as an Emulsifiable Concentrate (Container size – 9.71 L) and *Soraduo B* – 430 g/L Tebuconazole formulated as as a suspension concentrate (container size – 5.65 L).

Duplex: The *Duplex* package contains 2 components. *Duplex A* – 250 g/L Prothioconazole formulated as an Emulsifiable Concentrate. (Container size – 9.71 L) and *Duplex B* – 430 g/L Tebuconazole formulated as as a suspension concentrate (container size – 5.65 L).

Crops, Diseases, Rates and Timing:

Crop	Diseases	Application Rate for *Prosaro XTR, Shalimar, StarPro , Advantage Prothio +Teb 250 EC* and *VIKING Tromso Fungicide per acre*	Application Rate for *Soraduo* and *Duplex* per acre		Application Timing
Wheat*	Control of septoria leaf blotch (*Septoria tritici*), glume blotch (*S. tritici, Stagonospora* nodorum), tan spot *(Pyrenophora tritici-repentis)*, leaf rust *(Puccinia recondita)*, stem rust *(Puccinia graminis)*, stripe rust *(Puccinia striiformis)*, powdery mildew *(Erysiphe graminis)*	325 mL			FHB: apply within the time period from when at least 75% of the heads on the main stem are fully emerged to when 50% of heads on the main stem are in flower. For *Soraduo and Duplex*, use higher rate when disease pressure is expected to be high. Application at this timing will also control the listed leaf diseases.
	Suppression of fusarium head blight (FHB) *(Fusarium graminearum)*		121-162 ml/ac *Duplex A* + 70-94 ml/ac *Duplex B*	121-162 ml/ac *SORADUO™ A* + 70-94 ml/ac *SORADUO™ B*	
Barley*	Control of net blotch *(Pyrenophora teres)*, scald *(Rhynchosporium secalis)*, spot blotch *(Cochliobolus sativus)*, septoria leaf blotch *(Septoria passerinii)*, leaf rust *(Puccinia hordei)*, stem rust *(Puccinia graminis)*, stripe rust *(Puccinia striiformis)*, powdery mildew *(Erysiphe graminis)*	325 mL			FHB: apply within the time period when 70 to 100% of barley heads on the main stem are fully emerged to 3 days after full head emergence. For *Soraduo and Duplex*, use higher rate when disease pressure is expected to be high. Application at this timing will also control the listed leaf diseases.
	Suppression of fusarium head blight (FHB) *(Fusarium* spp.*)*		121-162 ml/ac *Duplex A* + 70-94 ml/ac *Duplex B*	121-162 ml/ac *SORADUO™ A* + 70-94 ml/ac *SORADUO™ B*	
Oat *(only if oat is on the label)*	Control of crown rust *(Puccinia coronata)*, stem rust *(Puccinia graminis)*, stagonospora leaf blotch *(Stagonospora nodorum)*, black stem *(Stagonospora avenae* syn. *Septoria avenae)*	325 mL			Apply as a preventative foliar spray when the earliest disease symptoms appear on leaves and stems. Fields should be observed closely for early disease symptoms, particularly when susceptible varieties are planted and/or under prolonged conditions favorable for disease development

***Soraduo and Duplex is for suppression of fusarium head blight only.**

Application Information:

- DO NOT apply during periods of dead calm or when winds are gusty. Ensure uniform coverage.
- **Water Volume:**
  - ***Ground:*** minimum 40 L per acre.
  - ***Aerial:*** Follow detailed label recommendations for aerial application.

How it Works:

The active ingredients prothioconazole and tebuconazole are demethylation inhibitors with broad-spectrum systemic activity. To be used as a preventative fungicide application. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:

None registered.

Restrictions:

- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Maximum number of applications:** DO NOT exceed 1 application of this product per season.
- **Grazing:** DO NOT allow livestock to graze or feed green forage to livestock prior to 6 days after treatment. Straw cut after harvest may be fed or used for bedding.
- **Preharvest interval:** 36 days
- **Restricted Entry Interval:** DO NOT re-enter treated fields until 12 hours post-application.
- **Re-cropping:** Treated areas may be replanted with any crop specified on the label and soybean as soon as practical after last application. For oat, DO NOT plant back within 30 days of application. For all other crops, DO NOT plant back until 120 days after application. Tebuconazole is persistent and will carryover. It is recommended that any products containing tebuconazole not be used in areas treated with this product during the previous season.
- **Storage:** DO NOT store in or around the home. DO NOT store at temperatures below freezing. Keep in original tightly closed container and store away from feeds, seeds, fertilizer, plants and food stuffs. Keep away from sources of heat. Shake well before using if stored for more than 1 year. DO NOT contaminate water, food, or feed by storage or disposal.
- **Environment:** Toxic to birds, small wild animals, aquatic organisms, and non-target plants. As this product is not registered for the control of pests in aquatic systems, DO NOT use to control aquatic pests. DO NOT apply to water, or to areas where surface water is present or to intertidal areas below the mean high water mark. Runoff is hazardous to aquatic organisms in neighbouring areas. To reduce runoff from treated areas into aquatic habitats, avoid application to areas with a moderate to steep slope, compacted soil, or clay. Contamination of aquatic areas as a result of runoff may be reduced by including a vegetative strip between the treated area and the edge of the water body. Follow buffer zones as per the product label.
- **Rainfast:** 1 hour

Hazard Rating:

Danger – Eye Irritant

Caution – Skin Irritant

Refer to the Introduction for an explanation of the symbols.

Prothioconazole

Fungicide Group 3

Company:

Bayer (*Proline 480 SC* – PCP#28359)
WinField United Canada (*Holdfast* – PCP#34013)
ADAMA Canada (*Soratel* – PCP#34155)
Nufarm Agriculture (*Joust* – PCP#34800)
Albaugh (*Pavise 480SC* – PCP#34769)
Advantage Crop Protection Inc. (*Advantage Prothioconazole 480 SC* – PCP#34978)
Viking Crop Production Partners Inc. (*VIKING Prothioconazole* – PCP#35109)
Sharda Crop Chem (*Taj* – PCP#35163)
NewAgco Inc distributed by AgraCity (*Rambler* – PCP#35048)

Formulation:

Proline 480 SC: 480 g/L prothioconazole formulated as a suspension concentrate.
- Container size – 5.1 L

Holdfast: 480 g/L prothioconazole formulated as a suspension concentrate.
- Container size – 2 x 101 L

Soratel: 250 g/L prothioconazole formulated as emulsifiable concentrate.
- Container size – 2 x 9.6 L

Joust: 250 g/L prothioconazole formulated as emulsifiable concentrate.
- Container size – 2 x 9.71 L

Pavise 480SC: 480 g/L prothioconazole formulated as a suspension conentrate.
- Container size – 2 x 5.1 L

Advantage Prothioconazole 480 SC: 480 g/L prothioconazole formulated as a suspension concentrate.
- Container size – 2 x 10.2 liters

Taj: 480 g/L prothioconazole formulated as a suspension concentrate.
- Container size – 2 x 5.1 L

VIKING Prothioconazole: 480 g/L prothioconazole formulated as a suspension concentrate.
- Container size – 2 x 10.2 liters

Rambler: 480 g/L prothioconazole formulated as a suspension concentrate.
- Container size – 2 x 10.2 liters

Crops, Diseases, Rates and Timing:

Crop	Diseases	Application Rate (per acre)		Application Timing
		480 g/L products	250 g/L products	
Wheat	Control of septoria leaf blotch *(Septoria tritici)*, tan spot *(Pyrenophora tritici-repentis)*, leaf rust *(Puccinia recondita)*	127 mL[1]	240 mL[3]	Apply as a preventative foliar spray when the earliest disease symptoms appear on leaves and stems. A second application may be made after 7 days.
	Control of glume blotch *(Stagonospora nodorum)*	127 to 170 mL[1]		Apply within the time period when at least 75% of heads on the main stem are fully emerged to when 50% of heads on the main stem are in flower. For FHB, use higher rate when disease pressure is expected to be high or to provide the highest level of mycotoxin reduction.
	Suppression of fusarium head blight (FHB) *(Fusarium* spp.*)*	127 to 170 mL[1]	240 to 320 mL	
Pearl millet, proso millet, rye, triticale, Buckwheat	Control of foliar rusts caused by *Puccinia* spp.	127 to 170 mL	-	Apply as a preventative foliar spray when disease symptoms appear.
	Suppression of fusarium head blight *(Fusarium* spp.*)* – except buckwheat	127 to 170 mL[1]	-	Apply as a preventative spray.

Crop	Diseases	Application Rate (per acre)		Application Timing
		480 g/L products	250 g/L products	
Barley	Control of net blotch *(Pyrenophora teres)*, scald *(Rhynchosporium secalis)*, spot blotch *(Cochliobolus sativus)*	85 to 127 mL[1]	240 mL[3]	Apply as a preventative foliar spray when the earliest disease symptoms appear on leaves and stems. A second application may be made after 7 days.
	Suppression of fusarium head blight (FHB) *(Fusarium* spp.*)*	127 to 170 mL[1]	240 to 320 mL	Apply within the time period when 70 to 100% of barley heads on the main stem are fully emerged to 3 days after full head emergence. Use higher rate when disease pressure is expected to be high or to provide the highest level of mycotoxin reduction.
Oats	Control of crown rust *(Puccinia coronata)*	127 mL[1]	240 mL[3]	Apply as a preventative foliar spray when the earliest disease symptoms appear on leaves and stems. A second application may be made after 7 days.
Corn	Suppression of Fusarium and Gibberella ear rots *(Fusarium* spp. and *Gibberella* spp.*), and grey leaf spot (Cercospora zeae-maydis)*	170 mL[1]	240 to 320 ml (follow product label)	For optimum suppression of Fusarium Ear Rot, apply from silking (tip of stigmata visible) to silk browning (stigmata drying).
	Control of rusts (*Puccinia sorghi, Puccinia polysora*) and northern leaf blight (*Setosphaeria turcica*)	127 mL	-	For leaf diseases, apply as a preventive foliar spray when the earliest disease symptoms appear on the leaves and stems.
Canola, rapeseed, oriental mustard, *Brassica carinata* [if oriental mustard *(Brassica juncea)* and *Brassica carinata* indicated on label]	Control of sclerotinia stem rot *(Sclerotinia sclerotiorum)*	127 to 150 mL[2]	240 to 280 mL	Apply at 20 to 50% bloom stage (prior to petal fall). Use high rate if history of heavy disease or if dense crop stand. For Soratel, a second application at a rate of 240 ml/acre may be applied 7-10 days later, up to full bloom, if disease persists or weather conditions are favorable for disease development. When conditions favoring disease are severe, use the shorter interval.
Soybean	Control of frogeye leaf spot (*Cercospora sojina*)	85 mL	160 mL	Apply when first disease symptoms are found or when the risk of infection is imminent.
Chickpea	Control of ascochyta blight *(Ascochyta rabiei)*	127 to 170 mL[2]	240 to 320 mL	Apply at first sign of disease. Repeat applications every 10 to 14 days. Use high rate when conditions favour disease or when growing susceptible varieties.
	Suppression of Grey mould (*Botrytis cinerea*)	170 mL	-	

Crop	Diseases	Application Rate (per acre)		Application Timing
		480 g/L products	250 g/L products	
Lentil	Control of ascochyta blight (*Ascochyta sp*). Control of white mould (*Sclerotinia sclerotiorum*) if on label.	127 to 170 mL[2]	240 to 320 mL	Apply at the beginning of flowering or at the first sign of disease as per indicated on label. A maximum of 340 mL/acre can be applied per crop year for lentil for 480 g/L products and 647 mL/acre for 250 mL/acre products. After the initial application, 1 additional application may be made 10 to 14 days afterwards if conditions remain favourable for continued or increased disease development. Apply the higher rate when conditions favour disease development or when growing less disease resistant varieties. Maximum of two applications per year.
	Suppression of grey mould (*Botrytis cinerea*) if on label.	170 mL	-	
	Suppression of anthracnose (*Colletrotrichum lentis*) if on label.	129 to 170 mL[2]	-	
Field pea (*Soratel* only)	Suppression of ascochyta blight (*Ascochyta sp*), control of white mould (*Sclerotinia sclerotiorum*)	-	240 to 320 mL	
Flax (linseed), borage	Control of sclerotinia stem rot *(Sclerotinia sclerotiorum)*	127 to 150 mL[2]	240 to 280 mL	Apply at 20 to 50% bloom. Best protection will be achieved when the fungicide is applied prior to petals beginning to fall, allowing the maximum number of petals to be protected. Use high rate in fields with a history of heavy disease pressure or for dense crop stands.
Sunflower (excluding those for export), safflower	Suppression of sclerotinia head rot (*Sclerotinia sclerotiorum*)	170 mL[1]	-	Apply when crop is in 10 to 50% disk flower bloom stage.
	If on label: Sunflower rust (*Puccinia helianthi*) Safflower rust (*Puccinia carthami*)	170 mL	320ml	Apply when average rust severity reaches 1% on the upper four fully expanded leaves prior to or during bloom

[1] **Apply with non-ionic surfactant, e.g. *AgSurf* or *Agral 90* at 0.125% v/v. Consult the products labels.**
[2] **May be applied with the lowest rate of non-ionic surfactant, e.g. *AgSurf* or *Agral 90*. Consult the products labels.**
[3] ***Joust:* When used in wheat, barley and oat, apply with a non-ionic surfactant (*AgSurf, Agral 90, Enhance,* or *Carrier* at 0.125%). The lowest labelled rate of adjuvant (*Enhance, Carrier, AgSurf* or *Agral 90*) may be tank-mixed with *Joust* in canola, flax, chickpea, lentil, corn, soybean, sunflower, safflower, and sugar beet.**

Application Information:

- DO NOT apply during periods of dead calm or when winds are gusty. Ensure uniform coverage.
- **Water Volume:**
  - ***Ground:*** minimum 40 L per acre.
  - ***Aerial:*** minimum of 20 L per acre when the product is registered for aerial applications. Follow detailed label recommendations for aerial application. *Joust* is not registered for aerial applications.

How it Works:

The active ingredient prothioconazole is a triazole fungicide with broad-spectrum systemic activity. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:

None registered.
According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Restrictions:

- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Maximum number of applications:**
  - ***Corn, flax, borage, sunflower, soybean, safflower*** – DO NOT exceed 1 application of this product per season.
  - ***Wheat, barley, oat, canola, lentil*** – DO NOT exceed 2 applications of this product per season.
  - ***Chickpea*** – DO NOT exceed 3 applications of this product per season.
- **Grazing:** No restrictions listed.
- **Preharvest interval:**
  - ***Barley, wheat, oat, rye, triticale, millet*** – 30 days
  - ***Canola, Rapeseed, Oriental Mustard, flax, borage*** – 36 days
  - ***Chickpea, lentil, field pea*** – 7 days
  - ***Corn*** – 14 days
  - ***Soybean*** – 20 days
  - ***Sunflower, safflower*** – 45 days
- **Restricted Entry Interval:** DO NOT re-enter treated areas within 24 hours of application.
- **Re-cropping:** May be re-planted with any crop specified on the label as soon as practical. For crops not listed, wait 30 days.
- **Storage:** DO NOT store at temperatures below freezing. Keep in original tightly closed container and store away from feeds, seeds, fertilizer, plants and food stuffs. Keep away from sources of heat. Shake well before using if stored for more than 1 year. Do not use or store in or around the home.
- **Environment:** Toxic to aquatic organisms and non-target terrestrial plants. Observe spray buffer zones specified on label under
- DIRECTIONS FOR USE. To reduce runoff from treated areas into aquatic habitats avoid application to areas with a moderate to steep slope, compacted soil, or clay. Avoid application when heavy rain is forecast. Contamination of aquatic areas because of runoff may be reduced by including a vegetative filter strip between the treated area and the edge of the water body.
- **Rainfast:** 1 hour
- **Aerial Application:** DO NOT apply during periods of dead calm. Avoid application of this product when winds are gusty. DO NOT apply when wind speed is greater than 16 km/h at flying height at the site of application. DO NOT apply with spray droplets smaller than the American Society of Agricultural Engineers (ASAE S572.1) medium classification. Reduce drift caused by turbulent wingtip vortices. Nozzle distribution along the spray boom length MUST NOT exceed 65% of the wing or rotor-span.

Hazard Rating:

Caution – Poison

Refer to the Introduction for an explanation of the symbols.

Prothioconazole and Pyraclostrobin

Fungicide Group 3, 11

Company

NewAgco Inc distributed by AgraCity [Spaxor (*Rambler* – PCP # 35048, *Spade* – PCP #32927]
VIKING Crop Production Partners Inc. "[*VIKING Vaasa (VIKING Prothioconazole* – PCP#35109, *VIKING Pyraclostrobin* PCP#34795)]

Formulation

Spaxor is a co- pack of *Rambler and Spade. Rambler* (480 g/L Prothioconazole formulated as suspension concentrate), *Spade* (250 g/L Pyraclostrobin formulated as emulsifiable concentrate), container size: co-pack 10L of *Rambler,* 13L of *Spade*
VIKING Vaasa is a co- pack of *VIKING Prothioconazole* and *VIKING Pyraclostrobin. VIKING Prothioconazole* (480 g/L Prothioconazole formulated as suspension concentrate), *VIKING Pyraclostrob*in (250 g/L Pyraclostrobin formulated as emulsifiable concentrate), container size: co-pack 10L of *VIKING Prothioconazole*, 13L of *VIKING Pyraclostrobin*

Crops, Diseases, Rates and Timing:

Crop*	Disease**	Rate per acre	Crop stage and other timing information***
Wheat	Control of Septoria leaf spot (*Septoria tritici, Leptosphaeria nodorum*), Tan spot (*Pyrenophora tritici-repentis*), Leaf rust (*Puccinia recondita*), Spot blotch (*Cochliobolus sativus*), Stripe rust (*Puccinia striiformis*), Powdery mildew (*Erysiphe graminis* f. sp. *tritici*)	*Spaxor* (162.5 mL *Spade* + 125 mL *Rambler*) *VIKING Vaasa* (162.5 mL *VIKING Pyraclostrobin* + 125 mL *VIKING Prothioconazole*)	Early disease symptoms or immediately after flag leaf emergence
Barley	Control of Net blotch (*Pyrenophora teres*), Spot blotch (*Cochliobolus sativus*), Stripe rust (*Puccinia stiiformis*), Scald (*Rhynchosporium secalis*)		Early disease symptoms or immediately after flag leaf emergence
Oats	Control of Crown rust (*Puccinia coronata*)		Early disease symptoms or immediately after flag leaf emergence
Chickpeas	Ascochyta blight (*Ascochyta* spp.)		
Lentils	Anthracnose (*Colletotrichum* spp.), Ascochyta blight (*Ascochyta* spp.)		At the beginning of flowering OR at the onset of symptoms
Dry field peas	Mycosphaerella blight (*Mycosphaerella* spp.)		
Dry beans *Phaseolus* spp.	Anthracnose (*Colletotrichum* spp.), Powdery mildew (*Erysiphe* spp.), Rust (*Uromyces* spp.)		
Dry beans *Vigna* spp.	Anthracnose (*Colletotrichum* spp.), Mycosphaerella blight (*Mycosphaerella* spp.), Powdery mildew (*Erysiphe* spp.), Rust (*Uromyces* spp.)		

Crop*	Disease**	Rate per acre	Crop stage and other timing information***
Dry beans *Lupinus* spp.	Mycosphaerella blight (*Mycosphaerella* spp.), Powdery mildew (*Erysiphe* spp.)		At the beginning of flowering OR at the onset of symptoms
Faba beans	Mycosphaerella blight (*Mycosphaerella* spp.), Powdery mildew (*Erysiphe* spp.)		
Soybeans	Frog eye leaf spot (*Cercospora sojina*)		

Application information

- Water Volume:
  - **Ground:** Minimum water volume 40 L/acre
  - **Air:** Minimum water volume 20 L/acre

How it Works

Prothioconazole: is a broad-spectrum systemic fungicide for the control or suppression of listed Ascomycetes, Basidiomycetes and Deuteromycetes diseases on the crops listed earlier. Pyraclostrobin: is a broad-spectrum foliar fungicide belonging to the strobilurin chemical class. It acts by inhibition of mitochondrial respiration. This leads to a reduction of the available ATP quantity in the fungal cell. It is used for control or suppression of fungal diseases on registered crops. For more information refer to "Fungicide Modes of Action".

Tank Mixes:

According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Restrictions:

- **Maximum number of applications:** Do not make more than one sequential application of *Spaxor* or *VIKING Vaasa*. Do not make more than a total of two applications of *Spaxor* or *VIKING Vaasa* per season.
- **Rainfall:** Avoid application when heavy rain is in forecast.
- **Rainfast:** One hour
- **Pre-harvest Intervals:** 30 days after application for barley, rye, wheat, dry beans (*Phaseolus, Vigna* and *Lupinus* spp.), faba beans, lentils, dry field peas, soybean and chickpeas. 7 days for succulent shelled beans and peas.
- **Re-entry:** 24 hours
- **Grazing:** None specific.
- **Re-cropping interval:** Treated areas may be replanted with any crop specified on this label as soon as practical after the last application. For crops not listed on this label, do not plant back within 30 days of last application.
- **Aerial Application:** Follow the label carefully. DO NOT apply during periods of dead calm. Avoid application of this product when winds are gusty. DO NOT apply when wind speed is greater than 16 km/h at flying height at the site of application. DO NOT apply with spray droplets smaller than the American Society of Agricultural Engineers (ASAE S572.1) medium classification. Reduce drift caused by turbulent wingtip vortices. Nozzle distribution along the spray boom length MUST NOT exceed 65% of the wing- or rotor span.
- **Storage:** Store this product away from food and feed. Keep away from direct sunlight. Keep away from fire or open flame or other sources of heat. Do not store at temperatures below freezing. If stored for 1 year or longer, shake well before using. Store the tightly closed container away from feeds, seeds, fertilizer, plants and foodstuffs. Do not use or store in or around the home. Keep in original container during storage.
- **Environment:** Toxic to aquatic organisms, non-target terrestrial plants and small wild mammals. Observe spray buffer zones specified under DIRECTIONS FOR USE. To reduce runoff from treated areas into aquatic habitats avoid application to areas with a moderate to steep slope, compacted soil, or clay. Avoid application when heavy rain is forecast. Contamination of aquatic areas as a result of runoff may be reduced by including a vegetative strip between the treated area and the edge of the water body.

Hazard Rating:

Poison. Treat symptomatically.

Pyraclostrobin

Fungicide Group 11

Headline EC, MPOWER Spade, Raclos, Preach, VIKING Pyraclostrobin*

***NOTE:** This product is no longer manufactured but product still remains in the distribution system. This product may be removed from future editions.

Company:

BASF Canada (*Headline EC* – PCP#27322)
New Agco Inc. distributed by AgraCity Crop and Nutrition Ltd. (*MPOWER Spade* – PCP#32927)
Albaugh (*Raclos* – PCP#34615)
Sharda Cropchem Limited (*Preach* – PCP#33928)
Viking Crop Production Partners Inc. (*VIKING Pyraclostrobin Fungicide* – PCP#34795)

Formulations:

Headline EC – 250 g/L of pyraclostrobin formulated as an emulsifiable concentrate.
- Container sizes – case (2 x 6.5 L), 120 L shuttle, 400 L tote

MPOWER Spade – 250 g/L of pyraclostrobin formulated as an emulsifiable concentrate.
- Container size – case (2 x 6.5 L), 120 L drum (bulk)

Preach and *Raclos* – 250 g/L of pyraclostrobin formulated as an emulsifiable concentrate.
- Container size – case (2 x 6.5 L)

VIKING Pyraclostrobin Fungicide – 250 g/L of pyraclostrobin formulated as an emulsifiable concentrate.
- Container size – 2 X 13 L, 120 L, 1000 L)

Crops, Diseases, Rates and Timing:

Crop	Diseases	Application Rate (per acre)	Application Timing
Wheat	Control of tan spot (*Pyrenophora tritici-repentis*), septoria leaf blotch (*Septoria tritici, S. nodorum*), leaf rust (*Puccinia recondita*)	121 to 242 mL	Apply single application immediately after flag leaf emergence. Use higher rate to obtain extended protection. If disease persists or weather conditions are favourable for disease development, apply a second application 10 to 14 days later with a fungicide that contains a different mode of action. To maximize yields in cereals, it is important to protect the flag leaf from disease.
	Control of powdery mildew (*Erysiphe graminis* f. sp. *tritici*), spot blotch (*Cochliobolus sativus*), stripe rust (*Puccinia striiformis*)	161 to 242 mL	
Barley	Control of net blotch (*Pyrenophora teres*)	121 to 242 mL	
	Control of scald (*Rhynchosporium secalis*), spot blotch (*Cochliobolus sativus*), stripe rust (*Puccinia striiformis*)	161 to 242 mL	
Rye	Control of leaf rust (*Puccinia recondita*)	121 to 242 mL	
	Control of powdery mildew (*Erysiphe graminis*)	161 to 242 mL	
Oat **(only if on label)**	Control of crown rust (*Puccinia coronata*)	121 to 161 mL	
Canola, rapeseed, canola quality *Brassica juncea*, mustard (oilseed and condiment) **(if on label)**	Control of black spot (*Alternaria brassicae, A. raphani*), blackleg (*Leptosphaeria maculans*)	121 to 161 mL	Apply in tank mix with supported canola herbicides to control blackleg at the 2 to 6-leaf (rosette) stage. Apply to control alternaria black spot at 20 to 50% bloom (suppression) to early pod stage (90% bloom) for control. *Headline EC* can be tank-mixed with *Lance WDG Fungicide* at 20 to 50% flower to control sclerotinia stem rot and suppress black spot.

Crop	Diseases	Application Rate (per acre)	Application Timing
Corn	Control of common rust (*Puccinia sorghi*), grey leaf spot (*Cercospora zeae-maydis*)	161 to 242 mL	Begin all applications prior to disease development. If disease persists or weather conditions are favourable for disease development, apply a second time 10 to 14 days later with a fungicide that contains a different mode of action. Use higher rate and shorter interval when disease pressure is high.
Chickpea	Control of ascochyta blight (*Ascochyta rabiei*)	161 to 242 mL *Headline EC* must be tank-mixed with 0.14 to 0.17 kg/acre Lance WDG	Apply a tank-mix of *Headline EC* with *Lance* at the beginning of flowering or the onset of symptoms. Ascochyta blight can develop quickly once established so early detection is essential. DO NOT apply sequential applications of this tank-mix; alternate to a fungicide with a mode of action other than Group 7 or 11 for at least one application.
Lentil	Control of anthracnose (*Colletotrichum truncatum*), ascochyta blight (*Ascochyta lentis*)	161 mL	Apply at the beginning of flowering or at the onset of symptoms for more aggressive diseases (anthracnose in lentils). If disease persists or weather conditions are favourable for disease development, apply a second application 10 to 14 days later with a fungicide that contains a different mode of action.
Field pea	Control of mycosphaerella blight (*Mycosphaerella* spp., *Ascochyta* spp.), powdery mildew (*Erysiphe* spp.)	161 mL	
	Suppression of downy mildew (*Peronospora viciae* f.sp. *pisi*)	161 to 242 mL	
Dry bean	Control of anthracnose (*Colletotrichum lindemuthianum*), powdery mildew (*Erysiphe* spp.), rust (*Uromyces* spp.)	161 mL	
Faba bean	Control of ascochyta blight (*Ascochyta fabae*), powdery mildew (*Erysiphe* spp.)	161 mL	
Sunflower (**if on label**)	Suppression of rust (*Puccinia helianthi*)	161 mL	For optimum disease suppression, apply prior to disease development. If disease persists or weather conditions are favourable for disease development, apply a second application 10 to 14 days later with a fungicide that contains a different mode of action.
Flax (including low-linolenic acid varieties) (**if on label**)	Control of pasmo (*Septoria linicola*)	121 to 161 mL	Apply at the mid flower stage (7 to 10 days after the initiation of flowering). If disease persists or weather conditions are favourable for disease development, apply a second application 10 to 14 days later with a fungicide that contains a different mode of action.
Alfalfa (for seed production)	Control of common leaf spot (*Pseudopeziza medicaginis*)	161 mL	Apply at the beginning of flowering (10 to 30% bloom) or at the onset of disease.
Bluegrasses; fescues; rye-grasses (for seed production)	Control of leaf rust (*Puccinia recondita*), stem rust (*P. graminis*) Suppression of powdery mildew (*Erysiphe graminis*)	161 to 271 mL	Apply prior to disease development. If disease conditions exist, apply again 12 to 14 days later with a fungicide that contains a different mode of action. Use higher rate and shorter interval when high disease pressure.

Crop	Diseases	Application Rate (per acre)	Application Timing
Potato*	Control of early blight (*Alternaria solani*)	182 to 271 mL	Apply prior to row closure or when conditions become favourable for disease development. Apply on a 7 to 14 day interval. Under high disease pressure, use higher rate or tank mix *Headline EC* with *Bravo 500*. It is recommended that no more than 1 application of *Headline EC* or *MPOWER Spade* is made before switching to a fungicide with an alternate mode of action.
	Control of late blight (*Phytophthora infestans*)	182 to 271 mL	Apply prior to row closure or when conditions become favourable for disease development. Apply on a 5 to 7 day interval. Under high disease pressure, use higher rate or tank mix *Headline EC* with *Bravo 500*. If using a tank-mix, apply on a 7 to 10 day interval. DO NOT make more than 1 application of *Headline EC* or *MPOWER Spade* before switching to a fungicide with an alternate mode of action.
Timothy hay**	Control of brown stripe (*Cercosporidium graminis*), leaf streak (*Drechslera phlei*), purple eye spot (*Cladosporium phlei*)	161 to 271 mL	Apply prior to disease development. Use higher rate when disease pressure is high. If disease persists or weather conditions are favourable for disease development, apply a second time 14 days later, with a fungicide with a different mode of action. In absence of an alternative fungicide registered for the specific diseases to be treated, for resistance management purposes, the maximum number of applications is limited to one. DO NOT apply more than 162 mL/acre by aerial application.
Soybean	Control of frogeye leaf spot (*cercospora sojina*)	161 to 242 mL	Apply at the beginning of flowering. If disease persists or weather conditions are favourable for disease development, apply a second time 10 to 14 days later with a fungicide that contains a different mode of action.

***BASF Canada does not recommend use of *Headline EC* alone on potato due to potential for fungicide resistance.**
****Minor use label expansion. Follow the product label. Do not apply *VIKING Pyraclostrobin Fungicide* on Timothy hay.**

Application Information:

- **Water Volume:**
  - ***Ground:*** Use a minimum water volume of 40 L per acre on oilseeds, cereals, pulses, alfalfa and grasses; use 80 L per acre on potatoes. Ensure thorough coverage of foliage.
  - ***Aerial:*** Use a minimum water volume of 20 L per acre. Ensure thorough coverage of foliage. DO NOT apply more than 160 mL per acre by aerial application.
  - ***Pivot or Sprinkler irrigation (*Headline EC*):*** DO NOT exceed 0.64 cm (1/4 inch) (63,500 L) per hectare. DO NOT apply registered tank mixes in potato, chickpea, and canola by pivot or sprinkler irrigation. Apply only through overhead sprinkler systems including centre pivot and lateral move containing low pressure drop nozzles.

How it Works:

The active ingredient pyraclostrobin is a strobilurin fungicide with broad spectrum contact and systemic activity. To be used as a preventative application when environmental conditions are favourable for disease development. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:

MPOWER Spade: no registered tank mixes.
VIKING Pyraclostrobin Fungicide: no registered tank mixes.
Herbicides: *Headline EC* at a rate of 120 to 160 mL per acre can be tank mixed with *Ares* on Clearfield canola, *Liberty Herbicide* (150SN or 200SN) in glufosinate ammonium tolerant canola (e.g.: LibertyLink canola), and registered glyphosate herbicides in glyphosate-tolerant canola (e.g.: Roundup Ready).
Fungicides: On chickpea, *Headline EC* at a rate of 160 to 240 mL per acre must be applied in tank-mix with 140 to 170 grams per acre *Lance* for control of ascochyta blight. On potatoes, *Headline EC* at rates of 180 to 270 mL per acre may be applied in tank-mix with *Bravo 500* at label rates, additional use recommendations, restrictions, and precautions for the control of late blight. On canola, *Headline EC* can be tank mixed with *Lance Fungicide* at 142 grams per acre at 20 to 50% flowering to control sclerotinia stem rot and suppress black spot.

Restrictions:

- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Note:** BASF Canada does not recommend use of *Headline* alone on potato due to potential for resistance.
- **Maximum number of applications:** DO NOT exceed 1 sequential application of *Headline EC* or *MPOWER Spade* per season. Any subsequent applications of this product must be in combination with a fungicide that contains a different mode of action.
  - ***Alfalfa*** – DO NOT exceed 1 application per season.
  - ***Canola, rapeseed, canola quality*** **Brassica juncea*****, mustard, flax, dry bean, faba bean, lentil, field pea, chickpea, bluegrass, fescue grass, ryegrass, corn, sunflower*** – DO NOT exceed 2 applications of this product per season.
  - ***Potato*** – DO NOT exceed 3 applications per season.
- **Grazing:** DO NOT graze treated corn crops within 6 days of last application. DO NOT feed alfalfa hay or forage to livestock. All other crops listed can be grazed or fed to livestock.
- **Preharvest interval:**
  - ***Barley, rye, wheat, oat*** – apply no later than the end of flowering
  - ***Corn*** – 7 days
  - ***Pulses*** – 30 days
  - ***Forage grasses*** – 14 days
  - ***Alfalfa*** – not applicable
  - ***Oilseeds*** – 21 days
  - ***Potatoes*** – 3 days
  - ***Soybean*** – 21 days
- **Restricted Entry Interval:** DO NOT re-enter treated areas within 12 hours of application.
- **Re-cropping:** Crops listed on label may be planted immediately following last application. Wait 14 days before planting all other crops.
- **Storage:** Store in a cool, dry, locked, well-ventilated area without a floor drain. DO NOT freeze.
- **Environment:** Avoid overspray or drift to sensitive habitats. Maintain specified buffer zones. DO NOT spray non-target terrestrial or aquatic habitats.

Hazard Rating:

Danger – Poison

Refer to the Introduction for an explanation of the symbols.

Pyraclostrobin and Tebuconazole

Fungicide Group 3, 11

Company:

AgraCity [*Tornado Pro* (*Tornado* – PCP#33995, *Spade* – PCP#32927)]
VIKING Crop Production Partners Inc. "[*VIKING Drobak (VIKING Pyraclostrobin* – PCP#34795, *VIKING Tebuconazole* PCP#34770)]

Formulation:

- *Tornado Pro* (*Tornado* – 250 g/L tebuconazole formulated as an emulsion in water, container sizes – 9.8 L, 118 L and *Spade* – 250 g/L pyraclostrobin as an emulsifiable concentrate, container sizes – 7.7 L, 92.4 L)
- *VIKING Drobak* (*VIKING Tebuconazole* – 250 g/L tebuconazole formulated as an emulsion in water, container sizes – 12 L, 96 L and *VIKING Pyraclostrobin* – 250 g/L pyraclostrobin as an emulsifiable concentrate, container sizes – 9.6 L, 77 L)

Crops, Diseases, Rates and Timing:

Crop	Diseases	Application Rate (per acre)	Application Timing
Wheat (spring, winter, durum)	Stem rust, leaf rust, stripe rust, septoria leaf blotch, tan spot	150 mL *Tornado* + 120 mL *Spade*	Apply immediately after flag stage or at the first sign or very early stage of disease, especially if weather conditions are conducive to disease development.
Barley	Net blotch, spot blotch, scald, stem rust, leaf rust, stripe rust, septoria leaf blotch, powdery mildew		

Application Information:

- **Water Volume:**
  - ***Ground:*** minimum of 40 L per acre.
  - ***Aerial:*** minimum of 20 L per acre.

How it Works:

The active ingredient tebuconazole is a triazole demethylation inhibitor (DMI) fungicide with systemic broad-spectrum activity. The active ingredient pyraclostrobin is a strobilurin fungicide with broad spectrum contact and systemic activity. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:

None registered.

Restrictions:

- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Maximum number of applications:** DO NOT exceed 1 application per season.
- **Preharvest interval:** DO NOT apply within 36 days of harvest.
- **Restricted Entry Interval:** DO NOT re-enter treated areas within 12 hours of application.
- **Re-cropping:** Treated areas may be replanted following harvest with any crop listed on the label. DO NOT replant treated areas for 120 days after last application for crops not listed on the label.
- **Storage:** Store in a cool, dry, locked, well ventilated area without floor drain and prevent cross contamination with other pesticides, fertilizers, food and feed.
- **Environment:** Any products containing tebuconazole should not be used in areas treated with this product during the previous season. This product is toxic to birds, small wild animals, aquatic organisms and non-target plants. Avoid overspray or drift to sensitive habitats. Maintain specified buffer zones. DO NOT spray non-target terrestrial or aquatic habitats. DO NOT contaminate irrigation or drinking water supplies or aquatic habitats by cleaning of equipment or disposal of wastes.

Hazard Rating:

Tornado /VIKING Tebuconazole:

Danger Poison – Corrosive to Eyes

Spade /VIKING Pyraclostrobin:

Danger – Poison – Corrosive to Eyes

Danger – Eye and Skin Irritant

Refer to the Introduction for an explanation of the symbols.

Pyrimethanil

Fungicide Group 9

Company:
Bayer (*Scala SC* – PCP#28011)
Sharda CropChem (*Shape SC*– PCP#34661)

Formulation:
400 g/L pyrimethanil formulated as a suspension concentrate.
- Container size – 6.07 L

Crops, Diseases and Timing:
Control of early blight *(Alternaria solani)* on potato. Apply when plants are 15 to 20 cm high or when disease threatens. Repeat applications at 7 to 14 day intervals or as necessary to maintain disease control. If severe disease conditions exist, use the 7 day interval. Minimum spray interval is 7 days. Ensure complete coverage.

Rates:
Apply at 300 mL per acre as a tank mix with *Bravo 500*.

Application Information:
- **Water Volume:**
  - ***Ground:*** minimum of 120 L per acre.
  - ***Aerial:*** minimum of 14 L per acre.

How it Works:
The active ingredient pyrimethanil is an anilinopyrimidine fungicide with contact and systemic activity. To be used as a preventative fungicide application. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:
Fungicides: To be applied ONLY as a tank mix with *Bravo ZN*. Follow mixing instructions provided on the label.

Restrictions:
- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Maximum number of applications:** DO NOT exceed 3 applications of this product per season.
- **Grazing:** No restrictions listed.
- **Preharvest interval:** 7 days
- **Restricted Entry Interval:** DO NOT re-enter treated areas within 12 hours of application.
- **Re-cropping:** A 30 day plant-back interval is required for potatoes and wheat and 130 days for all other crops.
- **Storage:** DO NOT allow product to freeze. If stored more than 1 year, shake well before using. Store in tightly closed container away from fertilizer, seeds, feed or food.
- **Environment:** Maintain a 1 m buffer zone between areas sprayed and aquatic systems. Toxic to aquatic organisms. DO NOT apply where runoff is likely to occur.

Hazard Rating:
Caution Poison – Skin Irritant

Refer to the Introduction for an explanation of the symbols.

Quadris Top

Fungicide Group 3, 11

Company:
Syngenta Canada (PCP#30518)

Formulation:
200 g/L azoxystrobin and 125 g/L difenoconazole formulated as a flowable suspension concentrate.
- Container size – 2 x 10.125 L

Crops, Diseases, Rates and Timing:

Crop	Diseases	Application Rate (per acre)	Application Timing
Potato	Control of early blight *(Alternaria solani)*	229 to 405 mL	Apply on a 7 to 14 day interval, starting prior to disease establishment.
Potato *continued*	Suppression of brown spot *(Alternaria alternata)*, black dot *(Colletotrichum coccodes)*	229 to 405 mL	Apply prior to disease. Apply no more than 1 application to target these diseases. If disease pressure is high, use the highest rate.
	Suppression of sclerotinia stem rot *(Sclerotinia sclerotiorum)*	405 mL	Apply at full bloom. Repeat applications at intervals of 7 to 10 days.

Application Information:
- **Water Volume:**
  - ***Ground:*** Use sufficient water volume to obtain adequate coverage. Use minimum 60 L per acre.
  - ***Aerial:*** Use sufficient water volume to obtain adequate coverage. Use minimum 60 L per acre.

How it Works:
The active ingredient azoxystrobin belongs to a strobilurin group of fungicides and difenoconazole is a triazole fungicide. Together they provide broad spectrum preventative and systematic. To be used as a preventative and curative fungicide application. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:
None registered.

Restrictions:
- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Maximum number of applications:** DO NOT exceed three applications per season.
- **Grazing:** No restrictions listed.
- **Preharvest interval:** 14 days
- **Restricted Entry Interval:** DO NOT re-enter treated areas until 12 hours after application.
- **Re-cropping:** DO NOT plant any other crop for a period of 60 days following application to the preceding crop unless *Quadris Top* or *Inspire* are registered for that crop.
- **Storage:** Store in cool, dry place. DO NOT store food, beverages or tobacco products in storage area.
- **Environment:** This product is toxic to aquatic organisms (or invertebrates), fish and mammals. Observe buffer zones outlined in the label.

Hazard Rating:
Caution – Eye Irritant

Refer to the Introduction for an explanation of the symbols.

Quash SC

Fungicide Group 3

Company:
Valent Canada distributed by Nufarm Agriculture Inc. (PCP#33081)

Formulation:
480 g/L of metconazole formulated as a soluble concentrate.
- Container size – 2 x 4.8 L jugs

Crops, Diseases, Rates and Timing:

Crop	Diseases	Application Rate (per acre)	Application Timing
Canola	Control of sclerotinia stem rot *(Sclerotinia sclerotiorum)*	59 to 118 mL	20 to 50% bloom. Under high disease pressure, use the application rate of 118 mL/acre. DO NOT make more than one application per year.
Dry bean, Field pea, Chickpea, Lentil	Control of powdery mildew (field peas only) Suppression of white mold, ascochyta blight (chickpeas and lentils only)	118 mL	20 to 50% bloom stage, before disease symptoms are visible. Make a second application at full bloom a minimum 7 days after the first application. DO NOT apply more than 236 mL/acre per year.
Potato	Control of early blight *(Alternaria solani)*	73 to 118 mL	Apply prior to infection for preventative control. If conditions favor disease development, make additional applications at 7 to 10 day intervals. DO NOT apply more than 354 mL/acre per year.
	Suppression of white mold *(Sclerotinia sclerotiorum)*	118 mL	
Sunflower	Control of rust *(Puccinia helianthi)* Suppression of sclerotinia head rot *(Sclerotinia sclerotiorum)*	118 mL	Apply when conditions favor disease development and prior to infection. DO NOT apply more than 236 mL/acre per year.

Application Information:
- **Water Volume:**
  - ***Ground:*** minimum 81 L per acre.
  - ***Aerial:*** minimum 20 L per acre.

How it Works:
The active ingredient metconazole is a broad spectrum triazole demethylation inhibitor (DMI) fungicide with systemic activity. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:
None registered.

Restrictions:
- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Maximum number of applications:**
  - ***Canola*** – DO NOT exceed more than 1 application of this product per year.
  - ***Dry bean, field pea, chickpea, lentil, sunflower*** – DO NOT exceed 236 mL per acre of this product per year.
  - ***Potato*** – DO NOT exceed 354 mL per acre of this product per year.
- **Preharvest interval:**
  - ***Canola*** – 45 days
  - ***Dry bean, field pea, chickpea, lentil, sunflower*** – 21 days
  - ***Potato*** – 8 days
- **Restricted Entry Interval:**
  - ***Canola, potato*** – DO NOT re-enter treated areas within 12 hours of application.
  - ***Peas*** – DO NOT re-enter treated areas within 24 hours of application.
- **Re-cropping:** DO NOT plant any other crop for a period of 30 days unless *Quash* is registered for that use.
- **Storage:** Store in a cool, dry, secure place

- **Environment:** Toxic to aquatic organisms, non-target terrestrial plants, birds, and small wild mammals. To reduce runoff from treated areas into aquatic habitats, avoid application to areas with a moderate to steep slope, compacted soil or clay.
- **Oral LD50 (Rats):** 1750 mg per kg.
- **Dermal LD50 (Rabbits):** >5000 mg per kg.

Hazard Rating:

Warning – Eye Irritant

Refer to the Introduction for an explanation of the symbols.

Quilt

Fungicide Group 3, 11

Company:

Syngenta Canada (PCP#28328)
Sharda CropChem Limited (*Fungtion SC* – PCP#32878)

Formulation:

75 g/L azoxystrobin and 125 g/L propiconazole formulated as a suspension concentrate.

- Container sizes – 2 x 10.125 L case and 101.25 L tote

Crops, Diseases, Rates and Timing:

Crop	Diseases Controlled	Application Rate (per acre)	Application Timing
Dry bean	Anthracnose *(Colletotrichum truncatum)*	405 to 607 mL	Make first application before disease is established and no later than the onset of flowering. A second application 14 days later may be needed if conditions persist. Apply the high rate under conditions of high disease pressure.
	Powdery mildew *(Microsphaera diffusa, Erysiphe* spp.)	405 mL	Make first application at the first sign of disease. A second application 14 days later may be needed if conditions persist.
Lentil Soybean	Anthracnose *(Colletotrichum truncatum)*	405 to 607 mL	Make first application before disease is established and no later than the onset of flowering. A second application 14 days later may be needed if conditions persist. Apply the high rate under conditions of high disease pressure.
	Powdery mildew (*Erysiphe* spp.)	405 mL	Make first application at the first sign of disease. A second application 14 days later may be needed if conditions persist.
Chickpea Faba bean	Powdery mildew (*Erysiphe* spp.)	405 mL	Make first application at the first sign of disease. A second application 14 days later may be needed if conditions persist. Apply the high rate under conditions of high disease pressure.
Field pea	Mycosphaerella blight *(Mycosphaerella pinodes)*	405 to 607 mL	
	Powdery mildew *(Erysiphe pisi, Microsphaera diffusa)*	405 mL	
Canola	Blackleg *(Leptosphaeria maculans)*	405 mL	Apply during the rosette stage between 2nd true leaf and bolting.
Soybean	Frogeye leaf spot (*Cercospora sojina*)	405 to 607 mL	Make the first application at growth stage R3 (early pod set) and 14 days late at approximately growth stage R5.
Barley	Net blotch *(Pyrenophora teres)*	202* to 405 mL	At first sign of disease starting at the two leaf stage. Use the higher rate if there is a history of high disease pressures in the field and/or field conditions favour disease.

Crop	Diseases Controlled	Application Rate (per acre)	Application Timing
Barley	Net blotch *(Pyrenophora teres)*, septoria leaf blotch (*Septoria* spp.), scald *(Rhynchosporium secalis)*, tan spot *(Pyrenophora tritici-repentis)*	304 mL	Apply between stem elongation and half-head emergence. For stripe rust, use the higher rate if there is a history of high disease pressures in the field and/or field conditions favour disease development.
	Stripe rust *(Puccinia striiformis)*	304 to 405 mL	
	Leaf rust *(Puccinia hordei)*	405 mL	
Wheat	Tan spot *(Pyrenophora tritici-repentis)*, septoria leaf blotch (*Septoria* spp.)	202* to 405 mL	At first sign of disease starting at the two leaf stage. Use the higher rate if there is a history of high disease pressures in the field and/or field conditions favour disease.
Wheat *continued*	Septoria leaf blotch (*Septoria* spp.), tan spot *(Pyrenophora tritici-repentis)*	304 mL	Apply between stem elongation and half-head emergence. For stripe rust and leaf rust in wheat, use the higher rate if there is a history of high disease pressures in the field and/or field conditions favour disease development.
	Stripe rust *(Puccinia striiformis)*, leaf rust *(Puccinia triticina)*	304 to 405 mL	
Rye	Scald *(Rhynchosporium secalis)*, septoria leaf blotch (*Septoria* spp.), tan spot *(Pyrenophora tritici-repentis)*	304 mL	
	Stripe rust (*Puccinia striiformis*)	304 to 405 mL	
Triticale	Septoria leaf blotch (*Septoria* spp.), tan spot *(Pyrenophora tritici-repentis)*	304 mL	
Oat	Septoria leaf blotch (*Septoria* spp.), net blotch *(Pyrenophora teres)*	304 mL	Apply between stem elongation and half-head emergence. For crown rust, use the higher rate if there is a history of high disease pressures in the field and/or field conditions favour disease development.
	Crown rust *(Puccinia coronata)*	304 to 405 mL	
Field, sweet, and popping corn (including seed production)	Rust *(Puccinia sorghi)*, northern leaf blight *(Setosphaeria turcicum)* Suppression of anthracnose leaf blight *(Colletotrichum graminicola)*	304 to 405 mL	Make first application at the first sign of disease, followed by a second application 14 days after the first, if environmental conditions are favourable for disease development.
Fescue, grown for seed production	Stem eyespot and leaf spot complex *(Didymella festucae)* and leaf spot *(Pyrenophora spp., Dreschslera spp.)*	405 mL	Begin applications when conditions are favourable for disease infection and prior to disease symptom appearance. In commercial fescue for seed production, the first application is to be made preventively prior to tiller leaves expansion; the second application 14 days later.

***Suppression only at rates less than 304 mL per acre.**

Application Information:

- **Water Volume:**
  - ***Ground:*** Apply in a minimum of 18 L of water per acre for legume vegetables and soybean. Apply in a minimum of 40 L of water per acre for other crops.
  - ***Aerial:*** Follow the recommendations on label for each use. Apply a minimum of 18 L of water per acre. DO NOT apply on fescue using aerial application equipment.

How it Works:

The active ingredient azoxystrobin is a methoxyacrylate compound (strobilurin) with broad spectrum contact and systemic activity. The active ingredient propiconazole is a triazole fungicide with broad-spectrum systemic activity. To be used as a preventative and curative fungicide application. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:

Insecticides: *Quilt* can be tank-mixed with insecticide *Matador 120EC* for foliar disease and insect control in cereals. Consult each label for pests controlled, precautions, and specific application instructions

According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Restrictions:

- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Maximum number of applications:**
  - ***Canola*** – DO NOT exceed 1 application of this product per season.
  - ***Soybean, dry bean, faba bean, chickpea, field pea, lentil, barley, wheat, rye, triticale, oat, corn and Fescue*** – DO NOT exceed 2 applications of this product per season.
- **Grazing:**
  - ***Fescue*** – DO NOT graze or harvest treated forage, and hay for livestock feed. Follow the instructions on label for other uses.
- **Preharvest interval:**
  - ***Soybean and dry legume vegetables, canola*** – 30 days
  - ***Succulent podded and shelled legume vegetables*** – 15 days
  - ***Soybean hay and dry pea hay*** – 14 days
  - ***Fescue*** – Make the last application at least 20 days before seed matures; seed not for human or animal consumption
  - ***Wheat, barley, rye, triticale, and oat*** – 45 days
  - ***Field corn, sweet corn, and popcorn*** – 14 days
- **Restricted Entry Interval:** DO NOT re-enter treated fields within 12 hours of application.
- **Re-cropping:** Oat and rye may be planted 45 days after *Quilt* application. DO NOT plant any other crop intended for food, grazing, or any component of animal feed or bedding within 105 days of *Quilt* application to the preceding crop unless the second crop appears on the *Quilt* label.
- **Storage:** Store in a cool, dry, well ventilated area away from feed and foodstuffs, and out of reach of children and animals. DO NOT store at temperatures below freezing. Keep in original container, tightly closed, during storage.
- **Environment:** Azoxystrobin is persistent and will carry over. *Quilt* is toxic to aquatic organisms and is extremely phytotoxic to certain apple varieties. Avoid spraying when the wind is blowing towards a nearby sensitive crop, garden, terrestrial habitat (such as shelterbelt), or aquatic habitat. DO NOT contaminate irrigation or drinking water supplies by cleaning of equipment or disposal of wastes. Avoiding spray drift is the responsibility of the applicator.

Hazard Rating:

Caution – Poison and Skin Irritant

Refer to the Introduction for an explanation of the symbols.

Ranman 400SC

Fungicide Group 21

Company:
ISK Biosciences Corporation; distributed by Belchim Crop Protection Canada (PCP#30716)

Formulation:
400 g/L cyazofamid formulated as a suspension concentrate.
- Container sizes – 500 mL, 200 L

Crops, Diseases and Timing:
Control of late blight *(Phytophthora infestans)* on potato. Begin applications on a 7 day schedule when warning systems forecast disease infection periods or at row closure. Use the low rate under low disease pressure and increase the rate as disease pressure and/or crop development increases, up to the maximum rate. For late blight tuber rot control, ensure that the last 2 to 3 applications prior to desiccation are made at the maximum rate following resistance management practices.

Rates:
40 to 80 mL per acre. *Ranman 400SC* should be tank mixed with a non-ionic or organo-silicone surfactant (such as Sylgard 309 at 60 mL per acre).

Application Information:
- DO NOT make sequential applications. After one application alternate with at least one application of fungicide with a different mode of action.
- **Water Volume:**
  - ***Ground:*** Apply in a minimum of 20 L of water.
  - ***Aerial:*** Use sufficient volume to obtain coverage of the foliage, 80 to 240 L per acre.

How it Works:
The active ingredient cyazofamid is a cyanoimidazole fungicide with contact activity. To be used as a preventative fungicide application. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:
None registered.

Restrictions:
- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Maximum number of applications:** DO NOT exceed 6 applications of this product per season.
- **Grazing:** No restrictions listed.
- **Preharvest interval:** 7 days
- **Restricted Entry Interval:** DO NOT re-enter treated areas within 12 hours of application.
- **Re-cropping:** A plant back interval of 30 days is required.
- **Storage:** Store product in original container in a secured dry place separate from other pesticides, fertilizer, food and feed.
- **Environment:** 20 m (fixed wing) and 15 m (helicopter) buffer zones for aerial applications in proximity of terrestrial habitats. For freshwater and marine habitats buffer zones for aerial are the same as field sprayer applications.

Hazard Rating:
None listed.

Reason 500SC

Fungicide Group 11

Company:
Gowan Canada (PCP#27462)

Formulation:
500 g/L fenamidone formulated as a suspension concentrate.
- Container size – 2 L

Crops, Diseases and Timing:
Control of early blight *(Alternaria solani)* and late blight *(Phytophthora infestans)* on potato. Begin application when plants are 15 to 20 cm high or when disease threatens. Apply a fungicide with a different mode of action within 7 to 10 days after each application using the shorter interval when conditions favor disease development. Ensure even application.

Rates:
Apply at 80 mL per acre (200 mL/ha) as a tank mix with either *Dithane DG** at 500 grams per acre (1.25 kg/ha) or *Bravo 500 at registered rates*.
*When using other formulations of mancozeb, adjust application rates to apply 375 grams active ingredient per acre (935 g active ingredient/ha).

Application Information:
- **Water Volume:**
  - ***Aerial:*** Use minimum of 14 L per acre (35 L/ha) at a pressure no less than 300 kPa.

How it Works:
The active ingredient fenamidone is a strobilurin fungicide with contact activity. To be used as a preventative and inhibitive (spore germination and antisporulant) fungicide application. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:
This product may be tank mixed with a fertilizer, a supplement, or with registered pest control products, whose labels also allow tank mixing, provided the entirety of both labels, including Directions For Use, Precautions, Restrictions, Environmental Precautions, and Spray Buffer Zones are followed for each product. In cases where these requirements differ between the tank mix partner labels, the most restrictive label must be followed. Do not tank mix products containing the same active ingredient unless specifically listed on the label. In some cases, tank mixing pest control products can result in reduced pesticide efficacy or increased host crop injury. The user should contact Gowan Company at 1-800-960-4318 for information before applying any tank mix that is not specifically recommended on the label.

Restrictions:
- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Maximum number of applications:** DO NOT exceed 6 applications of this product per season.
- **Grazing:** No restrictions listed.
- **Preharvest interval:** 14 days
- **Restricted Entry Interval:** DO NOT re-enter treated areas until residues have dried.
- **Re-cropping:** A 30 day plant-back interval is required for potato and all other crops.
- **Storage:** DO NOT allow product to freeze. If stored more than 1 year, shake well before using. Keep away from fire, open flame or other sources of heat. Store in tightly closed container away from fertilizer, seeds, feed or food
- **Environment:** For ground application maintain a 1 m buffer zone between areas sprayed and aquatic systems. For aerial application allow a 5 m buffer. Toxic to fish and other aquatic organisms; DO NOT apply where runoff is likely to occur.

Hazard Rating:
Caution Poison – Eye Irritant

Refer to the Introduction for an explanation of the symbols.

Regalia Maxx

Fungicide Group
Not classified, bio-fungicide

Company:
Marrone Bio Innovations (PCP#30199)

Formulation:
20% extract of *Reynoutria sachalinensis* formulated as a suspension concentrate.
- Container size – 4 x 5 L

Crops, Diseases and Timing:
Partial suppression of septoria leaf blotch (*Septoria tritici*) in wheat. Apply preventatively or when disease systems first appear after initial jointing. Repeat applications in 7 to 14 day intervals depending upon crop growth and disease pressure.

Rates:
0.25% v/v in 160 to 240 L of water per acre.

Application Information:
- DO NOT apply by air. When environmental conditions and plant stage are conducive to rapid disease development use *Regalia Maxx* in a rotational program with other registered fungicides.
- **Water Volume:**
  - ***Ground:*** minimum of 160 to 240 L per acre.

How it Works:
Reynoutria sachalinensis is a plant extract to induce the plants' natural defense mechanisms against certain fungal and bacterial disease. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:
None registered.

Restrictions:
- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Maximum number of applications:** No maximum number of applications specified.
- **Grazing:** No restrictions listed.
- **Preharvest Interval:** May be applied up to the day of harvest.
- **Restricted Entry Interval:** DO NOT re-enter into treated areas until the spray is dried.
- **Re-cropping:** No restrictions listed.
- **Storage:** Store in original tightly closed container.
- **Environmental Hazards:** DO NOT contaminate irrigation or drinking water supplies or aquatic habitats by cleaning of equipment or disposal of wastes.

Hazard Rating:
None listed.

Revus

Fungicide Group 40

Company:
Syngenta Canada (PCP#29074)

Formulation:
250 g/L mandipropamid formulated as a suspension concentrate.
- Container size – 4 x 3.78 L

Crops, Diseases and Timing:
Control of late blight (*Phytophthora infestans*) on potato. Begin applications prior to disease development. Continue applications on 7 to 10 day intervals, following resistance management guidelines.

Rates:
0.17 to 0.24 L per acre. The use of a non-ionic adjuvant (0.25% v/v) is recommended.

Application Information:
- **Water Volume:**
  - ***Ground:*** Use a minimum water volume of 40 L per acre. In situations where dense canopy or pest pressure is high, use greater water volumes.
  - ***Aerial:*** Use a minimum water volume of 18 L per acre.
  - ***Nozzles:*** DO NOT apply using any type of ultra low volume (ULV) spray system.

How it Works:
The active ingredient mandipropamid is a carboxylic acid amide (CAA) fungicide with contact and systemic activity. To be used as a preventative and inhibitive (prevents spore germination) fungicide application. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:
Fungicides: *Bravo ZN*

Restrictions:
- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Maximum number of applications:**
  - DO NOT exceed 4 applications of this product per season.
  - DO NOT exceed 2 consecutive applications of this product.
- **Grazing:** No restrictions listed.
- **Preharvest interval:** 14 days
- **Restricted Entry Interval:** DO NOT re-enter treated area within 12 hours of application.
- **Re-cropping:** DO NOT plant any crop which is not registered for use with *Revus* for a period of 30 days after the last application.
- **Storage:** Store in a cool dry place away from food, beverages, and tobacco products.
- **Environment:** To reduce runoff into aquatic habitats avoid application to areas with a moderate to steep slope, compacted soil, or clay. Runoff into aquatic habitats may be reduced by including a vegetative strip between the treated area and the edge of the water body.

Hazard Rating:
Caution – Poison

Warning – Skin Irritant
Potential Skin Sensitizer

Refer to the Introduction for an explanation of the symbols.

RevyPro

Fungicide Group 3

Company:
BASF Canada (PCP#34671)

Formulation:
50 g/L Mefentrifluconazole and 100 g/L Prothioconazole formulated as emulsifiable concentrate
- Container size – case (2 x 8.1 L)

Crops, Diseases, Rates and Timing:

Crop*	Disease**	Application Rate (per acre)	Application Timing***
Chickpea	Control of ascochyta blight (*Ascochyta spp.*), white mould (*Sclerotinia sclerotiorum*), suppression of grey mould (*Botrytis cinerea*), suppression of powdery mildew	405 mL	Apply RevyPro at the beginning of flowering or at the onset of symptoms. Apply a second time 10-14 days later if disease persists or if weather conditions are favourable for disease development.
Dry Bean	Control of anthracnose (*Colletotrichum lindemuthianum*), Ascochyta blight (*Ascochyta* sp.) suppression of white mould (*Sclerotinia sclerotiorum*) suppression of grey mould (*Botrytis cinerea*), suppression of powdery mildew (*Erysiphe* sp.)	405 mL	Apply RevyPro at the beginning of flowering or at the onset of symptoms. Apply a second time 10-14 days later if disease persists or if weather conditions are favourable for disease development.
Field pea	Control of mycosphaerella blight (*Mycosphaerella pinodes*), ascochyta blight (*Ascochyta spp.*), white mould (*Sclerotinia sclerotiorum*), suppression of powdery mildew (*Erysiphe pisi*), suppression of grey mould (*Botrytis cinerea*)	405 mL	Apply RevyPro at the beginning of flowering or at the onset of symptoms. Apply a second time 10-14 days later if disease persists or if weather conditions are favourable for disease development.
Faba bean	Control of ascochyta blight (*Ascochyta spp.*), white mould (*Sclerotinia sclerotiorum*), suppression of grey mould/Chocolate spot (*Botrytis cinerea*), suppression of powdery mildew (*Erysiphe* sp.)	405 mL	Apply RevyPro at the beginning of flowering or at the onset of symptoms. Apply a second time 10–14 days later if disease persists or if weather conditions are favourable for disease development.
Lentil	Control of ascochyta blight (*Ascochyta spp.*), anthracnose (*Colletotrichum lentis*), white mould (*Sclerotinia sclerotiorum*), suppression of grey mould (*Botrytis cinerea*), suppression of powdery mildew (*Erysiphe* sp.)	405 mL	Apply RevyPro at the beginning of flowering or at the onset of symptoms. Apply a second time 10–14 days later if disease persists or if weather conditions are favourable for disease development.

***See label for complete list of registered crops.**
****RevyPro is effective on Group 11 (strobilurin, QoI) fungicide-resistant isolates of *Colletotrichum lentis, C. lindemuthianum, Mycosphaerella pinodes* and *Ascochyta rabiei.***
*****Apply fungicide containing alternative mode of actions if second application is required.**

Application Information:
- **Water Volume:**
  - ***Ground:*** minimum water volume 40 L/acre.
  - ***Air:*** minimum water volume 20 L/acre.

How it Works:
The active ingredients, mefentrifluconazole and prothioconazole, are broad spectrum triazole demethylation inhibitor (DMI) fungicides with systemic activity. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:

Refer to the product label for tank mixing compatibility. According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Restrictions:

- **Maximum number of applications:** Do not make more than two (2) sequential applications of *RevyPro* before alternating to a non-Group 3 fungicide registered for the same use. Where possible, rotate the use of *RevyPro* or other Group 3 fungicides with different groups that control the same pathogens for optimal disease resistance management.
- **Rainfall:** Avoid application when heavy rain is in forecast.
- **Pre-harvest Intervals:** 21 days after application for all labelled crops.
- **Re-entry:** 12 hours.
- **Grazing:** All crops on label can be grazed or fed to livestock following a minimum of 21 days after application.
- **Re-cropping interval:** All crops on label may be planted immediately after the last application. Crops not on this label must not be planted within 1 month after the last application.
- **Storage:** Store in original container. Store this product away from food or feed. Protect from freezing.
- **Environment:** Toxic to aquatic organisms and non-target terrestrial plants. Observe spray buffer zones specified under DIRECTIONS FOR USE on label. Mefentrifluconazole is persistent and may carry over. It is recommended that any products containing mefentrifluconazole not be used in areas treated with this product during the previous season. To reduce runoff from treated areas into aquatic habitats, avoid application to areas with a moderate to steep slope, compacted soil, or clay. Contamination of aquatic areas as a result of runoff may be reduced by including a vegetative strip between the treated and the edge of the water body.

Hazard Rating:

Warning – Eye Irritant, Skin Irritant

Ridomil Gold Products

Fungicide Group 4
Ridomil Gold/Bravo, Ridomil Gold SL/Bravo/ Ridomil Gold 480EC/Ridomil Gold 480SL

Fungicide Group M5
Ridomil Gold/Bravo, Ridomil Gold SL/Bravo

Company:

Syngenta Canada

- (*Ridomil Gold/Bravo* – PCP#26443; *Ridomil Gold SL/Bravo* – PCP#29239; *Ridomil Gold 480EC* – PCP#25384; *Ridomil Gold 480SL* – PCP#28474)

Formulations:

Ridomil Gold/Bravo – 500 g/L chlorothalonil and 480 g/L metalaxyl-M.

- Container size – 8.83 L jug twin-pak

Ridomil Gold SL/Bravo – 500 g/L chlorothalonil and 480 g/L metalaxyl-M formulated as a soluble concentrate.

- Container size – 8.83 L jug twin-pak

Ridomil Gold 480EC – 480 g/L metalaxyl-M formulated as an emulsifiable concentrate.

- Container size – 4 x 3.78 L jugs

Ridomil Gold 480SL – 480 g/L metalaxyl-M formulated as a solution.

- Container sizes – 10 x 0.5 L or 4 x 3.78 L jugs

Crops, Diseases, Rates and Timing:

Crop	Diseases Controlled	Application Rate	Application Timing
Potato	***Ridomil Gold/Bravo, Ridomil Gold SL/Bravo:*** Early blight *(Alternaria solani)*, late blight *(Phytophthora infestans)*, late blight tuber rot, botrytis vine rot *(Botrytis cinerea)* Suppression of pythium leak (*Pythium* spp.) and pink rot *(Phytophthora erythroseptica)*	***Ridomil Gold/Bravo, Ridomil Gold SL/Bravo:*** One 8.83 L jug treats 10 acres. The entire contents of the jug must be added to the spray tank or an improper mixture will result.	Begin preventive applications early in the season when conditions are favorable for disease (before infection), no later than when the plant foliage meets within the row uniformly across the field. Apply a second and third application at 14 day intervals. Other registered contact fungicides should be applied 7 days after each application.
	Ridomil Gold 480EC, Ridomil Gold 480SL: Suppression of pink rot *(Phytophthora erythroseptica)* as in-furrow treatment.	***Ridomil Gold 480EC, Ridomil Gold 480SL:*** 4 mL/100 m row, applied in-furrow at planting.	

Application Information:

- **Water Volume:**
  - ***Ground:*** use sufficient water to ensure thorough coverage of foliage. Use a water volume of 90 to 640 L per acre.
    - *In-furrow treatment:* use a minimum of 12 L per acre. For tank mixes with *Quadris* water volume should be 20 to 56 L per acre.
  - ***Aerial:*** use a minimum water volume of 20 L per acre.

How it Works:

The active ingredient metalaxyl is an acylalanine fungicide with systemic activity. The active ingredient chlorothalonil is a chloronitrile fungicide with contact activity. To be used as a preventative fungicide application. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:

Ridomil Gold/Bravo, Ridomil Gold SL/Bravo: None registered.
Ridomil Gold 480EC, Ridomil Gold 480SL: May be tank mixed with *Quadris* for in-furrow treatment to control rhizoctonia stem rot, stolon canker, black scurf and suppression of pink rot.

Restrictions:

- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Maximum number of applications:**
  - ***Ground/aerial*** *(Ridomil Gold/Bravo, Ridomil Gold/SL Bravo)* – DO NOT exceed 3 applications of this product per season.
  - ***In-furrow*** *(Ridomil Gold 480EC, Ridomil Gold 480SL)* – DO NOT exceed 1 application of this product per season.
- **Grazing:** No restrictions listed.
- **Preharvest interval:** 14 days for *Ridomil Gold SL /Bravo*
- **Restricted Entry Interval:** *Ridomil Gold 480EC, Ridomil Gold 480SL* – DO NOT re-enter treated areas within 12 hours of application.
- **Re-cropping:** A plant back interval of 30 days for root crops is required after the in-furrow application.
- **Storage:** Protect from excessive heat.
- **Environment:** DO NOT apply where runoff is likely to occur. DO NOT use on coarse textured gravelly soils, soils with less than 2% organic matter or in areas where the water table may be high. Avoid application by ground or air near or around bodies of water. DO NOT contaminate streams or ponds by spray drift, by cleaning equipment, or disposal of wastes. A buffer zone of 100 m for aerial application and 15 m for ground application should be observed to protect water bodies.

Hazard Rating:

Ridomil Gold/Bravo, Ridomil Gold SL/Bravo:

Warning Poison – Eye Irritant

Ridomil Gold 480EC:

Caution Poison. Warning – Eye Irritant

Ridomil Gold 480SL:

Caution Poison. Warning – Eye Irritant, Skin Irritant

Refer to the Introduction for an explanation of the symbols.

Roxar*

Fungicide Group 3

***NOTE:** As of January 1, 2025, www.keepitclean.ca indicates that the use of this product on certain crop types may have market access concerns. Please see pg. 12 for more information AND consult potential grain buyers before using this product.

Company:
UPL AgroSolutions Canada (PCP#32200)

Formulations:
210 g/L tetraconazole formulated as a micro emulsion.
- Container size – 2 x 8.5 L

Crops, Diseases, Rates and Timing:

Crop	Diseases	Application Rate*	Application Timing
Wheat (durum, winter, spring)	Control of tan spot (*Pyrenophora tritici-repentis*), stem rust (*Puccinia graminis*), stripe rust (*Puccinia striiformis*)	135 mL	For optimum results, begin applications preventatively and repeat as needed on a 14 to 21 day interval. For leaf and stem diseases, apply prior to disease development from tillering up to late head emergence before flowering.
	Suppression of septoria leaf spot and glume blotch (*Septoria tritici*)		
	Suppression of Fusarium head blight (*Fusarium graminearum*)	212 mL	Apply when at least 75% of the heads on the main stem have emerged to when 50% of the heads on the main stem are in flower.

***Roxar can be applied with a non-ionic surfactant at 0.2-0.25% v/v. See label for further information.**

Application Information:
- **Water Volume:**
  - ***Ground:*** minimum water volume of 40 L per acre.
  - ***Aerial:*** minimum water volume of 20 L per acre.

How it Works:
The active ingredient tetraconazole is a demethylation inhibitor with systemic and contact activity. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:
None registered.

Restrictions:
- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Maximum number of applications:** DO NOT apply more than 270 mL per acre of *Roxar* in a single season.
- **Grazing:** No restrictions listed.
- **Preharvest interval:**
  - ***Wheat and barley harvested for grain*** – 40 days
- **Restricted Entry Interval:** DO NOT re-enter treated areas within 12 hours of application.
- **Re-cropping:**
  - ***Wheat, barley, dried shelled pea and bean, canola, corn, sugar beet*** – can be planted immediately after the last application.
  - ***All other crops*** – a 30 day plant interval must be observed prior to planting.
- **Storage:** Store this product away from food or feed.
- **Environmental Restrictions:** Toxic to aquatic organisms. Observe buffer zones as specified on the label. To reduce runoff from treated areas into aquatic habitats avoid application to ears with a moderate to steep slope, compacted soil, or clay. Avoid application when heavy rain is in the forecast.

Hazard Rating:
None registered.

Sercadis

Fungicide Group 7

Company:
BASF Canada (PCP#31697)

Formulation:
300 g/L fluxapyroxad formulated as a suspension concentrate.
- Container size – 2 x 1.35 L

Crops, Diseases, Rates and Timing:

Crop	Diseases Controlled	Application Rate (per acre)	Application Timing
Potato	Rhizoctonia canker (*Rhizoctonia* spp.)	135 mL	Apply in-furrow.
	Early blight *(Alternaria solani)*	68-135 mL	Apply to foliage prior to disease development.
	Sclerotinia stem rot *(Sclerotinia sclerotiorum)*	135 mL	Apply at the beginning of flowering. Apply a second time 7 to 14 days later is disease persists or weather conditions are favorable for disease development.

Application Information:
- **Water Volume:**
  - ***Ground:*** minimum 40 L per acre.
  - ***Aerial:*** minimum 20 L per acre.

How it Works:
The active ingredient fluxapyroxad is a carboxamide (SDHI) fungicide with system activity. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:
None registered.
In foliar applications always tank mix *Sercadis* with an alternate mode of action effective against the targeted disease. In foliar applications, the use of a non-ionic surfactant at 0.125 v/v is recommended. According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Restrictions:
- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Maximum number of applications:** DO NOT exceed 3 applications of this product per season
- **Grazing:** No restrictions listed.
- **Preharvest Interval:** 7 days
- **Restricted Entry Interval:** Re-entry interval after application is 12 hours.
- **Re-cropping:** Tuberous and corm vegetables, sugar beets, legume vegetables, fruiting vegetables, pome fruits, stone fruits, cereal and oilseeds may be planted immediately following the last application. A plan-back interval of one year is required for all other crops.
- **Storage:** Store this product away from food or feed.
- **Environmental Hazards:** Observe buffer zones specified on label. The use of this chemical may result in contamination of ground water, particularly in areas where soils are permeable (for example sandy soils) and/or the depth of the water table is shallow.
- **Toxicity:** Toxic to aquatic organisms and small mammals

Hazard Rating:
Warning – Contains the Allergen Soy

Serenade OPTI

Fungicide Group 44

Company:
Bayer (PCP#31666)

Formulation:
Serenade OPTI: 1.31 x 10^{10} CFU/g *Bacillus subtilis* (QST 713 strain) formulated as a wettable powder
- Container size – 2.72 kg

Crops, Diseases, Rates and Timing:

Crop	Diseases Suppressed	Application Rate (per acre)	Application Timing
Dry bean, chickpea, lentil, field pea	White mould *(Sclerotinia sclerotiorum)*, grey mould *(Botrytis cinerea)*	0.7 to 1.3 kg	Product should be applied prior to or in the early stages of disease development; repeat applications on 7 to 10 day intervals if conditions for disease persist.
Soybean	White mould *(Sclerotinia sclerotiorum)*	0.2 to 0.8 kg	Use maximum label rates and shortened spray intervals for conditions conducive to rapid disease development. When conditions are conducive to heavy disease pressure, use in a rotational program with other registered fungicides.
	Brown spot *(Septoria glycines)*	0.04 to 0.2 kg	
	Frogeye leaf spot (*Cercospora sojina*)	0.04 to 0.2 kg	
Potato	Sclerotinia stem rot (*Sclerotinia sclerotiorum*)	0.4 to 1.3 kg	Begin application soon after emergence and when conditions are conducive to disease development. Repeat as necessary on a 7 to 10 day interval.
	Early blight (*Alternaria solani*)	0.4 to 0.9 kg	
	Silver scurf (*Helminthosporium solani*)	7 to 14 g per tonne	For post-harvest application to aid in the control of silver scurf. See label for details.
Canola, flax, borage, camelina, mustard	Sclerotinia stem rot *(Sclerotinia sclerotiorum)*	0.1 to 0.4 kg	Begin application at 20 to 30% bloom. A second application may be made 7 to 10 days later, at approximately 50% bloom and prior to significant petal fall, if conditions for disease development remain favourable. Use higher rates in fields with a history of heavy disease pressure.
Caraway, coriander, fenugreek	Botrytis grey mould *(Botrytis cinerea)*, white mould *(Sclerotinia sclerotiorum)*	0.7 to 1.3 kg	Begin application when environmental conditions are conducive to disease development. Repeat as necessary on a 7 to 10 day interval.

Application Information:
- **Water Volume:**
  - Use water volumes to give good canopy penetration and coverage of plant parts to be protected. Ground application only for all crops, except canola (ground or air).

How it Works:
Bacillus subtilis is a bacterium that works as a bio-fungicide to prevent infection of labeled diseases by multi-site biochemical activity. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:
None registered.

Restrictions:
- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Maximum number of applications:** No restrictions listed.
- **Grazing:** No restrictions listed.
- **Preharvest interval:** Can be applied up to and including the day of harvest.

- **Restricted Entry Interval:** No restrictions listed.
- **Re-cropping:** No restrictions listed.
- **Storage:** Maximum storage period of two years at room temperatures up to 25°C. Store in a dry area inaccessible to children. Store in original container.
- **Environment:** DO NOT contaminate water, food, or feed by storage and disposal.

Hazard Rating:
None listed.
Potential Skin Sensitizer

Serenade SOIL

Fungicide Group 44

Company:
Bayer (PCP#30647)

Formulation:
1 x 10^9 CFU/g *Bacillus subtilis* (QST 713 strain) formulated as an aqueous suspension.
- Container sizes – 9.46 L, 511 L

Crops, Diseases, Rates and Timing:

Crop	Diseases Suppressed	Application Rate (per acre)	Application Timing
Potato	Rhizoctonia root rot, black scurf and stem canker (*Rhizoctonia solani*), phytophthora root rot and pink rot (*Phytophthora erythroseptica*), pythium root rot (*Pythium* spp.) and fusarium root rot (*Fusarium* spp.).	1.1 to 5.7 L	Apply in-furrow at planting.
Dry bean, chickpea, lentil, pea, corn	Fusarium root rot (*Fusarium* spp.), pythium root rot (*Pythium* spp.), Rhizoctonia root rot (*Rhizoctonia solani)*	1.1 to 5.7 L	Apply in-furrow at planting.
Dry bean, chickpea, lentil, pea	Botrytis blight (*Botrytis cinerea*), white mould (*Sclerotinia sclerotiorum*)	1.6 to 6.1 L	Foliar spray application. Begin application soon after emergence when conditions are conducive for disease development.
Soybean	Brown spot *(Septoria glycines*), frog eye (*Cercospora sojina*), White mould (*Sclerotinia sclerotiorum*)	0.4 to 1.6 L 1.6 to 6.1 L	Foliar spray application.
Canola	Sclerotinia stem rot (*Sclerotinia sclerotiorum*)	0.4 to 1.6 L	Ground and aerial foliar spray application. Begin application at 20 to 30% bloom.
Alfalfa *minor use registration	Blossom blight (*Botrytis cinerea)*	1.6 to 6.1 L	Test a small area under local conditions using standard practices to confirm product is suitable for widespread application. Begin application prior to disease development when environmental conditions are conducive to disease development.

Application Information:
- **Water Volume:**
  - Apply in the appropriate water volume to ensure full coverage.

How it Works:
Bacillus subtilis is a bacterium that works as a bio-fungicide to prevent infection of labeled diseases by multi-site biochemical activity. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:
None registered.

Restrictions:

- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Maximum number of applications:** No restrictions listed.
- **Grazing:** No restrictions listed.
- **Preharvest interval:** Can be applied up to and including the day of harvest.
- **Restricted Entry Interval:** No restrictions listed.
- **Re-cropping:** No restrictions listed.
- **Storage:** Maximum storage period of two years at room temperatures up to 25°C. Store in a dry area inaccessible to children. Store in original container.
- **Environment:** DO NOT contaminate water, food, or feed by storage and disposal.

Hazard Rating:

None listed.
Potential Skin Sensitizer

Serifel

Fungicide Group BM02

Company:

BASF Canada (PCP # 30054)

Formulation:

Bacillus amyloliquefaciens strain MBI 600 – not less than 5.5 x 10^{10} viable spores per gram formulated as wettable Powder.

- Container size – 2 kg jugs

Crops, Diseases, Rates and Timing:

Crop	Diseases Suppressed	Application Rate (per acre)	Application Timing
Potatoes	Suppression of Early blight (*Alternaria solani*)	0.1 to 0.2 kg	For early blight, begin applications shortly after emergence or transplanting but prior to disease development and continue on 7- to 10-day intervals if conditions are favourable for disease development.
	Suppression of Rhizoctonia stem canker/black scurf (*Rhizoctonia solani*)	0.1 to 0.2 kg	Use in furrow to suppress soilborne Rhizoctonia canker or black scurf.

Application Information:

- **Water Volume:**
  - ***Ground and in-furrow:*** 20 L/ac minimum
  - ***Aerial:*** Do NOT apply by air
  - Apply *Serifel* in sufficient water to ensure thorough coverage for optimum disease control. Maintain agitation of the product during the application process. The product mixture should be applied shortly after mixing. DO NOT store mixed suspensions of Serifel overnight.

How it Works:

Serifel is an agricultural biological fungicide product formulated as a wettable powder for the suppression or partial suppression of various fungal diseases.

Tank Mixes:

None registered.

Restrictions:

- **Rainfall:** Avoid application when heavy rain is forecast. If heavy rainfall or irrigation occurs shortly after application, reapplication of *Serifel* may be necessary.
- **Grazing:** There are no livestock feeding restrictions for *Serifel* treated plants and produce.
- **Pre-harvest Intervals:** 0 days for all labeled crops.
- **Re-cropping:** There are no crop rotation or plant back restrictions.
- **Re-entry:** 4 hours or until sprays have dried.

- **Storage:** To prevent contamination, store this product away from food or feed. Store in a dry area for up to 3 years from Date of Manufacture .
- **Environment:** To reduce runoff from treated areas into aquatic habitats avoid application to areas with a moderate to steep slope, compacted soil, or clay. Avoid application when heavy rain is forecast. Contamination of aquatic areas as a result of runoff may be reduced by including a vegetative strip between the treated area and the edge of the water body.

Hazard Rating:

None listed.
Potential Skin Sensitizer

Sphaerex

Fungicide Group 3

Company:

BASF (PCP#34263)

Formulation:

112.5 g/L metconazole and 187.5 g/L prothioconazole formulated as an emulsifiable concentrate.

- Container size – 8.65 L, 139 L

Crops, Diseases, Rates and Timing:

Crop	Diseases	Application Rate (per acre)	Application Timing
Barley	Control of net blotch (*Pyrenophora teres*), scald (*Rhynchosporium secalis*), leaf rust (*Puccinia hordei*), stripe rust (*Puccinia striiformis*), powdery mildew (*Erysiphe graminis* f.sp. *hordei*)	162 to 215 mL	Prior to disease development or at onset of disease.
	Suppression of Fusarium head blight (*Fusarium graminearum*), spot blotch (*Cochliobolus sativus)* and Ergot *(Claviceps purpurea*)	215 mL	Apply when 75 to 100% of main stem barley spikes are emerged until 3 days after full spike emergence using sprayer nozzles configured to provide excellent coverage of the cereal head.
Oats	Control of crown rust (*Puccinia coronata*), septoria leaf blotch (*Septoria avenae*)	162 to 215 mL	Prior to disease development or at onset of disease.
	Suppression of Fusarium head blight (*Fusarium graminearum*) and Ergot (*Claviceps purpurea*)	215 mL	Apply when oats are in anthesis stage (GS 61-69), that is at early panicle stage when anthers are yellow to white stage. Use sprayer nozzles configured to provide excellent coverage of the panicles.
Rye and triticale	Control of leaf rust (*Puccinia recondita*) stripe rust (*Puccinia striiformis*) powdery mildew (*Erysiphe graminis*)	162 to 215 mL	Prior to disease development or at onset of disease.
	Suppression of Fusarium head blight (*Fusarium graminearum*) and Ergot (*Claviceps purpurea*)	162 to 215 mL	Apply when rye or triticale are in anthesis stage; that is at early heading stage when anthers are yellow to white stage.
Wheat (all types)	Control of tan spot (*Pyrenophora tritici-repentis*), septoria leaf spot (*Septoria tritici* or *S. nodorum*), leaf rust (*Puccinia recondita*), stripe rust (*Puccinia striiformis*), stem rust (*Puccinia graminis*), powdery mildew (*Erysiphe graminis* f. sp. *tritici*), septoria glume blotch (*Stagonospora nodorum*)	162 to 215 mL	Prior to disease development or at onset of disease.
	Suppression of Fusarium head blight (*Fusarium graminearum*), spot blotch (*Cochliobolus sativus*) and Ergot (*Claviceps purpurea*)	215 mL	Apply when crop is at 20% flowering using sprayer nozzles configured to provide excellent coverage of the cereal head

Application Information:

- **Water Volume:**
  - ***Ground:*** minimum 40 L per acre.
  - ***Aerial:*** 12 L per acre for aerial applications targeting fusarium head blight in cereals. Use 20 L per acre for applications targeting ergot. Review and follow the product label prior to the application.

How it Works:

The active ingredients, metconazole and prothioconazole, are broad spectrum triazole demethylation inhibitor (DMI) fungicides with systemic activity. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:

None registered.

Restrictions:

- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Maximum number of applications:** DO NOT exceed 1 application of this product per season.
- **Grazing:** All crops can be grazed or fed to livestock.
- **Preharvest interval:** 30 days.
- **Restricted Entry Interval:** DO NOT re-enter treated areas within 24 hours of application.
- **Re-cropping:** A plant back interval of 35 days is required for all crops not listed on the label.
- **Storage:** DO NOT ship or store near food, feed, seed and fertilizers. Store in original tightly closed container. Protect from freezing.
- **Environment:** TOXIC to aquatic organisms. Observe buffer zones specified under Directions for Use.
  - To reduce runoff from treated areas into aquatic habitats avoid application to areas with a moderate to steep slope, compacted soil, or clay.
  - Avoid application when heavy rain is forecast.
  - Contamination of aquatic areas as a result of runoff may be reduced by including a vegetative strip between the treated area and the edge of the water body.
  - This product demonstrates the properties and characteristics associated with chemicals detected in groundwater. The use of this product in areas where soils are permeable, particularly where the water table is shallow, may result in groundwater contamination.

Hazard Rating:

Warning – Skin Irritant

Refer to the Introduction for an explanation of the symbols.

Tanos

Fungicide Group 11, 27

Company:
Corteva Agriscience (PCP#27435)

Formulation:
25% famoxadone and 25% cymoxanil formulated as a dry flowable.
- Container size – 4 x 3.4 kg

Crops, Diseases and Timing:
Potato – Early blight (*Alternaria solani*) and late blight (*Phytophthora infestans*). Make the first application following one or two applications of a preventative broad spectrum fungicide such as chlorothalonil or mancozeb. A minimum 12 day application interval must pass between the first and second application of *Tanos*. A minimum 24 day application interval must pass between the second and third application of *Tanos*. Fungicides other than *Tanos* may be used as necessary to protect the crop during these intervals.

Rates:
225 to 340 grams per acre.

Application Information:
- **Water Volume:**
  - ***Ground:*** Use sufficient water to obtain thorough coverage. With a conventional sprayer use no less than 100 to 120 L per acre. With an air-assisted sprayer use no less than 44 L per acre.
  - ***Aerial:*** minimum 20 L per acre.

How it Works:
The active ingredient cymoxanil is a cyanoacetamide-oxime fungicide with locally systemic activity. The active ingredient famoxadone is a strobilurin fungicide with broad spectrum activity. To be used as a preventative, curative and inhibitive (against sporulation) fungicide application. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:
None registered.
Tank mix solutions containing boron may affect product solubility. When using boron containing solutions, add the correct amount of *Tanos* first and boron containing solution last. According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Restrictions:
- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Maximum number of applications:** DO NOT exceed 3 applications of this product per season.
- **Grazing:** No restrictions listed.
- **Preharvest interval:** 14 days
- **Restricted Entry Interval:** DO NOT re-enter treated areas within 24 hours of application.
- **Re-cropping:** Crops that are on the product label may be planted back at any time. A 30-day plantback interval is required for cereal grains. All other crops may be planted following a 1 year interval.
- **Storage:** Store product closed in original container only. Protect against humid air and water. Avoid contact with food, drink and livestock feed material.
- **Environment:** Toxic to fish and aquatic organisms. Observe prescribed buffer zones. Toxic to birds, mammals and harmful to beneficial arthropods. Minimize off-target drift to reduce the effects on wildlife at the field boundary. DO NOT apply to areas prone to run-off.

Hazard Rating:
Warning Poison – Eye Irritant

Refer to the Introduction for an explanation of the symbols.

Tebuconazole

Fungicide Group 3

Palliser/Folicur 250 EW/Toledo 250 EW/Hornet 432 F/ Orius 430 SC/Advantage Tebuconazole 250/Tebbie/ FBN Tebuconazole 250

Company:

Bayer (*Palliser* – PCP#30491), (*Folicur 250 EW* – PCP#29820)
Albaugh (*Toledo 250 EW* – PCP#33719)
Nufarm Agriculture Inc. (*Hornet 432 F* – PCP#32500)
ADAMA Canada (*Orius 430 SC* – PCP#33673)
Advantage Crop Protection Inc. (*Advantage Tebuconazole 250* – PCP#33887)
Sharda CropChem Canada (*Tebbie* – PCP#33901)
Farmer's Business Networks, Canada, Inc (*FBN Tebuconazole 250 Fungicide* – PCP#33779)
AgraCity Crop & Nutrition Ltd. (*Tornado* – PCP#33995)
Viking Crop Production Partners Inc. (*VIKING Tebuconazole Fungicide* – PCP#34770)

Formulations:

Palliser – 432 g/L tebuconazole formulated as a suspension.
- Container size – 9.46 L

Hornet 432 F – 432 g/L tebuconazole formulated as a suspension.
- Container size – 2 x 9.46 L

Orius 430 SC – 430 g/L tebuconazole formulated as a suspension.
- Container size – 9.44 L

*Folicur 250 EW** – 250 g/L tebuconazole formulated as an emulsion in water.
- Container size – 8.1 L

Advantage Tebuconazole 250 – 250 g/L tebuconazole formulated as an emulsion in water.
- Container size – 96 L drum and 1000 L tote

Tebbie – 250 g/L tebuconazole formulated as an emulsion in water.
- Container sizes – 8.1 L jugs to 129.6 L drums

Toledo 250 EW – 250 g/L tebuconazole formulated as an emulsion in water.
- Container size – 8.1 L

FBN Tebuconazole 250 Fungicide – 250 g/L tebuconazole formulated as an emulsion in water.
- Container sizes – 4.04 L jugs to 405 L drums

Tornado – 250 g/L tebuconazole formulated as an emulsion in water.
- Container sizes – 2 x 8.1 L, 96 L, 1000 L

VIKING Tebuconazole Fungicide – 250 g/L of tebuconazole formulated as an emulsion in water.
- Container size – 2 x 8.1 L, 100 L, 1000 L

***NOTE:** This product is no longer being manufactured and will be removed from the book in 2024.

Crops, Diseases, Rates and Timing:

Crop	Diseases	Application Rate (per acre)				Application Timing
		Palliser/ Hornet 432 F **	*Orius 430 SC**	*Folicur 250 EW/ Toledo 250 EW/ VIKING Tebuconazole Fungicide*	*Advantage Tebuconazole 250/ Tebbie/FBN Tebuconazole 250/Tornado*	
Wheat**	Suppression of fusarium head blight (*Fusarium graminearum*) Control of septoria glume blotch *(Stagonospora nodorum)*	120 mL	118 mL	202 mL	200 mL	**Timing of application is critical:** Apply within the time period from when at least 75% of the wheat heads on the main stem are fully emerged to when 50% of the heads on the main stem are in flower. **Spray coverage is essential for optimum efficacy:** Spray equipment must be set to provide good coverage to heads (e.g. forward and backward mounted nozzles, or nozzles that have a two-directional spray).

Crop	Diseases	Application Rate (per acre)				Application Timing
		Palliser/ Hornet 432 F **	*Orius 430 SC**	*Folicur 250 EW/ Toledo 250 EW/ VIKING Tebuconazole Fungicide*	*Advantage Tebuconazole 250/ Tebbie/FBN Tebuconazole 250/Tornado*	
Wheat** *continued*	Control of tan spot *(Pyrenophora tritici-repentis)*, septoria leaf blotch *(Septoria tritici)*, leaf rust *(Puccinia triticina)*, stem rust *(Puccinia graminis)*, stripe rust *(Puccinia striiformis)*	90 to 120 mL	89 to 118 mL	152 mL to 202 mL	150 mL to 200 mL	Apply at the first sign or very early stage of disease, up to the end of the flowering stage. Use the higher rate when weather conditions are conducive for disease.
	Control of powdery mildew *(Erysiphe graminis)*	120 mL	118 mL	202 mL	200 mL	
Barley**	Control of net blotch *(Pyrenophora teres)*, spot blotch *(Cochliobolus sativus)*, scald *(Rhynchosporium secalis)*, leaf rust *(Puccinia hordei)*, stem rust *(Puccinia graminis)*, stripe rust *(Puccinia striiformis)*, septoria leaf blotch *(Septoria passerinii)*, powdery mildew *(Erysiphe graminis)*	90 to 120 mL	89 mL to 118 mL	152 mL to 202 mL	150 mL to 200 mL	Apply at the first sign or very early stage of disease, (for *Advantage Tebuconazole 250 EW* only, up to the end of the flowering stage.). Use the higher rate when weather conditions are conducive for disease.

Crop	Diseases	Application Rate (per acre)				Application Timing
		Palliser/ Hornet 432 F **	*Orius 430 SC**	*Folicur 250 EW/ Toledo 250 EW/ VIKING Tebuconazole Fungicide*	*Advantage Tebuconazole 250/ Tebbie/FBN Tebuconazole 250/Tornado*	
Oat	Control of crown rust *(Puccinia coronata)*, stem rust *(Puccinia graminis)*	90 mL	89 mL	152 mL	150 mL	Apply at the first sign or very early stage of disease, (for *Advantage Tebuconazole 250 EW* only, up to the end of the flowering stage.). Use the higher rate when weather conditions are conducive for disease.
	Control of Stagonospora (*Septoria*) leaf blotch; black stem (*Stagonospora avenae*; teleomorph – *Phaeosphaeria avenaria* f. sp. *avenaria*)	Not registered	Not registered	152 mL to 202 mL	150 mL to 200 mL	
Soybean	Control of frogeye leaf spot (*Cercospora sojina*) Suppression of powdery mildew *(Microsphaera diffusa)*	Not registered	Not registered	152 mL to 202 mL	150 mL to 200 mL	Apply when first symptoms of disease can be found or risk of infection is imminent. Use the higher rate when disease pressure is severe.

***Palliser, Hornet 432 F* and *Orius 430 SC* are recommended to be used with a registered non-ionic surfactant, such as *Agral 90* or *AgSurf*, at 1.25 L per 1000 L of spray solution.**

Application Information:

- **Water Volume:**
  - ***Ground:*** minimum 40 L per acre. Ensure thorough coverage of all wheat heads. Avoid excessive water volumes (maximum 80 L per acre) at flowering time because this can increase the risk of infection.
  - ***Aerial:*** minimum 19 L per acre (20 L per acre for *Orius 430 SC*).

How it Works:

The active ingredient tebuconazole is a triazole demethylation inhibitor (DMI) fungicide with systemic broad-spectrum activity. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:

VIKING Tebuconazole Fungicide: no registered tank mixes.
Herbicides: In spring wheat only, *Palliser* or *Hornet 432 F* may be tank-mixed with *Buctril M* for leaf diseases and respective weeds controlled (consult labels).
Insecticides: None registered.
Fungicides: None registered.
According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Restrictions:

- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Maximum number of applications:** DO NOT exceed one application of this product per season.
- **Grazing:** DO NOT allow livestock to graze or feed green forage to livestock prior to 6 days after treatment. Straw cut after harvest may be fed or used for bedding.
- **Preharvest interval:**
  - ***Soybean*** – 20 days
  - ***Barley, oat and wheat*** – 36 days; (for *Advantage Tebuconazole 250 EW* and *Tebbie* only – 20 days)
- **Restricted Entry Interval:** DO NOT re-enter treated areas within 12 hours of application.
- **Re-cropping:** Treated areas may be replanted immediately following harvest with any crop listed on the respective label. For crops not listed on these labels, DO NOT replant treated areas for 120 days after last application.
- **Storage:** Store in a cool, dry place and prevent cross contamination with other pesticides, fertilizers, food and feed.
- **Environment:** Any products containing tebuconazole should not be used in areas treated with this product during the previous season (use only in alternate years). This product is toxic to birds, small wild animals, aquatic organisms, and non-target plants.
  - DO NOT apply directly to water, or to areas where surface water is present. Maintain a buffer zone of 30 m near aquatic areas. DO NOT contaminate irrigation or drinking water supplies or aquatic habitats by cleaning of equipment or disposal of wastes.

Hazard Rating:

Danger – Skin Irritant

Caution – Eye Irritant

Refer to the Introduction for an explanation of the symbols.

TilMOR 240 EC

Fungicide Group 3

Company:

Bayer (PCP#33825)

Formulation:

80 g/L of prothioconazole and 160 g/L of tebuconazole formulated as an emulsifiable concentrate.

- Container size – 10.12 L

Crops, Diseases, Rates and Timing:

Crop	Diseases Suppressed	Application Rate (per acre)	Application Timing
Wheat (spring, winter, durum)	Control of leaf rust (*Puccinia recondita*), stem rust (*P. graminis*), stripe rust (*P. striiformis*), leaf and glume blotch (*Zymoseptoria* syn. *Septoria tritici, Parastagonospora* syn. *Stagonospora nodorum*), tan spot (*Pyrenophora tritici-repentis*), powdery mildew (*Erysiphe graminis*)	253 mL/acre	Apply to leaf foliage at the first sign or very early stage of disease, especially if weather conditions are conducive to disease development, up to the end of the flowering stage.
Wheat (spring, winter, durum), *cont'd*	Suppression of fusarium head blight (*Gibberella zeae/Fusarium graminearum*)	253 mL/acre	Apply within the time period from when at least 75% of the wheat heads on the main stem are fully emerged to when 50% of the heads on the main stem are in flower.
Barley	Net blotch (*Pyrenophora teres*), spot blotch (*Cochliobolus sativus*), scald (*Rhynchosporium secalis*), leaf blotch (*Septoria passerinii*), leaf rust (*Puccinia hordei*), stem rust (*P. graminis*) and stripe rust (*P. striiformis*), powdery mildew (*Erysiphe graminis*)		Apply at the very early stages of disease development.
Oats	Crown rust (*Puccinia coronata*), stem rust (*Puccinia graminis*), stagonospora (*septoria*), leaf blotch and black stem (*Phaeosphaeria* [syn. *Leptosphaeria*], *avenaria*, f. sp. *avenaria, asexual state Stagonospora avenae* syn. *Septoria avenae*)		

Application Information:

- **Water Volume:**
  - ***Ground:*** minimum 40 L per acre.
  - ***Aerial:*** minimum 20 L per acre.

How it Works:

The active ingredient tebuconazole is a triazole demethylation inhibitor (DMI) fungicide with systemic broad-spectrum activity. The active ingredient prothioconazole is a triazole fungicide with broad-spectrum systemic activity. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:

None registered.

Restrictions:

- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Maximum number of applications:** DO NOT exceed 1 application of this product per season. *Prosaro XTR Fungicide* may be applied sequentially after an application of *TILMOR 240 EC Fungicide*. Please refer to respective product labels for specific use directions, pertinent recommendations, restrictions and precautions.
- **Preharvest interval:**
  - ***Wheat, barley and oats*** – 36 days
- **Restricted Entry Interval:** DO NOT re-enter treated areas within 12 hours of application.
- **Re-cropping:** Treated areas may be replanted with any crop listed on the label as well as soybean as soon as practical after the last application. For all other crops, do not plant back within 120 days of last application.
- **Storage:** DO NOT store at temperatures below freezing. Keep in original tightly closed container and store away from feeds, seeds, fertilizer, plants and food stuffs. Keep away from sources of heat. Shake well before using if stored for more than 1 year.
- **Environment:** Toxic to birds, small wild animals, aquatic organisms and non-target terrestrial plants. Observe buffer zones specified under Spray Buffer Zones.
- **Rainfast:** 1 hour

Hazard Rating:

Danger – Eye and Skin Irritant
Potential Skin Sensitizer

Refer to the Introduction for an explanation of the symbols.

Trivapro

Fungicide Group 3, 7, 11

Trivapro is a co-pack of Trivapro A and Trivapro B. At the rates of application for Trivapro, not all diseases listed in the labels of the individual component (Trivapro A and Trivapro B) will be controlled. Please refer to the table below.

Company:

Syngenta Canada (*Trivapro A* – PCP#32184, *Trivapro B* – PCP#32185)

Formulations:

Trivapro A: 75 g/L azoxystrobin and 125 g/L propiconazole formulated as a suspension.

- Container sizes – 2 x 8.1 L (case), 320 L (bulk)

Trivapro B: 100 g/L benzovindiflupyr formulated as an emulsifiable concentrate.

- Container sizes – 2 x 2.43 L (case), 4 x 2 x 12 L (bulk)

Crops, Diseases, Rates and Timing:

Crop	Diseases	Application Rate	Application Timing
Barley, wheat (all types), oat, rye, triticale	Barley net blotch *(Pyrenophora teres)*, tan spot *(Pyrenophora tritici-repentis)*, septoria leaf spot (*Septoria* spp.), barley scald *(Rhynchosporium secalis)*, barley leaf rust *(Puccinia hordei)*, wheat leaf rust *(Puccinia triticina)*, stripe rust *(Puccinia striiformis)*, crown Rust (*Puccinia coronata* var. *avenae*), stem rust *(Puccinia graminis)*, leaf rust *(Puccinia recondita)*	40 acres per case or 800 acres per bulk pack This delivers 0.4 L/acre of *Trivapro A* and 0.12 L/acre of *Trivapro B*	Apply between stem elongation and head half emergence

Crop	Diseases	Application Rate	Application Timing
Corn	Control of rust *(Puccinia sorghi)*, Northern corn leaf blight *(Setosphaeria turcicum)*, grey leaf spot *(Cercospora zeae-maydis)*	40 acres per case or 800 acres per bulk pack This delivers 0.4 L/acre of *Trivapro A* and 0.12 L/acre of *Trivapro B*	Begin application prior to disease onset when conditions are conducive for disease development. Make applications no closer than 7 days apart.
Soybean	Powdery mildew *(Microsphaera diffusa, Erysiphe pisi, E. polygoni)*, anthracnose *(Colletotrichum truncatum)*	40 acres per case or 800 acres per bulk pack This delivers 0.4 L/acre of *Trivapro A* and 0.12 L/acre of *Trivapro B*	Make the first application prior to disease establishment.

Application Information:

- **Water Volume:**
  - ***Ground:*** minimum 76 L per acre.
  - ***Aerial:*** minimum 17.5 L per acre.
- DO NOT apply during periods of dead calm.

How it Works:

The active ingredient azoxystrobin is a methoxyacrylate compound (strobilurin) with broad spectrum contact and systemic activity. The active ingredient propiconazole is a triazole fungicide with broad spectrum systemic activity. The active ingredient benzovindiflupyr is a succinate dehydrogenase inhibitor (SDHI) fungicide with broad spectrum activity. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Restrictions:

- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Maximum number of applications:** DO NOT exceed 2 application per season and DO NOT exceed for than one application per season in forage and hay cereal crops.
  - Azoxystrobin is persistent and will carryover. It is recommended that this product not be used in areas treated with azoxystrobin during the previous season.
  - Benzovindiflupyr is persistent and may carryover. It is recommended that any products containing benzovindiflupyr not be used in areas treated with this product during the previous season.
- **Grazing:** DO NOT graze treated fields or feed treated forage to livestock.
- **Preharvest interval:**
  - ***Corn*** – 14 days for grain and sweet corn, and 30 days for forage
  - ***Cereals*** – 45 days for grain and straw, 30 days for forage and hay
  - ***Soybean*** – 30 days, 15 days for edible podded legume vegetables (Crop subgroup 6A), and 14 days for soybean hay
- **Restricted Entry Interval:** DO NOT re-enter treated area within 12 hours after application.
- **Re-cropping:** Azoxystrobin is persistent and can carryover. Oat and rye should not be planted within 40 days of application. All other crops intended for food and feed should not be planted within 105 days of application of *Trivapro*.
- **Storage:** DO NOT freeze.
- **Environment:** This product is toxic to fish and aquatic organisms. Observe buffer zones outlined in the label.

Hazard Rating:

Poison
Warning – Eye and Skin Irritant
Danger – Corrosive to Eyes and Skin

Refer to the Introduction for an explanation of the symbols.

Twinline*

Fungicide Group 3, 11

***NOTE:** This product is no longer manufactured but product still remains in the distribution system. This product may be removed from future editions.

Company:
BASF Canada (PCP#30337)

Formulation:
130 g/L pyraclostrobin and 80 g/L metconazole formulated as a liquid.
- Container sizes – case (2 x 8.1L), 64 L drum, 128 L shuttle, or 400 L tote

Crops, Diseases, Rates and Timing:

Crop	Diseases	Application Rate (per acre)	Application Timing
Wheat, triticale	Control of tan spot *(Pyrenophora tritici-repentis)*, septoria leaf blotch *(Septoria tritici* or *Stagonospora nodorum)*, leaf rust *(Puccinia recondita)*, spot blotch *(Cochliobolus sativus)*, stripe rust *(Puccinia striiformis)*, powdery mildew (*Erysiphe graminis* f. sp. *tritici*)	150 to 200 mL	Prior to disease development or at onset of disease. Optimal application timing is at the flag leaf stage. Use the 202 mL/acre rate to obtain extended protection with maximum yield benefits.
Barley	Control of net blotch *(Pyrenophora teres)*, spot blotch *(Cochliobolus sativus)*, scald *(Rhynchosporium secalis)*, stripe rust *(Puccinia striiformis)*	150 to 200 mL	Prior to disease development or at onset of disease. Optimal application timing is at the flag leaf stage. Use the 202 mL/acre rate to obtain extended protection with maximum yield benefits.
Oat	Control of crown rust *(Puccinia coronata)*		
Rye	Control of leaf rust *(Puccinia recondita)*, powdery mildew *(Erysiphe graminis)*		
Barley, rye, wheat (all types), triticale	Suppression of fusarium head blight *(Fusarium graminearum)* and control of all leaf diseases controlled by lower application rates.	456 mL	When weather is warm and wet at head emergence and flowering. For wheat and rye apply at 20% flowering, for barley apply between full head emergence to up to 3 days after full emergence of the main stem.

Application Information:
- **Water Volume:**
  - ***Ground:*** minimum of 40 L per acre.
  - ***Aerial:*** minimum of 20 L per acre.

How it Works:
The active ingredient metconazole is a broad spectrum triazole demethylation inhibitor (DMI) fungicide with systemic activity. The active ingredient pyraclostrobin is a strobilurin fungicide with broad spectrum contact and systemic activity. Best utilized as a preventative application when environmental conditions are favourable for disease development. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:
None registered.

Restrictions:
- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Maximum number of applications:** DO NOT exceed 2 applications of this product per season.
- **Grazing:** No restrictions listed.
- **Preharvest interval:** Apply no later than end of flowering.
- **Restricted Entry Interval:** DO NOT re-enter treated areas within 6 days.
- **Re-cropping:** A plant back interval of 35 days is required for all crops not listed on the label.
- **Storage:** Store in original tightly closed container. Protect from freezing.

- **Environment:** Avoid run-off from treated areas into aquatic areas. Toxic to aquatic organisms, non-target terrestrial plants and small wild animals.
  - For ground application, buffer zones must be 1 m for protection of terrestrial habitats and aquatic habitats greater than 1 m deep and buffer zones must be 5 m from aquatic habitats less than 1 m deep.
  - For aerial application, buffer zones must be 10 m for protection of terrestrial habitats and aquatic habitats greater than 1 m deep and buffer zones must be 250 m from aquatic habitats less than 1 m deep.

Hazard Rating:

Danger – Poison
Eye and Skin Irritant

Refer to the Introduction for an explanation of the symbols.

Veltyma

Fungicide Group 3, 11

Company:

BASF (PCP#34166)

Formulation:

200 g/L mefentrifluconazole and 200 g/L pyraclostrobin formulated as a suspension concentrate.

- Container size – 8.1 L

Crops, Diseases, Rates and Timing:

Crop	Diseases	Application Rate (per acre)	Application Timing
Potato	Control of early blight (*Alternaria solani*), black dot (*Colletotrichum coccodes*) Suppression of brown spot (*Alternaria alternata*)	202 mL	Begin applications prior to row closure or when conditions are favourable for disease development. Apply an additional application at an interval of 7 to 14 days if disease persists or weather conditions are favourable.
Corn	Control of common rust (*Puccinia sorghi*), eyespot (*Kabatiella zeae/Aureoasidium*), gray leaf spot (*Cercospora zeae-maydis*), northern leaf blight (*Exserohilum turcicum/Setosphaeria turcica*) Tar spot (*Phyllachora maydis*)	202 mL	Begin applications prior to disease development. Apply a second time 10 to 14 days later if disease persists.
Soybean	Control of cercospora blight and purple seed stain (*Cercospora kikuchii*), septoria brown spot (*Septoria glycines*)	152 to 202 mL	Apply prior to disease development when conditions are favourable. If disease persists, a second application can be applied 10 to 14 days later.
	Control of frogeye leaf spot (*Cercospora sojina*), pod and stem blight (*Diaporthe phaseolorum* var. *sojae/Phomopsis longicolla*) Tar spot (*Phyllachora maydis*)	202 mL	

Application Information:

- **Water Volume:**
  - ***Ground:*** minimum of 40 L per acre.
  - ***Aerial:*** 8 L/acre for aerial applications targeting foliar diseases. Use 20 L/acre for applications targeting Gibberella ear rots on corn. Follow the instructions on the label.

How it Works:

The active ingredient, mefentrifluconazole, is a broad spectrum triazole demethylation inhibitor (DMI) fungicide with systemic activity. The active ingredient pyraclostrobin is a strobilurin fungicide with broad spectrum contact and systemic activity. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:
None registered.

Restrictions:
- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Maximum number of applications:** DO NOT exceed 1 L per acre of this product per season.
- **Grazing:** No restrictions listed.
- **Preharvest interval:**
  - ***Potato*** – 7 days
  - ***Corn, soybean*** – 21 days
- **Restricted Entry Interval:** DO NOT re-enter treated areas for 12 hours.
- **Re-cropping:** A plant back interval of 35 days is required for all crops not listed on the label.
- **Storage:** Store in original container. To prevent contamination, store away from food or feed.
- **Environment:** Oral LD50 (rats) = >500 to 2000 mg/kg. Dermal LD50 (rats) = >5000 mg/kg.
  - Toxic to aquatic organisms, non-target terrestrial plants, and small wild mammals. Observe spray buffer zones specified under Directions for Use.
  - The use of this chemical may result in contamination of groundwater particularly in areas where soils are permeable (e.g. sandy soil) and/or the depth to the water table is shallow. To reduce runoff from treated areas into aquatic habitats avoid application to areas with a moderate to steep slope, compacted soil, or clay.
  - Avoid application when heavy rain is forecast.
  - Contamination of aquatic areas as a result of runoff may be reduced by including a vegetative strip between the treated area and the edge of the water body.

Hazard Rating:
Caution Poison – Skin Irritant

Refer to the Introduction for an explanation of the symbols.

Velum Prime

Fungicide Group 7

Company:
Bayer (PCP#32108)

Formulation:
500 g/L of Fluopyram formulated as a suspension concentrate.
- Container size – 2 x 4.04 L

Crops, Diseases, Rates and Timing:

Crop	Diseases	Application Rate* (per acre)	Application Timing
Potato	Early blight (*Alternaria solani*) and black dot (*Colletotrichum coccodes*)	202 mL	When using fungicides for late blight control throughout the season, utilize actives that also have activity on early blight.

Application Information:
- **Water Volume:**
  - ***Ground:*** minimum of 40 L per acre.

How it Works:
The active ingredient fluopyram is a carboxamide fungicide with systemic activity. Refer to “Fungicide Modes of Action” in the Plant Disease Control section for more information.

Tank Mixes:
None registered.

Restrictions:

- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Maximum number of applications:** DO NOT apply more than 202 g fluopyram per acre per year, regardless of formulation or method of application (soil or foliar). To limit the potential for development of disease resistance to this fungicide class do not make more than 2 sequential applications of *Velum Prime* or any other Group 7 containing fungicide.
- **Grazing:** DO NOT allow livestock to graze treated area for 7 days after application.
- **Preharvest interval:** 7 days (all crops on label).
- **Restricted Entry Interval:** DO NOT re-enter treated areas within 12 hours of application.
- **Re-cropping:** DO NOT replant to alfalfa for 14 days after application. All other crops may be replanted immediately following the last application of *Velum Prime*.
- **Storage:** Store this product away from food or feed. DO NOT store below freezing. If stored for 1 year or longer, shake well before using.
- **Environment:** Toxic to aquatic organisms and non-target terrestrial plants. Observe buffer zones specified under directions for use. Toxic to birds.

Hazard Rating:

None listed.

Velum Rise

Fungicide Group 7

Company:

Bayer (PCP#34871)

Formulation:

250 g/L Fluopyram and 106 g/L Penflufen formulated as Suspension Concentrate.

- Container size – 8.1 L jug (one jug treats 20 acres)

Crops, Diseases, Rates and Timing:

Crop	Disease / Pest	Rate	Application Timing
Potato	Control of soil-borne black scurf, control of stem and stolon canker caused by *Rhizoctonia solani*	400 mL/ac or 9mL/100 m of row (based on 90cm row spacing)	Apply at time of seeding; For best results, mount the spray nozzle to direct the spray as a 15-20 cm band onto the seed pieces in the furrow just before the seed is covered.
	Suppression of early blight, black dot, root lesion nematodes		

Application Information:

- **Water Volume:**
  - ***Ground:*** Apply using minimum water volume of 16 to 60 L/acre.
  - ***Do not apply by air.***

How it Works:

The active ingredient fluopyram is a carboxamide fungicide with systemic activity. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information. Penflufen is a loco-systemic carboxamide fungicide which inhibits mitochondrial respiration by inhibiting succinate dehydrogenase (SDHI), an enzyme in the electron transport system.

Tank Mixes:

None registered.

Restrictions:

- **Maximum number of applications:** To limit the potential for development of disease resistance to this fungicide class do not make more than 2 sequential applications of any Group 7 containing fungicide before rotating with a fungicide from a different Group registered for the same use. When *Velum Rise* is applied as a soil application use another mode of action for the first foliar fungicide application.
- **Fluopyram:** Do not apply more than 500 g/ha (202 g/ac.) fluopyram per year, regardless of formulation or method of application (soil or foliar).
- **Penflufen:** Do not apply more than 160 g/ha (65 g/ac.) penflufen per year, regardless of formulation or method of application (seed-piece treatment or in-furrow).

- **Re-entry:** 12 hours after application.
- **Pre-harvest Intervals:** 7 days.
- **Grazing:** Do not allow livestock to graze treated area for 7 days after application.
- **Re-cropping interval:** Do not replant to alfalfa for 14 days after application. All other crops may be replanted 30 days following the last application of *Velum Rise*.
- **Storage:** Store this product away from food or feed. Do not store below freezing. If stored for 1 year or longer, shake well before using. Do not use or store in or around the home. Keep the product in the original container during storage.
- **Environment:** Toxic to aquatic organisms and non-target terrestrial plants. Observe buffer zones specified under directions for use. Toxic to birds.

Hazard Rating:
None listed.

Viatude

Fungicide Group 3, 11

Company:
Corteva Agriscience (PCP#34672)

Formulation:
187.5 g/L of picoxystrobin and 62.5 g/L of prothioconazole formulated as suspension concentrate.
- Container size – 2 x 8.91 L case, 95.04 L drum

Crops, Diseases, Rates and Timing:

Crop	Disease	Application Rate (per acre)	Application Timing
Canola	Control of sclerotinia stem rot (white mould) (*Sclerotinia sclerotiorum*)	295 – 340 mL	Begin applications before or at onset of infection to control sclerotinia. Use the higher rate when disease pressure is high. Make 2 applications per season, 14 days apart when disease pressure is high.
Soybean	Suppression of sclerotinia rot (white mould) (*Sclerotinia sclerotiorum*), brown spot (*Septoria glycines*), and frogeye leafspot (*Cercospora sojina*).	295 – 340 mL	Begin applications prior to or at onset of disease development. Use higher rate when disease pressure is high. Make 2 applications per season, 14 days apart under high disease pressure

Application Information:
- **Water Volume:**
  - ***Ground:*** Apply using a minimum water volume of 61 L/ac.
  - ***Air:*** Apply using a minimum water volume of 20 L/ac.

How it Works:
The active ingredient picoxystrobin is a broad spectrum strobilurin fungicide and is to be used as a preventative application when environmental conditions are favorable for disease development. Picoxystrobin has preventative and locally systemic activity. Prothioconazole is a triazole fungicide with broad spectrum activity. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:
None registered. According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Restrictions:

- **Maximum number of applications:** Canola and Soybean – maximum 2 applications of *Viatude* per season.
- **Rainfall:** Avoid application when heavy rain is forecast.
- **Pre-harvest Intervals:** Canola – 36 days, Soybean – 20 days.
- **Re-entry:** Do not re-enter treated areas within 24 hours of application.
- **Re-cropping interval:** Treated areas may be replanted immediately after harvest with any crop appearing on the label. All other crops not on the label may be planted 30 days following the last application of *Viatude*.
- **Storage:** Store product in original container away from food or feed. Do not freeze, use an appropriately heated storage.
- **Environment:** Toxic to earthworms. Toxic to certain beneficial insects. Minimize spray drift to reduce harmful effects on beneficial insects in habitats next to the application site such as hedgerows and woodland. Toxic to aquatic organisms. Observe spray buffer zones specified on the label under *Spray Buffer Zones*. To reduce runoff from treated areas into aquatic habitats avoid application to areas with a moderate to steep slope, compacted soil, or clay. Avoid application when heavy rain is forecast. Contamination of aquatic areas as a result of runoff may be reduced by including a vegetative filter strip between the treated area and the edge of the water body. DO NOT use to control aquatic pests. DO NOT contaminate irrigation or drinking water supplies or aquatic habitats by cleaning of equipment or disposal of wastes.

Hazard Rating:

None listed.
Potential Skin Sensitizer.

Zampro

Fungicide Group 40, 45

Company:

BASF Canada (PCP#30321)

Formulation:

225 g/L dimethomorph and 300 g/L ametoctradin formulated as a suspension concentrate.

- Container size – 4 x 4.14 L

Crops, Diseases, Rates and Timing:

Crop	Diseases Controlled	Application Rate (per acre)	Application Timing
Potato	Late blight *(Phytophthora infestans)*	320 to 400 mL	Begin applications prior to disease development and continue on a 5 to 10 day interval. Use the higher rate and shorter interval when disease pressure is high. The addition of a spreading/penetrating adjuvant is recommended to improve disease control performance.
	Tuber blight *(Phytophthora infestans)*	400 mL	When used in accordance to label recommendations, *Zampro* also reduces tuber blight when applied immediately prior to or after vine kill.

Application Information:

- **Water Volume:**
  - ***Ground:*** minimum 80 L per acre.
  - ***Aerial:*** minimum 20 L per acre.

How it Works:

The active ingredient dimethomorph is a carboxylic acid amide fungicide with contact, systemic and antisporulant activity. The active ingredient ametoctradin is a quinone x inhibitor fungicide with contact and antisporulant activity. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:

None registered.

Restrictions:

- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Maximum number of applications:** DO NOT exceed 3 applications of this product per season.
- **Grazing:** No restrictions listed.
- **Preharvest Interval:** 4 days
- **Restricted Entry Interval:** DO NOT re-enter treated areas within 12 hours of application.
- **Re-cropping:** A plant back interval of 30 days is required for all crops not listed on the label.
- **Storage:** Store in original tightly closed container. Protect from freezing.
- **Environmental Hazards:** Avoid run-off from treated areas into aquatic areas. DO NOT contaminate irrigation or drinking water supplies or aquatic habitats by cleaning of equipment or disposal of wastes.
- **Toxicity:** Toxic to aquatic organisms.

Hazard Rating:

Warning Poison – Eye Irritant

Refer to the Introduction for an explanation of the symbols.

Zetigo PRM

Fungicide Group 11, 21

Company:

Corteva Agriscience (PCP # 34701)

Formulation:

50 g/L florylpicoxamid and 100 g/L pyraclostrobin formulated as emulsifiable concentrate

- Container size: 2 x 9.72 L case, 103.69 L drums

Crops, Diseases, Rates and Timing:

Crop	Disease	Rate per acre	Crop stage and other timing information
Lentil	Control of Anthracnose (*Colletotrichum truncatum*), Ascochyta blight (*Ascochyta fabae* f. sp. *lentis*), Botrytis Grey mould (*Botrytis cinerea*), Suppression of white mould (*Sclerotinia sclerotiorum*)	324 to 405 mL	The first application must be applied before disease is established and no later than the onset of flowering, whichever comes first. A second application with an alternate fungicide can be made 10-14 days after the first application, when disease pressure is severe or when agronomic or weather conditions are conducive to disease development or movement. Within the rate range, use the higher rate under conditions conducive to high disease pressure.
Chickpeas	Control of ascochyta blight (*Ascochyta rabiei*), botrytis grey mould (*Botrytis cinerea*)	324 to 405 mL	The first application must be applied before disease is established and no later than the onset of flowering, whichever comes first. A second application with an alternate fungicide can be made 10-14 days after the first application, when disease pressure is severe or when agronomic or weather conditions are conducive to disease development or movement. Within the rate range, use the higher rate under conditions conducive to high disease pressure.
	Suppression of White mould (*Sclerotinia sclerotiorum*)	324 to 405 mL	
Field Peas	Control of Anthracnose (*Colletotrichum truncatum*), Ascochyta/Mycosphaerella blight (*Mycosphaerella pinodes, Ascochyta pisi* and *Phoma medicaginis*), Powdery mildew (*Erysiphe pisi*), Botrytis Grey mould (*Botrytis cinerea*)	324 to 405 mL	The first application must be applied before disease is established and no later than the onset of flowering, whichever comes first. A second application with an alternate fungicide can be made 10-14 days after the first application, when disease pressure is severe or when agronomic or weather conditions are conducive to disease development or movement. Within the rate range, use the higher rate under conditions conducive to high disease pressure.
	Suppresion of white mould (*Sclerotinia sclerotiorum*)	324 to 405 mL	

Crop	Disease	Rate per acre	Crop stage and other timing information
Faba Beans	Control of Chocolate spot (*Botrytis cinerea*)	324 to 405 mL	Apply at first sign of disease or at the beginning of flowering (whichever occurs first). Within the rate range, use the higher rate under conditions conducive to high disease pressure.
	Suppression of white mould (*Sclerotinia sclerotiorum*)	324 to 405 mL	
Canola	Control of Blackleg (*Leptosphaeria maculans*), Alternaria leaf spot or black spot (*Alternaria brassicae*)	324 to 405 mL	For control of blackleg, apply preventatively at the 2 to 6-leaf (rosette) stage. Within the rate range, use the higher rate under conditions conducive to high disease pressure.
	Suppression of Sclerotinia stem rot (*Sclerotinia sclerotiorum*)	324 to 405 mL	Apply prior to the onset of disease, typically around the 20 - 50% bloom stage.
Wheat (spring, durum, winter)	Control of stripe rust or yellow rust (*Puccinia striiformis*) Brown rust/ Leaf rust (*Puccinia triticina*) Septoria leaf spot (*Septoria tritici* or *Leptosphaeria nodorum*) Tan spot (*Pyrenophora tritici-repentis*)	243 to 405 mL	At the first sign of disease, usually at the beginning of stem elongation (BBCH 29) or when conditions are favourable for disease development. To maximize yield it is important to protect the flag leaf from disease. Therefore, the optimum time to apply a single application of Zetigo PRM Fungicide is immediately after flag leaf emergence (BBCH 37-39). Do not apply after flowering (BBCH 59).
Barley	Control of net blotch (*Pyrenophora teres*)	295 to 405 mL	At the first sign of disease, usually at the beginning of stem elongation (BBCH 29) or when conditions are favourable for disease development. To maximize yield it is important to protect the flag leaf from disease. Therefore, the optimum time to apply a single application of Zetigo PRM Fungicide is immediately after flag leaf emergence (BBCH 37-39). Do not apply after flowering (BBCH 59).
	Control of Scald (*Rhynchosporium commune*)	267 to 405 mL	

Application information

- **Water Volume:**
  - Ground: 61L/ac minimum for lentils, field peas, chickpeas, and faba beans. 40L/ac minimum for canola, wheat, and barley.
  - Air: 20L/ac for cereals ONLY (wheat, and barley). Do not apply *Zetigo PRM* to lentils, field peas, chickpeas, faba beans, or canola by air.

How it Works

Zetigo PRM Fungicide is for use in pulses (lentils, field peas, chickpeas, faba bean), canola, wheat and barley. *Zetigo PRM* Fungicide is quickly absorbed into plant tissue and is locally systemic with translaminar movement. *Zetigo PRM* Fungicide should be included in a protective spray program and used in a rotation program with other fungicides. The active ingredient florylpicoxamid is a picolinamide fungicide with broad spectrum locally systemic activity. The active ingredient pyraclostrobin is a strobilurin fungicide with broad spectrum contact and systemic activity. To be used preventatively when environmental conditions are favorable for disease development. For more information refer to "Fungicide Modes of Action"

Tank Mixes:

Do not tank mix with copper-based fungicides. According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Restrictions:

- **Maximum number of applications:** Maximum 1 application per season, all crops (lentils, chickpeas, field peas, faba beans, canola, wheat, and barley). Alternate the use of Zetigo PRM Fungicide with a fungicide of a different mode of action.
- **Re-entry:** 12 hours
- **Pre-harvest Intervals:** Lentils, chickpeas, field peas, faba beans – 30 days. Canola – 21 days. Wheat and barley – 30 days.
- **Grazing:** No restrictions listed.
- **Re-cropping interval:** Crops listed on the *Zetigo PRM* Fungicide label may be planted immediately following the last application (see label). All other crops can be planted 30 days after the last application.
- **Aerial Application:** Registered for aerial applications on cereals (wheat and barley) ONLY. DO NOT apply *Zetigo PRM* to lentils, field peas, chickpeas, faba beans, or canola by air.

- **Rainfall:** Avoid application when heavy rain is forecast.
- **Storage:** Store this product away from food or feed. Store in original containers in a secure, dry heated storage. Do not allow contamination of seeds, plants, fertilizers, or other pesticides. Do not contaminate food, feedstuffs, or domestic water supplies. If containers are damaged or spill occurs, use the product immediately or contain the spill with absorbent materials and dispose of waste.
- **Environment:** Toxic to aquatic organisms. Observe spray buffer zones specified under Spray Buffer Zones. This product demonstrates the properties and characteristics associated with chemicals detected in groundwater. The use of this product in areas where soils are permeable, particularly where the water table is shallow, may result in groundwater contamination. Toxic to earthworms. Toxic to certain beneficial insects. Minimize spray drift to reduce harmful effects on beneficial insects in habitats next to the application site such as hedgerows and woodland. Toxic to aquatic organisms. Observe spray buffer zones specified on the label under Spray Buffer Zones. To reduce runoff from treated areas into aquatic habitats avoid application to areas with a moderate to steep slope, compacted soil, or clay. Avoid application when heavy rain is forecast. Contamination of aquatic areas as a result of runoff may be reduced by including a vegetative filter strip between the treated area and the edge of the water body. DO NOT use to control aquatic pests. DO NOT contaminate irrigation or drinking water supplies or aquatic habitats by cleaning of equipment or disposal of wastes.

Hazard Rating:

None listed.
Potential Skin Sensitizer

Zolera FX*

Fungicide Group 3, 11

***NOTE:** As of January 1, 2025, www.keepitclean.ca indicates that the use of this product on certain crop types may have market access concerns. Please see pg. 12 for more information AND consult potential grain buyers before using this product.

Company:

UPL AgroSolutions Canada (PCP#33367)

Formulation:

200 g/L fluoxastrobin and 200 g/L tetraconazole formulated as a micro emulsion.

- Container size – 2 x 5.7 L

Crops, Diseases, Rates and Timing:

Crop	Diseases	Application Rate (per acre)	Application Timing
Field pea	Control of powdery mildew (*Erysiphe pisi*), suppression of sclerotinia white mould (*Sclerotinia sclerotiorum*)	142 to 223 mL	For optimum results, begin applications preventatively and continue as needed on a 7 to 14 day interval. Use the highest rate and the shortest interval when conditions favour high disease pressure. For management of listed Ascochyta disease use the highest rate.
	Control of Mycosphaerella blight (*Mycosphaerella pinodes*), suppression of Ascochyta leaf and pod spot (*Ascochyta pisi*)	223 mL	
Lentil	Suppression of sclerotinia white mould (*Sclerotinia sclerotiorum*), suppression of anthracnose (include Group 11 resistant biotypes) in lentils	142 to 223 mL	
	Suppression of Ascochyta leaf and pod spot (*Ascochyta lentis*)	223 mL	
Dry bean, faba bean	Suppression of anthracnose (*Colletotrichum lindemuthianum*), sclerotinia white mould (*Sclerotinia sclerotiorum*)	142 to 223 mL	
Chickpea	Suppression of sclerotinia white mould (*Sclerotinia sclerotiorum*)	142 to 223 mL	
Corn	Control of common rust (*Puccinia sorghi*), grey leaf spot (*Cercospora maydis*) Suppression of northern corn leaf blight (*Setosphaeria turcica*, anamorph: *Exserohilum turcicum*)	202 mL	Apply preventatively between V4 (4 leaf collar) and dough stage (R4).

Application Information:

- **Water Volume:**
  - ***Ground:*** minimum 40 L per acre.
  - ***Aerial (corn only):*** minimum 20 L per acre.

How it Works:

The active ingredient fluoxastrobin is a systemic fungicide that works by interfering with respiration in plant pathogenic fungi, and is a potent inhibitor of spore germination and mycelial growth. The active ingredient, tetraconazole, is a broad spectrum triazole demethylation inhibitor (DMI) fungicide with systemic activity. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:

None registered.

Restrictions:

- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Maximum number of applications:** DO NOT exceed 2 applications per season for pulses or 1 application per season for corn.
- **Grazing:** No restrictions listed.
- **Preharvest Interval:**
  - ***Pulses*** – 14 days
  - ***Grain corn*** – 30 days
- **Restricted Entry Interval:** DO NOT re-enter treated areas within 12 hours of application.
- **Re-cropping:** All crops on the *Zolera FX* label (cereals, pulses, canola, corn) may be planted immediately following harvest. Alfalfa and forage grasses may be planted following a 30 day plant back interval. Sunflowers may be planted following a 180 day plant back interval. For all other crops, DO NOT plant back within one year of the last field application.
- **Storage:** Store this product away from food or feed.
- **Environmental Hazards:** Toxic to aquatic organisms. Observe buffer zones as specified on the label. To reduce runoff from treated areas into aquatic habitats, avoid application to ears with a moderate to steep slope, compacted soil, or clay.

Hazard Rating:

Potential Skin Sensitizer

Refer to the Introduction for an explanation of the symbols.

Seed Treatment Tables

*All seed treatment tables should be used only in consultation with the product labels. In case of any conflict, instructions on the label prevail.

Table 1. Seed Treatment Products for Barley, Oats, and Wheat

PRODUCTS	Page	BARLEY																OATS												WHEAT															
		DISEASES											INSECTS					DISEASES								INSECTS				DISEASES										INSECTS			
		Alternaria alternata (seed-borne)	*Aspergillus* spp., *Penicillium* spp.	*Cochliobolus sativus* (seed rot, damping-off)	Common root rot (*Cochliobolus sativus*)	*Fusarium* spp.	*Pythium* spp.	Leaf stripe (*Pyrenophora graminea*)	*Rhizoctonia* spp.	*Septoria* spp. (seed-borne)	Smuts (*Ustilago hordei, U. nigra, U. nuda*)	Take-all (*Gaeumannomyces graminis*)	Armyworm	Cutworm	Wireworms	Grasshoppers	*Alternaria alternata* (seed-borne)	*Aspergillus* spp., *Penicillium* spp.	*Cochliobolus sativus* (seed rot, damping-off)	Common root rot (*Cochliobolus sativus*)	*Fusarium* spp.	*Pythium* spp.	*Rhizoctonia* spp.	Smuts (*Ustilago hordei, U. avenae, U. kolleri*)	Armyworm	Cutworm	Wireworms	Grasshoppers	*Alternaria alternata* (seed-borne)	*Aspergillus* spp., *Penicillium* spp.	Bunts (*Tilletia tritici, T. laevis, T. controversa*[2])	*Cochliobolus sativus* (seed rot, damping-off)	Common root rot (*Cochliobolus sativus*)	*Fusarium* spp.	*Pythium* spp.	*Rhizoctonia* spp.	*Septoria* spp. (seed-borne)	Smut (*Ustilago tritici*)	Take-all (*Gaeumannomyces graminis*)	Armyworm	Cutworm	Wireworms	Grasshoppers
Allegiance FL	712						•																•													•									
Belmont 2.7 FS	712						•																•													•									
Cover 2	705		•	•	•[1]	•	•	•	•		•							•	•	•[1]	•	•	•	•						•	•	•	•[1]	•	•	•		•						
Cruiser 5FS	682														•																	•[1]											•	
Cruiser Vibrance Quattro	686	•	•	•[1]	•[1]	•	•		•		•	•[1]			•		•	•	•[1]	•[1]	•	•	•	•			•		•	•	•	•[1]	•[1]	•	•	•		•	•[1]			•	
Dividend Extreme Fungicide	689			•	•[1]	•[1]					•	•[1]							•	•[1]	•[1]			•							•	•	•[1]	•[1]				•	•[1]				
Insure Cereal FX4	698			•	•[1]	•	•		•		•								•	•[1]	•	•	•	•							•	•	•[1]	•	•	•		•						
INTEGO Solo Fungicide	702						•															•													•									
Interest Forte	703		•		•[1]	•[6]	•			•	•	•[1]						•		•[1]	•	•		•						•	•		•[1]	•[6]	•		•	•	•[1]				
Lixar PRO	720		•[3]	•	•[1]	•	•	•	•[1]		•							•[3]	•	•[1]	•	•	•[1]	•						•[3]	•	•	•[1]	•	•	•[1]		•						
Lumivia CPL	709												•	•	•	•										•	•	•	•												•	•	•	•
Nipslt INSIDE 600 Insecticide	681																																											•[1]	
Nipslt SUITE Cereals OF Seed Protectant	713																															•		•[1]	•	•	•		•				•	
Rancona Trio	717		•	•	•[1]	•	•	•	•		•							•	•	•[1]	•	•	•	•						•	•	•	•[1]	•	•	•		•						
Raxil PRO	720		•[3]	•	•[1]	•	•	•	•[1]		•							•[3]	•	•[1]	•	•	•[1]	•						•[3]	•	•	•[1]	•	•	•[1]		•						
Raxil PRO SHIELD	721		•[3]	•	•[1]	•	•	•	•[1]		•				•			•[3]	•	•[1]	•	•	•[1]	•			•			•[3]	•	•	•[1]	•	•	•[1]		•				•	
SHARDA METEB 11ST	725			•[1]	•[1]	•[6]	•				•								•[1]	•[1]	•[6]	•		•							•[7]	•[1]	•[1]	•[6]	•		•	•					
Sombrero 600 FS	696														•																													•	
Straxan	727		•	•[1]	•[1]	•	•				•							•	•[1]	•[1]	•	•		•						•	•	•[1]	•[1]	•	•			•	•[1]				
Stress Shield 600	696														•																													•	
Telex Fungicide	712						•															•													•									
Teraxxa F4	729			•	•[1]	•	•		•		•				•				•	•[1]	•	•	•	•			•					•	•[1]	•	•	•		•				•	
Vibrance Quattro	739	•	•	•[1]	•[1]	•	•		•		•	•[1]					•	•	•[1]	•[1]	•	•	•	•					•	•	•	•[1]	•[1]	•	•	•		•	•[1]				
Vitaflo Brands	741		•[4]	•	•[1]	•	•	•[5]			•							•[4]		•[1]	•	•		•						•[4]	•	•	•[1]	•	•		•	•					

1. Suppression only.
2. Winter wheat only.
3. Control of seed-borne *Aspergillus* spp. and suppression of seed-borne *Penicillium* spp.
4. And *Alternaria* spp.
5. And suppression of net blotch (*Pyrenophora teres*).
6. Refer to label for expectations for control vs suppression.
7. Refer to the label for details.

Table 2. Seed Treatment Products for Buckwheat, Grasses, Millet, Rye, Sorghum, and Triticale

PRODUCTS	Page	CANARYSEED		BUCKWHEAT			GRASSES	MILLET			RYE																SORGHUM			TRITICALE										
		DISEASES		DISEASES		INSECTS	DISEASES	DISEASES		INSECTS	DISEASES												INSECTS				DISEASES		INSECTS	DISEASES										INSECTS
		Fusarium spp., *Pythium* spp., *Rhizoctonia* spp.	*Cochliobolus sativus* (seed rot, damping-off)	*Fusarium* spp., *Pythium* spp., *Rhizoctonia* spp.	Common root rot (*Cochliobolus sativus*)	Wireworms	Seed decay, seedling blight, damping-off	*Fusarium* spp., *Pythium* spp., *Rhizoctonia* spp.	Common root rot (*Cochliobolus sativus*)	Wireworms	*Alternaria alternata* (seed-borne)	*Aspergillus* spp., *Penicillium* spp.	Bunts (*Tilletia tritici, T. controversa, T. laevis*)	*Cochliobolus sativus* (seed rot, damping-off)	Common root rot (*Cochliobolus sativus*)	*Fusarium* spp.	*Pythium* spp.	*Rhizoctonia* spp.	*Septoria* spp. (seed-borne)	Smut (*Ustilago tritici*)	Stem smut (*Urocystis occulta*)	Take-all (*Gaeumannomyces graminis*)	Armyworm	Cutworm	Wireworms	Grasshoppers	*Fusarium* spp., *Pythium* spp., *Rhizoctonia* spp.	Downy Mildew (*Peronosclerospora sorghi*)	Wireworms	*Alternaria alternata* (seed-borne)	*Aspergillus* spp., *Penicillium* spp.	Bunts (*Tilletia tritici, T. laevis*)	*Cochliobolus sativus* (seed rot, damping-off)	Common root rot (*Cochliobolus sativus*)	*Fusarium* spp.	*Pythium* spp.	*Rhizoctonia* spp.	Smut (*Ustilago tritici*)	Take-all (*Gaeumannomyces graminis*)	Wireworms
Allegiance FL	712						•[2]										•										•[2,7]	•[7]												
Belmont 2.7 FS	712						•[2]										•										•[2,7]	•[7]							•					
Cover 2	702											•		•	•[1]	•	•	•													•		•	•[1]	•	•	•			
Cruiser 5FS	682					•				•															•				•											•
Cruiser Vibrance Quattro	686										•	•	•	•[1]	•[1]	•	•	•				•[1]			•					•	•		•[1]	•[1]	•	•	•	•	•[1]	•
Dividend Extreme Fungicide	689												•	•	•[1]	•[1]				•		•[1]										•	•		•[1]			•	•[1]	
Insure Cereal FX4	698	•	•										•	•	•[1]	•	•	•		•												•	•	•[1]	•	•	•	•		
INTEGO Solo Fungicide	702			•[2]				•[2]									•																		•				
Interest Forte	703			•[8]				•[8]				•	•		•[1]	•	•		•			•[1]					•[8]				•		•[1]	•	•		•	•[1]	
Lumivia CPL	709																						•	•	•	•														
Rancona Trio	717											•		•	•[1]	•	•	•													•		•	•[1]	•	•	•			
Raxil PRO	720											•[7]	•	•		•	•			•											•[7]	•	•		•	•		•		
Sharda METEB 11ST	725												•[9]	•[1]	•[1]	•[10]	•		•	•												•	•[1]	•[1]	•[10]	•		•		
Straxan	727											•	•	•[1]	•[1]	•	•			•		•[1]									•		•[1]	•[1]	•	•		•	•[1]	
Telex Fungicide	712						•[2]										•											•[7]												
Teraxxa F4	729	•	•										•							•					•							•						•		•
Vibrance Quattro	739										•	•	•	•[1]	•[1]	•	•	•				•[1]								•	•		•[1]	•[1]	•	•	•	•	•[1]	
Vitaflo Brands	741											•[5]		•	•[1]	•	•				•										•[6]		•		•	•				

1. Suppression only.
2. *Pythium* only.
3. *Fusarium* and *Rhizoctonia* only.
4. Product does not specify causal pathogen.
5. And *Alternaria* spp.
6. *Penicillium* only.
7. For export only.
8. Product does not specify *Rhizoctonia*.
9. Refer to the label for details.
10. Refer to label for expectations for control vs. suppression.

Table 3. Seed Treatment Products for Oilseed Crops

		CANOLA								MUSTARD[1]								FLAX			SUNFLOWERS		SAFFLOWER
		DISEASES						INSECTS		DISEASES						INSECTS		DISEASES			DISEASES		DISEASES
PRODUCTS	**Page**	*Alternaria* spp.	Blackleg (seed-borne) (*Leptosphaeria maculans*)	Blackleg (air-borne) (*Leptosphaeria maculans*)	*Fusarium* spp.	*Pythium* spp.	*Rhizoctonia* spp.	Cutworm	Flea beetles	*Alternaria* spp.	Blackleg (seed-borne) (*Leptosphaeria maculans*)	*Fusarium* spp.	*Pythium* spp.	*Rhizoctonia* spp.	Seed decay, seedling blight, damping off	Cutworm	Flea beetles	*Fusarium* spp.	*Pythium* spp.	*Rhizoctonia solani*	Downy mildew (*Plasmopora halstedii*)	*Pythium* spp.	Seed decay, seedling blight, damping off
Allegiance FL	712					•															•	•	
Belmont 2.7 FS	712					•															•	•	
BUTEO start 480 FS	657								•								•						
Cruiser 5FS	682								•								•						
Fortenza	688							•	•							•	•						
Fortenza Advanced	692							•	•							•	•						
Helix Vibrance	695	•	•		•	•	•		•	•	•	•	•	•			•						
Insure Pulse	699									•	•	•	•	•				•		•			
INTEGO Solo Fungicide	702					•							•						•		•	•	•[3]
Lumiderm	688							•	•							•	•						
Lumisena	706																				•		
NipsIt INSIDE 600 Insecticide	681								•								•						
Poncho 600 FS	681								•														
Prosper EverGol	715	•	•		•	•	•		•	•	•	•	•	•			•						
Rancona V RS	719		•		•		•				•	•		•									
Saltro	724		•	•																			
Sombrero 600 FS	696								•								•						
Telex Fungicide	712					•															•	•	
Vitaflo Brands	741																	•		•			

1. **Refer to product pages and labels for specific information on mustard type.**
2. **Product does not specify causal pathogen.**
3. ***Pythium* spp. only.**
4. **Suppression when used with resistant varieties.**

Table 4. Seed Treatment Products for Dry Bean, Field Pea, and Lentil

PRODUCTS	Page	DRY BEAN															FIELD PEA														LENTIL												
		DISEASES										INSECTS					DISEASES									INSECTS				DISEASES								INSECTS			
		General seed rot/root rot/damping-off/seedling blight	Anthracnose (seed-borne) (*Colletotrichum* spp.)	Aphanomyces root rot (early-season (*Aphanomyces euteiches*)	Ascochyta blight (*Ascochyta* spp.)	*Botrytis* spp. (seed-borne)	*Fusarium* spp. (seed- and/or soil-borne)	*Pythium* spp. (soil-borne)	*Rhizoctonia* spp. (soil-borne)	*Sclerotinia sclerotiorum* (seed-borne)	White mould (*Sclerotinia sclerotiorum*)	Armyworm	Cutworm	Pea leaf weevil	Seedcorn maggot	Wireworms	General seed rot/root rot/damping-off/seedling blight	Anthracnose (seed-borne) (*Colletotrichum* spp.)	Ascochyta blight (*Ascochyta pinodes*)	Aphanomyces root rot (early-season) (*Aphanomyces euteiches*)	*Botrytis* spp. (seed-borne)	Downy mildew (*Peronospora viciae*)	*Fusarium* spp. (seed- and/or soil-borne)	*Pythium* spp. (soil-borne)	*Rhizoctonia* spp. (soil-borne)	*Sclerotinia sclerotiorum* (seed-borne)	Armyworm	Cutworm	Pea leaf weevil	Wireworms	General seed rot/root rot/damping-off/seedling blight	Anthracnose (seed-borne) (*Colletotrichum* spp.)	Aphanomyces root rot (early-season (*Aphanomyces euteiches*)	Ascochyta blight (*Ascochyta lentis*)	*Botrytis* spp. (seed-borne)	*Fusarium* spp. (seed- and/or soil-borne)	*Pythium* spp. (soil-borne)	*Rhizoctonia* spp. (soil-borne)	*Sclerotinia sclerotiorum* (seed-borne)	Armyworm	Cutworm	Pea leaf weevil	Wireworms
Allegiance FL	712							•														•		•													• [3]						
Apron Advance	677		•				•	•	•										•				•	•	•									•	•	•	•	•					
Apron Maxx (Co-pack)	678		•				•	•	•										•				•	•	•									•	•	•	•	•					
Belmont 2.7 FS	712							•														•		•													• [3]						
Cruiser 5FS	682														•	•													•	•													•
EverGol Energy	691					•	•	•	•												•		•	•	•										•	•	•	•					
Heads Up Plant Protectant	694								• [2]		• [2]																																
Insure Pulse	699		• [2]		•	• [2]	•	•	•									• [2]	•		• [2]		•	•	•							• [2]		•	• [2]	•	•	•					
INTEGO Solo Fungicide	702			• [2]				•												• [2]				•									• [2]				•						
Lumivia CPL	709											•	•	•													•	•	•											•	•	•	
Obex	730	•					•	•	•								•		• [1]				•	•	•						•			• [1]	•	•	•	•					
Rancona Trio	717	•		•		•	•	•									•			•											•			•									
Stress Shield 600	696															•													•	•													•
Telex Fungicide	712							•														•		•													• [3]						
Trilex EverGol	731				• [2]	•	•	•	•										• [2]		•		•	•	•									• [2]	•	•	•	•					
Trilex EverGol SHIELD	732				• [2]	•	•	•	•							•			• [2]		•		•	•	•				•	•				• [2]	•	•	•	•					•
Vibrance Maxx RFC	734		•				•	•	•										•				•	•	•	•								•	•	•	•	•	•				
Vibrance Maxx RFC with INTEGO Solo Seed Treatment	736		•	• [2]			•	•	•										•	• [2]			•	•	•	•							• [2]	•	•	•	•	•				
Vibrance Maxx RTA	734		•				•	•	•	•									•				•	•	•									•	•	•	•	•					
Vibrance Total	737	•	•				•	•	•	•							•		•				•	•	•	•					•			•	•	•	•	•	•				
VIKING Grimstad	730	•					•	•	•								•		• [1]				•	•	•						•			• [1]	•	•	•	•					
Vitaflo Brands	741		•						•										•				•	•	•										•	•	•	•					
Zeltera Pulse	744	•	• [2]	• [2]	• [2]	• [2]	•	•	•		• [2]						•	• [2]	• [2]	• [2]	• [2]		•	•	•	• [2]					•	• [2]	• [2]	• [2]	• [2]	•	•	•	• [2]				
Zeltera Pulse Co-pack	743	• [4]		• [2]			• [4]	•	• [4]								• [4]			• [2]			• [4]	•	• [4]						• [4]		• [2]			• [4]	•	• [4]					

1. Product does not specify causal pathogen.
2. Suppression.
3. Low tannin lentils destined for export or seed production only.
4. Refer to label for expectations for control vs. suppression.

Table 5. Seed Treatment Products for Chickpea and Faba Bean

PRODUCTS	Page	CHICKPEA												FABA BEAN											
		DISEASES								INSECTS				DISEASES								INSECTS			
		General seed rot/root rot/damping-off/seedling blight	Anthracnose (seed-borne) (*Colletotrichum* spp.)	Ascochyta blight (*Ascochyta rabiei*)	*Botrytis* spp. (seed-borne)	*Fusarium* spp. (seed- and/or soil-borne)	*Pythium* spp. (soil-borne)	*Rhizoctonia* spp. (soil-borne)	*Sclerotinia sclerotiorum* (seed-borne)	Armyworm	Cutworm	Pea leaf weevil	Wireworms	General seed rot/root rot/damping-off/seedling blight	Anthracnose (seed-borne) (*Colletotrichum* spp.)	Aphanomyces root rot (early-season (*Aphanomyces euteiches*)	Ascochyta blight (*Ascochyta* spp.)	*Botrytis* spp. (seed-borne)	*Fusarium* spp. (seed- and/or soil-borne)	*Pythium* spp. (soil-borne)	*Rhizoctonia* spp. (soil-borne)	Armyworm	Cutworm	Pea leaf weevil	Wireworms
Allegiance FL	712						•																		
Apron Advance	677			•	•	•	•	•							•				•	•	•				
Apron Maxx (Co-pack)	678			•	•	•	•	•											•	•	•				
Belmont 2.7 FS	712						•																		
Cruiser 5FS	682												•											•	•
EverGol Energy	691				•	•	•	•																	
Insure Pulse	699		•[2]	•	•[2]	•	•	•							•[2]		•	•[2]	•	•	•				
INTEGO Solo Fungicide	702						•									•[2]				•					
Lumivia CPL	709									•	•	•										•	•	•	
Obex	730	•		•[1]		•		•																	
Rancona Trio	717	•		•		•	•	•																	
Stress Shield 600	696												•											•	•
Telex Fungicide	712						•																		
Trilex EverGol	731			•[2]	•	•	•	•									•[2]	•	•	•	•				
Trilex EverGol SHIELD	732			•[2]	•	•	•	•					•				•[2]	•	•	•	•			•	•
Vibrance Maxx RFC	734			•	•	•	•	•	•										•	•	•				
Vibrance Maxx RFC with INTEGO Solo	736			•	•	•	•	•	•							•[2]			•	•	•				
Vibrance Maxx RTA	734			•	•	•	•	•											•	•	•				
Vibrance Total	737	•		•	•	•	•	•						•					•	•	•				
VIKING Grimstad	730	•		•[1]		•		•																	
Zeltera Pulse	744	•	•[2]	•[2]	•[2]	•	•	•	•[2]					•	•[2]	•[2]	•[2]	•[2]	•	•	•				
Zeltera Pulse Co-pack	743	•[3]				•[3]	•	•[3]						•[3]		•[2]			•[3]	•	•[3]				

1. Product does not specify causal pathogen.
2. Suppression.
3. Refer to label for expectations for control vs. suppression.

Table 6. Seed Treatment Products for Legumes

PRODUCTS	Page	ALFALFA	BIRDS-FOOT TREFOIL	CLOVER	LUPIN		SAINFOIN	VETCH
		DISEASES	DISEASES	DISEASES	DISEASES	INSECTS	DISEASES	DISEASES
		Pythium spp. (soil-borne)	*Pythium* spp. (soil-borne)	*Pythium* spp. (soil-borne)	General seed rot/root rot/damping-off/seedling blight	Wireworms	*Pythium* spp. (soil-borne)	*Pythium* spp. (soil-borne)
Allegiance FL	712	•	•	•			•	•
Belmont 2.7 FS	712	•	•	•			•	•
Cruiser 5FS	682					•		
Telex Fungicide	712	•	•	•			•	•
Vibrance Total	737				•			

Table 7. Seed Treatment Products for Soybean

PRODUCTS	Page	DISEASES										INSECTS			
		General Seed/Root/Seedling Rots/Blights	Ascochyta blight (*Ascochyta* spp.)	*Botrytis* spp. (seed- and/or soil-borne)	*Fusarium* spp. (seed- and/or soil-borne)	*Phomopsis* spp. (seed- or soil-borne)	*Phytophthora* spp. (soil-borne)	*Pythium* spp. (soil-borne)	*Rhizoctonia solani* (soil-borne)	Sudden Death Syndrome (SDS) (*Fusarium virguliforme*)	White mould (*Sclerotinia sclerotiorum*)	Seedcorn maggot	Wireworms	Soybean aphid	Cutworm
Allegiance FL	712						•	•							
Apron Maxx + Vibrance 500 FS (co-pack)	678				•	•	•	•	•						
Belmont 2.7 FS	712						•	•							
Cruiser 5FS	682											•	•		
EverGol Energy	691			•	•	•		•	•						
Fortenza	688											•	•		•
Heads Up Plant Protectant	694								•[2]	•[2]	•[2]				
Insure Pulse	699		•	•[2]	•			•	•						
INTEGO Solo Fungicide	702						•[2]	•							
Lumiderm	688											•	•	•	•
Lumisena	706						•								
Obex	730				•	•		•	•						
Rancona Trio	717	•			•			•	•	•[2]					
Sombrero 600 FS	696											•	•	•	
Stress Shield 600	696											•	•	•	
Telex Fungicide	712						•	•							
Vayantis IV	733	•			•	•	•	•	•						
Vibrance Maxx RFC	734														
Vibrance Maxx RFC with INTEGO Seed Treatment	736				•	•	•	•	•		•				
Vibrance Maxx RTA	734				•	•	•	•	•						
VIKING Grimstad	730				•	•		•	•						
Vitaflo Brands	741				•	•			•						
Zeltera Pulse	744	•			•	•[2]	•	•	•		•[2]				
Zeltera Pulse Co-pack	743	•[3]			•[3]	•[2]	•[2]	•	•[3]	•[3]					

1. **Product does not specify causal pathogen.**
2. **Suppression only.**
3. **Refer to label for expectations for control vs. suppression.**

Table 8. Seed Treatment Products for Corn

PRODUCTS	Page	DISEASES							INSECTS		
		General Seed/Root/Seedling Rots/Blights	*Aspergillus* spp., *Penicillium* spp.	Downy mildew (*Sclerophthora macrospora*)	*Fusarium* spp. (seed- and/or soil-borne)	Head smut (seed-borne) (*Sporisorium holci-sorghi*)	*Pythium* spp. (soil-borne)	*Rhizoctonia* spp.	Cutworm	Seedcorn maggot	Wireworms
Allegiance FL	712			•[4]			•				
Belmont 2.7 FS	712			•[4]			•				
Cruiser 5FS	682									•	•
Cruiser Maxx Corn	684		•		•		•	•		•	•
Fortenza	688								•		•
INTEGO Solo Fungicide	702						•				
Interest Forte	703	•[5]	•		•		•				
Lumivia	701								•	•[6]	•
Maxim Quattro	710		•		•		•	•			
NipsIt INSIDE 600 Insecticide	681									•	•
Poncho 600 FS	681									•	•
Sombrero 600 FS	696										•
Telex Fungicide	712			•[4]			•				
Vitaflo Brands	741	•[3]			•	•	•				

1. **Product does not specify causal pathogen.**
2. **Some products include black cutworm and white grubs.**
3. ***Penicillium* only.**
4. **For crops intended for export.**
5. **Refer to label for details.**
6. **Suppression only.**

Table 9. Seed Treatment Products for Potato

PRODUCTS	Page	DISEASES							INSECTS				
		Blackleg	*Fusarium* spp.[1]	Late blight (seed-borne) (*Phytophthora infestans*)	Pink rot (*Phytophthora erythroseptica*)	*Rhizoctonia solani*[2]	Silver Scurf (*Helminthosporium solani*)	Verticillium Wilt	Aphids	Colorado Potato Beetle	Potato Flea Beetle	Potato Leafhopper	Wireworms
Actara	803								•	•		•	
AZteroid FC	679					•[3]	•						
Cruiser Maxx Potato Extreme	685		•			•	•		•	•		•	
Emesto Silver	690		•			•	•						
Fortenza	688									•			
Heads Up Plant Protectant	694					•							
NipsIt INSIDE 600 Insecticide	681								•	•	•	•	•
Reason 500SC	722			•									
Revus	723			•	•								
Titan	681								•	•	•	•	•
Vibrance Ultra Potato	740		•	•	•	•	•						

Refer to product pages and labels for specific information on pathogens and insects listed as well as expectations for control vs. suppression.
Before using any pesticide on potatoes, consult the list of Agricultural Pesticide Approved for Use from Simplot Canada and McCain Foods (Canada)

1. **May include seed piece decay and/or dry rot.**
2. **May include black scurf and/or stem and stolon canker.**

Table 10. Seed Treatment Products for Potato Post-harvest Diseases

PRODUCTS	Page	DISEASES						
		Silver Scurf (*Helminthosporium solani*)	*Fusarium* spp.[2]	*Rhizoctonia* spp.	Other Storage Rots (Phoma, Oospora)	Bacterial Soft Rot	Bacterial Ring Rot	*Phytophthora* spp.[3]
Confine Extra	714	•						•
General Storage Disinfectant[1]	693						•	
Mertect SC	711	•	•	•	•			
Rampart	714							•
Serenade OPTI[4]	648	•						
Stadium	726	•	•					
StorOx	728	•	•			•		
Tibet 50 SC	711	•	•	•	•			

Refer to product pages and labels for specific information on pathogens and insects listed as well as expectations for control vs suppression.
Before using any pesticide on potatoes, consult the list of Agricultural Pesticide Approved for Use from Simplot Canada and McCain Foods (Canada)

1. **Not for use on potatoes. Use for disinfecting potato storages and equipment.**
2. **May include storage rot, tuber rot, and/or dry rot (refer to product page/label).**
3. **May include *Phytophthora infestans* (late blight) and/or *Phytophthora erythroseptica* (pink rot).**
4. ***Serenade OPTI* users please refer to page 544 for more information on this product as it has been removed from the Seed Treatment section of the guide.**

Apron Advance

Fungicide Group 1, 4, 12

Company:
Syngenta (PCP#30627)

Formulation: Apron Advance is formulated as a suspension.

Active ingredient	
Fludioxonil	25 g/L
Metalaxyl-M and S-isomer	20 g/L
Thiabendazole	150 g/L-

Crops, Diseases and Rates:

Crop	Diseases Controlled	Rate (per 100 kg of seed)
Chickpea	Seed-borne ascochyta blight (*Ascochyta rabiei*); seed rot/pre-emergence damping-off and post-emergence damping-off (*Fusarium* spp., *Pythium* spp., *Rhizoctonia* spp.); seedling blight (*Fusarium* spp., *Pythium* spp.); seed rot and seedling blight (seed-borne *Botrytis* spp.)	100 mL
Dry bean	Seed rot/pre-emergence damping-off, and post-emergence damping-off (*Fusarium* spp., *Pythium* spp., *Rhizoctonia* spp.); seedling blight (*Pythium* spp.); anthracnose (*Colletotrichum* spp.)	100 mL
Faba bean	Seed rot/premergence damping-off and post-emergence damping-off (*Fusarium* spp., *Pythium* spp., *Rhizoctonia* spp.); seedling blight (*Pythium* spp.); anthracnose (*Colletotrichum* spp.)	100 mL
Field pea	Seed-borne ascochyta blight and foot rot (*Ascochyta pinodes*); seed rot/pre-emergence damping-off, post-emergence damping-off, and seedling blight (*Fusarium* spp., *Pythium* spp., *Rhizoctonia* spp.)	100 mL
Lentil	Seed-borne ascochyta blight (*Ascochyta lentis*); seed rot/pre-emergence damping-off, postemergence damping-off, and seedling blight (*Fusarium* spp., *Pythium* spp., *Rhizoctonia* spp.); seedling root rot (*Fusarium* spp.); seed rot and seedling blight (seed-borne *Botrytis* spp.)	100 mL

Application Information:
Apron Advance is a seed treatment formulation for use in commercial seed treatment plants, and for on-farm treatment using auger treating only; DO NOT use in hopper box or seed drill.

How it Works:
Fludioxonil is a phenylpyrrole fungicide with contact activity. Metalaxyl-M is an acylalanine fungicide with systemic activity against diseases caused by the Oomycetes, including Pythium damping-off. Thiabendazole is a benzimidazole fungicide with both contact and systemic activity.
For more information refer to "Fungicide Modes of Action" in the Plant Disease Control section.

Tank Mixes:
None listed.

Restrictions:
- **Labelling:** All seed treated with Apron Advance must be labelled "This seed has been treated with thiabendazole, fludioxonil and metalaxyl-M and S-isomer fungicides.
- **Re-cropping:** DO NOT plant any crop other than soybean, dry bean, chickpea, lentil or dry pea within 30 days to fields in which treated seed was planted.
- **Storage:** Store away from feeds and feedstuffs. Store between 0 and 30°C. Any spilled or exposed seeds must be incorporated into the soil or otherwise cleaned up.
- **Environmental Restrictions:** This product is toxic to fish and other aquatic organisms. DO NOT apply directly to aquatic habitats; do not contaminate water by cleaning of equipment or disposal of wastes. Any spilled or exposed seeds must be incorporated into the soil or otherwise cleaned up.

- **Compatibility with Rhizobia-based inoculants:** This product is compatible with Rhizobia-based inoculants. Check with inoculant manufacturer for details and refer to product labels prior to use. Mixing with inoculants may increase drying time while treating. Recalibrate the seed drill before planting treated seed.

Hazard Rating:
None listed.

Apron Maxx (Co-pack)

Fungicide Group 4, 7, 12

Apron Maxx *is only available as a co-pack* of *Vibrance 500FS* (sedaxane fungicide) and *Vibrance Maxx RTA* (fludioxonil, metalaxyl-M and S-isomer).

Company:
Syngenta Canada Inc. (*Apron Maxx RTA* – PCP#27577), (*Vibrance 500FS* – PCP#30438)

Formulation:

Active ingredient		
	Apron Maxx RTA	*Vibrance 500FS*
Fludioxonil	0.73%	
Metalaxyl-M and S-isomer	1.10%	
Sedaxane	-	500 g/L
Rates:	325 mL/100 kg of seed	10 mL/100 kg of seed

Crops, Diseases and Rates:

Crop	Diseases Controlled	Rate (per 100 kg of seed)
Chickpea	Seed-borne ascochyta blight *(Ascochyta rabiei)*; seed rot/pre-emergence damping-off and post-emergence damping-off (*Fusarium* spp., *Pythium* spp., *Rhizoctonia* spp.); seedling blight (*Fusarium* spp., *Pythium* spp.); seed rot and seedling blight (seed-borne *Botrytis* spp.)	325 mL + 10 mL
Dry bean	Seed rot/pre-emergence damping-off, and post-emergence damping-off (*Fusarium* spp., *Pythium* spp., *Rhizoctonia* spp.); seedling blight (*Pythium* spp.); anthracnose (*Colletotrichum* spp.)	325 mL + 10 mL
Faba bean	Seed rot/pre-emergence damping-off, post-emergence damping-off, seedling blight (*Fusarium* spp., *Pythium* spp., *Rhizoctonia* spp.)	325 mL + 10 mL
Field pea	Seed-borne ascochyta blight and foot rot (*Ascochyta pinodes*); seed rot/pre-emergence damping-off, post-emergence damping-off, and seedling blight (*Fusarium* spp., *Pythium* spp., *Rhizoctonia* spp.)	325 mL + 10 mL
Lentil	Seed-borne ascochyta blight *(Ascochyta lentis)*; seed rot/pre-emergence damping-off, post-emergence damping-off, and seedling blight (*Fusarium* spp., *Pythium* spp., *Rhizoctonia* spp.); seedling root rot (*Fusarium* spp.); seed rot and seedling blight (seed-borne *Botrytis* spp.)	325 mL + 10 mL
Soybean	Seed rot/pre-emergence damping-off, and post-emergence damping-off (*Fusarium* spp., *Pythium* spp., *Rhizoctonia* spp.); seedling blight (*Fusarium* spp., *Pythium* spp.); seedling root rot (*Fusarium* spp.); seed rot and seedling blight (*Phomopsis* spp.); early season root rot (*Phytophthora megasperma* var. *sojae*)	325 mL + 10 mL

Application Information:
Apron Maxx is a ready-to-apply seed treatment formulation for use in commercial seed treatment plants and for on-farm treatment using standard gravity flow or mist type seed treatment equipment. Also used in treat-on-the-go air seeders.

This products contains a pigment which will colour the treated seed. However, users are responsible for ensuring that the treated seed, when dried and ready for bagging, storage or seeding has an unnatural colour. If the pigment contained in the formulation does not colour the seed adequately, additional colourant must be added to the mixture while treating the seed. Ensure uniform coverage of the seed, as uneven seed coverage may not give the desired level of disease control. Treatment of highly damaged seed or seed known to be of low vigour and poor quality may result in reduced germination and/or reduction of seed and seedling vigour. Allow the seed to dry before bagging, storing or seeding.

How it Works:
Fludioxonil is a phenylpyrrole fungicide with contact activity. Metalaxyl-M is an acylalanine fungicide with systemic activity against diseases caused by the Oomycetes, including Pythium damping-off. Sedaxane is a succinate dehydrogenase inhibitor fungicide with preventative and systemic activity that inhibits fungal metabolism by binding to the succinate dehydrogenase enzyme to disrupt cellular respiration and energy generation. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:
None.

Restrictions:
- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information. Experience has shown that strains of fungus resistant to metalaxyl-M may develop. Failure to control the disease will likely result in crop damage and/or yield losses. If disease appears in a treated field, consult the government extension specialist immediately.
- **Labelling:** All seed treated with *Apron Maxx* must be labelled "This seed has been treated with fludioxonil metalaxyl-M and sedaxane fungicides. DO NOT use for food, feed or oil purposes". DO NOT use for food, feed or oil purposes".
- **Grazing:** No restrictions listed.
- **Re-cropping:** DO NOT plant any crop other than soybean, dry bean, chickpea, lentil or dry pea within 30 days to fields in which treated seed was planted.
- **Storage:** Store away from feeds and feedstuffs. Store between 0 and 30°C. Any spilled or exposed seeds must be incorporated into the soil or otherwise cleaned up.
- **Environment:** This product is toxic to fish and other aquatic organisms. DO NOT apply directly to aquatic habitats; do not contaminate water by cleaning of equipment or disposal of wastes. Any spilled or exposed seeds must be incorporated into the soil or otherwise cleaned up.
- **Compatibility with *Rhizobia*-based inoculants:** These products are compatible with *Rhizobia*-based inoculants. Check with inoculant manufacturer for details and refer to product labels prior to use. Mixing with inoculants may increase drying time while treating. Recalibrate the seed drill before planting treated seed.

Hazard Rating:
None listed.

AZteroid FC

Fungicide Group 11

Company:
Vive Crop Protection, distributed by UAP (PCP#34742)

Formulation: AZteroid FC is formulated as a suspension concentrate.

Active ingredient	
Azoxystrobin	390 g/L
Container size:	4 x 3.78L case

Crops, Diseases and Rates:

Crop	Diseases Controlled	*Diseases Suppressed*	Rate
Potato	Silver Scurf (*Helminthosporium*)	Rhizoctonia stem rot, stolon canker, black scurf (*Rhizoctonia solani*)	2.56 – 3.85 mL per 100 m of row

Application Information:
Minimum water volume (ground): 20 to 56 L/acre water

How it Works:
The active ingredient azoxystrobin is a methoxyacrylate compound (strobilurin) with broad spectrum contact and systemic activity to be used as a preventative and curative fungicide application.
Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:
Liquid Fertilizer.

Restrictions:

- **Labelling:** All labelled crops are registered for commercial application facilities and mobile treaters. For all labelled seeds, commercial seed treatment (facilities and mobile treaters with closed transfer, including closed mixing, loading, calibrating, and closed treatment equipment only) is permitted. All labelled crops for on-farm treatment (open transfer, including open mixing, loading, calibrating, and open treatment equipment) is permitted.
- **Maximum number of applications:** DO NOT exceed one application of this product per season.
- **Re-entry interval:** 12 hours
- **Storage:** DO NOT store below zero degrees Celsius.

Hazard Rating:

None listed.

BUTEO start 480 FS Seed Treatment

Insecticide Group 4D

Company:

Bayer (PCP#31451)

Formulation:

480 g/L flupyradifurone formulated as a suspension.

Crops, Insects and Rates:

Crop	Insects Controlled	Rate (per 100 kg of seed)
Canola*, mustard*	Flea beetles	625 to 1042 mL

***DO NOT apply any subsequent application of a Group 4D Insecticide (for example, in-furrow, soil or foliar application) following planting of *BUTEO start 480 FS* treated seeds.**

Application Information:

Prior to and during application, *BUTEO start 480 FS* must be thoroughly agitated to ensure uniform mixing of the product. Keep above 10°C prior to and during application. DO NOT apply direct heat to container.

How it Works:

Flupyradifurone is a butenolide insecticide with systemic activity. For more information refer to "Insecticide Groups Based" on Modes of Action in the Insect Control section.

Tank Mixes:

None listed.

Restrictions:

Regardless of type of application (seed treatment or foliar), DO NOT apply more than 400 g of active ingredient flupyradifurone per hectare per season.

Hazard Rating:

Caution – Poison

Refer to the Introduction for an explanation of the symbols.

Clothianidin

Insecticide Group 4A

NipsIt INSIDE 600 Insecticide/Poncho 600 FS/Titan Poncho 600 FS *is available to commercial seed treaters only.* NipsIt INSIDE 600 Insecticide *is available for on-farm seed treatment for wheat and potato only.* Titan *is available for on-farm seed treatment.*

Company:

Valent Canada Inc. distributed by Nufarm Agriculture (*NipsIt INSIDE 600 Insecticide* – PCP#28975)
BASF Canada (*Poncho 600 FS* – PCP#27453, *Titan* – PCP#27449)

Formulation:

600 g per L clothianidin formulated as a suspension.

- *NipsIt INSIDE 600 Insecticide* container size - 3.78 L
- *Poncho 600 FS* container sizes - 56.8 L, 100 L, 113 L, 200 L, 1000 L
- *Titan* container sizes - 1 L, 3.8 L, 10 L, 200 L, 1000 L

Crops, Insects and Rates:

Product	Crop	Insects Controlled	Rate (per 100 kg of seed)
NipsIt INSIDE 600 Insecticide *Poncho 600 FS*	Canola, rapeseed	Flea beetles	250, 333 or 666 mL[1]
	Corn	Wireworms, seedcorn maggot, black cutworm[3]	33.3 to 66.6 mL/ 80,000 units of seed
NipsIt INSIDE 600 Insecticide *Titan*	Potato	Wireworms	20.8 mL
		Aphid (potato, green peach, foxglove and buckthorn aphids), Colorado potato beetle, potato leafhopper, potato flea beetle (overwintered adults and suppression of second generation)	10.4 to 20.8 mL
NipsIt INSIDE 600 Insecticide	Wheat	Wireworms	17 to 100 mL[2]

[1] **Increasing rates for low, moderate and severe flea beetle pressure.**
[2] **Rate of 17 mL per 100 kg of seed provides wireworm suppression only. Use higher rates of 33 to 100 mL per 100 kg of seed on wheat seed to be planted into fields known to have a history of severe wireworm infestations.**
[3] ***NipsIt INSIDE 600* insecticide and *Poncho 600FS* only.**

Application Information:

Poncho 600 FS is for use in commercial seed treatment facilities with closed transfer systems only. *Poncho 600 FS* DOES NOT contain a colourant. An appropriate colour must be added when this product is applied. Seed treatment must be thoroughly agitated to ensure uniform mixing of product prior to and during application. Treatment of highly mechanically scarred or damaged seed or seed known to be of low vigour and poor quality may result in reduced germination and/or reduction of seed and seedling vigour.

Titan is a seed piece treatment. Apply specified rate as a diluted spray onto seed pieces using a well contained, shielded spray system to prevent the loss of any liquid. Apply only in areas with adequate ventilation or in areas equipped to remove spray mist or dust. Agitate or stir spray solution as needed. For optimal insect control good coverage of seed pieces is required. DO NOT dilute with any more than 6 parts water to 1 part *Titan*. Plant seed pieces as soon as possible after cutting and treating.

In canola, rapeseed, Ethiopian mustard *(Brassica carinata)* and corn *NipsIt INSIDE 600 Insecticide* is for use with commercial seed treaters (facilities and mobile treaters) with closed transfer including closed mixing, loading, calibrating and closed treatment equipment only. No open transfer of *NipsIt INSIDE 600 Insecticide*.

In wheat, *NipsIt INSIDE 600 Insecticide* is for use in commercial seed treatment facilities (with closed transfer including closed mixing, loading, calibrating, and closed treatment equipment only) and for use on-farm (open transfer including open mixing, loading, calibrating, and open treatment equipment is allowed).

NipsIt INSIDE 600 Insecticide contains no colourant. An appropriate colourant must be added when this product is applied.

How it Works:

Clothianidin is a chloronicotinyl insecticide with systemic activity. For more information refer to "Insecticide Groups Based" on Modes of Action in the Insect Control section.

Tank Mixes:

Off-label tank mixes, as previously permitted under the Pest Management Regulatory Agency (PMRA) Off-label Tank Mix Policy memo of 2009 are no longer allowed under new guidance from PMRA. As of December 20, 2022 only products specifically indicated on product labels may be mixed, or when the labels of two or more products to be mixed include the statement quoted in the Introduction.

Restrictions:

NOTE: When using a seed flow lubricant for planting corn and soybean seed treated with neonicotinoid insecticides (containing the active ingredients clothianidin, imidacloprid or thiamethoxam), use only a dust-reducing fluency agent. Talc and graphite are not permitted.

- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information. DO NOT make any subsequent application of a group 4 insecticide (in-furrow or foliar application) following treatment with any of these products.
- **Labelling:** Treated seed must be labelled as follows: "This seed has been treated with clothianidin. DO NOT use for food, feed or oil processing. Store away from feeds and other foodstuffs."
- **Grazing:** None listed.
- **Re-cropping:**
  - For ***Poncho 600 FS***, corn and canola may be replanted at any time.
  - For ***Titan***, corn, and canola and potatoes may be replanted at any time.
  - For all products, a one year plant back interval is required for leafy, root and tuber vegetables.
  - A 30 day plant back is required for cereals, grasses, nongrass animal feeds, soybeans and dry beans.
  - For ***NipsIt INSIDE 600 Insecticide*** registered crops may be replanted at any time. A 30 day plant-back interval is required on cereals (except wheat), grasses, non-grass animal feeds, soybeans and dry beans.
- **Storage:** Protect products from freezing. DO NOT contaminate water, food or feed by storage, disposal or by cleaning of equipment. Store in a cool place. DO NOT store in direct sunlight. Store away from food or feed. DO NOT store treated seed above 25°C or in direct sunlight. Treated seed stored for periods in excess of 9 months should be tested for germination before planting.
- **Environment:** These products are toxic to aquatic invertebrates. DO NOT apply directly to water or to areas where surface water is present. DO NOT contaminate water when disposing of equipment wash waters. These products are toxic to birds and mammals. Any spilled or exposed seeds should be incorporated into the soil or otherwise cleaned up from the soil surface.

Hazard Rating:

Warning – Poison

Refer to the Introduction for an explanation of the symbols.

Cruiser 5FS

Insecticide Group 4A

Contains insecticide only. On-farm use for cereals and pulses up to a maximum application rate of 30 g per 100 kg seed. Higher application rates for commercial seed treaters only.

Company:

Syngenta Canada Inc. (PCP#27045)

Formulation:

47.6% thiamethoxam formulated as a suspension.

- Container sizes - 23.4 L, 56.78 L

Crops, Insects and Rates:

Crop	Insects Controlled	Rate[1] (per 100 kg of seed)
Wheat, barley	Wireworm (suppression)[1]	17 mL
	Wireworm (control)[1]	33 to 50 mL
Canola, rapeseed, mustard	Flea beetles	320 to 640 mL
Corn	Seedcorn maggot	83 to 166 mL
	Wireworm	83 mL
Soybean	Seedcorn maggot	50 mL
	Soybean aphid (early season protection)	50 mL
Dry bean	Seedcorn maggot	50 mL
	Wireworm	83 mL
Chickpea, lentil, lupins	Wireworm (suppression)[1]	17 mL
	Wireworm (control)[1]	33 to 50 mL

Crop	Insects Controlled	Rate[1] (per 100 kg of seed)
Faba bean	Wireworm (suppression)[1]	17 mL
	Wireworm (control)[1]	33 to 50 mL
	Pea leaf weevil	50 mL
Field pea	Wireworm (suppression)[1]	17 mL
	Wireworm (control)[1]	33 to 50 mL
	Pea leaf weevil	50 to 83 mL[2]
Rye, millet, sorghum, triticale, buckwheat	Wireworm (suppression)[1]	17 mL
	Wireworm (control)[1]	33 to 50 mL

[1] Use lower rate for early season suppression of wireworm. For control and/or moderate to high pressure, treat crops at higher rate.
[2] The higher rate must be applied by commercial treaters using closed transfer

Application Information:

For small-grain cereals (except oats) and pulse crops, *Cruiser 5FS* may be applied on-farm or by commercial seed treaters. For all other crops, application must be performed in commercial seed treatment facilities. A red colourant MUST be added when *Cruiser 5FS* is applied to grain. Allow the seed to dry before bagging or storing in bulk containers.

How it Works:

Thiamethoxam is a seed treatment insecticide in the neonicotinoid class of chemistry that controls listed chewing and sucking insects through contact and systemic activity. Refer to "Insecticide Groups Based on Modes of Action"in the Insect Control section for more information.

Tank Mixes:

For control of seed and soil-borne diseases, *Cruiser 5FS* can be mixed with fungicide seed treatments in a closed transfer system. Refer to label for details. Follow the label directions for each product and use the most restrictive precautions and limitations.

Restrictions:

NOTE: When using a seed flow lubricant for planting corn and soybean seed treated with neonicotinoid insecticides (containing the active ingredients clothianidin, imidacloprid or thiamethoxam), use only a dust-reducing fluency agent.
Talc and graphite are not permitted.

- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Labelling:** All seed must be labelled "Seed treated with thiamethoxam insecticide. DO NOT use for food, feed or oil processing." Consult label for additional labelling requirements.
- **Grazing:** DO NOT graze or feed livestock on treated areas for 45 days after planting.
- **Re-cropping:** No restrictions listed.
- **Storage:** Store away from food and feed. Ideal storage temperature is above freezing and below 30°C. If product should freeze, bring to room temperature, then ensure the contents are mixed well prior to application.
- **Environment:** Products are toxic to aquatic invertebrates and fish. DO NOT apply directly to water or areas where surface water is present. DO NOT contaminate food, feed, domestic or irrigation water supplies, lakes, streams and ponds. If treated seed is accessible to birds or spilled outdoors, promptly clean up or bury to prevent ingestion.

Hazard Rating:

Caution – Poison

Refer to the Introduction for an explanation of the symbols.

Cruiser Maxx Corn

Insecticide Group 4A
Fungicide Group 1, 4, 11, 12

Available to commercial seed treaters only.
Cruiser Maxx Corn *is a co-pack containing* Maxim Quattro *(thiabendazole, azoxystrobin, metalaxyl-M and S-isomer and fludioxonil fungicides) and* Cruiser 5FS *(thiamethoxam insecticide).*
For more detailed information on component products, consult product pages listed above.

Company:

Syngenta Canada Inc. (*Maxim Quattro* – PCP#29871, *Cruiser 5FS* – PCP#27045)

Formulations:

Maxim Quattro: 26.5% thiabendazole, 3.32% fludioxonil, 2.65% metalaxyl-M and S-isomer, and 1.33% azoxystrobin formulated as a liquid suspension treatment.

- Container sizes - 5 L to bulk

Cruiser 5FS: 47.6% thiamethoxam formulated as a suspension.

- Container sizes - 23.4 L, 56.78 L

Crops, Diseases, Insects and Rates:

Crop	Diseases Controlled	Insects Controlled	Rate (per 100 kg of seed)	
			Maxim Quattro	*Cruiser 5FS*
Corn	Seed- and soil-borne *Pythium, Rhizoctonia, Fusarium* (including *F. graminearum* and *F. verticillioides*); seed rot/pre-emergence damping-off, post-emergence damping-off, seedling blight (weakly pathogenic *Aspergillus* and *Penicillium*)	Seedcorn maggot, wireworm	67 mL	83 mL

Hazard Rating:

Maxim Quattro: Caution – Potential Skin Sensitizer
Cruiser 5FS: Caution – Poison
Refer to the Introduction for an explanation of the symbols.

Cruiser Maxx Potato Extreme

Insecticide Group 4A
Fungicide Group 3, 12

Company:
Syngenta Canada Inc. (PCP#31024)

Formulation:
250 g/L of thiamethoxam, 62.5 g/L of fludioxonil, and 123 g/L of difenoconazole formulated as a suspension.
- Container sizes - 2 x 9.6 L

Crops, Diseases, Insects and Rates:

Crop	Diseases Controlled	Diseases Suppressed	Insects Controlled	Rate (per 100 kg of seed)
Potato	Stem and stolon canker *(Rhizoctonia solani)*, fusarium dry rot (*Fusarium* spp.), silver scurf *(Helminthosporium solani)*	Black scurf *(Rhizoctonia solani)*	Colorado potato beetle, aphids, and potato leafhopper	20 mL

Application Information:
Apply as a water-based slurry utilizing standard slurry seed treatment equipment. Thoroughly mix the specified amount of product into the required amount of water or tank mix partner for slurry treater and dilution rate to be used. Apply only in areas with adequate ventilation or in areas that are equipped to remove mist or dust.

How it Works:
Thiamethoxam is a systemic chloronicotinyl insecticide, fludioxonil is a phenylpyrrole fungicide with contact activity, and difenoconazole is a triazole fungicide with broad-spectrum systemic activity. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:
None listed.

Restrictions:
- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Labelling:** No restrictions listed.
- **Grazing:** No restrictions listed.
- **Re-cropping:** Treated areas may be replanted immediately following harvest or as soon as practical following the last application with any crop listed on this label or to sorghum, wheat, barley, canola and pome fruit. Any cover crop planted for erosion control or soil improvement may be planted as soon as practical following the last application. However, the cover crop may not be grazed or harvested for food or feed. For all other crops, a 120 day plant-back interval must be observed.
- **Storage:** If soil conditions are ideal, plant potatoes immediately after application; however, if soil is predicted to be cold and wet for 3 days following application, either a) wait to cut, treat, plant until conditions are favorable or b) cut, treat and store. If cutting, treating and storing, potatoes can be treated with an inert dust to improve suberization. Store properly until conditions improve by making sure that there is adequate cool air (7 to 10°C) movement through the pile of cut seed potatoes and a relative humidity of 85 to 90 percent. Temperatures above 10°C promote soft rot in seed. Cut and treated seed should not be piled above 1.8 metres in height. Avoid storing treated potatoes for over 2 weeks. When transporting cut and treated seed make sure the seed is covered.
- **Environment:** DO NOT apply any subsequent application of thiamethoxam in-furrow or foliar application or other Group 4 insecticide following seed piece treatment with *Cruiser Maxx Potato Extreme*. DO NOT plant more than 128,700 kg of treated potato seed pieces per day. As this product is not registered for the control of pests in aquatic systems, DO NOT use to control aquatic pests. DO NOT contaminate irrigation or drinking water supplies or aquatic habitats by cleaning of equipment or disposal of wastes.

Hazard Rating:
None listed.

Cruiser Vibrance Quattro

Insecticide Group 4A
Fungicide Group 3, 4, 7, 12

Company:
Syngenta Canada Inc. (PCP#31453)

Formulation:
61.5 g/L thiamethoxam, 36.9 g/L difenoconazole, 15.4 g/L sedaxane, 9.2 g/L metalaxyl-M (and S-isomer), and 7.7 g/L fludioxonil formulated as a suspension.

- Container sizes - 1 to 1050 L

Crops, Diseases, Insects and Rates:

Crop	Diseases Controlled	Diseases Suppressed	Insects Controlled	Rate (per 100 kg of seed)
Barley	General seed rots (*Fusarium* spp., *Pythium* spp., *Rhizoctonia* spp., *Penicillium* spp., *Aspergillus* spp.); seedling blight, root rot, damping-off (*Fusarium* spp., *Rhizoctonia* spp., *Pythium* spp.); covered smut *(Ustilago hordei)*; false loose smut *(U. nigra)*; true loose smut *(U. nuda)*	Common root rot *(Cochliobolus sativus)*; fusarium crown and foot rot (*Fusarium* spp.); take-all *(Gaeumannomyces graminis)*	Wireworms	325 mL
Oats	General seed rots (*Fusarium* spp., *Pythium* spp., *Rhizoctonia* spp., *Penicillium* spp., *Aspergillus* spp.); seedling blight, root rot, damping-off (*Fusarium* spp., *Rhizoctonia* spp., *Pythium* spp.); covered smut *(Ustilago hordei)*; loose smut *(U. avenae)*	Common root rot *(Cochliobolus sativus)*	Wireworms	325 mL
Rye	General seed rots (*Fusarium* spp., *Pythium* spp., *Rhizoctonia* spp., *Penicillium* spp., *Aspergillus* spp.); seedling blight, root rot, damping-off (*Fusarium* spp., *Rhizoctonia* spp., *Pythium* spp.); common bunt *(Tilletia tritici)*; dwarf bunt *(T. controversa)*	Common root rot *(Cochliobolus sativus)*; fusarium crown and foot rot (*Fusarium* spp.); take-all *(Gaeumannomyces graminis)*	Wireworms	325 mL
Triticale	General seed rots (*Fusarium* spp., *Pythium* spp., *Rhizoctonia* spp., *Penicillium* spp., *Aspergillus* spp.); seedling blight, root rot, damping-off (*Fusarium* spp., *Rhizoctonia* spp., *Pythium* spp.); loose smut *(Ustilago tritici)*	Common root rot *(Cochliobolus sativus)*; fusarium crown and foot rot (*Fusarium* spp.); take-all *(Gaeumannomyces graminis)*	Wireworms	325 mL
Spring wheat	General seed rots (*Fusarium* spp., *Pythium* spp., *Rhizoctonia* spp., *Penicillium* spp., *Aspergillus* spp.); seedling blight, root rot, damping-off (*Fusarium* spp., *Rhizoctonia* spp., *Pythium* spp.); common bunt *(Tilletia tritici)*; loose smut *(Ustilago tritici)*	Common root rot *(Cochliobolus sativus)*; fusarium crown and foot rot (*Fusarium* spp.); take-all *(Gaeumannomyces graminis)*	Wireworms	325 mL
Winter wheat	General seed rots (*Fusarium* spp., *Pythium* spp., *Rhizoctonia* spp., *Penicillium* spp., *Aspergillus* spp.); seedling blight, root rot, damping-off (*Fusarium* spp., *Rhizoctonia* spp., *Pythium* spp.); common bunt *(Tilletia tritici)*; dwarf bunt *(T. controversa)*; loose smut *(Ustilago tritici)*	Common root rot *(Cochliobolus sativus)*; fusarium crown and foot rot (*Fusarium* spp.); take-all *(Gaeumannomyces graminis)*	Wireworms	325 mL

Application Information:
Cruiser Vibrance Quattro is for use on-farm. This product can also be applied by commercial seed treaters using closed system transfer. Treat seed in a well-ventilated area. When treating seeds, all workers must wear coveralls over a long sleeved shirt, long pants, chemical-resistant gloves, work boots, sock and a NIOSH-approved dust mask.

How it Works:
Thiamethoxam is a seed treatment insecticide in the neonicotinoid class of chemistry that controls listed chewing and sucking insects through contact and systemic activity. For more information refer to "Insecticide Groups Based" on Modes of Action in the Insect Control section. The active ingredient difenoconazole is a triazole fungicide with broad-spectrum, systemic activity. Metalaxyl-M is an acylalanine fungicide with systemic activity against diseases caused by the Oomycetes, including pythium damping-off. Sedaxane is a succinate dehydrogenase inhibitor fungicide with systemic activity that inhibits fungal metabolism by binding to the succinate dehydrogenase enzyme to disrupt cellular respiration and energy generation. Fludioxonil is phenylpyrrole fungicide with contact activity. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:

None listed.

Restrictions:

- **Resistance management**: Pathogen "Resistance" in the Plant Disease Control section for more information.
- **Labelling:** Treated seed must be labelled (listing only the applicable active ingredients) as follows: "This seed has been treated with the insecticide, thiamethoxam and the fungicides, difenoconazole, metalaxyl-M (and S-isomer), sedaxane and fludioxonil. Wear coveralls over a long-sleeved shirt, long pants, chemical-resistant gloves, work boots, socks and NIOSH-approved dust mask when handling treated seed, and during planting (including loading, sowing, maintenance, and clean-up). When using closed-cab planting equipment, chemical-resistant gloves and NIOSH-approved dust mask are not required inside cab. DO NOT graze or feed livestock on seeded area for 45 days after planting. DO NOT use for food, feed or oil processing. Store away from food and feed. Any spilled or exposed seeds must be incorporated into the soil or otherwise cleaned-up from the soil surface." Store away from food and feed."
- **Grazing:** DO NOT graze or feed livestock on treated areas for 45 days after planting.
- **Re-cropping:** DO NOT plant any crop other than cereals, corn, soybeans, members of Crop Subgroup 6C (dried, shelled peas and beans), members of Crop Subgroup 20A (canola and rapeseed subgroup) or potatoes within 60 days to fields in which treated seed were planted.
- **Storage:** Store away from food and feed. Ideal storage temperature is above freezing and below 30°C. If product should freeze, bring to room temperature, and then ensure the contents are mixed well prior to application.
- **Environment:** Toxic to aquatic organisms. DO NOT contaminate irrigation or drinking water supplies or aquatic habitats by cleaning of equipment or disposal of wastes. Any spilled or exposed seeds must be incorporated into the soil or otherwise cleaned-up from the soil surface. Toxic to bees. Bees can be exposed to product residues in flower, leaves, pollen and/or nectar resulting from seed treatment applications.

Hazard Rating:

⚠ Warning – Contains the Allergen Soy

Refer to the Introduction for an explanation of the symbols.

Cyantraniliprole

Fortenza/Lumiderm

Insecticide Group 28

Company:

Corteva Agriscience (*Lumiderm* – PCP#30894)
Syngenta Canada Inc. (*Fortenza* – PCP#30899)

Formulations:

Fortenza: 600 g/L cyantraniliprole formulated as a suspension.

- Container sizes - 1 to 1050 L

Lumiderm: 625 g/L cyantraniliprole formulated as a suspension.

- Container sizes - 100 L, 1000 L, bulk

Crops, Insects and Rates:

Product	Crop	Insects	Rate (per 100 kg of seed)
Fortenza	Potato	Colorado potato beetle[1]	10 to 22.5 mL
	Corn (field, pop and sweet)	Cutworm	83 to 167 mL
		Wireworms	167 mL
	Canola, rapeseed, mustard (oilseed and condiment mustard including *Brassica carinata*)	Cutworm	500 mL
		Flea beetles	1333 mL
	Soybean	Seedcorn maggot	41.5 to 83 mL
		Black cutworm	41.5 to 83 mL[3]
		Wireworms	83 mL
	Sunflower	Cutworm	164 to 323 mL (based on an average of 9920 seed/kg)
Lumiderm	Canola, rapeseed, oilseed mustard	Cutworm[2]	480 to 960 mL[4]
		Flea beetle	960 to 1600 mL[4, 5]
	Soybean	Cutworm, seedcorn maggot, Wireworms	74 to 197 mL[4]
		Soybean aphid	37 to 123 mL[4]

[1] Protection provided during early to mid-season growth and development of potatoes only.
[2] The *Lumiderm* application rate for cutworm will also provide some early season protection from flea beetle damage.
[3] Use higher rates for higher pest pressure.
[4] Use the higher rates in areas with high pest pressure, or where extended early season control is required.
[5] The application rates for flea beetles will also provide early season protection from cutworm feeding damage.

Application Information:

For corn and registered oilseed crops *Fortenza* and *Lumiderm* must be applied in a commercial seed treatment facility using closed transfer equipment. These products contain no colourant. An appropriate seed colourant must be added when this product is applied. *Fortenza* is designed for on-farm treating for potato seed pieces only using a closed-treatment system.

How it Works:

The active ingredient cyantraniliprole is a systemic insecticide from the diamides chemical class. For more information refer to "Insecticide Groups Based on Modes of Action" in the Insect Control section.

Tank Mixes:

Lumiderm: registered oilseed crops – *Prosper EverGol, Helix Vibrance*
Fortenza: registered oilseed crops – *Vibrance 500 FS*; Corn – *Cruiser 5FS, Maxim Quattro and/or Vibrance 500 FS*
Follow the label directions for each product and use the most restrictive precautions and limitations.

Restrictions:

- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information. DO NOT apply any subsequent application of a Group 28 insecticide (in-furrow, soil or foliar) within 60 days of treatment with any of these products.
- **Labelling:** Seed treated with *Lumiderm* must be labeled "This seed has been treated with *Lumiderm Insecticide Seed Treatment* which contain cyantraniliprole. DO NOT use for feed, food or oil processing. Store away from feeds and other foodstuffs. Wear long-sleeved shirt, long pants and chemical-resistant gloves when handling treated seed. This product is toxic to aquatic organisms. Dispose of all excess treated seed. Left over treated seed may be double-sown around the headland or buried away from water sources in accordance with local requirements. Dispose of seed packaging in accordance with local requirements. Cover or incorporate spilled treated seeds."
  - Seed treated with *Fortenza* must be labeled "These seeds have been treated with the insecticide cyantraniliprole. When handling and planting treated seed, workers must wear a long sleeved shirt and long pants, chemical-resistant gloves, and work boots. For good hygiene practice, it is also recommended that a NIOSH-approved dust mask be worn during all job activities. Plant treated seed only with closed cab planting equipment. DO NOT use for food, feed or oil processing. Toxic to bees. Follow best management practices to help minimize dust exposure to pollinators during planting of treated seed; refer to the complete guidance "Pollinator Protection: reducing risk of planting treated seed" on the Health Canada website."
- **Grazing:** No restrictions listed.
- **Re-cropping:** Registered crops, as well as flax, sunflower, and safflower, may be replanted at any time. For all other crops, do not plant-back within 30 days of seeding with cyantraniliprole treated seed.
- **Storage:** Store product in original container only, away from other pesticides, fertilizer, food or feed. Not for use or storage in or around the home. Keep container closed. To prevent contamination store this product away from food or feed.
  - *Fortenza:* Ideal storage temperature for the products is above freezing and below 30°C. Repeated freeze-thawing of *Fortenza* will not affect the physical integrity of the product. If the product should freeze, bring the product back to room temperature and ensure the contents are mixed well prior to application.
- **Environment:** Toxic to aquatic organisms and bees. When this product is applied and used according to label directions, risk to bees is expected to be negligible. DO NOT contaminate irrigation or drinking water supplies or aquatic habitats by cleaning of equipment or disposal of wastes. The use of this chemical may results in contamination of groundwater particularly in areas where soils are permeable and/or the depth to the water table is shallow.

Hazard Rating:

Caution – Eye Irritant

Refer to the Introduction for an explanation of the symbols.

Dividend Extreme Fungicide

Fungicide Group 3, 4

Company:

Syngenta Canada Inc. (PCP#29490)

Formulation:

7.7 3% difenoconazole and 1.93% metalaxyl-M and S-isomer formulated as a flowable suspension.

- Container size - 2 x 10 L

Crops, Diseases and Rates

Crop	Diseases Controlled	Diseases Suppressed	Rate (per 100 kg of seed)
Barley, oats, rye, triticale, wheat (spring, winter)	General seed rots, seedling blights, damping off, smuts and bunts	Common root rot, fusarium crown and foot rot, take-all	130 to 260 mL

Application Information:

Dividend Extreme is for use on-farm on barley, wheat oats, rye, and triticale.

Add 6 L of water to the 10 L container, which contains 4 L of *Dividend Extreme*, to obtain use rate of 325 mL per 100 kg seed as a water-based slurry utilizing standard treatment equipment that provides uniform seed coverage. When handling *Dividend Extreme Fungicide*, equipment or seed treated with *Dividend Extreme Fungicide*, wear long-sleeved coveralls over normal work clothing and chemical resistant gloves. In addition, wear a suitable dust mask when bagging or sewing bags of treated seed or when transferring seed to a storage bin.

How it Works:
Difenoconazole is a triazole fungicide with broad-spectrum systemic activity. Metalaxyl-M is an acylalanine fungicide with systemic activity against diseases caused by the oomycetes, including pythium damping-off. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:
Cruiser 5 FS on wheat, barley, triticale and rye.

Restrictions:
- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Labelling:** All bags containing treated seed for sale or use in Canada must be labeled or tagged as follows: "This seed has been treated with *Dividend Extreme Fungicide* which contains the fungicides difenoconazole and metalaxyl-M and S-isomer. DO NOT use for food, feed or oil purposes. Store away from feeds and foodstuffs. Wear long-sleeve shirt, long pants, and chemical-resistant gloves when handling treated seed. DO NOT graze, feed green forage or cut for hay within 35 days of planting of cereals. DO NOT plant any crop other than cereals within 30 days to fields in which treated seeds were planted."
- **Grazing:** DO NOT graze, feed green forage or cut for hay within 35 days of planting treated cereal grain seeds.
- **Re-cropping:** DO NOT plant any crop other than cereal grains listed on this label within 30 days to fields in which treated seeds were planted.
- **Storage:** To prevent contamination, store this product away from food or feed.
- **Environment:** This product is toxic to fish and aquatic invertebrates. DO NOT apply this product directly to freshwater habitats (such as lakes, rivers, sloughs, ponds, prairie potholes, creeks, marshes, streams, reservoirs, ditches and wetlands), estuaries or marine habitats. DO NOT contaminate irrigation or drinking water supplies or aquatic habitats by cleaning of equipment or disposal of wastes. DO NOT contaminate food or feed. If treated seed is spilled outdoors or in areas accessible to birds, promptly clean up or bury to prevent ingestion.

Hazard Rating:
None listed.

Emesto Silver Fungicide Seed Treatment

Fungicide Group 3, 7

Company:
Bayer (PCP#30361)

Formulation:
100 g/L penflufen, 18 g/L prothioconazole formulated as a suspension.
- Container sizes - 1 L to 200 L

Crops, Diseases and Rates

Crop	Diseases Controlled	Rate (per 100 kg of seed)
Potato	Seed-borne black scurf and stem and stolon canker *(Rhizoctonia solani)*, silver scurf *(Helminthosporium solani)*, fusarium tuber rot (*Fusarium* spp.)	20 mL

Application Information:
Emesto Silver is designed to be applied as a diluted spray using equipment that ensures uniform coverage of each seed piece. Apply no more than 150 mL of slurry per 100 kg of seed pieces. Agitate or stir the slurry solution as needed. Apply only in areas with adequate ventilation or in areas that are equipped to remove spray mist or dust. Seed pieces should be treated immediately after cutting. Plant seed-pieces as soon as possible after cutting and treating.

How it Works:
The active ingredient penflufen is a carboxamide (SDHI) fungicide with systemic activity. The active ingredient prothioconazole is a demethylation inhibitor with broad-spectrum systemic activity. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:
See label for tank-mix options.

Restrictions:

- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Labelling:** No restrictions listed.
- **Grazing:** No restrictions listed.
- **Re-cropping:** Potatoes, corn, cereals, legumes, soybean, canola, mustard, rapeseed, borage, flax and crambe may be replanted at any time. For all other crops, DO NOT plant back within 30 days of planting with *Emesto Silver*-treated seed pieces.
- **Storage:** If cut seed needs to be stored or held for a few days, make sure that there is adequate cool air movement through the pile of cut seed potatoes at relative humidity of 85 to 90 percent. Store cut seed at or below 7°C. Temperatures above 10°C promote soft rot in seed. Cut and treated seed should be piled above 1.8 metres in height.
- **Environment:** DO NOT apply this product or treated seed pieces directly to freshwater habitats, estuaries, or marine habitats. DO NOT contaminate irrigation or drinking water supplies or aquatic habitats by cleaning of equipment or disposal of wastes.

Hazard Rating:

None listed.

EverGol Energy Fungicide Seed Treatment

Fungicide Group 3, 4, 7

Company:

Bayer (PCP#30364)

Formulation:

38.4 g/L penflufen, 76.8 g/L prothioconazole, 61.4 g/L metalaxyl formulated as a suspension.

- Container size - 33.75 L

Crops, Diseases and Rates:

Crop	Diseases Controlled	Rate (per 100 kg of seed)
Soybean, Chickpea, Peas, Lentils, Dry Beans	Seed rot/pre-emergence damping off (*Rhizoctonia solani, Fusarium* spp., *Pythium* spp., *Phomopsis longicolla*); post-emergence damping off (*R. solani, Fusarium* spp., *Pythium* spp.); early-season root rot and seedling blight (*R. solani, Fusarium* spp.); seedling blight (seed-borne *Botrytis cinerea*)	65 mL

Application Information:

EverGol Energy is designed for commercial seed treating equipment which can accurately control application rates and provide a good distribution of the chemical into the seed in the mixing chamber. Uniform application to seed is necessary to ensure optimum product performance. This product contains no dye and an appropriate seed colourant must be applied.

How it Works:

The active ingredient penflufen is a carboxamide (SDHI) fungicide with systemic activity. The active ingredient prothioconazole is a demethylation inhibitor with broad-spectrum systemic activity. The active ingredient metalaxyl is an acylalanine fungicide with systemic activity. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:

Insecticide Seed Treatments: *Stress Shield 600*
Fungicide Seed Treatment: *Allegiance FL* for control of early-season Phytophthora in soybean.
Follow the label directions for each product and use the most restrictive precautions and limitations for either product.

Restrictions:

- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Labelling:** Treated seed must be labeled "This seed has been treated with *EverGol Energy*, which contains penflufen, prothioconazole and metalaxyl. When handling treated seed wear a long-sleeved shirt, long pants and chemical-resistant gloves. DO NOT use for feed, food or oil processing. Store away from feeds and other foodstuffs."
- **Grazing:** No restrictions listed.
- **Re-cropping:** Registered crops for *EverGol Energy*, as well as canola, mustard, rapeseed, borage, flax, crambe and potato, may be replanted at any time. For all other crops, do not plant-back within 30 days of seeding with *EverGol Energy*-treated seed.

- **Storage:** To prevent contamination store this product away from food or feed. Store in cool, dry area. DO NOT store in direct sunlight. DO NOT allow prolonged storage in temperatures that exceed 40°C or go below -10°C.
- **Environment:** Toxic to aquatic organisms and non-target terrestrial plants. DO NOT discharge effluent containing this product into sewer systems, lakes, streams, ponds, estuaries, oceans or other water. Dispose of all excess treated seed. Left over seed may be double-sown around the headland or buried away from water sources in accordance with local requirements. DO NOT leave exposed treated seed on soil surface. Any spilled or exposed seeds must be incorporated into the soil or otherwise cleaned-up from the soil surface. The use of this chemical may result in contamination of groundwater particularly in areas where soils are permeable (e.g. sandy soil) and/or depth to the water is shallow.

Hazard Rating:
None listed.

Fortenza Advanced

Insecticide Group 4C, 28

Available to commercial seed treaters only. Fortenza Advanced *is a co-pack containing* Rascendo *(sulfoxaflor insecticide, available only as part of this co-pack) and* Fortenza *(600 g/L cyantraniliprole insecticide). For other detailed information on Fortenza see the product page listed above.*

Company:
Syngenta Canada Inc. (*Fortenza* – PCP#30899, *Rascendo* – PCP#32250)

Formulation:
Rascendo: 500 g/L sulfoxaflor formulated as a suspension.
- Container size - 1 to 1050 L

Fortenza: 600 g/L cyantraniliprole.
- Container size - 1 to 1050 L

Crops, Diseases and Rates

Crop	Insects Controlled	Rate (per 100 kg of seed)	
		Fortenza	*Rascendo*
Canola, rapeseed and mustard (both oilseed and condiment types, including *Brassica carinata*)	Flea beetles (early season)	-	400 mL
	Cutworm	500 mL	-
	Flea beetles	1300 mL	-

Application Information:
For use only in commercial seed treatment facilities with closed transfer systems. This product contains no colourant. An appropriate colourant must be added when this product is applied. Regulations pertaining to the *Seeds Act* must be strictly adhered to when using this product. Seed must be conspicuously coloured at the time of treatment.

How it Works:
Cyantraniliprole is an insecticide belonging to the chemical class of diamides. Sulfoxaflor belongs to Group 4C insecticides. For more information, please consult with the product label.

Tank Mixes:
Please refer to the product label.

Restrictions:
- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information. DO NOT make any subsequent application of a Group 4 insecticide (e.g. in-furrow or foliar application) following treatment with *Rascendo*.
- **Labelling:** Treated seed must be labelled "This seed has been treated with sulfoxaflor and cyantraniliprole insecticides. DO NOT use for food, feed or oil purposes. Store away from feeds and foodstuffs. When handling treated seed, including planting, wear a long-sleeved shirt, long pants, chemical-resistant gloves, work boots and socks, and use closed-cab planting equipment. Chemical-resistance gloves are not required inside cab. For good hygiene practice, it is also recommended to wear a suitable dust mask during all job activities."
- **Grazing:** No restrictions listed.
- **Re-cropping:** DO NOT plant any crop other than barley, wheat or members of Crop Group 1 (root and tuber vegetables), Crop Group 5 (Brassica leafy vegetables) or Crop Subgroup 20A (canola/rapeseed subgroup) within 30 days to fields in which treated seeds were planted.
- **Storage:** Store in a well-ventilated, secure area. Avoid contamination of feed and foodstuffs. Ideal storage temperature is above freezing and below 30°C. Repeated freeze-thawing will not affect the physical integrity of the product. If the product should freeze, bring the product back to room temperature and ensure the contents are mixed well prior to application.

- **Environment:** DO NOT apply this product directly to freshwater habitats, estuaries or marine habitats. The use of this chemical may result in contamination of groundwater particularly in areas where soils are permeable and/or the depth of the water table is shallow. DO NOT contaminate irrigation or drinking water supplied or aquatic habitats by cleaning or equipment or disposal of wastes. Toxic to bees exposed to direct treatment, when used as a seed treatment according to label directions risk is not of concern. Any spilled or exposed seeds must be incorporated into the soil or otherwise cleaned-up from the soil surface.

Hazard Rating:

Rascendo:

None listed.

Fortenza:

Caution – Eye Irritant

Refer to the introduction for an explanation of the symbols.

General Storage Disinfectant

Company:

Ag-Services Inc. (PCP#14957)

Distributed by JEM Holdings Inc. in Saskatchewan and by White Potato Services Ltd. in Manitoba

Formulation:

10% n-Alkyl (40% C12, 50% C14, 10% C16) dimethyl benzyl ammonium chloride, formulated as a liquid.

- Container sizes - 4 to 200 L

Crops:

Use for disinfecting potato storages and other storage areas and equipment. Not for direct use on potatoes.

Diseases:

Control of bacterial ring rot in potato storage.

Rate:

60 mL per 10 L water.

Application Information:

Apply only when storage areas are empty. To disinfect hard non-porous walls and floors of potato storages, clean surfaces thoroughly with a broom or vacuum to remove all dirt and debris. Clean thoroughly with solution containing 60 mL in 10 L of water. Ensure surfaces and material are thoroughly saturated and remain wet for 10 minutes.

A solution of the same strength (60 mL in 10 L of water) can be used to disinfect used bags, potato planters and other machinery after all dirt has been removed. Ensure surfaces and material are thoroughly soaked and remain wet for 20 minutes.

Equipment: All handling and planting equipment should be cleaned and treated on a regular basis (daily when preparing seed and seed pieces). Treat equipment by mopping and brushing methods. Use 60 mL of disinfectant diluted in 10 L of water or 600 mL to 100 L drum. Ensure hard, non-porous surfaces are thoroughly saturated and remain wet for 10 minutes and all other items for 20 minutes.

Storage walls and ceilings: Use 600 mL of disinfectant in 100 L of water. Spray areas using a high pressure jet (up to 4250 kPa pressure) to penetrate cracks, etc. in floors. Spray A frames and other storage air ducts with a solution of 1.2 L per 100 L of water. Sub-surface air ducts, flumes and plenums should be thoroughly cleaned prior to disinfection. Use 60 mL of disinfectant diluted in 10 L of water or 600 mL to 100 L drum. Ensure hard, non-porous surfaces are thoroughly saturated and remain wet for 10 minutes and all other items for 20 minutes.

Tank Mixes:

DO NOT mix with soaps, detergents, foaming agents or surfactants.

Hazard Rating:

Caution – Corrosive

Other precaution: Corrosive, causes severe eye and skin damage. DO NOT get in eyes, on skin or on clothing. Avoid contamination of food. DO NOT breathe mist of diluted chemical created from pressure washer applications. Wear suitable protective clothing (gloves, goggles, rubber boots, wet suit, mist respirator) when using pressure washer system. Wear chemical-resistant gloves, long pants, a long-sleeved shirt and shoes when handling this concentrate.

Refer to the Introduction for an explanation of the symbols.

Heads Up Plant Protectant

Fungicide Group NC

Company:
Heads Up Plant Protectants, Inc. (PCP#29827)

Formulation:
63.02% saponins of *Chenopodium quinoa* formulated as a soluble powder.
- Container size - 50 g pouches

Crops and Diseases:

Crop	Diseases Suppressed
Potato (cut or whole tubers)	Rhizoctonia canker and black scurf *(Rhizoctonia solani)*
Soybean	Root rot and post-emergence damping-off *(Rhizoctonia solani)*, white mould *(Sclerotinia sclerotiorum)*, sudden death syndrome *(SDS) (Fusarium virguliforme)*
Dry bean	White mould *(Sclerotinia sclerotiorum)*, root rot and post-emergence damping-off *(Rhizoctonia solani)*

Rate Information:
Mix 1 gram of product per 1 L of water. Apply 1 L of solution for every 100 to 264 kg of potato seed. For soybeans and dry beans mix 50 g package to 3 L of water. Each 37 mL of solution treats 100 kg of seed.

Application Information:
Treat soybean or dry bean seed by dipping, spraying or dribbling the solution into a rotation auger conveyor or some other approved seed treatment device. Spray application to seeds within an enclosed spray device to ensure thorough coverage.

For seed potatoes, product must be applied to germination seed potatoes, as indicated by obvious sprouting activity coming from potato eyes. This sprouting activity can be from peeking to full sprout length, but before green leaves appear.

How it Works:
The active ingredient saponins of *Chenopodium quinoa* is made from plant sources. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:
None listed.

Restrictions:
- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Labelling:** No restrictions listed.
- **Grazing:** No restrictions listed.
- **Re-cropping:** No restrictions listed.
- **Storage:** Store this product away from food or feed. Store above -12°C.
- **Environment:** DO NOT contaminate irrigation or drinking water supplies or aquatic habitats. This product is toxic to aquatic organisms.

Hazard Rating:
Caution – Poison

Refer to the Introduction for an explanation of the symbols.

Helix Vibrance

Available to commercial seed treaters only.

Fungicide Group 3, 4, 12, 7
Insecticide Group 4A

Company:
Syngenta Canada Inc. (PCP#31454)

Formulation:
269 g/L thiamethoxam, 16 g/L difenoconazole, 5 g/L metalaxyl-M and S isomer, 1.7 g/L fludioxonil, and 3.4 g/L sedaxane formulated as a suspension.

- Container sizes - 105 L to bulk

Crops, Diseases, Insects and Rates:

Crop	Diseases Controlled	Insects Controlled	Rate (per 100 kg of seed)
Canola, rapeseed, and mustard (both oilseed and condiment types, including *Brassica carinata*)	Seed-borne blackleg *(Leptosphaeria maculans)*, seed-borne Alternaria (*Alternaria* spp.), seedling disease complex (damping-off, seedling blight, seed rot, root rot) (*Pythium* spp., *Fusarium* spp., *Rhizoctonia* spp.)	Flea beetles (early-season)	1500 mL

Application Information:
For use only in commercial seed treatment facilities with closed transfer systems. *Helix Vibrance* is a premix formulation that includes a pigment. However, users are responsible for ensuring that the treated seed, when dried and ready for bagging, has an unnatural colour. If the pigment contained in the formulation does not colour the seed adequately, or to optimize seed coverage, water, additional colourant and polymers can be added to facilitate application. Use standard commercial seed treatment equipment that provides uniform seed coverage to ensure desired level of insect or disease control. Maintain constant product agitation during the seed treatment process. Allow the seed to dry before bagging. Treatment of highly mechanically scarred or damaged seed, or seed known to be of low vigour and poor quality, may result in reduced germination and/or reduction of seed and seedling vigour.

How it Works:
The active ingredient thiamethoxam is a systemic insecticide from the neonicotinoid chemical class. For more information refer to "Insecticide Groups Based" on Modes of Action in the Insect Control section. The active ingredient difenoconazole is a triazole fungicide with broad-spectrum systemic activity. The active ingredient metalaxyl-M is an acylalanine fungicide with systemic activity against diseases caused by the Oomycetes class, including Pythium damping off. The active ingredient fludioxonil is a phenylpyrrole chemistry and has contact activity. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:
None listed.

Restrictions:
- **Resistance management:** Refer to Pathogen Resistance in the Plant Disease Control section for more information.. DO NOT make any subsequent application of a Group 4 insecticide (e.g. in-furrow or foliar application) following treatment with *Helix Vibrance*.
- **Labelling:** Treated seed must be labelled "This seed has been treated with *Helix Vibrance* which contains insecticide (thiamethoxam) and fungicides (difenoconazole, metalaxyl-M and S-isomer, fludioxonil, and sedaxane). Wear long- sleeve shirt, long pants, and chemical-resistant gloves when handling treated seed. DO NOT use for food, feed or oil processing. Store away from food and feed.
- **Grazing:** DO NOT graze or feed livestock on treated areas.
- **Re-cropping:** DO NOT plant any crop other than those on the *Helix Vibrance* or *Vibrance 500FS* labels within 60 days to fields in which seed treated with *Helix Vibrance* were planted.
- **Storage:** Store in a well-ventilated, secure area. Store away from food and feed. Ideal storage temperature is above freezing and below 30°C. Repeated freeze-thawing will not affect the physical integrity of the product. If the product should freeze, bring the product back to room temperature and ensure the contents are mixed well prior to application. Lab and field studies have shown that *Helix Vibrance* treated canola and mustard can be safely stored for 18 months without loss in germination or insect and disease performance. However, due to seed quality and seed storage conditions beyond the control of Syngenta Canada Inc., no claims are made to guarantee the germination of carry-over seed or propagating materials for all crop seed.

- **Environment:** TOXIC to bees, aquatic organisms, birds, and small mammals. Bees can be exposed to product residues in flowers, leaves, pollen and/or nectar resulting from seed treatment applications. Any spilled or exposed seeds must be incorporated into the soil or cleaned up. DO NOT apply directly to water, or to areas where surface water is present. In cleaning of equipment or disposing of wastes, DO NOT contaminate water used for human or animal consumption or by wildlife and aquatic life or for irrigation purposes. If treated seed is spilled outdoors, promptly clean up.

Hazard Rating:

Caution – Poison

Refer to the Introduction for an explanation of the symbols.

Imidacloprid

Sombrero 600 FS/Stress Shield 600

Insecticide Group 4A

Company:

Bayer (*Stress Shield 600 Seed Treatment* – PCP#30668)
ADAMA Canada (*Sombrero 600FS* – PCP#30505)

Formulations:

Sombrero 600 FS and *Stress Shield 600*: 600 g/L imidacloprid. Contains insecticide only.

Crops, Insects and Rates:

Product	Crop	Insects Controlled	Rate
Sombrero 600 FS[1] *Stress shield 600*[1]	Wheat, barley, oat[2]	Wireworms	17 to 50 mL/100 kg of seed
	Soybean[3]	Seedcorn maggot, wireworms, soybean aphid	104 to 208 mL/100 kg seed
Sombrero 600 FS[1]	Canola, mustard (condiment-type only) and rapeseed	Flea beetles	667 to 1333 mL/100 kg seed
	Corn	Wireworms	21.3 mL product/80,000 seeds
Stress shield 600[1]	Dry bean	Wireworms	104 mL/100 kg seed
	Field pea	Wireworms	104 mL/100 kg seed
		Pea leaf weevil	104 to 208 mL/100 kg seed
	Faba bean	Pea leaf weevil, wireworms	104 mL/100 kg seed
	Chickpea, lentil	Wireworms	104 mL/100 kg seed

[1] DO NOT apply any subsequent applications of Group 4 Insecticide (e.g. in-furrow or foliar application) following treatment with *Sombrero 600 FS* or *Stress Shield 600*.
[2] For fields with a history of moderate to high wireworm pressure, treat crops 34 to 50 mL per 100 kg seed. Use the higher rate when infestation pressures are expected to be heavy.
[3] Use the higher rate for earlier seeding or when insect populations are expected to be high in soybean and peas and for extended control period for aphids in soybean.

Application Information:

May be applied when potato pieces are being cut. Apply specified dosage as a diluted spray onto seed-pieces using a shielded spray system that is well contained and will prevent the loss of any liquid. DO NOT dilute *Sombrero 600 FS* beyond 6 percent. Agitate or stir spray solution as needed. Complete coverage of the seed piece is required for optimal insect control. As part of the seed cutting and treating process, application of a fungicide registered for potato seed treatment or an inert absorbent ingredient is recommended. Apply *Stress Shield 600* through a slurry applicator seed treater for uniform seed coverage. Allow seeds to dry before bagging or storing in bulk containers.

NOTE: A colourant must be added to *Sombrero 600 FS* and *Stress Shield 600* to colour seed in accordance with the *Pest Control Products Act* and the *Seeds Act Regulations*. A blue colourant must be added when this product is applied to an oilseed.

How it Works:

Imidacloprid is a chloronicotinyl insecticide with systemic activity. Refer to "Insecticide Groups Based on Modes of Action"in the Insect Control section for more information.

Tank Mixes:

Stress Shield 600 is registered for tank mix with the fungicide seed treatments *Raxil PRO*, or *EverGol Energy* in cereals. *Stress Shield 600* is registered for tank mix with fungicide seed treatments *Allegiance, EverGol Energy*, or *Apron Maxx RTA* in pulses.

Off-label tank mixes, as previously permitted under the Pest Management Regulatory Agency (PMRA) Off-label Tank Mix Policy memo of 2009 are no longer allowed under new guidance from PMRA. As of December 20, 2022 only products specifically indicated on product labels may be mixed, or when the labels of two or more products to be mixed include the statement quoted in the Introduction.

Follow the label directions for each product and use the most restrictive precautions and limitations for either product.

Restrictions:

NOTE: When using a seed flow lubricant for planting corn and soybean seed treated with neonicotinoid insecticides (containing the active ingredients clothianidin, imidacloprid or thiamethoxam), use only a dust-reducing fluency agent. Talc and graphite are not permitted.

- **Labelling:** All bags containing *Sombrero 600 FS/Stress Shield 600*-treated seed must be labeled or tagged as followed: "This seed has been treated with *Sombrero 600 FS/Stress Shield 600*, which contains imidacloprid. DO NOT use for feed, food, or oil processing. Store away from feeds and other foodstuffs"."
- **Grazing:** Cover crops that are used as a rotational crop without a plant-back interval following treatment should not be grazed or harvested for food or feed. DO NOT graze or feed livestock on areas treated with *Sombrero 600 FS* and *Stress Shield 600* for four weeks after planting. Mustard greens grown or harvested from *Sombrero 600 FS*-treated seed must not be used for human consumption.
- **Re-cropping:** Use a minimum plant-back interval of 30 days for cereals, 9 months for peas and beans, and 12 months for all other food and feed crops. Green manure and other cover crops not intended for human or animal consumption do not require a plant-back interval following treatment. DO NOT graze or harvest cover crops for food or feed. It is not recommended that this product be used in fields treated with imidacloprid during the previous season.
- **Storage:** Store product in cool, dry place and in such a manner as to prevent cross contamination with other pesticides, fertilizers, food and feed. Store in original container and out of reach of children. Carry-over of *Sombrero 600 FS*-treated seed is not recommended (treated canola, rapeseed or mustard (condiment-type only) seed stored for periods in excess of 6 months may decrease at a faster rate than untreated seed). Test seed germination if stored for more than 6 months. DO NOT store *Sombrero 600 FS*-treated seed above 25°C or in direct sunlight. DO NOT store *Stress Shield 600* in direct sunlight or above 35°C.
- **Environment:** DO NOT plant treated seed pieces when rainfall is forecast for the next 48 hours. DO NOT plant treated seed pieces within 15 metres of well-head or aquatic systems, including marshes, ponds, ditches, streams, lakes, etc. This product is toxic to wildlife. Keep out of lakes, streams, ponds, or other aquatic systems. DO NOT contaminate water when disposing of equipment wash waters. Leftover treated seed should be double sown around the headland, or buried away from water sources such as lakes, streams, ponds or other aquatic systems. *Stress Shield 600* spillage and exposed treated seeds must be incorporated into the soil or otherwise cleaned-up from the soil surface.

Hazard Rating:

Caution – Poison

Refer to the Introduction for an explanation of the symbols.

Insure Cereal FX4

Fungicide Group 3, 4, 7, 11

Company:
BASF Canada (PCP#33210)

Formulation:
16.7 g/L pyraclostrobin, 8.35 g/L fluxapyroxad, 16.7 g/L triticonazole, 10 g/L metalaxyl formulated as a liquid suspension.

- Container sizes - 2 x 9.8 L jug, 120 L drum, 450 L tote

Crops, Diseases and Rates:

Crop	Diseases Controlled	Diseases Suppressed	Rate per 100 kg of seed
Barley	Seed rots and pre-emergence damping-off (*Fusarium* spp., R*hizoctonia solani, Cochliobolus sativus, Pythium* spp.); post-emergence damping-off (*Fusarium* spp, *Rhizoctonia solani, Pythium* spp.); seedling blight and root rot (*Fusarium* spp., *Rhizoctonia solani, Pythium* spp.), true loose smut (*Ustilago nuda*); covered smut (*Ustilago hordei*), false loose smut (*Ustilago nigra*)	Seedling blight and root rot (*Cochliobolus sativus*): fusarium crown and root rot (*Fusarium* spp.)	300 mL
Canaryseed, annual canarygrass grown for human consumption	Seed rots and pre-emergence damping-off (*Fusarium* spp., *Rhizoctonia solani, Cochliobolus sativus, Pythium* spp.); post-emergence damping-off (*Fusarium* spp., *Rhizoctonia solani, Pythium* spp.); seedling blight and root rot (*Fusarium* spp., *Rhizoctonia solani, Pythium* spp.)		
Oats	Seed rots and pre-emergence damping-off (*Fusarium* spp., *Rhizoctonia solani*, *Cochliobolus sativus, Pythium* spp.); post-emergence damping-off (*Pythium* spp.); seedling blight and root rot (*Fusarium* spp., *Rhizoctonia solani*, *Pythium* spp.); loose smut (*Ustilago avenae*); covered smut (*U. kolleri*)		
Wheat, rye, triticale	Seed rots and pre-emergence damping-off (*Fusarium* spp., *Rhizoctonia solani*, *Cochliobolus sativus, Pythium* spp.); post-emergence damping-off (*Pythium* spp.); seedling blight and root rot (*Fusarium* spp., *Rhizoctonia solani*, *Pythium* spp.); loose smut (*Ustilago tritici*); common bunt (*Tilletia, tritici, T. laevis*)		

Application Information:
Insure Cereal FX4 is a ready-to-use broad spectrum fungicide seed treatment in a waterbased formulation that provides preventive seed and seedling protection. For use on farm and on closed transfer commercial seed treatment facilities. Closed transfer includes closed mixing, loading, calibrating and closed treatment equipment.

Apply *Insure Cereal FX4* using standard slurry, gravity flow or mist-type seed treatment application equipment. Agitate or shake well prior to use. Thorough seed coverage will offer the best protection of the seed from seed-, soil-borne, and seedling diseases. When used at the recommended rate of 300 mL per 100 kg seed, no additional dyes or dilutions with water are needed unless recommended by the manufacturer of the seed treatment application equipment/machines. If so, increase the use rate proportionally to the dilution rate (e.g. add 100 mL of water to 300 mL of *Insure Cereal FX4*, then apply at 400 mL per 100 kg seed). Please consult the seed treatment application equipment manufacturer in question for further directions.

How it Works:
Pyraclostrobin is a strobilurin fungicide with systemic broad spectrum activity against seed and soil borne diseases. It inhibits fungal metabolism by blocking mitochondrial respiration. Fluxapyroxad is a carboximide fungicide that provides systemic broad-spectrum protection against seed- and soil-borne diseases. Triticonazole is a triazole based fungicide that provides systemic broad spectrum protection against seed and soil borne diseases. Metalaxyl is an acylanine fungicide with systemic activity against diseases caused by Oomycete fungi, most commonly known as *Pythium*.

Tank Mixes:
None listed.

Restrictions:

- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Labelling:** Treated seed must be labelled as follows "This seed has been treated with *Insure Cereal FX4* containing fungicides pyraclostrobin, fluxapyroxad, triticonazole and metalaxyl. Workers handling or planting treated seed must wear long-sleeved shirt, long pants, chemical-resistant gloves, shoes and socks. Workers handling treated seed should wear suitable dust mask. DO NOT use for food, feed or oil processing. Store away from feed and food stuff. Any spilled or exposed seeds must be incorporated into the soil or otherwise cleaned-up from the soil surface."
- **Grazing:** No restrictions listed.
- **Re-cropping:** No restrictions listed.
- **Storage:** Store in original tightly closed container and the ideal storage temperature is above freezing and below 30°C. If *Insure Cereal FX4* freezes, bring to room temperature and agitate prior to use. To prevent contamination, store this product away from food and feed. Store in cool, dry, locked, well-ventilated area without floor drain.
- **Environment:** Ensure proper soil incorporation of the seeds. DO NOT feed treated seed to, or otherwise expose, wildlife or domestic birds. If treated seed is spilled outdoors or in areas accessible to birds, promptly clean up or bury to prevent ingestion. Ensure proper disposal of any surplus treated seed not intended for later planting. DO NOT contaminate domestic or irrigation water supplies, lakes, streams, ponds or any body of water with the chemical, used containers, treated seed or bags, which have held treated seed. DO NOT contaminate water by cleaning of equipment or disposal of wastes. Unused or leftover treated seed should not be stored where there is a chance of it becoming mixed with untreated seed.

  Toxic to aquatic organisms. The use of this product may result in contamination of groundwater particularly in areas where soils are permeable (e.g. sandy soil) or the water table is shallow. To reduce runoff from treated areas into aquatic habitats, consider the characteristics and conditions of the site before treatment. Site characteristics and conditions that may lead to runoff include, but are not limited to, heavy rainfall, moderate to steep slope, bare soil, poorly draining soil (e.g. compacted or fine-textured soils such as clay). Avoid application of this product when heavy rain is forecast.

Hazard Rating:

Caution – Poison

Caution – Eye Irritant and Potential Skin Sensitizer

Warning – Contains the Allergen Soy

Refer to the Introduction for an explanation of the symbols.

Insure Pulse

Fungicide Group 4, 7, 11

Company:

BASF Canada (PCP#32011)

Formulation:

16.7 g/L pyraclostrobin, 16.7 g/L fluxapyroxad and 13.3 g/L metalaxyl formulated as a liquid flowable.

- Container sizes - 9.8 L, 120 L drum, 450 L tote

Crops, Diseases and Rates:

Crops	Diseases controlled	Diseases suppressed	Rates per 100 kg of seed
Chickpea, dry bean, faba bean, field pea, lentil, soybean	Seed rot and seedling blight (soil-borne *Fusarium* spp.); seed rot, seedling blight and root rot (soil-borne *Rhizoctonia solani*); seed rot and seedling blight (soil-borne *Pythium* spp.); seedling blight (seed-borne *Ascochyta* spp.)	Anthracnose seedling blight (seed-borne *Colletotrichum lindemuthianum*); root rot (soil-borne *Fusarium* spp.); seed rot and seedling blight (seed-borne *Botrytis cinerea*)	300 mL
Flax	Seed rot, seedling blight and root rot (soil-borne *Fusarium* spp.; soil-borne *Rhizoctonia solani*)	-	300 to 600* mL

Crops	Diseases controlled	Diseases suppressed	Rates per 100 kg of seed
Mustard	Seed rot, seedling blight and root rot (soil-borne *Fusarium* spp.; soil-borne *Rhizoctonia solani,* soil-borne *Leptosphaeria maculans***); seed rot and seedling blight (soil-borne *Pythium* spp.); seedling blight and root rot (*Alternaria brassicae***)	-	600 mL

*** Use the lower rate under normal field conditions. Use the higher rate if there is a history of high disease pressures in the field OR where field conditions favour seed and soil-borne pathogens.**
****For control on crops that are members of the Brassicaceae family only (e.g. *Brassica* sp.).**

Application Information:

A ready-to-use seed treatment formulation for use in commercial seed treatment plants and for use in on-farm standard gravity flow or mist type treatment machines. Can also be used in "On the Go" air seeder treatment systems. When used at the recommended rate of 300 mL per 100 kg seed, no additional dyes or dilutions with water are needed unless recommended by the manufacturer of the seed treatment application equipment.

NOTE: If using the 600 mL per 100 kg rate (flax), it is highly recommended that the seed be treated into a bin or truck box to allow the treated seed to dry prior to placing into the seeder hopper. This will prevent clumping and bridging in the seeder.

How it Works:

The active ingredient pyraclostrobin is a strobilurin fungicide with broad spectrum contact and systemic activity. Fluxapyroxad is a carboximide fungicide that provides systemic broad spectrum protection. Metalaxyl is an acylalanines fungicide with systemic activity. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:

None listed.

Restrictions:

- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Labelling:** Treated seed must be labeled "This seed has been treated with *Insure Pulse* containing pyraclostrobin, fluxapyroxad and metalaxyl. DO NOT use for food, feed or oil processing."
- **Grazing:** DO NOT graze or feed livestock on treated areas for 4 weeks after planting.
- **Re-cropping:** No restrictions listed.
- **Storage:** Store treated seed in cool, dry, locked, well-ventilated area without a floor drain. Store in original tightly closed container and prevent freezing.
- **Environment:** Toxic to birds and wildlife. Ensure proper soil incorporation of the seeds. If treated seed is spilled outdoors or in areas accessible to birds, promptly clean up or bury to prevent ingestion. Ensure proper disposal of any surplus treated seed not intended for later planting. DO NOT contaminate domestic or irrigation water supplies, lakes, streams, ponds or any body of water with the chemical, used containers, treated seed or bags that have held treated seed. DO NOT contaminate water by cleaning of equipment or disposal of wastes. The use of this chemical may result in contamination of groundwater, particularly in areas where soils are permeable (e.g. sandy soil) and/or the depth to the water table is shallow.

Hazard Rating:

Warning – Contains the Allergen Soy

Caution – Skin Irritant

Refer to the Introduction for an explanation of the symbols.

Intego Suite Cereals OF

Fungicide Group 7

Company:
Valent Canada distributed by Nufarm Agriculture (PCP#34326)

Formulation:
10L, 110L drum. Formulated as a suspension.

Active Ingredient(s)	Guarantee	Resistance Group
Metalaxyl	8.82 g/L	4
Ethaboxam	14.7 g/L	22
Metconazole	4.41 g/L	3
Clothianidin	29.5 g/L	4

Crops, Diseases and Rates:

Crop	Diseases Controlled	Diseases Suppressed	Insects Suppressed	Rate (per 100 kg of seed)
Wheat	Early season seed rot/pre-emergence damping-off caused by *Fusarium spp*. and *Rhizoctonia solani* Early season seed rot/pre-emergence damping-off, post-emergence damping-off, seedling blight and seedling root rot caused by *Pythium spp*. Common bunt (*Tilletia laevis*) Loose smut (*Ustilago tritici*)	Common root rot (*Cochliobolus sativus*)	Wireworms*	339 ml

Application Information:
For use with closed transfer commercial seed treaters (facilities and mobile treaters). Closed transfer includes closed mixing, loading, calibrating, and closed treatment equipment. Also, for use in on-farm treatment of wheat with open or closed transfer equipment.

Tank Mixes:
For control of wireworm, apply NipsIt INSIDE 600 Insecticide at 17-83 mL/100 kg seed.

Restrictions:
- Labelling: Treated seed must be labeled "This seed has been treated with a product containing the active ingredient clothianidin, ethaboxam, metalaxyl, and metconazole. DO NOT use treated seed for feed, food or oil processing. Store away from feeds and other foodstuffs. Wear long-sleeved shirt, long pants and chemical-resistant gloves when handling treated seed. This product is toxic to aquatic invertebrates, oysters and shrimp. Dispose of all excess treated seed. Left over treated seed may be double-sown around the headland or buried away from water sources in accordance with local requirements. Dispose of seed packaging in accordance with local requirements. Cover or incorporate spilled treated seeds."
- Grazing: Do not graze or feed livestock on treated areas for 4 weeks after planting.
- Re-cropping: Corn, canola, rapeseed and wheat may be replanted at any time.
- Storage: Store in a cool place, out of direct sunlight. Protect from freezing temperatures.
- Environmental Restrictions: Toxic to aquatic organisms and bees.

Hazard Rating:
Warning – Poison

INTEGO Solo Fungicide

Fungicide Group 22

Company:
Valent Canada Inc. distributed by Nufarm Agriculture (PCP#31324)

Formulation:
383 g/L ethaboxam formulated as a suspension.
- Container size - 3.78 L

Crops, Diseases and Rates:

Crop	Diseases Controlled	Diseases Suppressed	Rate (per 100 kg of seed):
Barley, oats, rye, triticale, wheat, buckwheat, millet (pearl, proso)	Seed rot/pre-emergence damping-off (*Pythium* spp.)	-	13 to 17 mL
Corn (sweet, field, popcorn)	Seed rot/pre-emergence damping-off (*Pythium* spp.)	-	13 to 19.6 mL
Chickpea	Seed rot/pre-emergence damping-off (*Pythium* spp.)	-	19.6 to 39.1 mL
Dry bean, faba bean, lentil, field pea	Seed rot/pre-emergence damping-off (*Pythium* spp.)	Early-season root rot *(Aphanomyces euteiches)*	19.6 to 39.1 mL
Soybean	Seed rot/pre-emergence damping-off (*Pythium* spp.), early-season root rot *(Phytophthora sojae)*	-	19.6 to 39.1 mL
Canola, rapeseed, Ethiopian mustard *(Brassica carinata)*, flax, mustard (all types), camelina, borage	Seed rot/pre-emergence damping-off (*Pythium* spp.)	-	13 to 19.6 mL
Sunflower	Seed rot/pre-emergence damping-off (*Pythium* spp.), seed-borne downy mildew *(Plasmopara halstedii)*	-	402 to 603 mL
Safflower	Seed rot/pre-emergence damping-off (*Pythium* spp.)	-	402 to 603 mL

Application Information:
For use with closed transfer commercial seed treaters (facilities and mobile treaters). Closed transfer includes closed mixing, loading, calibrating, and closed treatment equipment. Also for use in on-farm treatment of cereal grains (except corn) and pulse crops only with open or closed transfer equipment. This product contains no colourant. An appropriate colourant must be added when the product is applied to the seed.

How it Works:
The active ingredient ethaboxam is a benzamide fungicide with activity against diseases caused by oomycetes. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:
Off-label tank mixes, as previously permitted under the Pest Management Regulatory Agency (PMRA) Off-label Tank Mix Policy memo of 2009 are no longer allowed under new guidance from PMRA. As of December 20, 2022 only products specifically indicated on product labels may be mixed, or when the labels of two or more products to be mixed include the statement quoted in the Introduction.

Restrictions:
- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Labelling:** Treated seed must be labeled "This seed has been treated with a product containing the active ingredient ethaboxam. DO NOT use treated seed for feed, food or oil processing. Store away from feeds and other foodstuffs. Wear long-sleeved shirt, long pants and chemical-resistant gloves when handling treated seed. This product is toxic to aquatic invertebrates, oysters and shrimp. Dispose of all excess treated seed. Left over treated seed may be double-sown around the headland or buried away from water sources in accordance with local requirements. Dispose of seed packaging in accordance with local requirements. Cover or incorporate spilled treated seeds."
- **Grazing:** DO NOT graze field pea grown from treated seeds, or feed field pea forage or hay from such fields to livestock.
- **Re-cropping:** No restrictions listed.

- **Storage:** To prevent contamination store this product away from food or feed. Store in a cool place. DO NOT store in direct sunlight. Protect from freezing temperatures.
- **Environment:** Toxic to aquatic organisms.

Hazard Rating:
None listed.

Interest Forte

Fungicide Group 3, 4

Company:
Sharda Crop Chem distributed by UAP Canada (PCP#34196)

Formulation:
3.37% difenoconazole and 0.27% metalaxyl-M and s-isomer as a suspension.
- Container sizes - 10 L, 200 L, 500 L, 1000 L

Crops, Diseases and Rates:

Crop	Diseases Controlled	Diseases Suppressed	Rate (per 100 kg of seed):
Barley	Seed rots caused by saprophytic organisms *Fusarium* spp., *Pythium* spp., *Penicillium* spp. and *Aspergillus* spp. Common root rot, damping-off and seedling blight caused by seed- and soil-borne *Fusarium* spp. Pythium root rot, damping-off and seedling blight caused by soil-borne *Pythium* spp. Septoria leaf blotch caused by seed-borne *Septoria passerinni*[1], covered smut (*Ustilago hordei*), false loose smut (*Ustilago avenae*)	Common root rot caused by *Cochliobolus sativus,* fusarium crown and foot rot (*Fusarium* spp.), take-all (*Gaeumannomyces graminis* var. *tritici*[2])	325 to 650 mL
Corn, buckwheat, millet (pearl and proso), sorghum	Seed rots caused by saprophytic organisms *Fusarium* spp., *Pythium* spp., *Penicillium* spp. and *Aspergillus* spp. Fusarium root rot, damping-off and seedling blight caused by seed- and soil-borne *Fusarium* spp. Pythium root rot, damping-off and seedling blight caused by soil-borne *Pythium* spp.	-	
Sweet corn, corn seed	Penicillium three-leaf dieback (*Penicillium* spp.)	-	325 mL
Oats	Seed rots caused by saprophytic organisms *Fusarium* spp., *Pythium* spp., *Penicillium* spp. and *Aspergillus* spp. Fusarium root rot, damping-off and seedling blight caused by seed- and soil-borne *Fusarium* spp. Pythium root rot, damping-off and seedling blight caused by soil-borne *Pythium* spp., covered smut (*Ustilago kolleri*), loose smut (*Ustilago avenae*)	Common root rot caused by *Cochliobolus sativus*[2]	325 to 650 mL
Rye	Seed rots caused by saprophytic organisms *Fusarium* spp., *Pythium* spp., *Penicillium* spp. and *Aspergillus* spp. Common root rot, damping-off and seedling blight caused by seed- and soil-borne *Fusarium* spp. Pythium root rot, damping-off and seedling blight caused by soil-borne *Pythium* spp., septoria leaf blotch caused by seed-borne *Septoria secalis*[1], common and dwarf bunt caused by seed- and soil-borne *Tilletia* spp.	Common root rot caused by *Cochliobolus* spp., fusarium crown and foot rot (*Fusarium* spp.), take-all (*Gaeumannomyces graminis* var. *tritici*[2])	325 to 650 mL
Triticale	Seed rots caused by saprophytic organisms *Fusarium* spp., *Pythium* spp., *Penicillium* spp. and A*spergillus* spp. Common root rot, damping-off and seedling blight caused by seed- and soil-borne F*usarium* spp. Pythium root rot, damping-off and seedling blight caused by soil-borne *Pythium* spp., loose smut (*Ustilago tritici*)		

Crop	Diseases Controlled	Diseases Suppressed	Rate (per 100 kg of seed):
Winter wheat	Seed rots caused by saprophytic organisms *Fusarium* spp., *Pythium* spp., *Penicillium* spp. and *Aspergillus* spp. Common root rot, damping-off and seedling blight caused by seed- and soil-borne *Fusarium* spp. Pythium root rot, damping-off and seedling blight caused by soil-borne *Pythium* spp. Septoria leaf blotch caused by seed-borne *Septoria tritici*[1], septoria leaf blotch (*Septoria tritici*)[1,3], common and dwarf bunt caused by seed- and soil-borne *Tilletia* spp., loose smut (*Ustilago tritici*)	Common root rot caused by *Cochliobolus* spp., fusarium crown and foot rot (*Fusarium* spp.), take-all (*Gaeumannomyces graminis* var. *tritici*[2])	325 to 650 mL
Spring wheat	Seed rots caused by saprophytic organisms *Fusarium* spp., *Pythium* spp. *Penicillium* spp. and *Aspergillus* spp. Common root rot, damping-off and seedling blight caused by seed- and soil-borne *Fusarium* spp. Pythium root rot, damping-off and seedling blight caused by soil-borne *Pythium* spp., septoria leaf blotch caused by seed-borne *Septoria tritici*[1], common bunt caused by seed-borne *Tilletia* spp.[1], loose smut (*Ustilago tritici*)		

[1] **Use the 650 mL rate for control of these diseases.**
[2] **Suppression means consistent control at a level which is not optimal but is still of commercial benefit.**
[3] **Early season foliar disease control for first 4 weeks after planting. For full season control, apply a foliar fungicide according to label directions.**

Application Information:

Interest Forte is a ready-to-use water-based formulation for use in commercial seed treatment plants, and for on-farm treatment using standard gravity flow or mist type seed treatment equipment which accurately meters and mixes a flowable seed treatment. *Interest Forte* may also be used in a treat-on-the-go air seeder. The equipment must provide uniform coverage of *Interest Forte* on the seed.

How it Works:

Difenoconazole is a triazole fungicide with broad-spectrum systemic activity. Metalaxyl is an acylalanine fungicide with systemic activity against diseases caused by the oomycetes, including pythium damping-off. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:

For the control of true loose smut (*Ustilago nuda*) in barley, mix *Interest Forte* with either *Charter*, *Raxil 250FL* or *Baytan 30*. Consult each product label for registered use rates and follow all label use instructions. Read the label directions for each product and follow the most restrictive label precautions and limitations.

Restrictions:

- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Labelling:** ALL SEED TREATED WITH THIS PRODUCT MUST BE CONSPICUOUSLY COLOURED. All containers or packages containing treated seed for sale or use in Canada must be labeled or tagged as follows: "This seed has been treated with *Interest Forte* which contains the fungicides difenoconazole and metalaxyl-M and S-isomer. DO NOT use for food, feed or oil purposes. Store away from feeds and foodstuffs. Wear long-sleeve shirt, long pants, and chemical-resistant gloves when handling treated seed. DO NOT graze, feed green forage or cut for hay within 35 days of planting of cereals. DO NOT plant any crop other than cereals within 30 days to fields in which treated seeds were planted."
- **Grazing:** DO NOT graze, feed green forage or cut for hay within 35 days of planting treated cereal grain seeds.
- **Re-cropping:** 30 days
- **Storage:** Store this product away from food or feed.
- **Environment:** Toxic to aquatic organisms. Any spilled or exposed seeds must be incorporated into the soil or otherwise cleaned-up from the soil surface.

Hazard Rating:

None listed.

Ipconazole + Metalaxyl

Cover2

Fungicide Group 3, 4

Company:

Loveland Products Canada Inc. (*Cover 2* – PCP#32950)

Formulation:

4.61 g/L ipconazole and 6.15 g/L metalaxyl formulated as a suspension.

- Container size - 2 x 10 L

Crops, Diseases and Rates:

Crop	Diseases Controlled	Diseases Suppressed	Rate (per 100 kg of seed):
Wheat	General seed rots (including those caused by saprophytic organisms such as *Penicillium* spp. and *Aspergillus* spp.); seed rot, damping off and seedling blight (*Fusarium* spp., *Rhizoctonia* spp., seed- and soil-borne *Cochliobolus sativus*); seed rot, pre-emergence damping off and seedling blight (*Pythium* spp.); loose smut (*Ustilago tritici*); common bunt (*Tilletia tritici, T. laevis*)	Common root rot (*Cochliobolus sativus*); crown and foot rot (*Fusarium* spp.)	325 mL
Barley	General seed rots (including those caused by saprophytic organisms such as *Penicillium* spp. and *Aspergillus* spp.); seed rot, damping off and seedling blight (*Fusarium* spp., *Rhizoctonia* spp., seed- and soil-borne *Cochliobolus sativus*); seed rot, pre-emergence damping off and seedling blight (*Pythium* spp.); covered smut (*Ustilago hordei*); false loose smut (*U. nigra*); leaf stripe (*Pyrenophora graminea*)		
	True loose smut (*Ustilago nuda*)		325 to 433 mL*
Oats	Loose smut (*Ustilago avenae*); covered smut (*U. kolleri*); seed rot and seedling blight (*Fusarium* spp., *Cochliobolus sativus, Aspergillus* spp., *Penicillium* spp., *Rhizoctonia* spp.); seed rot, pre-emergence damping off and seedling blight (*Pythium* spp.).	Common root rot (*Cochliobolus sativus*); crown and foot rot (*Fusarium* spp.)	325 mL
Rye	Seed rot and seedling blight (*Fusarium* spp., *Cochliobolus sativus, Aspergillus* spp., *Penicillium* spp., *Rhizoctonia* spp.); seed rot, pre-emergence damping off and seedling blight (*Pythium* spp.).		
Triticale			

***Use the higher rate for highly infected seed lots only.**

Application Information:

Cover 2 is for both commercial and for on farm application. Products may be applied utilizing mechanical, slurry or mist-type seed treating equipment provided that the equipment can be calibrated to accurately and uniformly apply the product to seed. Uniform application to seed is necessary to assure best disease protection and optimum performance.

Closed mix/load equipment must be used in commercial seed treatment facilities. In most cases, *Cover 2* is ready to use and can be applied undiluted. However, dilution with water or container rinsate may be appropriate for some types of treaters and/or treating under dry and/or hot conditions to achieve more uniform product to seed coverage. Contact your local representative or supplier for specific recommendations.

How it Works:

The active ingredient ipconazole is a demethylation inhibitor with systemic and contact activity and metalaxyl is an acylaline fungicide with systemic activity. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:

None listed.

Restrictions:

- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Labelling:** All bags containing treated seed for sale or use in Canada must be labeled as follows: "This package or bag contains seed treated with ipconazole and metalaxyl. DO NOT use treated seed for food, feed or oil processing. Store away from food and feed. Handlers of treated seed must wear long sleeved coveralls over normal work clothing, chemical resistant gloves, and shoes plus socks. Treated seed is toxic to birds and small wild mammals. Any spilled or exposed seed must be incorporated into the soil or otherwise cleaned up from the soil surface."

- **Grazing:** DO NOT graze or feed livestock on treated areas for 30 days after planting.
- **Re-cropping:** No restrictions listed.
- **Storage:** Store in original container only, away from other pesticides, fertilizer, food or feed. Store in a secure place that is temperate, dry and out of direct sunlight. Avoid excess heat. DO NOT freeze.
- **Environment:** DO NOT contaminate water used for human or animal consumption or by wildlife and aquatic life or for irrigation purposes.

Hazard Rating:

None listed.

Lumisena

Fungicide Group 49

Company:

Corteva Agriscience (PCP#33001)

Formulation:

200 g/L of oxathiapiprolin formulated as a flowable suspension.

- Container sizes - 52 L, 2 x 5.4 L

Crops, Diseases and Rates:

Crop	Diseases Controlled	Rate (per 100 kg of seed)
Soybean	Control of phytophthora seed rot/pre-emergence damping off and post emergence damping off (*Phytophthora sojae*)	37 mL
Sunflower	Control of systemic downy mildew (*Plasmopara halstedii*)	67 mL

***Use the higher rates in areas with high disease pressure, or where extended earl season control is required.**

Application Information:

Lumisena is for use in commercial seed treatment facilities only. It is not for use in on-farm treating systems such as hopper-box or slurry-box applications just prior to planting. Closed transfer includes closed mixing, loading, calibrating, and closed treatment equipment. No open transfer of *Lumisena* is permitted.

This product contains no colourant. An appropriate colourant must be added when this product is applied. Regulations pertaining to *The Seeds Act* must be strictly adhered to when using this product. Treatment of damaged seed, or seed known to be of low vigour and poor quality, may result in poor germination and/or seed and seedling vigour. In cases where seed quality is unknown, treat a small portion of the seed with *Lumisena* and confirm acceptable germination, prior to treating the entire seed lot.

Mixing instructions: Before transferring *Lumisena* from its container, thoroughly mix the contents to insure the product is homogenous. Dilute in a sufficient volume to obtain through, uniform coverage. Polymers, colourants, and other additives should be tested for compatibility and seed prior to use in combination with *Lumisena*.

How it Works:

The active ingredient oxathiapiprolin is an oxysterol binding protein homologue inhibitor with activity against diseases caused by oomycete fungi including phytophthora seed rot and downy mildew.

Tank Mixes:

None registered.

Restrictions:

- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Labelling:** All bags containing treated seed must be labelled or tagged as follows: This seed has been treated with *Lumisena* which contains oxathiapiprolin.
- **Re-cropping:** Crops and crop groups that are on this label may be planted immediately after harvest. For all legume crops except succulent peas and soybeans, a plant back interval of 180 days is required. All other crops may be planted immediately following the planting of seed treated with *Lumisena*. Seed treated with *Lumisena* may be replanted if an emergency replanting is required due to an early season crop failure.

- **Storage:** Storage product in original container away from fertilizer, food or feed. Field and laboratory tests have demonstrated that application of *Lumisena* to soybean and sunflower will not negatively affect germination. However, due to seed quality and seed storage conditions beyond the control of Corteva Agriscience, no claims are made to guarantee the germination of carry-over seed.
- **Environment:** DO NOT contaminate irrigation or drinking water supplies or aquatic habitats by cleaning of equipment or disposal of waste. Dispose of all access treated seed. Left over treated seed may be double-sown around the headland or buried away from water sources in accordance with local requirements. Dispose of seed packaging in accordance local requirements. DO NOT contaminate water bodies when disposing of plant equipment washwaters. Cover or incorporate spilled treated seed.

Hazard Rating:
None listed.

Lumivia

Insecticide Group 28

Company:
Corteva Agriscience (PCP#32154)

Formulation:
625 g/L of chlorantraniliprole formulated as a suspension.
- Container sizes - 1 L to Bulk

Crops, Diseases and Rates:

Crop	Insects Controlled	Insects Suppressed	Rate
Corn (field, sweet, pop)	Cutworms, armyworm (*Mythimna unipuncta*), wireworms, larvae of May/June beetles (junebugs)	Seedcorn maggot	64 mL/unit (80,000 seed unit)

Application Information:
Lumivia Insecticide Seed Treatment is an insecticide seed treatment for use in commercial seed treatment (facilities and mobile treaters) with closed transfer only. No open transfer is permitted. It is not for use in on farm treating systems such as hopper-box or slurry-box applications just prior to planting.

This product contains no colourant. An appropriate colourant must be added when this product is applied. Regulations pertaining to the *Seeds Act* must be strictly adhered to when using this product. Seed must be conspicuously coloured at the time of treatment.

Treatment of damaged seed, or seed known to be of low vigour and poor quality, may result in reduced germination and/or seed and seedling vigour. In cases where seed quality is unknown, treat a small portion of the seed with *Lumivia* and confirm acceptable germination, prior to treating the entire seed lot.

Dilute in a sufficient volume to obtain thorough, uniform coverage. Polymers, colourants, and other additives should be tested for compatibility and seed safety prior to use in combination with *Lumivia*.

Apply only in areas with adequate ventilation or in areas that are equipped to remove mist or dust.

DO NOT make a subsequent foliar application of any Group 28 insecticide for a minimum of 60 days after planting seed treated with *Lumivia*. If a foliar spray is required during this window, it must be made with an insecticide other than Group 28.

How it Works:
Chlorantraniliprole disrupts muscle activity in the insects, resulting in paralysis. Treated pests stop feeding quickly after initial ingestion, become lethargic and lose mobility. Refer to "Insecticide Groups Based on Modes of Action"in the Insect Control section for more information.

Tank Mixes:
Refer to the product label.

Restrictions:

- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information. For resistance management, please note that *Lumivia* contains a Group 28 insecticide. Any insect population may contain individuals naturally resistant to *Lumivia* and other Group 28 insecticides. The resistant individuals may dominate the insect population if this group of insecticides are used repeatedly in the same fields. Other resistance mechanisms that are not linked to site of action but are specific for individual chemicals, such as enhanced metabolism, may also exist. Appropriate resistance-management strategies should be followed.
    - ***To delay insecticide resistance:*** Where possible, rotate the use of *Lumivia* or other Group 28 insecticides with different groups that control the same pests in a field. Use tank mixtures with insecticides from a different group when such use is permitted. Insecticide use should be based on an IPM program that includes scouting, record keeping, and considers cultural, biological and other chemical control practices. Monitor treated pest populations for resistance development. Contact your local extension specialist or certified crop advisors for any additional pesticide resistance-management and/or IPM recommendations for the specific site and pest problems in your area. For further information or to report suspected resistance contact Production Agriscience Canada Company at 1-800-667-3852.
- **Labelling:** All bags containing treated seed must be labelled or tagged as follows: "This seed has been treated with *Lumivia Insecticide Seed Treatment* which contains chlorantraniliprole. DO NOT use for feed, food or oil processing. Store away from feeds and other foodstuffs. Wear long-sleeved shirt, long pants, chemical-resistant gloves and shoes plus socks when handling treated seed. This product is toxic to aquatic organisms. Dispose of all excess treated seed. Leftover treated seed may be double-sown around the headland or buried away from water sources in accordance with local requirements. Dispose of seed packaging in accordance with local requirements. Cover or incorporate spilled treated seeds. Toxic to birds. Any spilled or exposed seeds must be incorporated into the soil or otherwise cleaned up from the soil surface."
- **Grazing:** None listed.
- **Re-cropping:** None listed.
- **Storage:** Store product in original container only, away from other pesticides, fertilizer, food or feed. Not for use or storage in or around the home. Keep container closed. To prevent contamination, store this product away from food or feed. Field and laboratory tests have demonstrated that application of *Lumivia* to corn seed will not negatively affect germination. However, due to seed quality and seed storage conditions beyond the control of Corteva Agriscience, no claims are made to guarantee the germination of carry-over seed.
- **Environment:** This product is toxic to aquatic organisms. Residues of chlorantraniliprole are persistent and may carryover. It is recommended that any products containing chlorantraniliprole not be used in areas treated with this product during the previous season. The use of this chemical may result in contamination of groundwater particularly in areas where soils are permeable (e.g. sandy soil) and/or the depth of the water table is shallow. Dispose of all excess treated seed. Leftover treated seed may be double-sown around the headland or buried away from water sources in accordance with local requirements. Dispose of seed packaging in accordance with local requirements. Cover or incorporate spilled treated seeds. Treated seed is toxic to birds. Any spilled or exposed seeds must be incorporated into the soil or otherwise cleaned up from the soil surface. For information on disposal of unused, unwanted product, contact the manufacturer or the provincial regulatory agency. Contact the manufacturer and the provincial regulatory agency in case of a spill, and for clean-up of spills.

Hazard Rating:

None listed.

Lumivia CPL

Insecticide Group 28

Company:
Corteva Agriscience (PCP#33335)

Formulation:
625 g/L chlorantraniliprole formulated as a suspension.
- Container sizes - 4 x 3.5 L jugs per case.

Crops, Insects and Rates:

Crop	Insects Controlled	Rate per 100 kg of seed[1]
Wheat, barley, oats, rye	Cutworm, armyworm	8 to 24 mL
	Wireworms	24 to 40 mL
	Grasshoppers (suppression only)	40 mL
Dry bean, chickpea, lentil, field pea, faba bean	Cutworm, armyworm	32 to 64 mL
	Pea leaf weevil larvae	64 to 96 mL

[1] **Use higher rates in areas with high pest pressure.**

Application Information:
For use in commercial and on-farm treating facilities. This product contains no colourant. An appropriate colourant must be applied when this product is applied. Polymers, colourants and other additives must be tested for compatibility and seed safety prior to use in combination with *Lumivia CPL*.

Apply only in areas with adequate ventilation or in areas that are equipped to remove mist or dust.

Dilute in a sufficient volume to obtain thorough, uniform coverage.

Treatment of damaged seed, or seed known to be of low vigor and poor quality may result in reduced germination and/or seed and seedling vigor. If seed lot quality is not known, treat a small portion of the seed with *Lumivia CPL* and confirm acceptable germination prior to treating the entire seed lot.

How it Works:
Chlorantraniliprole disrupts muscle activity in the insects, resulting in paralysis. Treated pests stop feeding quickly after ingestion, become lethargic and lose mobility. Refer to "Insecticide Groups Based on Modes of Action"in the Insect Control section for more information.

Tank Mixes:
Lumivia CPL should be applied as a tank mix with registered fungicide seed treatments containing colourant. Follow the more stringent label precautionary measures for mixing, loading and applying stated on both product labels.

When *Lumivia CPL* is applied without a fungicide seed treatment, a colourant must be added.

Restrictions:
- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information. DO NOT make any subsequent application of a Group 28 insecticide for a minimum of 60 days after planting seed treated with *Lumivia CPL*. If a foliar spray is required during this window, it must be made with an insecticide other than Group 28.
- **Labelling:** All bags containing treated seed must be labelled or tagged as follows: "This seed has been treated with *Lumivia CPL* which contains chlorantraniliprole. DO NOT use for feed, food or oil processing, Store away from feeds and other foodstuffs. Wear long-sleeved shirt, long pants, chemical resistant gloves and shoes plus socks when planting and handling treated seed. Gloves are not required when planting with a closed cab. This product is toxic to aquatic organisms. Dispose of all excess treated seed. Left over treated seed may be double-sown around the headland or buried away from water sources in accordance with local requirements. Dispose of seed packaging in accordance with the local requirements. Cover or incorporate spilled treated seeds. Toxic to birds. Any spilled or exposed seeds must be incorporated into the soil or otherwise cleaned up from the soil surface."
- **Grazing:** None listed.
- **Re-cropping:** None listed

- **Storage:** Store product in original container only, away from other pesticides, fertilizer, food or feed. Not for use or storage in and around the home. Keep container closed. To prevent contamination, store this product away from food or feed. Field and laboratory tests have demonstrated that application of *Lumivia CPL* will not negatively affect germination. However, due to seed quality and seed storage conditions beyond the control of Corteva Agriscience, no claims are made to guarantee the germination of carry-over seed.
- **Environment:** This product is toxic to aquatic organisms. Residues of chlorantraniliprole cannot be used in areas treated with this product during the previous season. Use of this chemical may result in contamination of groundwater particularly in areas where soils are permeable (e.g. sandy soils) and/or the depth to the water table is shallow. Treated seeds is toxic to birds. Any spilled or exposed seeds must be incorporated into the soil or otherwise cleaned up from the soil surface.

Hazard Rating:
None listed.

Maxim Quattro

Fungicide Group 1, 4, 11, 12

Available to commercial seed treaters only.

Company:
Syngenta Canada Inc. (PCP#29871)

Formulation:
26.5% thiabendazole, 3.32% fludioxonil, 2.65% metalaxyl-M and S-isomer, 1.33% azoxystrobin formulated as a liquid suspension seed treatment.

- Container sizes - 5 L to bulk

Crops, Diseases and Rates:

Crop	Diseases Controlled	Rate (per 100 kg of seed)
Corn (field, pop, sweet)	Seed- and soil-borne *Pythium* spp., *Rhizoctonia* spp., *Fusarium* spp. (including *F. graminearum* and *F. verticillioides*); seed rot/pre-emergence damping-off, post-emergence damping-off, seedling blight (weakly pathogenic *Aspergillus* spp. and *Penicillium* spp.)	67 mL

Application Information:
For use by a commercial seed treater only. Mix with water to form a slurry seed treatment. Contains no colourant; an appropriate colourant must be added to slurry before treating seed. Maintain constant agitation of slurry. Allow seed to dry before bagging. Treatment of highly mechanically dam aged, poor quality or low vigour seed may result in reduced germination and/or reduced seed and seedling vigour. If seed lot quality is unknown conduct a germination test prior to treating.

How it Works:
The active ingredient thiabendazole is a benzimidazole fungicide with contact and systemic activity. The active ingredient fludioxonil is a phenylpyrrole fungicide with contact activity. The active ingredient metalaxyl-M is an acylalanine fungicide with systemic activity against diseases caused by the Oomycetes class, including pythium damping off. The active ingredient azoxystrobin is a methoxyacrylate (strobilurin) fungicide with broad spectrum activity to be used as a preventative and curative fungicide. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:
Maxim Quattro may be tank-mixed with *Cruiser 5FS*.
Follow the label directions for each product and use the most restrictive precautions and limitations for either product.

Restrictions:
- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Labelling:** Treated seed must be labelled "This seed has been treated with thiabendazole, fludioxonil, metalaxyl-M and S-isomer, and azoxystrobin. Use chemical resistant-gloves when handling treated seed. DO NOT use for food, feed or oil processing. Store away from feed and foodstuffs. DO NOT graze corn or cut for forage within 30 days of planting."
- **Grazing:** DO NOT graze or feed livestock on treated areas within 30 days of planting.
- **Re-cropping:** No restrictions listed.
- **Storage:** Store product between 0°C and 30°C. Repeated freeze-thawing of the product will not compromise its integrity. If the product should freeze, bring the product back to room temperature and ensure thorough mixing before use. Store away from food and feed. DO NOT carry over treated sweet corn to the following year.
- **Environment:** DO NOT apply directly to water, or to areas where surface water is present. In cleaning of equipment or disposing of wastes, DO NOT contaminate water used for human or animal consumption or by wildlife and aquatic life or for irrigation purposes. If treated seed is spilled outdoors, promptly clean up.

Hazard Rating:

Caution – Potential Skin Sensitizer

Refer to the Introduction for an explanation of the symbols.

Mertect SC

Fungicide Group 1

Company:

Syngenta Canada Inc. (*Mertect SC* - PCP#13975); Sharda CropChem (*Tibet 50 SC* - PCP#34386)

Formulation:

500 g/L thiabendazole formulated as a water dispersible suspension.

- Container size - 4 x 5 L

Crops and Diseases:

Post-harvest control of storage rots caused by *Fusarium, Phoma, Helminthosporium, Oospora* and *Rhizoctonia* spp. on potato.

Rate and Water Volume:

7.5 L per 170 L of water. Spray 2 L of this suspension per 1 metric tonne of potatoes.

Application Information:

Post-harvest treatment. Shake well before using. DO NOT allow suspension to stand without continuous agitation. Potatoes must rotate along conveyor line to ensure complete coverage. Prior to treating potatoes destined for export, confirm with authorities that treated potatoes will be allowed to enter importing country.

How it Works:

The active ingredient thiabendazole is a benzimidazole fungicide with systemic activity. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:

None listed.

Restrictions:

- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Labelling:** No restrictions listed.
- **Grazing:** No restrictions listed.
- **Re-cropping:** No restrictions listed.
- **Storage:** Minimum storage temperature 0°C.
- **Environment:** Toxic to aquatic organisms. DO NOT contaminate irrigation or drinking water supplies or aquatic habitats by cleaning of equipment or disposal of wastes. DO NOT discharge effluent containing this product into sewer systems, lake, streams, ponds, estuaries, oceans, and other waters.

Hazard Rating:

None listed.

Metalaxyl

Fungicide Group 4

Allegiance FL Fungicide Seed Treatment/Belmont 2.7FS/Telex Fungicide

Company:

Bayer (*Allegiance FL*– PCP#26674)
UPL AgroSolutions Canada Inc. (*Belmont 2.7 FS* – PCP#30246); Sharda CropChem (*Telex Fungicide* - PCP#34273)

Formulation:

317 g/L metalaxyl formulated as a liquid seed treatment.

- *Allegiance FL* container size - 4 x 3.79 L
- *Belmont 2.7 FS* container size - 10 L, 115 L

Crops, Diseases and Rates (for crops processed in Canada):

Crop	Disease Controlled	Application Rates[1] (per 100 kg of seed)	Water Volume (required to make up a total volume of 500 mL)
Chickpea, field pea	Seed rots and seedling blights (*Pythium* spp.)	16 to 110 mL	484 to 390 mL
Canola (rapeseed)	Seed rots and seedling blights (*Pythium* spp.)	32 to 110 mL	468 to 390 mL
Alfalfa, dry bean, clover, corn, sainfoin, vetch	Seed rots and seedling blights (*Pythium* spp.)	46 to 110 mL	454 to 390 mL
Grasses (forage)	Seed rots and seedling blights (*Pythium* spp.)	46 to 93 mL	454 to 407 mL
Soybean	Seed rots and seedling blights (*Pythium* spp.), early season Phytophthora *(Phytophthora sojae)*	46 to 93 mL	454 to 407 mL
Sunflower	Seed rots and seedling blights (*Pythium* spp.), downy mildew *(Plasmopara halstedii)*	110 to 189 mL[2]	390 to 311 mL
Low tannin lentil[3]	Seed rots and seedling blights (*Pythium* spp.)	16 mL	484 mL

[1] Use the high rate if planting into cold, wet soils, if the seed is of poor quality, or if disease pressure is expected to be high.
[2] High rate is for downy mildew control.
[3] For use on low tannin lentils destined export or seed production only.

Crops, Diseases and Rates (for crops intended for export):

Crop	Disease Controlled	Application Rates[1] (per 100 kg of seed)	Water Volume (required to make up a total volume of 500 mL)
Corn	Seed rots and seedling blights (*Pythium* spp.), downy mildew *(Sclerophthora macrospora)*	189 to 620 mL	311 to 0 mL
Pea	Seed rots and seedling blights (*Pythium* spp.), downy mildew *(Peronospora viciae)*	146 mL	354 mL
Sunflower	Seed rots and seedling blights (*Pythium* spp.), downy mildew *(Plasmopara halstedii)*	620 mL	0 mL
Wheat, barley, oats, rye, triticale[2]	Seed rots and seedling blights (*Pythium* spp.)	46 to 110 mL	454 to 390 mL
Sorghum	Seed rots and seedling blights (*Pythium* spp.)	93 to 110 mL	407 to 390 mL
	Downy mildew *(Peronosclerospora sorghi)*	189 mL	311 mL
Bird's-foot trefoil	Seed rots and seedling blights (*Pythium* spp.)	46 to 110 mL	454 to 390 mL
Low-tannin lentil	Seed rots and seedling blights (*Pythium* spp.)	16 mL	484 mL

[1] Use the high rate if planting into cold, wet soils, if the seed is of poor quality, or if disease pressure is expected to be high.
[2] Triticale is a registered crop for treatment with *Belmont 2.7 FS* only and not on triticale intended for export.

Application Information:
Mix with water to form a slurry seed treatment. Contains no colourant; an appropriate colourant must be added to slurry before treating seed. Maintain constant agitation of slurry. Allow seed to dry before bagging. Treatment of highly mechanically damaged, poor quality or low vigour seed may result in reduced germination and/or reduced seed and seedling vigour. If seed lot quality is unknown conduct a germination test prior to treating.

How it Works:
The active ingredient metalaxyl is an acylalanine fungicide with systemic activity. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:
For control of early season root rot (*Aphanomyces euteiches*) during plant emergence and early crop establishment in pea and lentil fields with low disease pressure *Belmont* can be mixed with *Rancona Trio* at a rate of 72 mL/100 kg of seed.

Restrictions:
- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Labelling:** Treated seed must be labelled as follows; "This seed has been treated with *Allegiance FL* or *Belmont 2.7 FS* seed protectant which contains metalaxyl. DO NOT use for feed, food or oil processing." All bags containing seed for export must be labelled "FOR EXPORT ONLY." *Belmont 2.7 FS* cannot be used on triticale intended for export.
- **Grazing:** DO NOT graze or feed livestock on treated areas for 4 weeks after planting.
- **Re-cropping:** No restrictions listed.
- **Storage:** DO NOT store above 35°C or below 0°C. Store in original container, away from pesticides, food or feed.
- **Environment:** Treated seed may be toxic to birds and other wildlife. Clean up any spilled seeds and ensure seed is properly incorporated at planting.

Hazard Rating:
Warning – Skin and Eye Irritant

Refer to the Introduction for an explanation of the symbols.

NipsIt INSIDE 600 Insecticide

See clothianidin.

NipsIt SUITE Cereals OF Seed Protectant

Fungicide Group 3, 4
Insecticide Group 4A

Company:
Valent Canada Inc. distributed by Nufarm Agriculture (PCP#31357)

Formulation:
30.7 g/L clothianidin, 9.24 g/L metalaxyl and 4.92 g/L metconazole formulated as a ready to use suspension.
- Container sizes - 2 x 10 L, 110 L drums

Crops, Diseases, Insects and Rates:

Crop	Diseases Controlled	Diseases Suppressed	Insects Suppressed	Rate (per 100 kg of seed)
Wheat	Early season seed rot/pre-emergence damping-off (*Fusarium* spp., *Rhizoctonia solani*); early season seed rot/ pre-emergence damping-off, post-emergence damping-off, seedling blight and seedling root rot (*Pythium* spp.); common bunt *(Tilletia laevis)*; loose smut *(Ustilago tritici)*	Common root rot *(Cochliobolus sativus)*	Wireworms*	326 mL

*** Under moderate to high wireworm pressure or in situations where control is required tank mix with *NipsIt INSIDE 600 Insecticide*.**

Application Information:
For use in commercial seed treatment facilities (with closed transfer including closed mixing, loading, calibrating, and closed treatment equipment only) and for use on-farm (open transfer including open mixing, loading, calibrating, and open treatment equipment is allowed).

How it Works:
The active ingredient clothianidin is a chloronicotinyl insecticide with systemic activity. Refer to "Insecticide Groups Based on Modes of Action"in the Insect Control section for more information.

The active ingredient metalaxyl is an acylalanine fungicide with systemic activity against diseases caused by oomycetes, including Pythium damping-off. Metconazole is a broad-spectrum triazole demethylation inhibitor (DMI) fungicide with systemic activity. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:
Off-label tank mixes, as previously permitted under the Pest Management Regulatory Agency (PMRA) Off-label Tank Mix Policy memo of 2009 are no longer allowed under new guidance from PMRA. As of December 20, 2022 only products specifically indicated on product labels may be mixed, or when the labels of two or more products to be mixed include the statement quoted in the Introduction.

Restrictions:
- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information. DO NOT apply any subsequent application of a Group 4 insecticide (in-furrow or foliar) following treatment with *NipsIt SUITE Cereals OF Seed Protectant*.
- **Labelling:** Treated seed must be labeled "This seed was treated with *NipsIt SUITE Cereals OF Seed Protectant*, which contains clothianidin, metalaxyl, and metconazole. DO NOT use treated seed for feed, food or oil processing. Store away from feeds and other foodstuffs. Wear long-sleeved shirt, long pants and chemical-resistant gloves when handling treated seed. This product is toxic to aquatic invertebrates. Dispose of all excess treated seed. Left over treated seed may be double-sown around the headland or buried away from water sources in accordance with local requirements. Cover or incorporate spilled treated seeds. A closed cab planter is required when planting treated wheat seeds."
- **Grazing:** DO NOT graze or feed livestock on treated areas for four weeks after planting.
- **Re-cropping:** Corn, canola, rapeseed, and wheat may be replanted at any time. A 35 day plant-back interval on cereal grains (except wheat), grasses, non-grass animal feeds, potato, soybeans and dry beans is required.
- **Storage:** Store in a cool place. DO NOT store in direct sunlight. Protect from freezing temperatures.
- **Environment:** Toxic to aquatic organisms. Treated seed is toxic to birds and small wild animals. Any spilled or exposed seeds must be incorporated into the soil or otherwise cleaned-up from the soil surface. Toxic to bees. Bees can be exposed to product residues in flowers, leaves, pollen and/or nectar resulting from seed treatments. The use of this product in areas where soils are permeable, particularly where the water table is shallow, may result in ground water contamination. DO NOT use to control aquatic pests. DO NOT contaminate irrigation or drinking water supplies or aquatic habitats by cleaning of equipment or disposal of wastes.

Hazard Rating:
None listed.

Phosphorous acid

Fungicide Group 33

Confine Extra/Rampart

Company:
WinField United Canada (*Confine Extra* – PCP#30648)
Loveland Products Canada (*Rampart* – PCP#30654)

Formulation:
53% mono and di-potassium salts of phosphorous acid.
- Container sizes - 9.46 to 946.35 L *(Confine Extra)*
- Container size - 9.46 L (*Rampart*)

Crops Diseases and Rates:
Confine Extra: Post-harvest treatment of potatoes for the suppression of late blight *(Phytophthora infestans)*, pink rot *(P. erythroseptica)*, and silver scurf *(Helminthosporium solani)* storage infection.

Rampart: Post-harvest treatment of potatoes for control of late blight *(Phytophthora infestans)* and pink rot *(P. erythroseptica)*.

Rate and Application Information:

For application prior to storage:

- Dilute *Confine Extra* at a 1 to 5.13 ratio with water (326 mL *Confine Extra* + 1674 mL water). Apply 2 L of solution as a spray to 1000 kg of potatoes.
- Dilute *Rampart* at a 1 to 5.26 ratio with water (190 mL *Rampart* + 1 L water). Apply 2 L of solution per 100 kg of harvested potatoes as a spray or rinse.

For application to stored potatoes (*Rampart* only):

- Dilute *Rampart* at a 1 to 5.26 ratio with water (190 mL *Rampart* + 1 L water). Apply 2 L of solution per 100 kg of stored potatoes into water used for post-harvest storage.

How it Works:

The active ingredient mono- and di-potassium salts of phosphorous acid is a phosphonate fungicide with systemic activity to suppress pathogen inoculum. To be used as a preventative fungicide application on harvested tubers.

Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:

None listed.

Restrictions:

- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Labelling:** No restrictions listed.
- **Grazing:** No restrictions listed.
- **Re-cropping:** No restrictions listed.
- **Storage:** Store this product away from food or feed.
- **Environment:** DO NOT contaminate irrigation or drinking water supplies or aquatic habitats by cleaning of equipment or disposal of waste. DO NOT apply by air.

Hazard Rating:

None listed.

Prosper EverGol Seed Treatment

Fungicide Group 4, 7, 11
Insecticide Group 4A

Available to commercial seed treaters only.

Company:

Bayer (PCP#30363)

Formulation:

Active ingredient:	
Clothianidin	290 g/L
Penflufen	10.7 g/L
Trifloxystrobin	7.15 g/L
Metalaxyl	7.15 g/L
Container size:	3.8 L to 1000 L, bulk

Crops, Insects, Diseases and Rates:

Product	Crop	Diseases Controlled	Insects Controlled	Rate (per 100 kg of seed)
Prosper EverGol	Canola, rapeseed, mustard (oilseed and condiment)	Seed rot, damping off, seedling blight and early season root rot (*Pythium* spp., *Rhizoctonia* spp., *Fusarium* spp., seed-borne *Alternaria* spp.); seed-borne blackleg *(Leptosphaeria maculans)*	Flea beetles	1400 mL

Application Information:

Prosper EverGol is for use in commercial seed treatment facilities with closed transfer systems only. Seed treatment must be thoroughly agitated to ensure uniform mixing of product prior to and during application. Treatment of highly mechanically scarred or damaged seed or seed known to be of low vigour and poor quality may result in reduced germination and/or reduction of seed and seedling vigour.

How it Works:

Clothianidin is a chloronicotinyl insecticide with systemic activity. For more information refer to "Insecticide Groups Based" on Modes of Action in the Insect Control section. Carbathiin is a carboxamide fungicide with systemic activity; penflufen is a carboxamide (SDHI) fungicide with systemic activity; trifloxystrobin is a strobilurin fungicide with broad spectrum preventative activity; and metalaxyl is an acylalanine fungicide with systemic activity. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:

None listed.

Restrictions:

NOTE: When using a seed flow lubricant for planting corn and soybean seed treated with neonicotinoid insecticides (containing the active ingredients clothianidin, imidacloprid or thiamethoxam), use only a dust-reducing fluency agent.
Talc and graphite are not permitted.

- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information. DO NOT make any subsequent application of a group 4 insecticide (in-furrow or foliar application) following treatment with any of these products.
- **Labelling:** Treated seed must be labelled as follows: "This seed has been treated with clothianidin and/or carbathiin, penflufen and metalaxyl. DO NOT use for food, feed or oil processing. Store away from feeds and other foodstuffs."
- **Grazing:** No restrictions listed.
- **Re-cropping:** For *Prosper EverGol*, corn and canola may be replanted at any time. A 1 year plant back interval is required for leafy, root and tuber vegetables. A 30 day plant back is required for cereals, grasses, nongrass animal feeds, soybeans and dry beans.
- **Storage:** Protect products from freezing. DO NOT contaminate water, food or feed by storage, disposal or by cleaning of equipment. Store in a cool place. DO NOT store in direct sunlight. Store away from food or feed. DO NOT store treated seed above 25°C or in direct sunlight. Treated seed stored for periods in excess of 9 months should be tested for germination before planting.
- **Environment:** These products are toxic to aquatic invertebrates. DO NOT apply directly to water or to areas where surface water is present. DO NOT contaminate water when disposing of equipment wash waters. These products are toxic to birds and mammals. Any spilled or exposed seeds should be incorporated into the soil or otherwise cleaned up from the soil surface.

Hazard Rating:

Warning – Poison

Refer to the Introduction for an explanation of the symbols.

Rancona Trio

Fungicide Group 3, 4, 7

Company:
UPL AgroSolutions Canada Inc. (PCP#32668)

Formulation:
5.0 g/L ipconazole, 133.33 g/L carbathiin, and 13.33 g/L metalaxyl formulated as a liquid suspension seed treatment.

- Container sizes - 10L, 115L

Crops, Diseases and Rates:

Crop	Diseases Controlled	Diseases Suppressed	Rate (per 100 kg of seed)
Barley	General seed rots (*Fusarium* spp., *Pythium* spp., *Rhizoctonia solani, Penicillium* spp., *Aspergillus* spp., *Cochliobolus sativus*); seedling blight, damping-off (*Fusarium* spp., *Pythium* spp., *R. solani, C. sativus*); true loose smut (*Ustilago nuda*); covered smut (*U. hordei*); false loose smut (*U. nigra*); leaf stripe (*Pyrenophora graminea*)	Common root rot (*Cochliobolus sativus*); Fusarium crown and foot rot (*Fusarium* spp.)	300 mL
Oats	General seed rots (*Fusarium* spp., *Pythium* spp., *Rhizoctonia solani, Penicillium* spp., *Aspergillus* spp., *Cochliobolus sativus*); seedling blight, damping-off (*Fusarium* spp., *Pythium* spp., *R. solani, C. sativus*); loose smut (*Ustilago avenae*); covered smut (*U. kolleri*)	Common root rot (*Cochliobolus sativus*); Fusarium crown and foot rot (*Fusarium* spp.)	300 mL
Rye, triticale	General seed rots (*Fusarium* spp., *Pythium* spp., *Rhizoctonia solani, Penicillium* spp., *Aspergillus* spp., *Cochliobolus sativus*); seedling blight, damping-off (*Fusarium* spp., *Pythium* spp., *R. solani, C. sativus*)	Common root rot (*Cochliobolus sativus*); Fusarium crown and foot rot (*Fusarium* spp.)	300 mL
Spring wheat, winter wheat	General seed rots (*Fusarium* spp., *Pythium* spp., *Rhizoctonia solani, Penicillium* spp., *Aspergillus* spp., *Cochliobolus sativus*); seedling blight, damping-off (*Fusarium* spp., *Pythium* spp., *R. solani, C. sativus*); loose smut (*Ustilago tritici*); common bunt (*Tilletia tritici*)	Common root rot (*Cochliobolus sativus*); Fusarium crown and foot rot (*Fusarium* spp.)	300 mL
Field pea	General seed rots (*Fusarium* spp., *Pythium* spp., *Rhizoctonia solani*, *Penicillium* spp., *Aspergillus* spp.); seedling blight, damping-off (*Fusarium* spp., *Pythium* spp., *Rhizoctonia solani*)	Seedling root rot (*Fusarium* spp.); early season root rot (*Aphanomyces euteiches*)	500 mL
Dry bean	General seed rots (*Fusarium* spp., *Rhizoctonia solani*, *Penicillium* spp., *Aspergillus* spp.); seedling blight, damping-off (*Fusarium* spp., *Rhizoctonia solani*)	Seedling root rot (*Fusarium* spp.)	500 mL
Lentil	General seed rots (*Fusarium* spp., *Pythium* spp., *Rhizoctonia solani, Penicillium* spp., *Aspergillus* spp.); seedling blight, damping-off (*Fusarium* spp., *Pythium* spp., *Rhizoctonia solani*); seed-borne Ascochyta blight (*Ascochyta lentis*)	Seedling root rot (*Fusarium* spp.)	500 mL
Chickpea	General seed rots (*Fusarium* spp., *Pythium* spp., *Rhizoctonia solani, Penicillium* spp., *Aspergillus* spp.); seedling blight, damping-off (*Fusarium* spp., *Pythium* spp., *Rhizoctonia solani*); seed-borne Ascochyta blight (*Ascochyta rabiei*)	Seedling root rot (*Fusarium* spp.)	500 mL
Soybean	General seed rots (*Fusarium* spp., *Rhizoctonia solani, Penicillium* spp., *Aspergillus* spp.); seedling blight, damping-off (*Fusarium* spp., *Rhizoctonia solani*); seedling root rot (*Rhizoctonia solani*)	Seedling root rot (*Fusarium* spp.); Sudden Death Syndrome (SDS) (*Fusarium virguliforme*)	500 mL

Application Information:

Rancona Trio is ready to use and does not need dilution prior to application. The optimum treating process and slurry composition depends on the crop, the treating process and application conditions.

How it Works:

The active ingredient ipconazole is a demethylation inhibitor with systemic and contact activity, carbathiin is a carboximide fungicide with systemic activity, and metalaxyl is an acylalanine fungicide systemic activity. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:

In dry bean and soybean, *Rancona Trio* can be mixed with *Belmont 2.7 FS* at 24 to 89 mL per 100 kg of seed for control of seed rot/pre-emergence damping-off, post-emergence damping-off, and seedling blight caused by *Pythium* spp. In soybean, *Rancona Trio* can be mixed with *Belmont 2.7 FS* at 24 to 72 mL per 100 kg of seed for control of early season root rot caused by *Phytophthora sojae*. For control of early season root rot caused by *Aphanomyces euteiches* in fields with low disease pressure, *Rancona Trio* can be tank mixed with *Intego Solo* at 20 mL/100 kg of seed in peas and lentils or with *Belmont* 2.7 FS at 72 mL/100 kg of seed in PEAS ONLY. In wheat, barley, and oats *Rancona Trio* can be tank-mixed with 17-50 mL of *Stress Shield* per 100 kg of seed for control of wireworms. In pea, *Rancona Trio* can be mixed with 104-208 mL of *Stress Shield* per 100 kg of seed for control of pea leaf weevil. In pea, dry bean, lentil, chickpea, soybean, and faba bean *Rancona Trio* can be mixed with 104 mL of *Stress Shiel*d per 100 kg of seed for control of wireworms. This tank-mix will also control potato leafhopper in dry and faba beans, pea leaf weevil in faba bean, and soybean aphid, seedcorn maggot. In wheat, barley, oat, and rye Rancona Trio can be mixed with 8-24 mL of *Lumivia CPL* for control of cutworms and armyworms and 24-40 mL of *Lumivia CPL* for control of wireworms. In pea, dry bean, lentil, chickpea, and faba bean *Rancona Trio* can be mixed with 32-64 mL of *Lumivia CPL* for control of cutworms and armyworms and 64-96 mL of *Lumivia CPL* for control of larvae of pea leaf weevil.

Restrictions:

- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Labelling:** Treated seed must be labelled as follows "This seed has been treated with *Rancona Trio Fungicide*, which contains ipconazole, carbathiin, and metalaxyl. DO NOT use for feed, food, or oil processing. Store away from feeds and other food stuffs. When planting or handling treated seeds, workers must wear a long-sleeved shirt, long pants, socks and shoes, and chemical-resistant gloves. Gloves are not required while driving the tractor. A closed-cab tractor is required when planting more than 2200 kg of treated seeds per day."
- **Grazing:** DO NOT graze or feed livestock on treated area for six weeks after planting barley, oats, or wheat. DO NOT graze or feed livestock on treated area for four weeks after planting all other crops.
- **Re-cropping:** No restrictions listed.
- **Storage:** Store this product away from food or feed. Store in original container only, away from other pesticides, fertilizer, food, or feed. DO NOT freeze. DO NOT store treated seed above 25°C or in direct sunlight.
- **Environment:** DO NOT contaminate ponds, lakes or streams. Treated seed is toxic to birds and small wild mammals. Any spilled or exposed seeds must be incorporated into the soil or otherwise cleaned-up from the soil surface.

Hazard Rating:

None listed.

Rancona V RS

Fungicide Group 3, 7

Company:
UPL AgroSolutions Canada Inc. (PCP#30217)

Formulation:
9.38 g/L ipconazole and 87.5 g/L carbathiin formulated as a liquid suspension seed treatment.
- Container sizes - 10 L, 200 L

Crops, Diseases and Rates:

Crop	Diseases Controlled	Diseases Suppressed	Rate (per 100 kg of seed)
Canola, rapeseed, mustard	Seed rot, damping off, and seedling blight (*Rhizoctonia* spp., *Fusarium* spp.); seed-borne blackleg *(Leptosphaeria maculans)*	Root rot (*Rhizoctonia* spp., *Fusarium* spp.)	800 mL

Application Information:
Rancona V RS is ready to use and may be applied to seed as purchased. However, dilution with water may help to achieve more uniform seed coverage when using some types of treaters and/or when treating under dry and/or hot conditions.

How it Works:
The active ingredient ipconazole is a demethylation inhibitor with systemic and contact activity and carbathiin is a carboximide fungicide with systemic activity. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:
None listed.

Restrictions:
- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Labelling:** Treated seed must be labelled as follows "This seed has been treated with carbathiin and ipconazole. DO NOT use treated seed for feed, food, or oil processing."
- **Grazing:** DO NOT graze or feed livestock on treated area for four weeks after planting.
- **Re-cropping:** No restrictions listed.
- **Storage:** Store this product away from food or feed.
- **Environment:** DO NOT contaminate ponds, lakes or streams.

Hazard Rating:
None listed.

Raxil PRO Seed Treatment

Fungicide Group 3, 4

Company and Formulation:
Bayer (PCP#30102), Sharda (Lixar PRO - PCP#34270)

Formulation:
3.0 g/L tebuconazole, 15.4 g/L prothioconazole and 6.2 g/L metalaxyl formulated as a micro-dispersion formulation.
- Container sizes - 10 L, 58.5 L, 175.5 L, 1000 L

Crops, Diseases and Rates:

Crop	Diseases Controlled	Diseases Suppressed	Rate (per 100 kg of seed)
Barley	Seed rot/pre-emergent damping-off, seedling blight (seed- and soil-borne *Fusarium* spp., soil-borne *Pythium* spp., *Cochliobolus sativus*, seed-borne *Aspergillus* spp.); post-emergent damping-off (seed- and soil-borne *Fusarium* spp., *C. sativus*, seed-borne *Aspergillus* spp.); true loose smut *(Ustilago nuda)*; covered smut *(U. hordei)*; false loose smut *(U. nigra)*; barley leaf stripe *(Pyrenophora graminis)*	Root rot (seed- and soil-borne *Fusarium* spp., *Cochliobolus sativus, Rhizoctonia solani)*; crown rot (*Fusarium* spp.); seedling blight (seed-borne *Penicillium* spp.); seed rot, pre-emergent damping off *(R. solani)*	325 mL
Oats	Seed rot/pre-emergent damping-off, seedling blight (seed- and soil-borne *Fusarium* spp., soil-borne *Pythium* spp., *Cochliobolus sativus*, seed-borne *Aspergillus* spp.); post-emergent damping-off (seed- and soil-borne *Fusarium* spp., *C. sativus*, seed-borne *Aspergillus* spp.); Covered smut *(Ustilago kolleri)*; loose smut *(U. avenae)*	Root rot (seed- and soil-borne *Fusarium* spp., *Cochliobolus sativus, Rhizoctonia solani)*; crown rot (*Fusarium* spp.); seedling blight (seed-borne *Penicillium* spp.); seed rot, pre-emergent damping off *(R. solani)*	325 mL
Wheat, rye, triticale	Seed rot/pre-emergent damping-off, seedling blight (seed- and soil-borne *Fusarium* spp., soil-borne *Pythium* spp., *Cochliobolus sativus*, seed-borne *Aspergillus* spp.); post-emergent damping-off (seed- and soil-borne *Fusarium* spp., *C. sativus*, seed-borne *Aspergillus* spp.); loose smut *(Ustilago tritici)*; common bunt *(Tilletia tritici, T. laevis)*	Root rot (seed- and soil-borne *Fusarium* spp., *Cochliobolus sativus, Rhizoctonia solani)*; crown rot (*Fusarium* spp.); seedling blight (seed-borne *Penicillium* spp.); seed rot, pre-emergent damping off *(R. solani)*	325 mL

Application Information:
Raxil PRO is a ready-to-use treatment formulation for use in commercial seed treatment operations and for on-farm treatment with conventional seed treating which can accurately meter, mix and apply flowable seed treatment formulations.

How it Works:
The active ingredient tebuconazole is a triazole demethylation inhibitor (DMI) fungicide with systemic activity. The active ingredient prothioconazole is a demethylation inhibitor with broad-spectrum systemic activity. The active ingredient metalaxyl is an acylalanine fungicide with systemic activity. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:
Insecticide Seed Treatment: May be mixed with *Stress Shield 600*.
Follow the label directions for each product and use the most restrictive precautions and limitations for either product.

Restrictions:
- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Labelling:** Treated seed must be labeled "This seed has been treated with *Raxil PRO*, which contains tebuconazole, prothioconazole and metalaxyl. When handling treated seed wear chemical-resistant gloves. DO NOT use for feed, food or oil processing. Store away from feeds and other foodstuffs."
- **Grazing:** No restrictions listed.
- **Re-cropping:** No restrictions listed.
- **Storage:** Store product in original container only, away from other pesticides, fertilizer, food or feed. Keep container closed. Store in a cool, dry area and avoid excessive heat.
- **Environment:** Toxic to aquatic organisms. DO NOT contaminate irrigation or drinking water supplies or aquatic habitats by cleaning of equipment or disposal of wastes. Dispose of all excess treated seed. Left over seed may be double-sown around the headland or buried away from water sources. DO NOT leave exposed treated seed on soil surface. Any spilled or exposed seeds must be incorporated into the soil or otherwise cleaned-up from the soil surface. The use of this chemical may result in contamination of groundwater particularly in areas where soils are permeable and/or the depth to the water is shallow.

Hazard Rating:

Caution – Skin Irritant

Refer to the Introduction for an explanation of the symbols.

Raxil PRO Shield Seed Treatment

Fungicide Group 3, 4
Insecticide Group 4A

Raxil PRO Shield is a co-pack of Raxil PRO (tebuconazole, prothioconazole and metalaxyl fungicides) and Stress Shield 600 *(imidacloprid insecticide). For other detailed information on the component products see the product pages listed above.*

Company:

Bayer (*Raxil PRO* – PCP#30102, *Stress Shield 600* – PCP#30668)

Formulation:

Raxil PRO: 3.0 g/L tebuconazole, 15.4 g/L prothioconazole and 6.2 g/L metalaxyl formulated as a suspension.
Stress Shield 600: 600 g/L imidacloprid formulated as a suspension.

- Container sizes - 10 L *Raxil PRO* and 1.54 L *Stress Shield 600*; 175.5 L *Raxil PRO* and 27 L *Stress Shield 600*

Crops, Diseases, Insects and Rates:

Crop	Diseases Controlled	Diseases Suppressed	Insects Controlled	Rate (per 100 kg of seed)*	
				Raxil PRO	*Stress Shield 600*
Barley	Seed rot/pre-emergent damping-off, seedling blight (seed- and soil-borne *Fusarium* spp., soil-borne *Pythium* spp., *Cochliobolus sativus*, seed-borne *Aspergillus* spp.); post-emergent damping-off (seed- and soil-borne *Fusarium* spp., *C. sativus*, seed-borne *Aspergillus* spp.); true loose smut *(Ustilago nuda)*; covered smut *(U. hordei)*; false loose smut *(U. nigra)*; barley leaf stripe *(Pyrenophora graminis)*	Root rot (seed- and soil-borne *Fusarium* spp., *Cochliobolus sativus, Rhizoctonia solani*); crown rot (*Fusarium* spp.); seedling blight (seed-borne *Penicillium* spp.); seed rot, pre-emergent damping off *(R. solani)*	Wireworm	325 mL	50 mL
Oats	Seed rot/pre-emergent damping-off, seedling blight (seed- and soil-borne *Fusarium* spp., soil-borne *Pythium* spp., *Cochliobolus sativus*, seed-borne *Aspergillus* spp.); post-emergent damping-off (seed- and soil-borne *Fusarium* spp., *C. sativus*, seed-borne *Aspergillus* spp.); Covered smut *(Ustilago kolleri)*; loose smut *(U. avenae)*	Root rot (seed- and soil-borne *Fusarium* spp., *Cochliobolus sativus, Rhizoctonia solani*); crown rot (*Fusarium* spp.); seedling blight (seed-borne *Penicillium* spp.); seed rot, pre-emergent damping off *(R. solani)*	Wireworm	325 mL	50 mL
Wheat, rye and triticale	Seed rot/pre-emergent damping-off, seedling blight (seed- and soil-borne *Fusarium* spp., soil-borne *Pythium* spp., *Cochliobolus sativus*, seed-borne *Aspergillus* spp.); post-emergent damping-off (seed- and soil-borne *Fusarium* spp., *C. sativus*, seed-borne *Aspergillus* spp.); loose smut *(Ustilago tritici)*; common bunt *(Tilletia tritici, T. laevis)*	Root rot (seed- and soil-borne *Fusarium* spp., *Cochliobolus sativus, Rhizoctonia solani*); crown rot (*Fusarium* spp.); seedling blight (seed-borne *Penicillium* spp.); seed rot, pre-emergent damping off *(R. solani)*	Wireworm	325 mL	50 mL

Hazard Rating:

Stress Shield 600: Warning – Poison

Raxil PRO: Caution – Skin Irritant

Refer to the Introduction for an explanation of the symbols.

Reason 500SC

Fungicide Group 11

Company:
Gowan (PCP#27462)

Formulation:
500 g/L fenamidone formulated as a suspension concentrate.
- Container size - 2 L

Crops, Diseases and Rates:

Crop	Diseases Controlled	Rate (per 100 kg of seed)*
Potato	Seed-borne late blight *(Phytophthora infestans)*	10 mL

Application Information:
For optimal disease control, good coverage of the seed piece is required. Apply specified dosage as a diluted spray using equipment that ensures uniform coverage of each seed piece.

Agitate or stir the slurry solution as needed. Apply only in areas with adequate ventilation or in areas that are equipped to remove spray mist or dust. It is recommended to periodically clean and sanitize all surfaces which may come in contact with cut seed-pieces (i. e. cutting machines, tables, knives, planting equipment etc.). Seed pieces must be treated immediately after cutting. DO NOT use treated seed pieces for food, feed, or fodder. As part of the seed cutting and treating process, application of an absorbent ingredient is recommended to improve suberization.

How it Works:
The active ingredient fenamidone is a strobilurin fungicide with contact activity. To be used as a preventative and inhibitive (spore germination and antisporulant) fungicide application. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:
Reason 500 SC can be tank mixed with *Titan* and *Emesto Silver Titan* or *Emesto Silver* for application as a seed-piece treatment of potato when additional disease control and/or insect control is required. Refer to the registered label of each tank mix partner for application rate, precautions and directions for use associated with those products. Follow the most restrictive label precautions and limitations.

Restrictions:
- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information. If following a seed treatment application of *Revus* with foliar applications of this product, apply a fungicide belonging to a group other than Group 40 as the first foliar application of the season. DO NOT apply more than 243 g mandipropamid per acre per year.
- **Maximum number of applications:** DO NOT exceed 6 applications, or 0.48 L per acre, of this product per season.
- **Grazing:** No restrictions listed.
- **Preharvest interval:** 14 days.
- **Re-entry:** DO NOT re-enter treated areas until residues have dried.
- **Re-cropping:** A 30 day plant-back interval is required for potato and all other crops.
- **Storage:** DO NOT allow product to freeze. If stored more than 1 year, shake well before using. Keep away from fire, open flame or other sources of heat. Store in tightly closed container away from fertilizer, seeds, feed or food
- **Environment:** For ground application, maintain an 8 m buffer zone between areas sprayed and aquatic systems. For aerial application, allow a 10 m buffer. Toxic to fish and other aquatic organisms; DO NOT apply where runoff is likely to occur.

Hazard Rating:
Caution Poison – Eye Irritant

Refer to the Introduction for an explanation of the symbols.

Revus

Fungicide Group 40

Company:
Syngenta Canada Inc. (PCP#29074)

Formulation:
250 g/L mandipropamid formulated as a suspension.
- Container size - 10 kg

Crops, Diseases and Rates:

Crop	Diseases Controlled	Diseases Suppressed	Rate (per 100 kg of seed)*
Potato	Seed-borne late blight *(Phytophthora infestans)*	Pink rot (*Phytophthora erythroseptica*)	13 to 26 mL

*** Use the higher rate when conditions favour heavy infection pressure.**

Application Information:
Apply using standard seed treating equipment that provides uniform seed coverage. Uneven or incomplete seed coverage may not get the desired level of disease control. Add sufficient water to allow for a slurry volume that will allow for sufficient coverage. Wear coveralls over long-sleeved shirt, long pants, chemical-resistant gloves, socks and boots during mixing, loading, application, clean-up and repair. When handling or planting treated potato seed pieces, workers must wear a long-sleeved shirt, long pants, gloves, socks and boots. DO NOT use open treating equipment when treating potato seed pieces. This product must be applied using a closed treatment system.

How it Works:
The active ingredient mandipropamid is a carboxylic acid amid (CAA) with contact and systemic activity. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:
None listed.

Restrictions:
- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information. If following a seed treatment application of *Revus* with foliar applications of this product, apply a fungicide belonging to a group other than Group 40 as the first foliar application of the season. DO NOT apply more than 243 g mandipropamid per acre per year.
- **Labelling:** No restrictions listed.
- **Grazing:** No restrictions listed.
- **Re-cropping:** No restrictions listed.
- **Storage:** Store in a cool, dry place away from food, beverages, and tobacco products. To prevent contamination store this product away from food and feed.
- **Environment:** DO NOT apply this product directly to freshwater habitats, estuarine/marine habitats. DO NOT contaminate irrigation or drinking water supplies or aquatic habitats by cleaning of equipment or disposal of wastes.

Hazard Rating:
Warning – Poison

Caution – Skin Irritant

Potential Skin Sensitizer

Refer to the Introduction for an explanation of the symbols.

Saltro

Fungicide Group 7

Company:
Syngenta Canada Inc. (PCP#33643)

Formulation:
500 g/L pydiflumetofen formulated as a flowable suspension.
- Container sizes - 1 to 1050 L

Crops, Diseases and Rates:

Crop	Diseases Suppressed	Rate (per 100 kg of seed)
Canola	Seed and air-borne blackleg	80 mL

Application Information:
For commercial seed treatment (including mobile treaters).

How it Works:
The active ingredient pydiflumetofen is a N-methoxy-(phenyl-ethyl)-pyrazole-carboxamide, unique within the carboxamide (SDHI) fungicides. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:
Fortenza 600 FS, Helix Vibrance, Prosper EverGol, Rascendo.

Restrictions:
- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Labelling:** Canola seed treated with *Saltro* (bulked or bagged) must be labeled with the following statements: "DO NOT use for food, feed or oil processing. This seed has been treated with the fungicide pydiflumetofen. Store this product away from food or feed. Keep out of reach of children and animals. During handling and planting treated seeds, wear a long-sleeved shirt, long pants, chemical-resistant gloves, socks and shoes. Wear a NIOSH-approved N95 (minimum) filtering facepiece respirator (dust mask) that is properly fit tested when transferring treated seed to the planter/seeder."
- **Grazing:** DO NOT graze or feed livestock on treated crops.
- **Re-cropping:** DO NOT plant any crop other than potatoes and tuberous and corm vegetable subgroup (CG 1C), leafy greens vegetables subgroup (CG 4-13A), dried shelled pea and bean subgroup (CSG 6C), soybeans, peanut, fruiting vegetables crop group, (CG 8-09), cucurbit vegetables crop group (CG 9), cereals (wheat, barley, oats, rye, triticale), corn, rapeseed subgroup (CSG 20A), or leaf petiole vegetables subgroup (CSG 22B) immediately into fields which treated seeds were planted. DO NOT plant leaves of root and tuber vegetable crops or root and tuberous vegetables, except CSG 1C, sorghum, buckwheat, millet and teosinte or any other crops intended for food and feed, within 30 days to fields in which treated seeds were planted.
- **Storage:** Ideal storage temperature is above freezing and below 30°C. Repeated freeze-thawing of *Saltro* will not affect the physical integrity of the product. If the product should freeze, bring the product back to room temperature and ensure the contents are mixed well prior to application. Store this product away from food or feed.
- **Environment:** Toxic to small wild mammals. Any spilled or exposed seeds must be incorporated into the soil or otherwise cleaned-up from the soil surface.

Hazard Rating:
Caution – Poison

Refer to the Introduction for an explanation of the symbols.

Sharda METEB 11ST

Fungicide Group 3, 4

Company and Formulation:
Sharda Crop Chem distributed by UAP Canada (PCP#34038)

Formulation:
5.0 g/L tebuconazole and 6.6 g/L metalaxyl formulated as a suspension.
- Container sizes - 10 L, 110 L drums, 200 L, 1000 L

Crops, Diseases and Rates:

Crop	Diseases Controlled	Diseases Suppressed	Rate (per 100 kg of seed)
Barley	True loose smut (*Ustilago nuda*), covered smut (*Ustilago hordei*), false loose smut (*Ustilago nigra*), seed rot and pre-emergent damping-off caused by seed- and soil-borne *Fusarium* spp., seedling blight caused by seed-borne *Fusarium* spp., damping-off caused by *Pythium* spp.	Root and crown rot caused by seed- and soil-borne *Fusarium* species, common root rot caused by seed- and soil-borne *Cochliobolus sativus*, seed rot and pre-emergent damping-off caused by seed- and soil-borne *Cochliobolus sativus*, seedling blight caused by seed-borne *Cochliobolus sativus*	300 mL
Oats	Covered smut (*Ustilago kolleri*), loose smut (*Ustilago avenae*), seed rot and pre-emergent damping-off caused by seed- and soil-borne *Fusarium* spp., seedling blight caused by seed-borne *Fusarium* spp., damping-off caused by *Pythium* spp.	Root and crown rot caused by seed- and soil-borne *Fusarium* species, common root rot caused by seed- and soil-borne *Cochliobolus sativus*, seed rot and pre-emergent damping-off caused by seed- and soil-borne *Cochliobolus sativus*, seedling blight caused by seed-borne *Cochliobolus sativus*	
Wheat, rye, triticale	Loose smut (*Ustilago tritici*), common bunt or stinking smut (*Tilletia tritici, T. laevis*), seed rot and pre-emergent damping-off caused by seed- and soil-borne *Fusarium* spp., seedling blight caused by seed-borne *Fusarium* spp., damping-off caused by *Pythium* spp., seed-borne *Septoria nodorum*	Root and crown rot caused by seed- and soil-borne *Fusarium* species, common root rot caused by seed- and soil-borne *Cochliobolus sativus*, seed rot and pre-emergent damping-off caused by seed- and soil-borne *Cochliobolus sativus*, seedling blight caused by seed-borne *Cochliobolus sativus*	

Application Information:
Commercial or on farm treating equipment that can control the application rates and provide good distribution of the chemical onto the seed in the mixing chamber. Review the product label before use for further instructions.

How it Works:
The active ingredient tebuconazole is a triazole demethylation inhibitor (DMI) fungicide with systemic activity. The active ingredient metalaxyl is an acylalanine fungicide with systemic activity. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:
None listed.

Restrictions:
- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Labelling:** All containers or packages containing treated seed for sale or use in Canada must be labeled or tagged as follows: "This seed has been treated with *Sharda METEB 11ST* fungicide containing tebuconazole and metalaxyl. Wear coveralls or a long-sleeved shirt and long pants, NIOSH-approved N95 (minimum) filtering facepiece respirator (dust mask), shoes plus socks and chemical resistant gloves when handling treated seed, stacking bags, or transferring to storage bin. DO NOT use for food, feed, or oil processing. DO NOT graze or feed livestock on treated areas for 4 weeks after planting. DO NOT contaminate feed or foodstuffs with treated seed. Do not apply this product directly to freshwater habitats (such as lakes, rivers, sloughs, ponds, prairie potholes, creeks, marshes, streams, reservoirs, ditches, and wetlands), estuaries or marine habitats. Do not contaminate irrigation or drinking water supplies or aquatic habitats by cleaning of equipment or disposal of wastes. Do not expose treated seeds on soil surface.

Any spilled or exposed seed must be incorporated into the soil or otherwise cleaned-up from the soil surface. Dispose of all excess treated seed. Leftover treated seed may be double sown around the headland or buried away from water sources in accordance with local requirements. Dispose of seed packaging in accordance with local requirements. DO NOT re-use bags from treated seed to handle food or feed products."

- **Grazing:** DO NOT graze or feed livestock on treated areas for 4 weeks after planting.
- **Re-cropping:** No restrictions listed.
- **Storage:** DO NOT freeze. Store product in original container only, away from other pesticides, fertilizer, food or feed. Store in a cool, dry place and avoid excessive heat. Keep container closed. DO NOT contaminate water, food, or feed by storage, disposal, or by cleaning of equipment.
- **Environment:** DO NOT contaminate irrigation or drinking water supplies or aquatic habitats by cleaning of equipment or disposal of wastes. Any spilled or exposed seeds must be incorporated into the soil or otherwise cleaned-up from the soil surface.

Hazard Rating:

None listed.

Stadium

Fungicide Group 11, 3, 12

Company:

Syngenta Canada Inc. (PCP#31050)

Formulation:

143 g/L azoxystrobin, 112 g/L difenoconazole and 143 g/L fludioxonil formulated as a suspension concentrate seed treatment.

Crops and Diseases:

For use in post-harvest treatment of potatoes to control fusarium dry rot (*Fusarium* spp.) and to suppress silver scurf *(Helminthosporium solani)*.

Rate and Application Information:

Stadium is a suspension concentrate that must be diluted with water and applied at the rate of 32.5 mL per tonne of potatoes. Finally spray solution should deliver an application rate of 2 L (*Stadium* + water) per metric tonne of potatoes. Application is for in-line as an aqueous spray. Tubers should be rotating along a conveyor line in a single layer to ensure proper coverage. DO NOT make more than one post-harvest application to the tubers.

How it Works:

The active ingredient azoxystrobin is a methoxyacrylate (strobilurin) fungicide with broad spectrum activity to be used as a preventative and curative fungicide, difenoconazole is a triazole fungicide with broad-spectrum systemic activity and fludioxonil is phenylpyrrole fungicide with contact activity. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:

None listed.

Restrictions:

- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Labelling:** No restrictions listed.
- **Grazing:** No restrictions listed.
- **Re-cropping:** This product is restricted to table and processing potatoes.
- **Storage:** Store in a cool dry place. DO NOT store food, beverages or tobacco products in storage area.
- **Environment:** This product is toxic to fish and aquatic invertebrates. DO NOT apply directly to water or to areas where surface water is present. DO NOT allow contaminated waste water from the processing areas to entre lakes, streams, ponds or other waters. DO NOT contaminate irrigation or drinking water supplies or aquatic habitats by cleaning of equipment or disposal of wastes.

Hazard Rating:

Warning – Poison

Refer to the Introduction for an explanation of the symbols.

Straxan

Fungicide Group 3, 4

Company:
Corteva Agriscience (PCP#34928)

Formulation: Straxan is formulated as a suspension.

Active ingredient	
Difenoconazole	36.3 g/L
Metalaxyl	12.6 g/L
Tebuconazole	4.6 g/L
Container sizes:	2 x 9.45L case, 113.45L drum

Crops, Diseases and Rates:

Crop	Diseases Controlled	Diseases Suppressed	Rate (per 100 kg of seed)
Wheat, Rye, Triticale	Seed rot/pre-emergence damping-off caused by *Aspergillus* spp., and *Penicillium* spp. Loose smut (*Ustilago tritici*) Common bunt and stinking smut (*Tilletia caries, T. tritici, T. laevis*) Dwarf bunt (*Tilletia controversa*) on wheat and rye only. Seed rot and pre-emergent damping-off caused by seed- and soil-borne *Fusarium* spp. Seedling blight caused by seed-borne *Fusarium spp*. Damping-off caused by *Pythium* spp.	Root and Crown rot caused by seed- and soil-borne *Fusarium* spp. Common root rot caused by seed- and soil-borne *Cochliobolus sativus* Seed rot and pre-emergent damping-off caused by seed- and soil-borne *Cochliobolus sativus* Seedling blight caused by seed-borne *Cochliobolus sativus* Take-all (*Gaeumannomyces graminis*)	325 mL
Barley	Seed rot/pre-emergence damping-off caused by *Aspergillus spp*., and *Penicillium* spp. True loose smut (*Ustilago nuda*) Covered smut (*Ustilago hordei*) False loose smut (*Ustilago nigra*) Seed rot and pre-emergent damping-off caused by seed- and soil-borne *Fusarium* spp. Seedling blight caused by seed-borne *Fusarium* spp. Damping-off caused by *Pythium* spp.	Root and Crown rot caused by seed- and soil-borne *Fusarium* species Common root rot caused by seed- and soil-borne *Cochliobolus sativus* Seed rot and pre-emergent damping-off caused by seed- and soil-borne *Cochliobolus sativus* Seedling blight caused by seed-borne *Cochliobolus sativus*	325 mL
Oats	Seed rot/pre-emergence damping-off caused by *Aspergillus* spp., and *Penicillium* spp. Covered smut (*Ustilago kolleri*) Loose smut (*Ustilago avenae*) Seed rot and pre-emergent damping-off caused by seed- and soil-borne *Fusarium* spp. Seedling blight caused by seed-borne *Fusarium* spp. Damping-off caused by *Pythium spp.*	Root and Crown rot caused by seed- and soil-borne *Fusarium* species Common root rot caused by seed- and soil-borne *Cochliobolus sativus* Seed rot and pre-emergent damping-off caused by seed- and soil-borne *Cochliobolus sativus* Seedling blight caused by seed-borne *Cochliobolus sativus*	325 mL

Application Information:
Straxan Fungicide Seed Treatment is a ready-to-use water-based formulation for use in commercial seed treatment plants, and for on-farm treatment using standard gravity flow or mist type seed treatment equipment which accurately meters and mixes a flowable seed treatment. Straxan Fungicide Seed Treatment may also be used in a treat-on-the-go air seeder. The equipment must provide uniform coverage of Straxan Fungicide Seed Treatment on the seed. Uneven seed coverage may not give the desired level of disease control. This product does not require the addition of water for application. Consult the manufacturer of the application equipment planned to be used for suitability for this application and for instructions on operation and calibration of the equipment. Water can be added to Straxan Fungicide Seed Treatment to create a slurry if additional seed coverage is required. Total application volume must be adjusted to reflect the additional volume so that the correct amount of Straxan Fungicide Seed Treatment is applied to each unit of seed (325 mL/100 kg).

How it Works:
Straxan contains the active ingredients difenoconazole, metalaxyl and tebuconazole. Difenoconazole and Tebuconazole are triazole fungicides (Group 3) with broad-spectrum systemic activity. Metalaxyl is a member of the acylalanine chemical group (Group 4) and interrupts fungal nucleic acid synthesis.
Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:
Lumivia CPL is a supported tank mix partner for wheat, barley oats, and rye.

Restrictions:
- **Labelling:** Treated seed must be labeled "This seed has been treated with Straxan Fungicide Seed Treatment which contains the fungicides difenoconazole, metalaxyl and tebuconazole. Do not use treated seed for food, feed or oil processing. Store away from feeds and other foodstuffs. During handling and planting of commercially treated seeds, wear coveralls over a long-sleeved shirt, long pants, chemical-resistant gloves, socks and shoes. Use a closed-cab tractor when planting. Gloves are not required within the closed cab. Any spilled or exposed seeds and dust must be incorporated into the soil or cleaned up from the soil surface."
- **Storage:** Store product in original container only, away from other pesticides, fertilizer, food or feed. Store in a cool, dry place and avoid excessive heat. Keep container closed. DO NOT contaminate water, food, or feed by storage, disposal, or by cleaning of equipment.
- **Grazing:** Do not graze, feed green forage or cut for hay within 35 days of planting of cereals. DO NOT plant any crop other than cereals within 30 days to fields in which treated seeds were planted.
- **Environmental Restrictions:** DO NOT contaminate irrigation or drinking water supplies or aquatic habitats by cleaning of equipment or disposal of wastes. Toxic to aquatic organisms. Toxic to birds and small wild mammals. Any spilled or exposed seeds must be incorporated into the soil or otherwise cleaned-up from the soil surface. This product demonstrates the properties and characteristics associated with chemicals detected in groundwater. The use of this product in areas where soils are permeable, particularly where the water table is shallow, may result in groundwater contamination.

Hazard Rating:
None listed.

StorOx

Fungicide Group NC

Company:
Manufactured by BioSafe Systems LLC (PCP#27432)
Distributed in Western Canada by Storcool Potato Services

Formulation:
27% hydrogen peroxide.
- Container size - 10 to 220 L

Crops and Diseases:
Control of fusarium tuber rot (*Fusarium* spp.), bacterial soft rot and silver scurf *(Helminthosporium solani)* in potato.

Rate and Application Information:
Prior to storage and in storage treatment for harvested potato tubers.

As a spray treatment for newly harvested potatoes before storage: 100 mL of *StorOx* per 10 L water. Spray diluted solution on tuber to runoff to achieve full and even coverage. Use 4.15 to 8.3 L water per tonne of potatoes.

As application to potatoes in storage as a direct injection into humidification water: 100 mL *StorOx* per 10 L water. Apply diluted product for at least 20 minutes per day, based on a humidification airflow rate of 0.6 cfm.

Tank Mixes:
May be used in conjunction with a growth inhibitor during humidification. Should not be combined or mixed with pesticides or fertilizer.

How it Works:
Hydrogen peroxide is an inorganic compound with contact activity against fungi and bacteria. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Restrictions:
- **Storage:** Store in cool, well ventilated area away from direct sunlight. Since *StorOx* is a strong oxidizing agent, contact with combustibles may cause fire.
- **Environmental:** DO NOT discharge effluent containing *StorOx* into lakes, streams, ponds or other bodies of water. DO NOT permit this product to enter surface or ground water.

Hazard Rating:

Danger – Corrosive to Eyes

Warning – Skin Irritant

Other Precautions: This product is corrosive to metal surfaces; rinse all application equipment thoroughly with water after use. DO NOT enter treated storage bins until the hydrogen peroxide air concentrations are below exposure levels established by occupational health and safety authorities.

Teraxxa F4

Fungicide Group 3, 4, 7, 11
Insecticide Group 30

Company:

BASF Canada Inc. (PCP#33667)

Formulation:

16.7 g/L broflanilide, 16.7 g/L triticonazole, 10.0 g/L metalaxyl, 8.35 g/L fluxapyroxad, 16.7 g/L pyraclostrobin formulated as a suspension concentrate.

- Container sizes - 2 x 9.8 L case, 120 L drum, 450 L tote

Crops, Diseases and Rates:

Crop	Diseases Controlled	Diseases Suppressed	Insects Controlled	Rate (per 100 kg of seed)
Wheat	Loose smut (*Ustilago tritici*), common bunt (*Tilletia tritici, T. laevis*)	Seedling blight and root rot (*Cochliobolus sativus*): fusarium crown and root rot (*Fusarium* spp.)	Wireworm (all species)	300 mL
Barley	Smuts (*Ustilago nuda, U. hordei, U. nigra*)			
Oats	Smuts (*Ustilago avenae, U. kolleri*)		Wireworm (all species)	300 mL
Rye	Common bunt (*Tilletia tritici, T. laevis*)			
Triticale	Common bunt (*Tilletia tritici, T. laevis*)			
Wheat, barley, oat, canaryseed, rye, triticale, annual canarygrass grown for human consumption	Seed rot, damping off, seedling blight and root rot caused by *Fusarium* spp., *Rhizoctonia solani*, and *Pythium* spp., seed rot and pre-emergent damping off caused by *Cochliobolus sativus*. Suppression of seedling blight and root rot caused by *Cochliobolus sativa*.			

Application Information:

Apply *Teraxxa F4* as a water-based mixture using standard slurry or mist-type seed treatment application equipment. The required amount of *Teraxxa F4* should then be diluted with the recommended amount of water that will provide uniform and complete coverage on the seed surface.

How it Works:

The active ingredient broflanilide is a GABA-gated chloride channel moderator with contact activity. The active ingredient triticonazole is a triazole fungicide that provides systemic broad spectrum activity. The active ingredient metalaxyl is an acylalanine fungicide with systemic activity. Fluxapyroxad is a carboximide fungicide that provides systemic broad spectrum protection. The active ingredient pyraclostrobin is a strobilurin fungicide with broad spectrum contact and systemic activity.

Tank Mixes:

None listed.

Restrictions:

DO NOT use for food, feed or oil processing. This seed is treated with broflanilide, pyraclostrobin, fluxapyroxad, triticonazole and metalaxyl.

Hazard Rating:

Warning – Contains the Allergen Soy

Caution – Skin Irritant

Trifloxystrobin + Metalaxyl

Obex/VIKING Grimstad

Fungicide Group 11, 4

Company:

AgraCity Crop & Nutrition Ltd. (*Obex* – PCP#34858)
Viking Crop Production Partners Inc. (*VIKING Grimstad* – PCP#34970)

Formulation: Formulated as a suspension.

Active ingredient	
Trifloxystrobin	13.5 g/L
Metalaxyl	10.8 g/L
Container sizes:	2 x 10 L case and 100 L drum

Crops, Diseases and Rates:

Crop	Diseases Controlled	Diseases Suppressed	Rate (per 100 kg of seed)
Soybeans	Seed decay / pre-emergence damping-off and post-emergence damping-off caused by *Rhizoctonia solani, Fusarium* spp., and *Pythium* spp. Seed decay / pre-emergence damping-off caused by *Phomopsis longicolla*.	-	370 mL
Dry Beans	Seed decay / pre-emergence damping-off and post-emergence damping-off caused by *Rhizoctonia solani, Fusarium* spp, and *Pythium* spp.	-	370 mL
Field Pea Chickpea	Seed decay / pre-emergence damping-off and post-emergence damping-off caused by *Rhizoctonia solani, Fusarium* spp, and *Pythium* spp.	Seed-borne ascochyta blight caused by *Ascochyta* spp.	370 mL
Lentil	Seed decay / pre-emergence damping-off and post-emergence damping-off caused by *Rhizoctonia solani, Fusarium* spp., and *Pythium* spp. Seed rot / pre-emergence damping-off, post-emergence damping-off and seedling blight caused by *Botrytis cinerea* (seed-borne)	Seed-borne ascochyta blight caused by Ascochyta spp.	370 mL

Application Information:

These Seed Treatment Fungicides are ready-to-use formulations designed for commercial or on-farm treating with conventional seed treating equipment. If diluted with water by greater than 10% by volume, ensure agitation of the mixture prior to application to seed. Compatible with *Rhizobium*-based inoculants. Please check with inoculant manufacturers for further details prior to use.

How it Works:

Metalaxyl is a Group 4 fungicide as classified by the Fungicide Resistance Action Committee (FRAC); its mode of action is the interruption of fungal nucleic acid synthesis. Trifloxystrobin belongs to the strobilurin or Quinone Outside Inhibitors (QoI) class of fungicides (Group 11).
Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:

None.

Restrictions:

- **Grazing:** DO NOT feed or graze livestock for four weeks after planting. Treated seed must not be used for food, feed or oil processing.
- **Storage:** Store product in original container only, away from other pesticides, fertilizer, food or feed. DO NOT store below 0°C. This product cannot be frozen must be placed in a heated or adequately insulated area to avoid sub-zero temperatures. Store in a cool, dry place and avoid excessive heat. Keep container closed. Do not contaminate water, food, or feed by storage, disposal, or by cleaning of equipment
- **Environmental Restrictions:** Any spilled or exposed seeds must be incorporated into the soil or otherwise cleaned up from the soil surface. This product demonstrates the properties and characteristics associated with chemicals detected in groundwater. The use of this product in areas where soils are permeable, particularly where the water table is shallow, may result in groundwater contamination.

Hazard Rating:

None listed.

Trilex EverGol Fungicide Seed Treatment

Fungicide Group 4, 7, 11

Trilex EverGol *is a co-pack of* Trilex Component A *(penflufen and trifloxystrobin fungicides) and* Trilex Component B *(metalaxyl fungicide)*. Trilex Component A *and* Trilex Component B *are not sold individually.*

Company:

Bayer (*Trilex Component A* – PCP#30644, *Trilex Component B* – PCP#30645)

Formulations:

Trilex Component A: 154 g/L penflufen and 154 g/L trifloxystrobin formulated as a liquid based water formulation.

- Container sizes - 1.5 L or in bulk package 6.49 L

Trilex Component B: 317 g/L metalaxyl formulated as a suspension.

- Container sizes - 0.96 L or in bulk package 4.15 L

Crops, Diseases and Rates:

Crop	Diseases		Rate (per 100 kg of seed)	
	Trilex Component A	*Trilex Component B*	*Trilex Component A*	*Trilex Component B*
Chickpea Dry Bean Faba bean Field pea Lentil	Control of seed decay/pre-emergence damping-off and post-emergence damping-off (*Rhizoctonia solani, Fusarium* spp., and *Botrytis cinerea*); seedling blight *(B. cinerea)*	Seed rots and seedling blights (*Pythium* spp.)	25 mL	16 mL
	Suppression of seedborne Ascochyta blight (*Ascochyta* spp.)	-	25 to 32 mL	-

***Add 7 to 1 ratio of water (25 mL of component A + 16 mL of component B + 287 mL of water for a total of 328 mL per 100 kg).**

Application Information:

Trilex Component A is a seed treatment formulation for use in commercial seed treatment operations, and for on-farm treating with conventional seed treating equipment which can accurately meter and apply flowable seed treatment formulations. This product is recommended to be diluted with water or another suitable liquid just prior to application to ensure uniform coverage on the seed during the application process. Uniform application to seed is necessary to ensure optimum performance. Allow seeds to dry before bagging, storing or seeding.

Trilex Component B should be mixed with water to form a slurry seed treatment. Mix 500 mL of slurry per 100 kg of seed to be treated. The slurry should be applied as a spray into the mixing chamber of the seed treating equipment to ensure good coverage. When preparing the slurry the following procedure should be used: 1) partially fill the mixing tank with water; 2) add the required quantity of *Trilex Component B* onto the water surface; 3) allow product to disperse and then switch on agitation; 4) top up with extra water to required volume and maintain agitation during use; and 5) add colourant last.

How it Works:

Trilex Component A: The active ingredient penflufen is a carboxamide (SDHI) fungicide with systemic activity. The active ingredient trifloxystrobin is a strobilurin fungicide with broad spectrum preventative activity.

Trilex Component B: The active ingredient metalaxyl is an acylalanine fungicide with systemic activity. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:

Fungicide Seed Treatments: In addition to *Trilex Component B, Trilex Component A* may be mixed with *Allegiance FL*. Follow the label directions for each product and use the most restrictive precautions and limitations for either product.

Off-label tank mixes, as previously permitted under the Pest Management Regulatory Agency (PMRA) Off-label Tank Mix Policy memo of 2009 are no longer allowed under new guidance from PMRA. As of December 20, 2022 only products specifically indicated on product labels may be mixed, or when the labels of two or more products to be mixed include the statement quoted in the Introduction.

Restrictions:

- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Labelling:** Treated seed must be labeled "This seed has been treated with *Trilex Component A* (containing penflufen and trifloxystrobin) and *Trilex Component B* (containing metalaxyl). Wear long-sleeved shirt, long pants and chemical-resistant gloves when handling treated seed. DO NOT use for feed, food or oil processing. Store away from feeds and other foodstuffs."
- **Grazing:** DO NOT graze or feed livestock on treated areas for four weeks after planting.
- **Re-cropping:** Registered crops for *Trilex Component A*, as well as canola, mustard, rapeseed, soybean, alfalfa, corn and cereal grains, may be replanted at any time. For all other crops, DO NOT plant back within 30 days of seeding with *Trilex Component A*-treated seed.
- **Storage:** Store product in original container only, away from other pesticides, fertilizer, food or feed. Keep container closed. Store in a cool, dry area. DO NOT store in direct sunlight. DO NOT store *Trilex Component A* above 40°C or below -10°C. DO NOT store *Trilex Component B* above 35°C or below 0°C.
- **Environment:** Toxic to aquatic organisms. Treated seed may be toxic to birds and other wildlife. DO NOT discharge effluent containing this product into sewer systems, lakes, streams, ponds, estuaries, oceans or other waters. Dispose of all excess treated seed. Left over seed may be double-sown around the headland or buried away from water sources. DO NOT leave exposed treated seed on soil surface. Any spilled or exposed seeds must be incorporated into the soil or otherwise cleaned-up from the soil surface. The use of this chemical may result in contamination of groundwater particularly in areas where soils are permeable and/or the depth to the water is shallow.

Hazard Rating:

Trilex Component B: Warning – Skin and Eye Irritant

Refer to the Introduction for an explanation of the symbols.

Trilex EverGol Shield Seed Treatment

Fungicide Group 4, 7, 11
Insecticide Group 4A

Trilex EverGol SHIELD is a co-pack of *Trilex Component A* (penflufen and trifloxystrobin fungicides), *Trilex Component B* (metalaxyl fungicide), and *Stress Shield 600* (imidacloprid). *Trilex Component A* and *Trilex Component B* are not sold individually. For individual component information, see the product pages listed above.

Company:

Bayer (*Trilex Component A* – PCP#30644, *Trilex Component B* – PCP#30645, *Stress Shield 600* – PCP#30668)

Formulations:

Trilex Component A: 154 g/L penflufen and 154 g/L trifloxystrobin formulated as a liquid based water formulation.

- Container sizes - 1.5 L or in bulk package 6.49 L

Trilex Component B: 317 g/L metalaxyl formulated as a suspension.

- Container sizes - 0.96 L or in bulk package 4.15 L

Stress Shield 600: 600 g/L imidacloprid formulated as a suspension.

Vayantis IV (Co-pack)

Fungicide Group
U17, 7, 4, 12

Company:
Syngenta Canada Inc.

Formulation:
Co-pack contains 3.42L of Vayantis (PCP#34138) and 54.72L of Vibrance Trio (PCP#33310) formulated as a suspension.

Active Ingredient:	Vayantis	Vibrance Trio
Picarbutrazox	400 g/L	-
Sedaxane	-	24.8 g/L
Metalaxyl-M and S-isomer	-	149.3 g/L
Fludioxonil	-	24.8 g/L
Container size:	1 L to 1000 L	

Crops, Diseases and Rate:

Crop	Diseases Controlled	Rate (per 100 kg of seed)
Soybeans	Control of seed rot and pre-and post-emergence damping-off caused by *Phytophthora sojae*. Seed rot/pre-emergence damping-off, post-emergence damping-off and seedling blight caused by Fusarium spp., *Pythium* spp. and *Rhizoctonia* spp. Seedling root rot caused by *Fusarium* spp. Seed rot and seedling blight caused by seed-borne *Phomopsis* spp. Early season root rot caused by *Phytophthora megasperma* var. *sojae*	Vayantis 6.25 mL + Vibrance Trio 100 mL

Application Information:
For use in commercial seed treatment (facilities and mobile treaters) with closed-transfer, including closed mixing, loading, calibrating, and closed-treatment equipment only. No open transfer is permitted.

VAYANTIS Seed Treatment mixes easily with water. When mixing with products from other manufacturers, the compatibility should be tested prior to use by conducting a jar test; mixing all intended seed treatments with the appropriate amount of water in a clear glass container, mix well, and allow to sit for one hour. Remix and observe for incompatibility.

VAYANTIS Seed Treatment may be applied as a seed treatment following the guidelines specified in the Directions for Use section of the label. Ensure product is thoroughly mixed prior to application. Apply VAYANTIS Seed Treatment as a water-based slurry utilizing standard slurry seed treatment equipment that provides uniform seed coverage. Uneven or incomplete seed coverage may not give the desired level of disease control. Thoroughly mix the recommended amount of VAYANTIS Seed Treatment into the required amount of water for the slurry treater and dilution rate to be used. Follow the manufacturer's application instructions for the seed treatment equipment being used. Maintain constant agitation of the slurry during the seed treatment process. Allow the seed to dry before bagging.

Depending on planting equipment, seed treated with VAYANTIS Seed Treatment or a combination of VAYANTIS Seed Treatment and other seed treatment products may not flow through planting equipment at the same rate as untreated seed. Recalibrate the equipment before planting treated seed.

How it Works:
Picarbutrazox is an ingredient belonging to the tetrazolyloxines chemical group of fungicides (FRAC U17). Picarbutrazox is a systemic fungicide developed to protect soybeans from key diseases like *Pythium* and Phytophthora caused by oomycete plant pathogens. In combination with metalaxyl-M, picarbutrazox improves the consistency of oomycete protection through overlapping effective modes of action. Sedaxane is a succinate dehydrogenase inhibitor fungicide with preventative and systemic activity that inhibits fungal metabolism by binding to the succinate dehydrogenase enzyme to disrupt cellular respiration and energy generation. Fludioxonil is a phenylpyrrole fungicide with contact activity. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:
None listed.

Restrictions:

- **Labelling:** KEEP TREATED SEED OUT OF REACH OF CHILDREN AND ANIMALS. All containers or packages containing treated seed for sale or use in Canada must be labelled or tagged as follows: This seed has been treated with VAYANTIS Seed Treatment, which contains picarbutrazox. Do not use for feed, food or oil processing. Store this product away from food or feed. When handling and planting treated seed, wear a long-sleeved shirt, long pants, chemical-resistant gloves, socks and shoes. Gloves are not required within a closed-cab tractor. For good hygiene practice, it is also recommended to wear a NIOSH-approved N95 (minimum) filtering facepiece respirator (dust mask) that is properly fit tested during all job activities. This product is toxic to aquatic invertebrates. Dispose of all excess treated seed. Dispose of seed packaging in accordance with local requirements. Any spilled or exposed seeds must be incorporated into the soil or otherwise cleaned-up from the soil surface.
- **Grazing:** DO NOT graze or feed livestock on treated area for 45 days after planting soybeans.
- **Re-cropping:** DO NOT plant any crop other than cereals, corn, soybeans, members of Crop Subgroup 6C (Dried shelled peas and beans, chickpeas, lentils and fava beans) or members of Crop Subgroup 20A (Canola/rapeseed subgroup), within 60 days to fields in which treated seeds were planted.
- **Storage:** Store this product away from food or feed. Ideal storage temperature is above freezing and below 30 °C. Repeated freeze-thawing of VIBRANCE TRIO Seed Treatment will not affect the physical integrity of the product. If the product should freeze, bring the product back to room temperature and ensure the contents are mixed well prior to application. To prevent contamination store this product away from food or feed.
- **Environmental Restrictions:** Toxic to aquatic organisms.
  - DO NOT contaminate irrigation or drinking water supplies or aquatic habitats by cleaning of equipment or disposal of wastes. Any spilled or exposed seeds must be incorporated into the soil or otherwise cleaned-up from the soil surface.
  - This product demonstrates the properties and characteristics associated with chemicals detected in groundwater. The use of this product in areas where soils are permeable, particularly where the water table is shallow, may result in groundwater contamination.

Hazard Rating:

Warning – contains the allergen soy

Vibrance Maxx RFC/RTA

Fungicide Group 4, 7, 12

Vibrance Maxx RTA *is a co-pack of* Apron Maxx RTA *(fludioxonil and metalaxyl-M and S-isomer fungicides and* Vibrance 500 FS *(sedaxane fungicide)*. Vibrance Maxx RFC *is a pre-mix formulation. For other detailed information on the component products see the product pages listed above.*

Company:

Syngenta Canada Inc. (*Apron Maxx RTA* – PCP#27577, *Vibrance 500 FS* – PCP#30438, *Vibrance Maxx RFC* – PCP#32272)

Formulations:

Apron Maxx RTA: 0.73% fludioxonil, 1.10% metalaxyl-M and S-isomer formulated as a suspension.
Vibrance 500 FS: 500 g/L sedaxane formulated as a suspension.
Vibrance Maxx RFC: 50 g/L sedaxane, 37.5 g/L metalaxyl-M and S-isomer and 25 g/L fludioxonil.

- Container sizes - 2 x 3.075 L jugs per case, 56.78 L drum
- *Vibrance Maxx RTA* co-packs container size - 115 L *Apron Maxx RTA* + 3.33 L *Vibrance 500 FS;* 450 L *Apron Maxx RTA* + 4 x 3.33 L *Vibrance 500 FS*

Crops, Diseases and Rates:

Crop	Diseases Controlled	Rate (per 100 kg of seed)		
		Apron Maxx RTA	*Vibrance 500 FS*	*Vibrance Maxx RFC*
Chickpea	Seed-borne Ascochyta blight (*Ascochyta rabiei)*; seed rot/pre-emergence damping-off and post-emergence damping-off, (*Fusarium* spp., *Pythium* spp., *Rhizoctonia* spp.); seedling blight (*Fusarium* spp., *Pythium* spp.); seed rot and seedling blight (seed-borne *Botrytis* spp.)	325 mL	10 mL	100 mL
	Seed-borne *Sclerotinia sclerotiorum*	-	-	100 mL
Dry bean	Seed rot/pre-emergence damping-off, and post-emergence damping-off (*Fusarium* spp., *Pythium* spp., *Rhizoctonia* spp.); seedling blight (*Pythium* spp.); anthracnose (*Colletotrichum* spp.)	325 mL	10 mL	100 mL
Faba bean	Seed rot/pre-emergence damping-off, post-emergence damping-off, seedling blight (*Fusarium* spp., *Pythium* spp., *Rhizoctonia* spp.)	325 mL	10 mL	100 mL

Crop	Diseases Controlled	Rate (per 100 kg of seed)		
		Apron Maxx RTA	*Vibrance 500 FS*	*Vibrance Maxx RFC*
Field pea	Seed-borne Ascochyta blight and foot rot *(Ascochyta pinodes)*; seed rot/pre-emergence damping-off, post-emergence damping-off, and seedling blight (*Fusarium* spp., *Pythium* spp., *Rhizoctonia* spp.)	325 mL	10 mL	100 mL
	Seed-borne *Sclerotinia sclerotiorum*	-	-	100 mL
Lentil	Seed-borne Ascochyta blight (*Ascochyta* lentis); seed rot/pre-emergence damping-off, post-emergence damping-off, and seedling blight (*Fusarium* spp., *Pythium* spp., *Rhizoctonia* spp.); seedling root rot (*Fusarium* spp.); seed rot and seedling blight (seed-borne *Botrytis* spp.)	325 mL	10 mL	100 mL
	Seed-borne *Sclerotinia sclerotiorum*	-	-	100 mL
Soybean	Seed rot/pre-emergence damping-off, and post-emergence damping-off (*Fusarium* spp., *Pythium* spp., *Rhizoctonia* spp.); seedling blight (*Fusarium* spp., *Pythium* spp.); seedling root rot (*Fusarium* spp.); seed rot and seedling blight (*Phomopsis* spp.), early season root rot (*Phytophthora megasperma* var. *sojae*)	325 mL	10 mL	100 mL
	Seed-borne *Sclerotinia sclerotiorum*	-	-	100mL

Product information provided below for *Vibrance Maxx RFC* (pre-mix). For detailed information on component products of *Vibrance Maxx RTA* co-pack please consult individual product pages.

Application Information

Vibrance Maxx RFC is for use in commercial seed treatment and for on-farm seed treatment using seed treatment equipment that accurate metres, mixes and applies a flowable seed treatment. Thoroughly mix the recommended amout of *Vibrance Maxx RFC* with the required amount of water for the slurry treatment and dilution rate to be used. Maintain constant agitation of the slurry during the treatment. Allow the seed to dry before bagging, storing or seeding.

How it Works:

The active ingredient sedaxane is a succinate dehydrogenase inhibitor fungicide with preventative and systemic activity that inhibits fungal metabolism by binding to the succinate dehydro-genase enzyme to disrupt cellular respiration and energy generation. The active ingredient fludioxonil is a phenylpyrrole fungicide with contact activity. The active ingredient metalaxyl-M is an acylalanine fungicide with systemic activity against diseases caused by the Oomycetes, including Pythium damping-off. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Restrictions:

- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Labelling:** All seed treated with *Vibrance Maxx RFC* must be labelled "This seed has been treated with the fungicides metalaxyl-M and S-isomer, fludioxonil and sedaxane. When handling and planting treated seed, workers must wear cotton coveralls or long-sleeved shirt and long pants, chemical-resistant gloves, and work boots. For good hygiene practice, it is also recommended to wear a NIOSH-approved N95 filtering facepiece respirator (dust mask) that is properly fit tested during all job activities. DO NOT use for food, feed or oil processing. Store away from food and feed."
- **Grazing:** DO NOT graze or feed livestock on treated areas for 45 days after planting soybeans. DO NOT graze or feed livestock on treated area for 60 days after planting chickpea, dry beans, faba beans, field peas, or lentils.
- **Re-cropping:** DO NOT plant any crop other than cereals, corn, soybeans, dry beans, chickpeas, lentils, faba beans and field peas within 60 days in which treated seeds were planted.
- **Storage:** Store away from food and feed. Ideal storage temperature is above freezing and below 30°C. If product should freeze, bring to room temperature and ensure the contents are mixed well prior to application.
- **Environment:** This product is toxic to fish and other aquatic organisms. DO NOT apply this product directly to aquatic habitats, estuaries or marine habitats. DO NOT contaminate irrigation or drinking water supplies or aquatic habitats by cleaning of equipment or disposal of wastes. Any spilled or exposed seeds must be incorporated into the soil or otherwise cleaned-up from the soil surface.
- **Compatibility with *Rhizobia*-based inoculants:** *Vibrance Maxx RFC* is compatible with *Rhizobia*-based inoculants. Please check with inoculants manufacturers for specific planting windows and methods of application prior to use.

Hazard Rating:

Vibrance 500 FS: Caution – Poison

Refer to the Introduction for an explanation of the symbols.

Vibrance Maxx RFC with INTEGO Solo

Fungicide Group 4, 7, 12, 22

Vibrance Maxx RFC with INTEGO Solo *is a co-pack of* Vibrance Maxx RFC *(sedaxane, fludioxonil and metalaxyl-M and S-isomer fungicides) and* INTEGO Solo Fungicide *(ethaboxam fungicide). For more detailed information on the component products see the product pages listed above.*

Company:

Syngenta Canada Inc. (*Vibrance Maxx RFC* – PCP#32272)
Valent Canada Inc. distributed by Nufarm Agriculture (*INTEGO Solo Fungicide* – PCP#31324)

Formulations:

Vibrance Maxx RFC: 50 g/L sedaxane, 37.5 g/L metalaxyl-M and S-isomer and 25 g/L fludioxonil.

- Container sizes - 2 x 3.075 L jugs in a case, 56.78 L drum

INTEGO Solo Fungicide: 383 g/L ethaboxam formulated as a suspension.

- Container sizes - 2 x 605 mL

Crops, Diseases and Rates:

Crop	Diseases Controlled	Diseases Suppressed	Rate per 100 kg of seed	
			Vibrance Maxx RFC	*INTEGO Solo*
Chickpea	Seed-borne Ascochyta blight *(Ascochyta rabiei)*; seed rot/pre-emergence damping-off and post-emergence damping-off, (*Fusarium* spp., *Pythium* spp., *Rhizoctonia* spp.); seedling blight (*Fusarium* spp., *Pythium* spp.); seed rot and seedling blight (seed-borne *Botrytis* spp.)	-	100 mL	19.6 mL
	Seed-borne *Sclerotinia sclerotiorum*	-	-	100 mL
Dry bean	Seed rot/pre-emergence damping-off, and post-emergence damping-off (*Fusarium* spp., *Pythium* spp., *Rhizoctonia* spp.); seedling blight (*Pythium* spp.); anthracnose (*Colletotrichum* spp.)	Early season root rot *(Aphanomyces euteiches)*	100 mL	19.6 mL
Faba bean	Seed rot/premergence damping-off and post-emergence damping-off (*Fusarium* spp., *Pythium* spp., *Rhizoctonia* spp.); seedling blight (*Pythium* spp.)	Early season root rot *(Aphanomyces euteiches)*	100 mL	19.6 mL
Field pea	Seed-borne Ascochyta blight and foot rot (*Ascochyta* pinodes); seed rot/pre-emergence damping-off, post-emergence damping-off, and seedling blight (*Fusarium* spp., *Pythium* spp., *Rhizoctonia* spp.)	Early season root rot *(Aphanomyces euteiches)*	100 mL	19.6 mL
	Seed-borne *Sclerotinia sclerotiorum*	-	-	100 mL
Lentil	Seed-borne Ascochyta blight *(Ascochyta lentis)*; seed rot/pre-emergence damping-off, post-emergence damping-off, and seedling blight (*Fusarium* spp., *Pythium* spp., *Rhizoctonia* spp.); seedling root rot (*Fusarium* spp.); seed rot and seedling blight (seed-borne *Botrytis* spp.)	Early season root rot *(Aphanomyces euteiches)*	100 mL	19.6 mL
	Seed-borne *Sclerotinia sclerotiorum*	-	-	100 mL
Soybean	Seed rot/pre-emergence damping-off, and post-emergence damping-off (*Fusarium* spp., *Pythium* spp., *Rhizoctonia* spp.); seedling blight (*Fusarium* spp., *Pythium* spp.); seedling root rot (*Fusarium* spp.); seed rot and seedling blight (*Phomopsis* spp.);early-season root rot (*Phytophthora megasperma* var. *sojae*)	-	100 mL	19.6 mL
	Seed-borne *Sclerotinia sclerotiorum*	-	-	100 mL

Hazard Rating:

None listed.

Vibrance Total

Fungicide Group
1, 4, 7, 12, U17

Company:
Syngenta Canada Inc. (PCP#34890)

Formulation: Vibrance Total is formulated as a suspension.

Active ingredient	
Thiabendazole	46.2 g/L
Metalaxyl-M and S-isomer	11.4 g/L
Sedaxane	15.4 g/L
Fludioxonil	7.7 g/L
Picarbutrazox	7.7 g/L
Container sizes:	10 L jugs, 115L totes

Crops, Diseases and Rates:

Crop	Diseases Controlled	Rate (per 100 kg of seed)
Lentils	Seed-borne ascochyta blight caused by *Ascochyta lentis* Seed rot/pre-emergence damping-off, post-emergence damping-off and seedling blight caused by *Fusarium* spp., *Pythium* spp. and *Rhizoctonia* spp. Seedling root rot caused by *Fusarium* spp. Seed-borne *Sclerotinia sclerotiorum* Seed rot and seedling blight caused by seed-borne *Botrytis* spp.	325 mL
Chickpeas	Seed-borne ascochyta blight caused by *Ascochyta rabiei* Seed rot/pre-emergence damping-off and post-emergence damping-off and seedling blight caused by *Fusarium* spp., *Pythium* spp. and *Rhizoctonia* spp. Seed rot and seedling blight caused by seed-borne *Botrytis* spp. Seed-borne *Sclerotinia sclerotiorum*	325 mL
Field peas	Seed-borne ascochyta blight and foot root caused by *Ascochyta pinodes* Seed rot/pre-emergence damping-off, post-emergence damping-off and seedling blight caused by *Fusarium* spp., *Pythium* spp. and *Rhizoctonia* spp. Seed-borne *Sclerotinia sclerotiorum*	325 mL
Dry beans	Seed rot/pre-emergence damping-off and post-emergence damping-off caused by *Fusarium* spp., *Pythium* spp. and *Rhizoctonia* spp. Seedling blight caused by *Pythium* spp. and *Rhizoctonia* spp. Seed-borne *Sclerotinia sclerotiorum* Anthracnose caused by seed-borne *Colletotrichum* spp.	325 mL
Lupins and Faba Beans	Seed rot/pre-emergence damping-off, post-emergence damping-off and seedling blight caused by *Fusarium* spp., *Pythium* spp. and *Rhizoctonia* spp.	325 mL

Application Information:
Vibrance Total is a seed treatment formulation for use in commercial seed treatment (in facilities or with mobile treaters) and for on-farm treatment using seed treatment equipment that accurately meters, mixes and applies a flowable seed treatment. The equipment must provide uniform coverage of Vibrance Total on the seed. Uneven seed coverage may not give the desired level of disease control. Allow the seed to dry before bagging, storing or seeding. Thoroughly mix the recommended amount of Vibrance Total with the required amount of water for the slurry treater and dilution rate to be used. Slurry volumes will vary depending on seed size. Follow the manufacturer's application instructions for the seed treatment equipment being used. Maintain constant agitation of the slurry during the treatment.

Seed Treatment and Inoculants

Vibrance Total is compatible with Rhizobium based inoculants. Please check with inoculant manufacturers for specific planting windows and methods of application prior to use. Consult the manufacturer of the application equipment planned to be used for suitability for this application and for instructions on operation and calibration of the equipment. Seed treated with Vibrance Total, or a combination of Vibrance Total and seed inoculants, may not flow through a seed drill at the same rate as untreated seed. Recalibrate the seed drill before planting treated seed. Mixing with inoculants may increase drying time while treating, extending the processing time.
This product contains a pigment that will colour the treated seed; however, users are responsible for ensuring that the treated seed, when dried and ready for bagging, storage or seeding has an unnatural colour. If the pigment contained in the formulation does not colour the seed adequately, additional colourant must be added to the mixture while treating the seed.

How it Works:

Vibrance Total contains the active ingredients thiabendazole, metalaxyl, sedaxane, fludioxonil and picarbutrazox. Thiabendazole is a benzimidazole fungicide with both contact and systemic activity. Metalaxyl-M is an acylalanine fungicide with systemic activity against diseases caused by the Oomycetes, including Pythium damping-off. Sedaxane is a succinate dehydrogenase inhibitor fungicide with systemic activity that inhibits fungal metabolism by binding to the succinate dehydrogenase enzyme to disrupt cellular respiration and energy generation. Fludioxonil is phenylpyrrole fungicide with contact activity. Picarbutrazox is an ingredient belonging to the tetrazolyloxines chemical group of fungicides (FRAC U17). Picarbutrazox is a systemic fungicide developed to protect against diseases caused by oomycete plant pathogens like Pythium. In combination with metalaxyl-M, picarbutrazox improves the consistency of oomycete protection through overlapping effective modes of action.
Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:

This product may be tank mixed with a fertilizer, a supplement, or with registered pest control products, whose labels also allow tank mixing, provided the entirety of both labels, including Directions for Use, Precautions, Restrictions, Environmental Precautions, and Spray Buffer Zones are followed for each product. In cases where these requirements differ between the tank mix partner labels, the most restrictive label must be followed. DO NOT tank mix products containing the same active ingredient unless specifically listed on this label.

Restrictions:

- **Labelling:** All containers or packages containing treated seed for sale or use in Canada must be labeled or tagged as follows: "This seed has been treated with the fungicides thiabendazole, sedaxane, metalaxyl-M and S-isomer, fludioxonil, and picarbutrazox. Wear chemical resistant coveralls over a long-sleeved shirt, long pants, chemical-resistant gloves, socks, and shoes during planting and handling of treated seeds and any other activities involving calibrating, clean-up, and repair. Wear a NIOSH-approved N95 (minimum) filtering facepiece respirator (dust mask) that is properly fit tested when transferring treated seed to the planter/seeder. This product is toxic to aquatic organisms. Do not use for food, feed or oil processing. Store away from food and feed. Dispose of all excess treated seed. Dispose of seed packaging in accordance with local requirements. Toxic to birds and small wild mammals. Any spilled or exposed seeds.
- **Grazing:** DO NOT graze or feed livestock on treated area for 60 days after planting dried shelled pea and bean crops, chickpeas, lentils and faba beans
- **Re-cropping: D**O NOT plant any crop other than cereals, soybeans, members of Crop Subgroup 6C (Dried shelled peas and beans, chickpeas, lentils and faba beans) or members of Crop Subgroup 20A (Canola/rapeseed subgroup), within 60 days to fields in which treated seeds were planted.
- **Storage:** Keep in original container, tightly closed, during storage. Store in a cool, dry, well-ventilated area away from other pesticides, feed and foodstuffs, and out of the reach of children and animals. To prevent contamination, store this product away from seed, food or feed. Ideal storage temperature is above freezing and below 30°C. If the product should freeze, bring the product back to room temperature and ensure the contents are mixed well prior to application.
- **Environmental Restrictions:** Toxic to aquatic organisms. Toxic to birds and small wild mammals. Any spilled or exposed seeds must be incorporated into the soil or otherwise cleaned-up from the soil surface. This product demonstrates the properties and characteristics associated with chemicals detected in groundwater. The use of this product in areas where soils are permeable, particularly where the water table is shallow, may result in groundwater contamination.

Hazard Rating:

None listed.

Vibrance Quattro

Fungicide Group 3, 4, 7, 12

Company:
Syngenta Canada Inc. (PCP#31408)

Formulation:
36.8 g/L difenoconazole, 15.4 g/L sedaxane, 9.2 g/L metalaxyl-M (and S-isomer), and 7.6 g/L fludioxonil formulated as a suspension.

- Container sizes - 1 to 1050 L

Crops, Diseases and Rates:

Crops	Diseases Controlled	Diseases Suppressed	Rate (per 100 kg of seed)
Barley	General seed rots (*Fusarium* spp., *Pythium* spp., *Rhizoctonia* spp., *Penicillium* spp., *Aspergillus* spp.); seedling blight, root rot, damping-off (*Fusarium* spp., *Rhizoctonia* spp., *Pythium* spp.); covered smut *(Ustilago hordei)*; false loose smut *(U. nigra)*; true loose smut *(U. nuda)*; seed-borne *Alternaria alternata*	Common root rot *(Cochliobolus sativus)*; seed-borne *Cochliobolus sativus*; fusarium crown and foot rot (*Fusarium* spp.); take-all *(Gaeumannomyces graminis)*	325 mL
Oats	General seed rots *(Fusarium* spp., *Pythium* spp., *Rhizoctonia* spp., *Penicillium* spp., *Aspergillus* spp.*)*; seedling blight, root rot, damping-off (*Fusarium* spp., *Rhizoctonia* spp., *Pythium* spp.); covered smut *(Ustilago hordei)*; loose smut *(U. avenae)*; seed-borne *Alternaria alternata*	Common root rot *(Cochliobolus sativus);* seed-borne *Cochliobolus sativus*	325 mL
Rye	General seed rots *(Fusarium* spp., *Pythium* spp., *Rhizoctonia* spp., *Penicillium* spp., *Aspergillus* spp.*)*; seedling blight, root rot, damping-off (*Fusarium* spp., *Rhizoctonia* spp., *Pythium* spp.); common bunt *(Tilletia tritici)*; dwarf bunt *(T. controversa)*; seed-borne *Alternaria alternata*	Common root rot *(Cochliobolus sativus)*; seed-borne *Cochliobolus sativus*; fusarium crown and foot rot (*Fusarium* spp.); take-all *(Gaeumannomyces graminis)*	325 mL
Triticale	General seed rots *(Fusarium* spp., *Pythium* spp., *Rhizoctonia* spp., *Penicillium* spp., *Aspergillus* spp.*)*; seedling blight, root rot, damping-off (*Fusarium* spp., *Rhizoctonia* spp., *Pythium* spp.); loose smut *(Ustilago tritici)*; seed-borne *Alternaria alternata*	Common root rot *(Cochliobolus sativus)*; seed-borne *Cochliobolus sativus*; fusarium crown and foot rot (*Fusarium* spp.); take-all *(Gaeumannomyces graminis)*	325 mL
Spring wheat	General seed rots *(Fusarium* spp., *Pythium* spp., *Rhizoctonia* spp., *Penicillium* spp., *Aspergillus* spp.*)*; seedling blight, root rot, damping-off (*Fusarium* spp., *Rhizoctonia* spp., *Pythium* spp.); common bunt *(Tilletia tritici)*; loose smut *(Ustilago tritici)*; seed-borne *Alternaria alternata*	Common root rot *(Cochliobolus sativus)*; seed-borne *Cochliobolus sativus*; fusarium crown and foot rot (*Fusarium* spp.); take-all *(Gaeumannomyces graminis)*	325 mL
Winter wheat	General seed rots *(Fusarium* spp., *Pythium* spp., *Rhizoctonia* spp., *Penicillium* spp., *Aspergillus* spp.*)*; seedling blight, root rot, damping-off (*Fusarium* spp., *Rhizoctonia* spp., *Pythium* spp.); common bunt *(Tilletia tritici)*; dwarf bunt *(T. controversa)*; loose smut *(Ustilago tritici)*; seed-borne *Alternaria alternata*	Common root rot *(Cochliobolus sativus)*; seed-borne *Cochliobolus sativus*; fusarium crown and foot rot (*Fusarium* spp.); take-all *(Gaeumannomyces graminis)*	325 mL

Application Information:
Vibrance Quattro is for use on-farm on barley, wheat, oats, rye and triticale. This product can also be applied by commercial seed treaters using closed system transfer. Treat seed in a well-ventilated area. When treating seeds, handling and planting treated seed, workers should wear cotton coveralls or long-sleeved shirt and long pants, chemical-resistant gloves, and work boots. Wear a suitable dust mask when transferring treated seed to a storage bin. For good hygiene practice, it is also recommended to wear a NIOSH approved dust mask during all job activities.

How it Works:
The active ingredient difenoconazole is a triazole fungicide with broad-spectrum, systemic activity. Metalaxyl-M is an acylalanine fungicide with systemic activity against diseases caused by the Oomycetes, including Pythium damping-off. Sedaxane is a succinate dehydrogenase inhibitor fungicide with systemic activity that inhibits fungal metabolism by binding to the succinate dehydrogenase enzyme to disrupt cellular respiration and energy generation. Fludioxonil is phenylpyrrole fungicide with contact activity. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:

Vibrance Quattro may be mixed with *Cruiser 5FS* for crops common to the registered labels of both products. Refer to label for details. Consult each product and follow the most restrictive label precautions and limitations.

Restrictions:

- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Labelling:** Treated seed must be labelled (listing only the applicable active ingredients) as follows: "This seed has been treated with difenoconazole, metalaxyl- M (and S-isomer), sedaxane and fludioxonil fungicides. When handling and planting treated seed, workers should wear cotton coveralls over a long-sleeved shirt, long pants, chemical-resistant gloves, and work boots. Wear a suitable dust mask when transferring seed to a storage bin. DO NOT graze or feed livestock on seeded area for 45 days after planting. DO NOT use for food, feed or oil processing. Store away from food and feed."
- **Grazing:** DO NOT graze or feed livestock on treated areas for 45 days after planting.
- **Re-cropping:** DO NOT plant any crop other than cereals within 60 days to fields in which treated seed were planted.
- **Storage:** Store away from food and feed. Ideal storage temperature is above freezing and below 30°C. If product should freeze, bring to room temperature, and then ensure the contents are mixed well prior to application.
- **Environment:** Toxic to aquatic organisms. DO NOT contaminate irrigation or drinking water supplies or aquatic habitats by cleaning of equipment or disposal of wastes. Any spilled or exposed seeds must be incorporated into the soil or otherwise cleaned-up from the soil surface.

Hazard Rating:

Potential Skin Sensitizer

Refer to the Introduction for an explanation of the symbols.

Vibrance Ultra Potato

Fungicide Group 3, 7, 40

Company:

Syngenta Canada Inc. (PCP#33171)

Formulation:

77.2 g/L Sedaxane, 77.2 g/L difenoconazole, 154.3 g/L mandipropamid formulated as a suspension.

- Container sizes - 1 L to bulk

Crops, Diseases and Rates:

Crop	Diseases Controlled	Diseases Suppressed	Rate (per 100 kg of seed)
Potato	Seed-borne Silver Scurf (*Helminthosporium solani*), fusarium dry rot (*Fusarium* spp.), Seed-borne black scurf, stem and stolon canker (*Rhizoctonia solani*) Preventative control of seed-borne late blight (*Phytophthora infestans*)	Pink rot (*Phytophthora erythroseptica*)	32 mL

Application Information:

DO NOT use open treating equipment when treating seed-pieces, *Vibrance Ultra Potato* must be applied using a closed treatment system. Treat seed in a well ventilated area and keep treated seed-pieces away from animals.

How it Works:

Sedaxane is a succinate dehydrogenase inhibitor fungicide with preventative and systemic activity that inhibits fungal metabolism by binding to the succinate dehydrogenase enzyme to disrupt cellular respiration and energy generation. The active ingredient difenoconazole is a triazole fungicide with broad-spectrum, systemic activity. The active ingredient mandipropamid is a carboxylic acid amide (CAA) fungicide with contact and systemic activity. To be used as a preventative and inhibitive (prevents spore germination) fungicide application. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:

For control of Colorado potato beetle, aphids and potato leafhopper, *Vibrance Ultra Potato* can be tank mixed with *Actara 240 SC* insecticide. For control of Colorado potato beetle, *Vibrance Ultra Potato* can be tank mixed with *Fortenza*. Protection is provided during early to mid-season growth and development for potatoes only. Refer to to tank-mix partner labels for specific application instructions and precautions. Always use in accordance with the most restrictive label restrictions and precautions.

Restrictions:

- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Maximum number of applications:** DO NOT apply more than 243 g mandipropamid per acre per year.
- **Labelling:** No restrictions listed.
- **Grazing:** No restrictions listed.
- **Re-cropping:** DO NOT plant any crop other than corn, cereals, canola, soybean, dry beans, dry pea, chickpea, lentil and sugar beets within 60 days to fields where seed treated with *Vibrance Ultra Potato* were planted.
- **Storage:** Store away from food or feed. Ideal storage temperature is above freezing and below 30°C. repeated freeze thawing will not affect the physical integrity of the product. If the product freezes, bring it back to room temperature and ensure the contents are well mixed prior to application.
- **Environment:** TOXIC to aquatic animals. DO NOT contaminate irrigation or drinking water supplies or aquatic habitats by cleaning of equipment or disposal of wastes. Treated seed is toxic to small wild animals. Any spilled or exposed seed must be incorporated into the soil or cleaned-up from the soil surface.

Hazard Rating:

None listed.

Vitaflo Brands

Fungicide Group 7, M3

Company:

Manufactured by UPL AgroSolutions Canada Inc. (*Vitaflo 280 Fungicide* – PCP#11423)
Manufactured by Interprovincial Cooperative Limited (*Vitaflo SP Fungicide* – PCP#30381)
Manufactured for Loveland Products by Interprovincial Cooperative Limited (*Vitaflo Fungicide* – PCP#30380)

Formulation:

Vitaflo 280/Vitaflo Fungicide/Vitaflo SP Fungicide: 15.59% carbathiin and 13.25% thiram formulated as a liquid suspension.

- Container sizes - 10 L, 55 L, 100 L, 200 L, 1000 L

Crops, Diseases and Rates:

Crop	Diseases Controlled	Diseases Suppressed	Rate (per 100 kg of seed)
Barley	False loose smut *(Ustilago nigra)*; covered smut *(U. hordei)*; leaf stripe *(Pyrenophora graminea)*; partial control of true loose smut *(U. nuda)*	Root rot (*Fusarium* spp.); net blotch *(Pyrenophora teres)*	230 mL
	Seed rot and seedling blight (*Pythium* spp., *Penicillium* spp., *Fusarium* spp., *Cochliobolus sativus*); seed rot (*Aspergillus* spp., *Alternaria* spp.)	Root rot (*Cochliobolus sativus, Fusarium* spp.)	330 mL
Wheat	Common bunt *(Tilletia tritici, T. laevis)*; seed-borne dwarf bunt *(T. controversa)*; Partial control of loose smut *(Ustilago tritici)*	Root rot (*Fusarium* spp.)	230 mL
	Seed-borne *Septoria* spp.; seed rot and seedling blight (*Pythium* spp., *Penicillium* spp., *Fusarium* spp., *Cochliobolus sativus*); seed rot (*Aspergillus* spp., *Alternaria* spp.), soil-borne dwarf bunt *(Tilletia controversa)*	Root rot *(Cochliobolus sativus)*	330 mL
Oats	Loose smut *(Ustilago avenae)*; covered smut *(U. kolleri)*; seed rot and seedling blight (*Fusarium* spp., *Pythium* spp., *Penicillium* spp.); seed rot (*Aspergillus* spp., *Alternaria* spp.)	Root rot *(Cochliobolus sativus)*	330 mL
Rye	Partial control of stem smut *(Urocystis occulta)*	Root rot *(Cochliobolus sativus)*	230 mL
	Damping off, seed rot and seedling blight (*Fusarium* spp., *Pythium* spp., *Penicillium* spp., *Cochliobolus sativus)*; seed rot (*Aspergillus* spp., *Alternaria* spp.)	Root rot *(Cochliobolus sativus)*	330 mL
Triticale	Seed rot, damping off, seedling blight (*Fusarium* spp., *Pythium* spp., *Penicillium* spp., *Cochliobolus sativus)*	–	200 mL
Dry bean	Early season seed rot, seedling blight, root rot *(Rhizoctonia solani);* seed-borne anthracnose *(Colletotrichum lindemuthianum)*[1]	–	260 mL

Crop	Diseases Controlled	Diseases Suppressed	Rate (per 100 kg of seed)
Corn (field & sweet)	Seed rot and damping off (*Fusarium* spp., *Pythium* spp., *Penicillium* spp.)	–	280 mL
	Seed-borne head smut *(Sporisorium holci-sorghi)*		560 to 748 mL
Flax	Seed rot, root rot and seedling blight (*Rhizoctonia solani, Fusarium* spp.)	–	525 mL
Lentil	Seed rot, seedling blight, and early season root rot *(Botrytis cinerea, Rhizoctonia solani, Fusarium* spp., *Pythium* spp.)	–	330 mL
Field pea	Seed rot and seedling blight *(Rhizoctonia solani, Fusarium* spp., *Pythium* spp.)	–	260
	Seed rot and seeding blight *(Ascochyta pinodes)*		330
Soybean	Seed rot and seedling blight *(Rhizoctonia solani, Phomopsis* spp., *Fusarium* spp.)	–	260 mL

[1] **Will not control severe anthracnose infections**

Application Information:
Designed to be used undiluted in commercial seed treaters. Undiluted product can be used at temperatures down to -20°C. Centrifugal pumps are not recommended for pumping product. Centrifugal pumps are not recommended for pumping product. Peristaltic pumps (positive displacement) using polypropylene lines with a minimum inside diameter of 2 cm are recommended. If containers have been in storage, some settling may occur and require agitation.

How it Works:
The active ingredient carbathiin is a carboximide fungicide with systemic activity and the active ingredient thiram is a dithiocarbamate fungicide with contact activity. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:
None listed.

Restrictions:
- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Labelling:** Treated seed must be labelled as follows "This seed has been treated with *Vitaflo 280, Vitaflo Fungicide, or Vitaflo SP Fungicide* liquid seed protectant containing carbathiin and thiram. DO NOT use for feed, food, or oil processing."
- **Grazing:** DO NOT graze or feed livestock on treated area for four weeks after planting except for the following crops:
  - ***Soybean*** – DO NOT graze or feed livestock on forage and hay on treated areas.
  - ***Bean*** – DO NOT graze or feed on bean forage for 60 days.
  - ***Barley, oat, wheat*** – DO NOT graze or feed on treated area for 6 weeks.
- **Re-cropping:** No restrictions listed.
- **Storage:** DO NOT store product in direct sunlight or above 35°C. Will not freeze even at extreme temperatures. If containers have been stored for several months, shake well before using. DO NOT store dry beans, peas, lentils, or soybeans treated with any *Vitaflo* product. Wheat, barley, rye, oats, triticale and flax seed treated with *Vitaflo 280/Vitaflo Fungicide/Vitaflo SP Fungicide* can be stored up to 18 months and treated corn seed can be stored up to one year without reduction in germination.
- **Environment**: DO NOT contaminate ponds, lakes or streams.
- **Compatibility with *Rhizobia*-based inoculants:** *Vitaflo 280, Vitaflo Fungicide*, and *Vitaflo SP Fungicide* are compatible with *Rhizobia*. DO NOT tank mix *Vitaflo 280, Vitaflo Fungicide*, or *Vitaflo SP Fungicide* and *Rhizobia*. Always check with *Rhizobia* manufacturers on any restrictions that may exist with seed treatments.

Hazard Rating:
Warning – Eye Irritant

Caution – Skin Irritant

Refer to the Introduction for an explanation of the symbols.

Zeltera Pulse (Co-pack)

Fungicide Group 4, 7, 11, 22

Company:
Valent Canada, distributed by Nufarm Agriculture (PCP#33820)

Formulation:
***Intego Pulse* (PCP#34011):** 24.9 g/L ethaboxam, 33.2 g/L mandestrobin and 13.3 g/L metalaxyl formulated as a suspension.
- Container size - 9.8 L

***Zeltera Fungicide* (PCP#33820):** 381 g/L inpyrfluxam formulated as a suspension.
- Container size - 0.407 L

Crops, Diseases and Rates:

Crop	Diseases Controlled	Diseases Suppressed	Rate (per 100 kg of seed)	
			Intego Pulse	*Zeltera Fungicide*
Lentil, field pea, chickpea, dry bean, faba bean	Seed rots, seedling blight and seedling root rot caused by *Rhizoctonia solani* and *Fusarium* spp., seed rot/pre-emergence damping-off caused by *Pythium* spp., seed decay/pre-emergence damping-off, postemergence, damping-off, and seedling blight (*Rhizoctonia solani*)	Seed rots, seedling blight and seedling root rot caused by *Phomopsis longicolla*, suppression of root rot (*R. solani*), early season root rot caused by *Phytophthora sojae*, early season root rot caused by *Aphanomyces euteiches*	300 mL	13 mL
Soybean	Seed rots, seedling blight and seedling root rot caused by *Rhizoctonia solani* and *Fusarium* spp., seed rot/pre-emergence damping-off caused by *Pythium* spp., seed decay/pre-emergence damping-off, postemergence, damping-off, and seedling blight (*Rhizoctonia solani*), sudden death syndrome (*Fusarium virguliforme*)	Seed rots, seedling blight and seedling root rot caused by *Phomopsis longicolla*, early season root rot caused by *Phytophthora sojae*, early season root rot caused by *Aphanomyces euteiches*		

Application Information:
Pour the *Zeltera Fungicide* (0.407 L) jug into *Intego Pulse* (9.8 L) jug, shake well, then start treating at a total rate of 313 mL per 100 kg of seed. All labelled crops are registered for commercial application facilities and mobile treaters. For all labelled seeds, commercial seed treatment (facilities and mobile treaters with closed transfer, including closed mixing, loading, calibrating, and closed treatment equipment only) is permitted.

How it Works:
Intego Pulse contains the active ingredients ethaboxam, mandestrobin, and metalaxyl. Ethaboxam is a Group 22 fungicide; it's mode of action is the inhibition of cell division. Mandestrobin belongs to the strobilurin or Quinone Outside Inhibitors class Group 11 of fungicides. Metalaxyl is a member of the acylalanine chemical Group 4 and interrupts fungal nucleic acid synthesis. The active ingredient in *Zeltera Fungicide*, inpyrfluxam, belongs to Group 7, the succinate dehydrogenase inhibitor group of fungicides and acts by inhibiting succinate dehydrogenase, a key enzyme in the fungal respiration chain.

All labelled crops for on-farm treatment (open transfer, including open mixing, loading, calibrating, and open treatment equipment) is permitted. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:
None listed.

Restrictions:
- **Resistance management:** Refer to "Pathogen Resistance" in the Plant Disease Control section for more information.
- **Labelling:** All containers or packages containing treated seed for sale or use in Canada must be labeled or tagged as follows: "This seed was treated with a product containing the active ingredients ethaboxam, mandestrobin, metalaxyl and inpyrfluxam.
- DO NOT use treated seed for feed, food or oil processing. Store away from feeds and other foodstuffs. Wear long-sleeved shirt, long pants and chemical-resistant gloves, socks and shoes when handling and planting treated seeds, and during clean-up, maintenance, and repair of seed treatment equipment. A closed cab tractor is required when planting treated seed. Chemical resistant gloves are not required when inside closed-cab planting equipment. Dispose of all excess treated seed. Leftover treated seed may be double-sown around the headland or buried away from water sources in accordance with local requirements. Dispose of seed packaging in accordance with local requirements. Toxic to birds and small wild mammals. Any spilled or exposed seeds must be incorporated into the soil or otherwise cleaned-up from the soil surface."

- **Grazing:** DO NOT graze or feed forage and hay of legume vegetables (including pea vines) to livestock.
- **Re-cropping:** No restrictions listed.
- **Storage:** Keep pesticide in its original container. Store in a cool place. DO NOT store in direct sunlight. Protect from freezing temperatures. Store this product away from food or feed.
- **Environment**: Toxic to aquatic organisms. Toxic to birds and small wild mammals. Any spilled or exposed seeds must be incorporated into the soil or otherwise cleaned-up from the soil surface.

Hazard Rating:

Intego Pulse:

Caution – Eye Irritant

Zeltera Fungicide:

Warning – Poison

Refer to the Introduction for an explanation of the symbols.

Zeltera Pulse

Fungicide Group 4, 22, 11, 7

Company:

Valent Canada Inc., distributed by Nufarm Agriculture Inc. (PCP#34329)

Formulation:

Zeltera Pulse is formulated as a suspension. *Zeltera Pulse* is packaged with a *Valent ST Polymer*. It's recommended that the Polymer be added to *Zeltera Pulse*. The 2 x 10 L case of *Zeltera Pulse* will be packaged with a 2 x 500 ml case of *Valent ST Polymer* and the drum will be packaged with a 5.5 Litre jug.

Active Ingredient:	
Metalaxyl	12.7 g/L
Ethaboxam	23.9 g/L
Mandestrobin	31.7 g/L
Inpyrfluxam	15.9 g/L
Container size:	2 x 10.21L case packaged with 2 x 500ml *Valent St Polymer*, 110 L drum packaged with 5.5 L *Valent St Polymer* jug

Crops, Diseases and Rate:

Crop	Diseases Controlled	Diseases Suppressed	Rate (per 100 kg of seed)
Soybeans	Seed rots, seedling blight and seedling root rot caused by *Rhizoctonia solani*, and *Fusarium* spp., Pre-emergence damping-off, post-emergence damping-off caused by *Rhizoctonia solani*, Seed rot/pre-emergence damping-off caused by *Pythium* spp., including control of metalaxyl-resistant *Pythium* spp., Early season root rot caused by *Phytophthora sojae*	Seed rots, seedling blight and seedling root rot caused by *Phomopsis longicolla*, Seedling blight caused by seed-borne *Sclerotinia sclerotiorum*, Seed rot and seedling blight caused by seed-borne anthracnose (*Colletotrichum lindemuthianum*)	313 mL
Lentil, Field pea, Chickpeas, Dry Bean, Faba Bean	Seed rots, seedling blight and seedling root rot caused by *Rhizoctonia solani* and *Fusarium* spp. (including but not limited to *F. avenaceum*, *F. solani*, and *F. oxysporum*) Pre-emergence damping-off, post-emergence damping-off caused by *Rhizoctonia solani*, Seed rot/pre-emergence damping-off caused by *Pythium* spp., including control of metalaxyl-resistant *Pythium* spp.	Seed rots, seedling blight and seedling root rot caused by *Phomopsis longicolla*, Early season root rot caused by *Aphanomyces euteiches*, Seedling blight caused by seed-borne Ascochyta spp., Seed rot and seedling blight caused by seed-borne *Botrytis cinerea*, Seedling blight caused by seed-borne *Sclerotinia sclerotiorum*, seed rot and seedling blight caused by seed-borne anthracnose (*Colletotrichum lindemuthianum* and *C. truncatum*)	313 mL

Application Information:
Shake well, then start treating a total rate of 313 mL/100 kg seed.

How it Works:
Zeltera Pulse contains the active ingredients ethaboxam, inpyrfluxam, mandestrobin, and metalaxyl. Ethaboxam is a Group 22 fungicide as classified by the Fungicide Resistance Action Committee (FRAC); its mode of action is the inhibition of cell division. Inpyrfluxam belongs to the succinate dehydrogenase inhibitor (SDHI) group of fungicide (Group 7); it acts by inhibiting succinate dehydrogenase, a key enzyme in the fungal respiration chain. Mandestrobin belongs to the strobilurin or Quinone Outside Inhibitors (QoI) class of fungicides (Group 11). Metalaxyl is a member of the acylalanine chemical group (Group 4) and interrupts fungal nucleic acid synthesis. Refer to "Fungicide Modes of Action" in the Plant Disease Control section for more information.

Tank Mixes:
None listed.

Restrictions:
- **Labelling:** All labelled crops are registered for commercial application facilities and mobile treaters. For all labelled seeds, commercial seed treatment (facilities and mobile treaters with closed transfer, including closed mixing, loading, calibrating, and closed treatment equipment only) is permitted. All labelled crops for on-farm treatment (open transfer, including open mixing, loading, calibrating, and open treatment equipment) is permitted.
- **Storage:** Store this product away from food or feed. Keep pesticide in its original container. Store in a cool place. Do not store in direct sunlight. Protect from freezing temperatures.
- **Environmental Restrictions:** Oral LD50 (rats) = 1750 mg/kg. Dermal LD50 (rabbits) = >5000 mg/kg
  - Toxic to aquatic organisms, birds, small wild mammals and non-target terrestrial plants.

Hazard Rating:
None listed.

Insect Control

Additional Resources

For additional information on monitoring, economic thresholds and biological control of insects in field crops, as well as information on insect management in commodities other than those covered in this guide, see the WCCP Guide to Integrated Control of Insect Pests of Crops at **https://www.westernforum.org/wccp%20guidelines.html**.

Insect Management Decisions

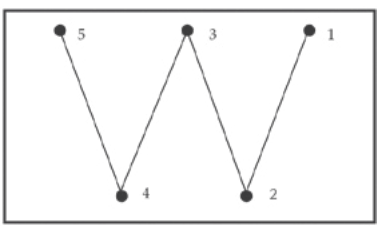
Crop rotations, cultivar selections, and seeding dates can be chosen to reduce the risk of injury from some insects that may be of higher risk to a crop. Management of insects with insecticides should only be considered when numbers or damage exceed economic thresholds. To select an insecticide, verify the registered products for the insect and field crop in the following insect management charts. Consideration should then be given to the preharvest intervals, beneficial insects that may be present, how the product will be applied, restrictions, precautions and the hazard rating.

Pre-harvest Interval

The **pre-harvest interval** is the number of days that must pass between the last application of a pesticide and harvest. Harvest is the cutting of the crop or removal of the produce from the plant. It includes direct-combining, cutting (swathing) or grazing; it does not include swath-combining or baling for hay.

Field Scouting

Field scouting is the regular examination of fields to accurately assess the kind and the number of insects, plant pathogens and weeds present and the amount of damage being done. Scouting should be done weekly during the growing season and more frequently when infestations approach economic levels or when weather conditions favour the rapid development of specific pests.



To properly scout for insects that feed on crops or are beneficial, you must know when they occur, where they live, what they look like, and how to find and count them. The number of locations to assess in a field will depend on the field size, and any specific pests that may be of concern. Generally a minimum of 5 sites should be sampled; however, some insects may require more sites to be sampled to accurately make management decisions.

There are several possible scouting patterns that can be used when checking fields. These options are based on insect distribution and field configuration.

- **Pattern 1:** Used when insects are uniformly distributed.
  - This scouting pattern typically looks like an X, Z or W, excluding field edges. Insects that fit this pattern include aphids, bertha armyworm and diamondback moth.

- **Pattern 2:** Used when insects are generally more abundant at the edges of fields.
  - Scout by walking along field edges, fence lines or ditches. Some examples of when you would include more focused scouting along field edges are to estimate early-season populations of flea beetles, Colorado potato beetles and grasshoppers.

In each area examined, use of a sweep net, if possible, is a good way to determine what potential crop feeding and beneficial insects may be present. This should be followed by examining some plants and the soil surface. More specific counts of a particular type of insect or plant damage may be necessary if they are abundant during the more general scouting.

Economic Thresholds

Monitoring methods, typical symptoms, and economic thresholds or nominal thresholds for the more common crop pests are described in the field scouting section for each commodity. The smallest number of insects (or level of injury) that cause damage equal to the pest management costs is called the **economic injury level**. The **economic threshold** is the density of insects (or level of injury) at which control measures should be applied to prevent an increasing population from reaching the economic injury level. Note that factors such as moisture, temperature conditions and stage of crop growth, can increase or decrease the impact of insects on crop production. In some instances, nominal thresholds are presented; these decision guidelines are based on experience rather than research quantifying the impact of the insects on the crop.

Estimating Percent Defoliation

Many economic thresholds for insects are based on percent defoliation of the plants they are feeding on. The following figure may assist in determining the percent defoliation. Although the following photo is of sunflower leaves, this figure can be used to estimate percent defoliation for many crops.

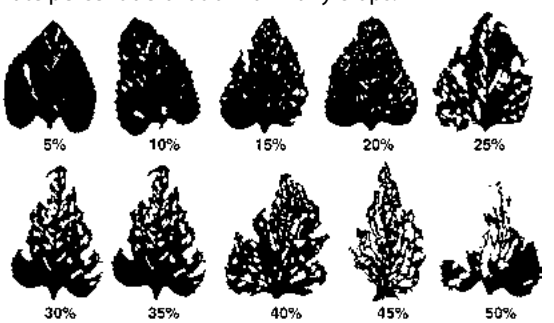


Photo courtesy of North Dakota State University Extension

Hazard Ratings and Residual Times of Insecticides to Bees

The following table can be used to assist in selecting an insecticide to apply to fields where either the crop or weeds may be flowering at the time of application. Residual time indicates the length of time the residue of the product remains toxic to bees after application. **These times are to be used as general guidelines only.** Environmental conditions influence the rate at which pesticides degrade.

INSECTICIDE	HAZARD RATING[a]		RESIDUE HAZARD (DAYS)[b]
	HONEY BEE	LEAFCUTTER BEE	
Least Hazardous Insecticides to Bees (no label precautions for bees)			
Dipel	3	3	none
Nolo Bait	3	3	none
Eco bran	3	3	N/A
Coragen MaX/Coragen/Shenzi	3	-	<3 hours
Carbine/Beleaf	3	-	<1
Moderately to Highly Hazardous to Bees (see label for precautions to bees)			
Assail/Aceta	1 to 2	-	<1
Delegate	1 to 2	1	3 hours
Closer	-	-	3 hours
Decis/Poleci/Advantage Deltamethrin 5 EC/Decimate/Rauma	1 to 2	1 to 2	<8 hours
Rimon	1 to 2	2	1
Success/Entrust	1 to 2	1	<1 to >1
Admire	1	1 to 2	<1 to >1
Matador/Silencer/Labamba/Zivata	1	1	>1
Oberon	1 to 2	1	-
Movento	1	-	-
Cimegra	1	1	-
Agri-mek	1 to 3	2	<1 to 3
UP-Cyde/Ship	1	1	<1 to >3
Ambush/Pounce/Perm-UP/IPCO Syncro	1	1	<1 to 5
Imidan	1	1	1 to 5
Malathion	1 to 2	1	2 (honey bee), 6 (leafcutter bee)
Sevin	1 to 2	1 to 2	>1 to 7
Cygon/Lagon/Diamante 4	1	1	3 to 7

[a] *HAZARD RATING* 1 = Very poisonous to bees; DO NOT apply to crops or weeds in bloom unless bees are kept off for the period that residue on the crop is a hazard. 2 = Moderately poisonous to bees; avoid direct application to bees, but may be applied with minimum hazard in late evening when bees are not foraging. 3 = Not very poisonous to bees; may be applied with minimum hazard to bees.

[b] Residue hazard represents the average time in days that residues poisonous to honey bees will remain on foliage (may vary with formulation and weather). Unusually low temperatures following spray application may cause residues to remain toxic longer than under warmer conditions. Morning dew can also make residues more toxic to foraging bees. A more extensive list of hazard ratings of insecticides to bees and duration of toxicity can be found at the Western Committee on Crop Pests website at: https://www.westernforum.org/WCCP%20Guidelines.html.

Reducing Bee Losses from Insecticides

Careless use of insecticides can kill bees and other beneficial insects such as pollinators, predatory and parasitic biological control insects. Help to reduce insecticide poisoning of bees by:

1. **Avoid applying insecticides that are toxic to bees when crops are in bloom.** Any field with even a small amount of bloom, whether it is the main crop, cover crop, or weeds will probably have foraging bees visiting the flowers. If at all possible, apply insecticides before or after the crop has gone into bloom. Control all flowering weeds prior to insecticide application.
2. **Apply insecticides when bees are least active.** The highest level of bee activity occurs during the day. Apply insecticides in late evening or early morning when the bees are not foraging. As a general rule, evening applications are less hazardous to bees than morning applications. DO NOT apply insecticides if unusually low temperatures or heavy dew are forecast following application, because residuals typically remain toxic to bees longer under these conditions.
3. **Minimize insecticide drift.** To avoid insecticides drifting into non-target locations, DO NOT apply insecticides during windy conditions. Choose nozzles with a low drift rating. As a general rule, ground applications of insecticide are less prone to drift than aerial applications. When planting insecticide treated seeds, reduce the movement of dust from the seeding equipment to flowering crops, weeds and water sources that are in or adjacent to the field being seeded. If seeding equipment may potentially generate dust, controlling flowering weeds in the field prior to seeding may reduce pollinators being attracted to the field.
4. **Contact the beekeeper before spraying.** Communication and cooperation between the insecticide applicator and the beekeeper can usually prevent bee losses. Notifying the beekeeper in advance (e.g. 48 hours) of applying insecticides will allow the beekeeper to move or protect the colonies from insecticide damage. The app BeeConnected (**http://www.beeconnected.ca**/) can be used to facilitate communication between farmers and beekeepers within a 5 km radius of the farm or beehives.
5. **If possible, use insecticides and/or insecticide formulations which are the least hazardous to bees.** The table "Hazard Ratings of Insecticides to Bees" will help in selecting the least hazardous insecticide. In general, dusts are more hazardous to bees than sprays. Wettable powders are more hazardous than emulsifiable concentrates (EC) or water-soluble formulations. Granular insecticides and spreadable bran bait insecticides are generally the least hazardous to bees.

Insecticide Poisoning in Humans

Organophosphate (OP) and carbamate insecticides (identified on the Insecticide Groups chart) can pose a serious risk to unprotected persons. Poisonings can occur while mixing, loading and/or during the application of these products without the appropriate protective equipment or measures. These pesticides are readily absorbed through the skin or the lungs, and can act as nervous system toxins. Overexposure can produce symptoms such as headache, nausea, pupil dilation and excessive sweating and salivation. Higher doses may cause breathing difficulties, muscle twitching, weakness and spasms. Very high doses have caused respiratory failure and death.

Both OP and carbamate pesticides inhibit an enzyme called cholinesterase. Measurements of cholinesterase in the blood before and during the application season can indicate harmful exposures to OPs and carbamates. **Persons who intend to mix, load and/or apply these types of pesticides repeatedly during a season, need a baseline and repeat measurements. Consult your doctor before the spraying season to arrange for these measurements.**

Degree of Risk and Hazard Rating:

(see introduction for full description on symbols and ratings)

Resistance of Insects to Insecticides

Repeated use of the same insecticide, or insecticides with the same mode of action, against a particular insect in a given area may result in the effectiveness of the insecticide being reduced. To delay or prevent resistance of insects to insecticides:

1. Integrate different control methods (cultural, biological, chemical) into insect control programs whenever possible,
2. Use insecticides only when the economic threshold for a pest has been surpassed and natural controls fail to limit economic damage,
3. Rotate between insecticides with different modes of action, particularly if several applications are made in a season, and
4. Keep accurate records of insecticides used for each of your fields.

Insecticides can be classified according to their similarity in chemical structure (chemical group in the table below), and by mode of action (the process by which the insecticide kills the insect). The "Group" column in the following table separates insecticides based on their mode of action. By selecting products with different modes of action for an insecticide rotation program, risk of insecticide resistance can be reduced.

Insecticide Groups Based on Modes of Action

GROUP	CHEMICAL GROUP	TRADE NAME	ACTIVE INGREDIENT	MODE OF ENTRY
1A	Carbamates	*Sevin XLR, Eco Bran*	carbaryl	contact/ingestion (*Sevin XLR*) ingestion (*Eco Bran*)
1B	Organophosphates	*Malathion*	malathion	contact
		Imidan	phosmet	contact/ingestion
		Lagon, Cygon, Diamante 4	dimethoate	contact/ingestion
		Thimet 20-G	phorate	ingestion
3A	Pyrethroids	*Decis, Poleci, Advantage Deltamethrin 5 EC, Decimate, Rauma, Concept* (3A + 4A)*	deltamethrin	contact/ingestion
		UP-Cyde, Ship	cypermethrin	contact/ingestion
		Matador, Silencer, Labamba, Zivata, Voliam Xpress (3A + 28)*	lambda-cyhalothrin	contact/ingestion
		Ambush, Pounce, Perm-UP, IPCO Syncro	permethrin	contact/ingestion
4A	Neonicotinoids	*Helix, Cruiser* *Actara 240SC* *Actara 25WG, Minecto Duo* (4A + 28)*	thiamethoxam	ingestion ingestion contact/ingestion
		Admire, Raxil PRO Shield, Sombrero, Trilex EverGol Shield, Concept (3A + 4A)*	imidacloprid	contact/ingestion (flowable formulations), ingestion (seed treatments)
		Assail, Aceta, Cormoran (4A + 15)*	acetamiprid	contact/ingestion
		Prosper, Poncho, NipsIt, Titan	clothianidin	ingestion
4C	Sulfoximines	*Closer*	sulfoxaflor	contact/ingestion
4D	Butenolides	*Sivanto Prime, BUTEO start*	flupyradifurone	contact/ingestion
5	Spinosyns	*Success, Entrust, Scorpio Ant and Insect Bait*	spinosad	contact/ingestion (*Success, Entrust*), ingestion (*Scorpio Ant and Insect Bait*)
		Delegate	spinetoram	contact/ingestion
6	Avermectins, Milbemycins	*Agri-mek, Minecto Pro* (6 + 28)*	abamectin	contact/ingestion
9D	Pyropenes	*Sefina*	Afidopyropen	contact
11A	Microbial disruptors of insect midgut membranes	*Dipel, Bioprotec*	*Bacillus thuringiensis var. Kurstaki*	ingestion
15	Benzoylureas	*Rimon, Cormoran* (4A + 15)*	novaluron	ingestion/contact
18	Ecdysone receptor agonists	*Intrepid*	methoxyfenozide	
23	Tetronic and tetramic acid derivatives	*Movento*	spirotetramat	
		Oberon	spiromesifen	contact
24A	Phosphides	*Phostoxin, Fumitoxin*	aluminum phosphide	inhalation (fumigant)
28	Diamides	*Coragen MaX, Coragen, Shenzi, Lumivia CPL, Lumivia, Voliam Xpress* (3A + 28)*	chlorantraniliprole	ingestion mainly
		Lumiderm, Verimark, Fortenza, Exirel , Minecto Duo (4A + 28), Minecto Pro* (6+ 28)*	cyantraniliprole	ingestion
		Harvanta	cyclaniliprole	contact/ingestion
		Vayego	tetraniliprole	contact/ingestion
29	Flonicamid	*Carbine, Beleaf*	flonicamid	contact/ingestion

GROUP	CHEMICAL GROUP	TRADE NAME	ACTIVE INGREDIENT	MODE OF ENTRY
30	Meta-diamides, isoxazolines	*Teraxxa F4, Cimegra*	broflanilide	
31	Baculoviruses	*Plutex*	Plutella xylostella granulovirus	ingestion
UNF	Fungal Agents of unknown or uncertain MOA	BioTitan	Beauveria bassiana	
UNM	Non-specific mechanical and physical disruptors	*Protect-it*	diatomaceous earth	
		Superior 70 Oil	mineral oil	

A more detailed table showing insecticides organized by mode (site) of action, and specific information on the mode (site) of action for the different groups can be found on the Insecticide Resistance Action Committee website at: **https://irac-online.org/mode-of-action/**.

*Product contains more than one active ingredient and appears in more than one group.

Field Scouting and Insect Management Charts

Field Scouting in Alfalfa

Sap Or Fluid Feeders

- **Lygus bugs/Alfalfa plant bug**
  - ***Typical Damage:*** Field blooms poorly or not at all. Flower buds blasted, whitish, and dry; flowers dropping off before fully open. Collapsed seed.
  - ***When and How to Monitor:*** Look for plant bugs when monitoring alfalfa in June through mid-August. Make five 180° sweeps with a 15 inch (40 cm) insect net through alfalfa canopy at each sampling site. Record total number of plant and lygus bugs (both nymphs and adults) captured. Calculate average number per sweep.
  - ***Economic Threshold:*** Hay: Control not recommended. Seed alfalfa at bud and early bloom: 8 lygus bugs per sweep (40 in 5 sweeps); 4 alfalfa plant bugs per sweep; or 5 bugs if the plant bug population is a combination of lygus bugs and alfalfa plant bug. If insecticides are used, attempt to spray before the onset of bloom. Protecting insect pollinators in seed production fields is very important.
- **Potato Leafhopper**
  - Leafhoppers are most severe in new seedings and in regrowth under hot dry weather.
  - ***When and How to Monitor:*** Take 20, 180° sweeps from 5 areas of the field. Avoid field edges. Determine the average number of potato leafhoppers per sweep.
  - ***Economic Threshold:*** For 9 cm stem height = 0.2 adult leafhoppers per sweep; 15 cm stem height = 0.5 adults per sweep; 25 cm stem height = 1 adult or nymph per sweep; 36 cm stem height = 2 adults or nymphs per sweep.
- **Pea Aphid**
  - ***Typical Damage:*** Suck juices from plants; stunt growth; cause premature drying.
  - ***When and How to Monitor:*** Look for when monitoring in July through August. Take 5 sweeps at each location. Monitor fields closely during periods of slow plant growth.
  - ***Economic Threshold:*** 100 to 200 aphids per 180° sweep when crop is moisture stressed, or until mid-August.

Defoliators

- **Alfalfa Weevil**
  - ***Typical Damage:*** Feed on developing buds and leaves. Stunt growth.
  - ***When and How to Monitor:*** Start scouting fields in mid-May. Look for shot holes initially, then clipping along the edges of leaves and pinhole damage. For determining if levels are at threshold in hay crops, collect 30 stems in an M-shaped pattern, place them inside a white pail and beat them against the side to knock off larvae. DO NOT include younger first and second instar larvae (3 mm or less) in the counts. Determine the average height of the crop as well.
  - ***Economic Threshold:***
    - *Alfalfa Hay:* One of the best control strategies is to cut fields for hay early. If early cutting of the hay crop is not possible, treatment thresholds are based on the following measurements of plant height and levels of larvae: <30 cm to 1 larva per stem; <40 cm to 2 larvae per stem; 3 larvae per stem is generally economical to control regardless of height of crop. On regrowth for second crop, 2 or more active larvae per crown (4 to 8 larvae per square feet) will require insecticide application.
    - *Alfalfa Seed:* 20 to 30 3rd or 4th instar larvae per sweep (90° = straight sweep) or 35 to 50 percent of foliage tips showing damage. In some instances it may be practical to just treat hotspots and not entire fields.

Alfalfa Insect Management Chart

Insect	Insecticide (and insecticide group[1])	Rate per Acre	Pre-harvest interval (Days)	Application (A=aerial; G=ground)	LD_{50} (Mammalian Toxicity)[2]
Belowground and Surface Feeders					
Cutworms	*Coragen MaX*	34 mL	0	G	>5,000
Sap or Fluid Feeders					
Lygus bugs	*Carbine/Beleaf 50SG* (F)	81 to 121 g	7	G	>2000
	Rimon (seed production only) (SB)	338 mL	14	G	3,914 to >5000
	Cormoran (seed production only) (SB + N)	304 to 364 mL	14	G	>2000
	Assail/Aceta (seed production only) (N)	35 to 69 g	1	G	1064
	Matador/ Silencer/Labamba/Zivata (P)	34 mL	DO NOT cut treated fields for hay or forage; do not graze treated fields.	A or G (Matador/ *Labamba*) G (*Silencer/ Zivata*)	56 to 98
	Decis 100 EC/ Advantage Deltamethrin 5 EC/Poleci (seed production only) (P)	41 to 51 mL (*Decis 100 EC*) 81 to 101 mL (*Advantage Delta...5 EC*) 162 to 202 mL (*Poleci*)	20	G	>300 to 2000
	Malathion 85E (OP)	0.445 to 0.544 L	7	A or G	>550
	Cygon 400EC/Cygon 480-AG/ Diamante 4 (OP) (seed and forage production)	206 mL (*Cygon 400EC*) 170 ML (*Cygon 480-AG, Diamante 4*)	2 (*Cygon 400-AG*) 10 (*Cygon 400, Diamante 4*)	A or G	245 to 550
	Lagon/Cygon 400EC/Cygon 480-AG/ Diamante 4 (OP) (seed production only)	440 mL (*Lagon, Cygon 480-AG, Diamante 4*) 534 mL (*Cygon 400EC*)	28	A or G	245 to 550
Alfalfa plant bug	*Cormoran* (seed production only) (SB + N)	304 to 364 mL	14	G	>2000
	Assail/Aceta (seed production only) (N)	35 to 69 g	1	G	1064
	Lagon/Cygon 400EC/Cygon 480-AG/ Diamante 4 (OP) (seed production only)	440 mL (*Lagon, Cygon 480-AG, Diamante 4*) 534 mL (*Cygon 400EC*)	28	A or G	245 to 550
Potato leafhopper	*Sefina* (PP) (suppression only)	81 to 162 ml	0	A or G	>2,000
	Sivanto Prime (B)	202 to 304 mL	7	G	>2000
	Matador/Silencer/Labamba/Zivata (P)	34 mL	DO NOT cut treated fields for hay or forage; do not graze treated fields.	A or G (Matador/ *Labamba*) G (*Silencer/Zivata*)	56 to 98
	Malathion 85E (OP)	0.445 to 0.544 L	7	A or G	>550
	Lagon/Cygon 400EC/Cygon 480-AG/ Diamante 4 (OP)	170 mL (*Lagon, Cygon 480-AG, Diamante 4*) 206 mL (*Cygon 400EC*)	2 (*Cygon 480-AG*) 10 (*Lagon, Cygon 400 EC, Diamante 4*)	A or G	245 to 550

Insect	Insecticide (and insecticide group[1])	Rate per Acre	Pre-harvest interval (Days)	Application (A=aerial; G=ground)	LD_{50} (Mammalian Toxicity)[2]
Spittlebugs	*Malathion 85E* (OP) (adults)	0.445 to 0.544 L	7	A or G	>550
Pea aphid	*Sefina* (PP)	81 ml	0	A or G	>2,000
	Carbine/Beleaf 50SG (F)	49 to 65 g	7	G	>2000
	Sivanto Prime (B)	202 to 304 mL	7	G	>2000
	Matador/Silencer/Labamba/Zivata (P)	34 mL	DO NOT cut treated fields for hay or forage; do not graze treated fields.	A or G *(Matador/ Labamba)* G (*Silencer/Zivata*)	56 to 98
	Malathion 85E (OP)	0.445 to 0.544 L	7	A or G	>550
	Lagon/Cygon 400EC/Cygon 480-AG/ Diamante 4 (OP)	170 mL (*Lagon, Cygon 480-AG, Diamante 4*) 206 mL (*Cygon 400EC*)	2 (*Cygon 480-AG*) 10 (*Lagon, Diamante 4, Cygon 400 EC*)	A or G	245 to 550
Spider mites	*Malathion 85E* (OP)	0.445 to 0.544 L	7	A or G	>550
	Oberon (TT)	0.202 to 0.405 L		A or G	>2000
Defoliators					
Grasshoppers	**Spreadable Bran Baits**				
	Nolo Bait (M)	Minimum of 0.45 kg		A or G	
	Sprays				
	Coragen MaX *Coragen* *Shenzi* (D)	17 to 33.5 mL 51 to 101 mL 25.5 to 50.6 ml	0	G	>5000
	Matador/Silencer/Labamba/Zivata (P)	25 to 34 mL (ground) 34 mL (air)	DO NOT cut treated fields for hay or forage; do not graze treated fields.	A or G	56 to 98
	Decis 100 EC (seed production only) (P)	20 to 30 mL	20	G	633
	Malathion 85E (OP)	0.445 to 0.544 L	7	A or G	>550
	Lagon/Cygon 400EC/Cygon 480-AG/ Diamante 4 (OP)	Nymphs: 220 mL (*Lagon, Cygon 480-AG, Diamante 4*), 267 mL (*Cygon 400EC*). Adults: 340 to 360 mL (*Lagon, Cygon 480-AG, Diamante 4*), 413 to 437 mL (*Cygon 400EC*).	10 (nymphs) 28 (adults)	A or G	245 to 550

Insect	Insecticide (and insecticide group[1])	Rate per Acre	Pre-harvest interval (Days)	Application (A=aerial; G=ground)	LD_{50} (Mammalian Toxicity)[2]
Alfalfa weevil	If alfalfa has reached the bud or early bloom stage, immediate **cutting** will kill many alfalfa weevil larvae.				
	Coragen MaX *Coragen* *Shenzi* (suppression only) (D)	50.5 to 67.5 mL 152 to 202 mL 76 to 101 ml	0	G	>5000
	Assail (seed production only) (N)	69 g	1	G	1064
	Matador/Silencer/Labamba/Zivata (P)	34 mL	DO NOT cut treated fields for hay or forage; do not graze treated fields.	A or G (Matador/ *Labamba*) G (*Silencer/Zivata*)	56 to 98
	Decis 100 EC/ *Advantage Deltamethrin 5 EC/* *Poleci* (seed crops only) (P)	41 to 51 mL (*Decis 100 EC*) 81 to 101 mL (*Advantage Delta...5 EC*) 162 to 202 mL (*Poleci*)	20	G	>300 to 2000
	Malathion 85E (larvae only) (OP)	0.445 to 0.544 L	7	A or G	>550
	Lagon/Cygon 400EC/Cygon 480-AG/ Diamante 4 (OP) (reduction only)	170 mL (*Lagon, Cygon 480-AG, Diamante 4*) 206 mL (*Cygon 400EC*)	2 (*Cygon 480-AG*) 10 (*Lagon, Diamante 4, Cygon 400 EC*)	A or G	245 to 550
Leafminers					
Alfalfa blotch leafminer	*Malathion 85E* (OP)	0.544 L	7	A or G	>550
	Lagon/Cygon 400EC/Cygon 480-AG/ Diamante 4 (OP)	220 mL (*Lagon, Cygon 480-AG, Diamante 4*) 267 mL (*Cygon 400EC*)	10	A or G	245 to 550

ALWAYS CONSULT THE INSECTICIDE LABEL BEFORE APPLYING ANY INSECTICIDE.

[1] Insecticide Group: M=microbials, SB=substituted benzoylurea, B=butenolides, F=flonicamid, N=neonicotinoids, P=pyrethroids, PP=pyropenes, C=carbamates, OP=organophosphates, TT=tetronic and tetramic acid derivatives.

[2] LD_{50} values represent the relative toxicity of a pesticide. They represent the dose (in milligram per kilogram body weight) that will kill 50 percent of the test animals. Thus the lower the number the greater the toxicity. Values given are for oral LD_{50}.

Barley – *See Small Grain Cereals*

Scouting for insects in Beans (Dry Beans)

Belowground Feeders and Cutworm

- **Seedcorn Maggot**
  - ***Typical Damage:*** Seedcorn maggot attacks bean seed, preventing sprouting or weakening seedlings. The yellowish white maggot is found burrowing in the seeds or emerging stem. Seedcorn maggots are usually most severe in wet, cold seasons and on high organic matter soils.
- **Cutworm**
  - ***When and How to Monitor:*** To find cutworm, dig in the soil to a depth of 2.5 to 5 cm at the base of recently damaged plants.
  - ***Nominal Threshold:*** Treatment is warranted when one cutworm or more is found per metre of row and the larvae are still small (less than 2 cm long).

Sap Feeders

- **Leafhoppers**
  - ***Typical Damage:*** Foliage becomes dwarfed, crinkled, and curled. Small triangular brown areas appear at the tips of leaves, gradually spreading around the entire leaf margin.
  - ***When and How to Monitor:*** Leafhopper adults are quick and can be observed by running your hand over the top of the plants as you approach them and observing adults that fly off the plants. On the same plants, turn over each leaf to determine the number of nymphs per trifoliate.
  - ***Economic Threshold:*** Unifoliate stage – 0.25 leafhoppers per trifoliate; second trifoliate stage – 0.5 leafhoppers per trifoliate; fourth trifoliate stage – 1.0 leafhopper per trifoliate; first bloom – 2.0 leafhoppers per trifoliate.

Defoliators

- **Grasshoppers**
  - ***Economic Threshold:*** Substantial yield loss does not occur until up to 35 percent defoliation occurs before bloom and 15 percent after bloom.

Beans (Dry) Insect Management Chart

Insect	Insecticide (and insecticide group[1])	Rate/Acre	Pre-harvest interval (days)	Application (A=aerial; G=ground)	LD_{50} (Mammalian Toxicity)[2]
Belowground and Surface Feeders					
Wireworms	*Cruiser 5FS* (N)	83 mL/100 kg seed	Must be applied in commercial seed treatment facilities.		
	Trilex EverGol Shield	A seed treatment containing *Stress Shield 600* and 3 fungicides.			
	Scorpio Ant and Insect Bait (suppression) (Sp)	10 to 20 kg	Incorporate into the soil at planting to a depth of 10 to 20 cm.		
Seedcorn maggot	Sow seeds as shallow as possible in a warm, well-prepared seedbed. If manure is used, apply and plow it under the previous fall.				
	Cruiser 5FS (N)	50 to 83 mL/100 kg seed	Must be applied in commercial seed treatment facilities.		
Cutworms	*Lumivia CPL* (D)	32 to 64 mL/100 kg seed	Seed treatment		>5000
	Scorpio Ant and Insect Bait (black cutworm) (Sp)	10 to 20 kg	28	G	
	Coragen MaX *Coragen* *Shenzi* (D)	33.5 mL 101 mL 50.6 ml	1	A or G	>5000
	Matador/ Silencer/Labamba/Zivata (P)	34 mL	14 (Matador/*Labamba*) 21 (*Silencer/Zivata*)	A or G	56 to 98
	Decis 100 EC (P)	41 mL	7	A or G	633

Insect	Insecticide (and insecticide group[1])	Rate/Acre	Pre-harvest interval (days)	Application (A=aerial; G=ground)	LD_{50} (Mammalian Toxicity)[2]
Sap or Fluid Feeders					
Lygus bugs	*Carbine* (F)	81 g	7	G	>2000
	Matador/Silencer/Labamba/Zivata (P)	34 mL	14 (Matador/*Labamba*) 21 (*Silencer/Zivata*)	A or G	56 to 98
	Voliam Xpress (D+P)	91 mL	14. Do not feed treated crop to livestock.	A or G	98
	Decis 100 EC (P)	41 mL	7	A or G	633
	Sevin XLR (C)	2.12 to 2.59 L	5	G	699
	Cygon 400EC/Cygon 480-AG/ Diamante 4 (OP)	280 to 400 mL (*Cygon 480-AG, Diamante 4*) 340 to 486 mL (*Cygon 400EC*)	7	G	245 to 550
Potato leafhopper	*Sivanto Prime* (B)	202 to 304 mL	7	A or G	>2000
	Matador/Silencer/Labamba/Zivata (P)	34 mL	14 (Matador/*Labamba*) 21 (*Silencer/Zivata*)	A or G	56 to 98
	Voliam Xpress (D+P)	91 mL	14. Do not feed treated crop to livestock.	A or G	98
	Sevin XLR (C)	1.01 L	5	G	699
	Cygon 400EC/Cygon 480-AG/ Diamante 4 (OP)	280 to 400 mL (*Cygon 480-AG, Diamante 4*) 340 to 486 mL (*Cygon 400EC*)	7	G	245 to 550
Aphids	*Carbine* (F)	49 to 65 g	7	G	>2000
	Movento (TT)	75 to 111 mL	7	G	>2000
	Sivanto Prime (B)	202 to 304 mL	7	A or G	>2000
	Matador/Silencer/Labamba/Zivata (P)	34 to 94 mL	14 (Matador/Labamba) 21 (Silencer/*Zivata*)	A or G	56 to 98
	Voliam Xpress (D+P)	91 to 223 mL	14. Do not feed treated crop to livestock.	A or G	98
	Malathion 85E (OP)	0.297 to 0.544 L	3	G	>550
	Cygon 400EC/Cygon 480-AG/ Diamante 4 (OP)	280 to 400 mL (*Cygon 480-AG, Diamante 4*) 340 to 486 mL (*Cygon 400EC*)	7	G	245 to 550
Spider mites	*Oberon* (TT)	202 to 243 mL	10	A or G	>2000
	Cygon 400EC/Cygon 480-AG/ Diamante 4 (OP)	280 to 400 mL (*Cygon 480-AG, Diamante 4*) 340 to 486 mL (*Cygon 400EC*)	7	G	245 to 550

Insect	Insecticide (and insecticide group[1])	Rate/Acre	Pre-harvest interval (days)	Application (A=aerial; G=ground)	LD_{50} (Mammalian Toxicity)[2]
Defoliators and Borers					
Grasshoppers	**Spreadable Bran Baits**				
	Eco bran (C)	0.8 to 1.6 kg	5	G	N/A
	Sprays				
	Coragen MaX *Coragen* *Shenzi* (D)	17 to 33.5 mL 51 to 101 mL 25.5 to 50.6 ml	1	A or G	>5000
	Voliam Xpress (D+P)	91 mL	14. Do not feed treated crop to livestock	A or G	98
	Decis 100 EC (P)	20 to 30 mL	7	A or G	633
European corn borer	*Coragen MaX* *Coragen* *Shenzi* (D)	33.5 to 50.5 mL 101 to 152 mL 50.6 to 76.1 ml	1	A or G	>5000
	Intrepid (E)	121 to 243 mL	7	G	>5000
	Matador/Silencer/Labamba/Zivata (P)	34 mL	14 (Matador/*Labamba*) 21 (*Silencer/Zivata*)	A or G	56 to 98
	Voliam Xpress (D+P)	202 mL	14. Do not feed treated crop to livestock.	A or G	98

ALWAYS CONSULT THE INSECTICIDE LABEL BEFORE APPLYING ANY INSECTICIDE.

[1] Insecticide Group: F=flonicamid, D=diamides, E=ecdysone receptor agonists, N=neonicotinoids, P=pyrethroids, C=carbamates, OP=organophosphates, TT = tetronic and tetramic acid derivatives.

[2] LD^{50} values represent the relative toxicity of a pesticide. They represent the dose (in milligram per kilogram body weight) that will kill 50 percent of the test animals. Thus the lower the number the greater the toxicity. Values given are for oral LD^{50}.

Buckwheat Insect Management Chart

Insect	Insecticide (and insecticide group[1])	Rate per Acre	Pre-harvest interval (days)	Application (A=aerial; G=ground)	LD_{50} (Mammalian Toxicity)[2]
Belowground and Surface Feeders					
Cutworms	*Coragen MaX* *Coragen* *Shenzi* (D)	33.5 mL 101 mL 50.6 ml	1	A or G	>5000
Defoliators					
Grasshoppers	*Coragen MaX* *Coragen* *Shenzi* (D)	17.0 to 33.5 mL 51 to 101 mL 25.5 to 50.6 ml	1	A or G	>5000

ALWAYS CONSULT THE INSECTICIDE LABEL BEFORE APPLYING ANY INSECTICIDE.

[1] Insecticide Group: D=diamides

[2] LD^{50} values represent the relative toxicity of a pesticide. They represent the dose (in milligram per kilogram body weight) that will kill 50 percent of the test animals. Thus the lower the number the greater the toxicity. Values given are for oral LD_{50}.

Scouting for insects in Canaryseed

Sap Feeders

- **Aphids**
  - ***When and How to Monitor:*** Start checking for aphids when monitoring during the early heading stage of canaryseed. The head should be bent and closely inspected for aphids hiding along the small stem inside the canaryseed head. Also check the stems, underside of leaves, and in the canaryseed boot.
  - ***Nominal Threshold:*** 10 to 20 aphids on 50 percent of the stems prior to the soft dough stage.

Canaryseed Insect Management Chart

Insect	Insecticide (and insecticide group[1])	Rate per Acre	Pre-harvest interval (days)	Application (A=aerial; G=ground)	LD_{50} (Mammalian Toxicity)[2]
Sap Feeders					
Aphids	*Lagon/Cygon 400EC/Cygon 480-AG/ Diamante 4* (OP)	200 mL (*Lagon, Cygon 480-AG, Diamante 4*) 242 mL (*Cygon 400EC*)	21	A or G	245 to 550
	Malathion 85E (OP)	0.277 L	14	A or G	>550

ALWAYS CONSULT THE INSECTICIDE LABEL BEFORE APPLYING ANY INSECTICIDE.

[1] Insecticide Group: OP=organophosphates

[2] LD^{50} values represent the relative toxicity of a pesticide. They represent the dose (in milligram per kilogram body weight) that will kill 50 percent of the test animals. Thus the lower the number the greater the toxicity. Values given are for oral LD_{50}.

Field Scouting in Canola

Scouting Calendar

Early-season: Flea beetles, cutworm, red turnip beetle, diamondback moth

Mid-season: Diamondback moth, cabbage seedpod weevil, grasshoppers

Late season: Bertha armyworm, diamondback moth, Lygus bugs, grasshoppers, alfalfa looper

- **Cutworm**
  - ***Typical Damage:*** Notched, wilted, dead, or cut-off plants (weed or crop seedlings). Plants missing from rows, bare patches appearing in field.
  - ***When and How to Monitor:*** Look for cutworm, and evidence of cutworm feeding, when monitoring canola in May and June. Often cutworms will be close to the cut or shriveled plants that they have just damaged. Cutworm will sometimes be most abundant in patches or a specific area of a field.
  - ***Nominal Threshold:*** 25 to 30 percent stand reduction. Sometimes it is most economical to just treat infested patches, and not whole fields.

Sap Or Fluid Feeders

- **Lygus bugs**
  - ***Typical Damage:*** Attacked buds appear shrunken and bleached white. Damaged seeds appear dark brown and shriveled.
  - ***When and How to Monitor:*** Monitor from when flowering is complete until seeds within the pod have become firm. Make 10 sweeps with a 38 cm diameter insect net at each of at least 5 sampling site. If while doing these samples populations appear to be of concern, take additional samples; a minimum of 15 samples is needed to accurately determine whether controls are economical. Sample canola for lygus bugs on a sunny day when the temperature is above 20°C and the crop canopy is dry.
  - ***Economic Threshold:*** A threshold of 20 to 30 per 10 sweeps is suitable for good growing conditions. Using the lower end of the threshold (about 20 per 10 sweeps) may be appropriate for stressed canola with less ability to compensate for feeding. When most pods become leathery and when seeds inside are firm, lygus bugs can no longer penetrate the pods or seeds with their mouthparts and are no longer an economic threat. When precipitation is greater than 100 mm from the onset of bud formation to the end of flowering, the crop may partially compensate for plant bug damage.
- **Aphids**
  - ***Economic Threshold:*** Control aphids in canola if densities exceed 25 aphids per 10 cm shoot tip after flowering.

Defoliators

- **Flea beetles**
  - ***Typical Damage:*** Shot-holes in leaves to complete destruction of seedling plants in late May through June. Holes chewed in pods in August (occasional).
  - ***When and How to Monitor:*** Look for when monitoring in May through June when crop is in seedling stage. Examine 10 plants at random at each stop. Estimate overall percentage leaf loss.
  - ***Economic Threshold:*** When 25 percent of leaf surface is destroyed and flea beetles are present. If damage is only along the field margins and beetles are still congregated there, then control measures should be applied to the damaged areas only.
- **Cabbage Seedpod Weevil**
  - ***When and How to Monitor:*** Sample at 10 to 20 percent flower. Do 10 sweeps (180°) at a minimum of 4 locations; field edge, 50 metres into the field, and repeat the 2 sets at the opposite end of the field. If weevil numbers are close to the threshold the estimate may be improved by taking additional samples.
  - ***Economic Threshold:*** 25 to 40 weevils per 10 sweeps.
- **Diamondback moth**
  - ***Typical Damage:*** Flowers clipped or chewed, outer layers of stem and pods chewed, holes chewed in pods.
  - ***When and How to Monitor:*** Look for when monitoring in late May through early September. Observing for adults and larvae while taking sweep net samples can determine the presence and relative abundance of diamondback moth in the field. If levels appear to be of concern, shake plants within a 50 cm x 50 cm area and count larvae on the ground or surface (such as a sweep net) that plants were shaken over. Another alternative is to clip or pull the plants and knock over a light colored surface (such as a sweep net, jacket, hood of a car, etc.). Multiply by 4 to get the number of larvae per square metre. Do this in at least 5 areas of the field.
  - ***Nominal Threshold:*** 100 to 150 larvae per square metre in immature to flowering plants. 200 to 300 larvae per square metre in plants with flowers and pods.
    - Note that these threshold numbers are based on stands averaging 150 to 200 plants per square metre. In areas where stands are thinner, the economic threshold should be lowered accordingly. A nominal threshold of 25 to 33 percent defoliation with larvae still present can be applied for canola at seedling stage.

- **Bertha Armyworm**
  - ***Typical Damage:*** Outer layers of stems and pods chewed resulting in whitish appearance, holes chewed in pods.
  - ***When and How to Monitor:*** Look for larvae when monitoring fields in late July through early August. At each stop, shake plants in a 1/4 square metre (50 cm x 50 cm) area and carefully check soil surface for dislodged larvae. During heat of the day, larvae will often be found under leaves on soil surface.
  - ***Economic Threshold:*** A loss of 0.058 bushels per acre for each larva per square metre can be expected. Multiplying 0.058 x average number of larvae per square metre x expected seed value (dollars per bushel) will determine the economic loss (in dollars per acre) due to the larvae. Only if control costs (insecticide plus application costs) can be applied for less than this economic loss will insecticide applications be economical. Yield loss may be greater for canola under moisture stress.
  - At an expected seed value of $12.00 per bushel, the economic threshold will be between about 14 and 28 larvae per square metre, depending on control costs. At an expected seed value of $16 per bushel, the economic threshold will be between about 11 and 21 larvae per square metre, depending on control costs. Tables showing specific economic thresholds at various expected seed values and control costs can be found at: **https://www.gov.mb.ca/agriculture/crops/insects/pubs/bertha-armyworm-factsheet.pdf**.

Canola Insect Management Chart

Insect	Insecticide (and insecticide group[1])	Rate per Acre	Pre-harvest interval (days)	Application (A=aerial; G=ground)	LD_{50} (Mammalian Toxicity)[2]
Belowground and Surface Feeders					
Root maggots	• **Increased seeding rates and increased row spacing** (to about 25 to 30 cm) can reduce damage to the roots by root maggots. • **Cultivating** prior to seeding reduces adult emergence from overwintered pupae. Root maggot infestations are greater under zero-till systems than under conventional tillage, but yields under zero tillage usually still exceed those with conventional tillage.				
Cutworms	**Seed treatments**				
	Fortenza Advanced (D)[3]	A co-pack of *Fortenza* and *Rascendo* (sulfoxaflor) that can be combined with neonicotinoid-based seed treatments.			
	Lumiderm (D)[4]	A seed treatment that can be combined with a neonicotinoid-based seed treatment.			>5000
	Foliar Sprays				
	Coragen MaX *Coragen* *Shenzi* (D)	33.5 mL 101 mL 50.6 ml	1	A or G	>5000
	Matador/Labamba (P)	34 mL	7	A or G	56 to 93
	Decis 100 EC (P)	40 mL	7	A or G	633
	Pounce/Perm-UP/IPCO Syncro (P) *Ambush* (P)	73 to 158 mL 57 to 121 mL	Treat up to 5-leaf stage	A or G (see labels)	789 to 1030
Sap and Fluid Feeders					
Lygus bugs	*Decis 100 EC/Advantage Deltamethrin 5 EC/Poleci* (P)	30 mL (*Decis 100 EC*) 60 mL (*Advantage Delta..5EC*) 121 mL (*Poleci*)	7	A or G	>300 to 2000
	Matador/ Silencer/Labamba/ Zivata (P)	34 mL	7	A or G	56 to 98
	Voliam Xpress (D+P)	91 mL	7. Do not feed treated crop to livestock.	A or G	98
	Cygon 400EC/Cygon 480-AG (OP)	219 to 437 mL (Cygon 400EC) 182 to 364 mL (Cygon 480-AG)	21	A or G	450 to 550

Insect	Insecticide (and insecticide group[1])	Rate per Acre	Pre-harvest interval (days)	Application (A=aerial; G=ground)	LD_{50} (Mammalian Toxicity)[2]
Turnip aphid	*Lagon/Cygon 400EC/ Cygon 480-AG/Diamante 4* (OP)	340 to 360 mL (*Lagon, Cygon 480-AG, Diamante 4*) 413 to 437 mL (*Cygon 400EC*)	21	A or G	245 to 550
Aster leafhopper	*Lagon/Cygon 400EC/ Cygon 480-AG/Diamante 4* (OP)	340 to 360 mL (*Lagon, Cygon 480-AG, Diamante 4*) 413 to 437 mL (*Cygon 400EC*)	21	A or G	245 to 550
Defoliators					
Flea beetles (crucifer and/or striped)	**Seed treatments**				
	Lumiderm (D)[4]	Applied combined with a neonicotinoid-based seed treatment.			
	Fortenza Advanced (D)[3]	A co-pack of *Fortenza* and *Rascendo* (sulfoxaflor) that can be combined with neonicotinoid-based seed treatments.			
	BUTEO start (B)	625 to 1042 mL/ 100 kg seed	Seed treatment containing flupyradifurone – applied combined with a neonicotinoid-based seed treatment		1,030
	Helix Vibrance (N)	A seed treatment containing *Helix Xtra* and *Vibrance 500FS*.			
	Prosper EverGol (N)	A seed treatment containing the insecticide clothianidin and 3 fungicides.			
	NipsIt INSIDE (N)	250 to 666 mL/ 100 kg seed	Seed treatment		3044
	Sombrero (N)	0.67 to 1.33 L/ 100 kg seed	Seed treatment		N/A
	Foliar Sprays				
	Decis 100 EC/Advantage Deltamethrin 5 EC/Decimate/ Rauma/Poleci (P)	20 to 30 mL (*Decis 100 EC*) 40 to 60 mL (*Advantage Delta..5EC/ Decimate/Rauma*) 81 to 121 mL (*Poleci*)	7	A or G	>300 to 2000
	UP-Cyde/Ship (P)	56.6 mL	30	A or G	355
	Matador/ Silencer/Labamba/ Zivata (P)	34 mL	7	A or G	56 to 98
	Voliam Xpress (D+P)	91 mL	7. Do not feed treated crop to livestock	A or G	98
	Pounce/Perm-Up/IPCO Syncro (P) *Ambush* (P)	36 to 73 mL 28 to 57 mL	Treat up to 5-leaf stage	A or G	789 to 1030
	Malathion 85E (OP)	0.217 to 0.346 L	7	A or G	>550
	Sevin XLR (C)	0.202 L	Seedling application only	A or G	699
Cabbage seedpod weevil	**Trap crops** of earlier-flowering canola can be used to concentrate cabbage seedpod weevils, which can be managed with an insecticide if needed.				
	Matador/Silencer/Labamba/ Zivata (P)	34 mL	7	A or G	56 to 98
	Voliam Xpress (D+P)	91 mL	7. Do not feed treated crop to livestock	A or G	98
	Decis 100 EC/Advantage Deltamethrin 5 EC/Poleci (for control of adults only) (P)	40 mL (*Decis 100 EC*) 80 mL (*Advantage Delta..5EC*) 162 mL (*Poleci*)	7	A or G	>300 to 2000

Insect	Insecticide (and insecticide group[1])	Rate per Acre	Pre-harvest interval (days)	Application (A=aerial; G=ground)	LD_{50} (Mammalian Toxicity)[2]
Diamondback moth	*Plutex*	20 to 81 mL	0	G	
	CoragenMax *Coragen* *Shenzi* (D)	17 mL 51 mL 25.5 mL	1	A or G	>5000
	Decis 100 EC/ Advantage *Deltamethrin 5 EC/ Poleci* (P)	20 to 30 mL (*Decis 100 EC)* 40 to 60 mL (*Advantage Delta..5EC*) 81 to 121 mL (*Poleci*)	7	A or G	>300 to 2000
	Matador/ Silencer/Labamba/ Zivata (P)	34 mL	7	A or G	56 to 98
	Voliam Xpress (D+P)	91 mL	7. Do not feed treated crop to livestock.	A or G	98
	Malathion 85E (OP)	0.109 to 0.168 L	7	A or G	>550
Bertha armyworm	**Seeding as early as possible** and choosing **early maturing varieties of canola** may help minimize damage in years when outbreaks are forecasted.				
	CoragenMax *Coragen* *Shenzi* (D)	17 to 50.5 mL 51 to 152 mL 25.5 to 76.1 mL	1	A or G	>5000
	Decis 100 EC/Advantage *Deltamethrin 5 EC/ Poleci* (P)	20 to 30 mL (*Decis 100 EC)* 40 to 60 mL (*Advantage Delta..5EC*) 81 to 121 mL (*Poleci*)	7	A or G	>300 to 2000
	UP-Cyde/Ship (P)	81 to 113 mL	30	A or G	355
	Matador/Silencer/Labamba/ Zivata (P)	34 mL	7	A or G	56 to 98
	Voliam Xpress (D+P)	91 mL	7. Do not feed treated crop to livestock	A or G	98
Cabbage looper	*CoragenMax* *Coragen* *Shenzi* (D)	33.5 mL 101 mL 50.6 mL	1	A or G	>5000
Beet webworm	*Decis 100 EC/ Advantage* *Deltamethrin 5 EC/ Poleci* (P)	20 to 30 mL (*Decis 100 EC)* 40 to 60 mL (*Advantage Delta..5EC*) 81 to 121 mL (*Poleci*)	7	G	>300 to 2000
Clover cutworm	*Decis 100 EC/ Advantage* *Deltamethrin 5 EC/ Poleci* (P)	20 to 30 mL (*Decis 100 EC)* 40 to 60 mL (*Advantage Delta..5EC*) 81 to 121 mL (*Poleci*)	7	A or G	>300 to 2000
Imported cabbageworm	*CoragenMax* *Coragen* *Shenzi* (D)	33.5 mL 101 mL 50.6 mL	1	A or G	>5000
	Matador/Silencer/Labamba/ Zivata (P)	34 mL	7	A or G	56 to 98
	Voliam Xpress (D+P)	91 mL	7. Do not feed treated crop to livestock	A or G	98
Grasshoppers	**Spreadable Bran Baits**				
	Eco bran (C)	0.8 to 1.6 kg	Treat only seedlings	G	N/A

Insect	Insecticide (and insecticide group[1])	Rate per Acre	Pre-harvest interval (days)	Application (A=aerial; G=ground)	LD_{50} (Mammalian Toxicity)[2]
Grasshoppers, *continued*	**Sprays**				
	CoragenMax *Coragen* *Shenzi* (D)	17 to 33.5 mL 51 to 101 mL 25.5 to 50.6 mL	1	A or G	>5000
	Decis 100 EC/Advantage Deltamethrin 5 EC/Poleci (P)	20 to 30 mL (*Decis 100 EC)* 40 to 61 mL (*Advantage Delta..5EC)* *Poleci*: 81 to 121 mL (ground), 121 mL (air)	7	A or G	>300 to 2000
	Matador/Silencer/Labamba/ Zivata (young grasshoppers only) (P)	25 to 34 mL (ground), 34 mL (air)	7	A or G	56 to 98
	Voliam Xpress (D+P)	91 mL	7. Do not feed treated crop to livestock	A or G	98
	UP-Cyde/Ship (P) (young grasshoppers only)	33 to 46 mL	30	G	355
	Malathion 85E (OP)	0.217 to 0.346 L	7	A or G	>550
	Lagon/Cygon 400EC/ Cygon 480-AG/Diamante 4 (OP)	340 to 360 mL (*Lagon, Cygon 480-AG, Diamante 4*) 413 to 437 mL (*Cygon 400EC*)	21	A or G	245 to 550
Slugs	*Sluggo Professional*	10 to 20 kg		G	>5000

ALWAYS CONSULT THE INSECTICIDE LABEL BEFORE APPLYING ANY INSECTICIDE.

[1] Insecticide Group: D=diamides, B=butenolides, N=neonicotinoids, S=sulfoximines, P=pyrethroids, C=carbamates, OP=organophosphates.

[2] LD_{50} values represent the relative toxicity of a pesticide. They represent the dose (in milligram per kilogram body weight) that will kill 50 percent of the test animals. Thus the lower the number the greater the toxicity. Values given are for oral LD_{50}.

[3] DO NOT apply any subsequent applications of a group 28 insecticide (such as *Coragen*) after planting seed treated with *Fortenza*.

[4] DO NOT apply any subsequent applications of a group 28 insecticide (such as *Coragen*) for a minimum of 60 days after planting seed treated with *Lumiderm*.

Chickpea Insect Management Chart

Insect	Insecticide (and insecticide group[1])	Rate per Acre	Pre-harvest interval (days)	Application (A=aerial; G=ground)	LD_{50} (Mammalian Toxicity)[2]
Belowground and Surface Feeders					
Wireworms	*Cruiser 5FS* (N)	17 to 50 mL/100 kg seed	May be applied on-farm or by commercial seed treaters.		
	Trilex EverGol Shield (N)	A seed treatment containing *Stress Shield 600* and 3 fungicides.			
	Scorpio Ant and Insect Bait (suppression) (Sp)	10 to 20 kg	Incorporate into the soil at planting to a depth of 10 to 20 cm		
Cutworms	*Lumivia CPL (D)*	32 to 64 mL/100 kg seed	Seed treatment		>5000
	Scorpio Ant and Insect Bait (black cutworm) (Sp)	10 to 20 kg	28	G	
	CoragenMax *Coragen* *Shenzi* (D)	33.5 mL 101 mL 50.6 mL	1	A or G	>5000
	Matador/Silencer/Labamba/ Zivata (P)	34 mL	14 (Matador/*Labamba*) 21 (*Silencer/Zivata*)	A or G	56 to 98
	Decis 100 EC (P)	41 mL	7	A or G	633
Sap Feeders					
Pea aphid	Carbine (F)	49 to 65 g	7	G	>2000
	Movento (TT)	75 to 111 mL	7	G	>2000
	Sivanto Prime (B)	202 to 304 mL	7	A or G	>2000
	Matador/Silencer/Labamba/ Zivata (P)	34 to 94 mL	14 (Matador/*Labamba*) 21 (*Silencer/Zivata*)	A or G	56 to 98
	Voliam Xpress (D+P)	91 to 223 mL	14. Do not feed treated crop to livestock	A or G	98
Potato leafhopper	*Sivanto Prime* (B)	202 to 304 mL	7	A or G	>2000
	Matador/Silencer/Labamba/ Zivata (P)	34 mL	14 (Matador/*Labamba*) 21 (*Silencer/Zivata*)	A or G	56 to 98
	Voliam Xpress (D+P)	91 mL	14. Do not feed treated crop to livestock	A or G	98
Defoliators					
Grasshoppers	*CoragenMax* *Coragen* *Shenzi* (D)	17 to 33.5 mL 51 to 101 mL 25.5 to 50.6 mL	1	A or G	>5000
	Matador/Silencer/Labamba/ Zivata (P)	34 mL	14 (Matador/*Labamba*) 21 (*Silencer/Zivata*)	A or G	56 to 98
	Voliam Xpress (D+P)	91 mL	14. Do not feed treated crop to livestock	A or G	98
	Decis 100 EC (P)	20 to 30 mL	7	A or G	633

ALWAYS CONSULT THE INSECTICIDE LABEL BEFORE APPLYING ANY INSECTICIDE.

[1] Insecticide Group: F=flonicamid, D=diamides, P=pyrethroids, N=neonicotinoids, TT= tetronic and tetramic acid derivatives.

[2] LD_{50} values represent the relative toxicity of a pesticide. They represent the dose (in milligram per kilogram body weight) that will kill 50 percent of the test animals. Thus the lower the number the greater the toxicity. Values given are for oral LD_{50}.

Field Scouting in Clovers

Defoliators

- **Sweetclover Weevil**
  - ***Typical Damage:*** Adults chew crescent-shaped and jagged notches in leaves and can completely defoliate plants.
  - ***When and How to Monitor:*** Inspect clover seedlings for weevil damage in spring as the seedlings emerge. In midsummer and throughout August, inspect first-year clover stands for damage along crop margins. Invading weevils move into these stands only as far as necessary to satisfy their food requirements, so an insecticide application to affected field margins is usually all that is required. Visually estimating the number of weevils per plant must be done carefully because weevils fall from plants easily and are difficult to see on the ground.
  - ***Economic Threshold:*** 1st year stands: 1 weevil adult per 3 seedlings (1 per 5 seedlings under dry conditions). 2nd year stands: 9 to 12 weevil adults per plant.

Clovers (sweet, red, alsike) Insect Management Chart

Insect	Insecticide (and insecticide group[1])	Rate per Acre	Pre-harvest interval (days)	Application (A=aerial; G=ground)	LD_{50} (Mammalian Toxicity)[2]
Belowground and Surface Feeders					
Cutworms	*Coragen MaX*	34 mL	0	G	>5000
Defoliators					
Grasshoppers	*CoragenMax* *Coragen* *Shenzi* (D)	17 to 33.5 mL 51 to 101 mL 25.5 to 50.6 mL	0	G	>5000
	Malathion 85E (OP)	0.445 to 0.544 L	7	A or G	>550
	Lagon/Diamante 4 (OP)	172 to 405 mL	2 to 28 (see label)	A or G	245 to 425
Sweetclover Weevil	Locate new seedlings as far as possible from 2nd year clover. Cultivating 2nd year stands of sweet clover silage and hay as soon as possible after the crop is taken kills the new generation weevil larvae in the soil.				
	Malathion 85E (OP) (sweet clover only)	0.445 to 0.544 L	7 (cattle may be returned immediately after spraying)	A or G	>550
	Lagon/Cygon 400EC/ Cygon 480-AG/Diamante 4 (OP)	340 to 450 mL (*Lagon, Cygon 480-AG, Diamante 4*) 413 to 534 mL (*Cygon 400EC*)	28	A or G	245 to 550
Alfalfa weevil	*Coragen Max* *Coragen* *Shenzi* (D) (suppression only)	50.5 to 67.5 mL 152 to 202 mL 76.1 to 101.2 mL	0	G	>5000
Lesser clover leaf weevil	*Decis 100 EC/Advantage Deltamethrin 5 EC/ Poleci* (P) (suppression only/red clover seed production only)	51 mL (*Decis 100 EC*) 101 mL (*Advantage Delta..5EC*) 202 mL (*Poleci*)		G	>300 to 2000
Sap or Fluid Feeders					
Lygus bugs	*Carbine/Beleaf 50SG* (F)	81 to 121 g	7	G	>2000
	Lagon/Diamante 4 (OP)	172 ml	2	A or G	245 to 425
Leafhoppers	*Sefina* (PP) (suppression only)	81 to 162 mL	0	A or G	>2000
	Malathion 85E (OP)	0.445 to 0.544 L	7	A or G	>550
Aphids	*Sefina* (PP)	81 mL	0	A or G	>2,000
	Carbine/Beleaf 50SG (F)	49 to 65 g	7	G	>2000
	Malathion 85E (OP)	0.445 to 0.544 L	7	A or G	>550

ALWAYS CONSULT THE INSECTICIDE LABEL BEFORE APPLYING ANY INSECTICIDE.

[1] Insecticide Group: D=diamides, F=flonicamid, P=pyrethroids, C=carbamates, OP=organophosphates.

[2] LD_{50} values represent the relative toxicity of a pesticide. They represent the dose (in milligram per kilogram body weight) that will kill 50 percent of the test animals. Thus the lower the number the greater the toxicity. Values given are for oral LD_{50}.

Field Scouting in Corn (Field Corn)

- **Cutworm**
  - ***Typical Damage:*** Notched, wilted, dead, or cut-off plants (weed or crop seedlings). Plants missing from rows, bare patches appearing in field.
  - ***When and How to Monitor:*** Look for cutworm, and evidence of cutworm feeding, when monitoring corn in May and June. Often cutworms will be close to the cut or shriveled plants that they have just damaged. Cutworm will sometimes be most abundant in patches or a specific area of a field. At each stop, examine 100 plants in a row. Calculate percentage of plants cut off or showing leaf feeding.
  - ***Economic Threshold:*** When 2 to 4 percent of plants are cut below the ground or when 6 to 8 percent of plants are cut above the soil surface, and cutworms less than 1 inch long are present. Sometimes it is most economical to just treat infested patches, and not whole fields.
- **European corn borer**
  - ***Typical Damage:*** Shot-holes in leaves. Holes in stalk, tassels and ears. Damage may cause stalk breakage prior to harvest or cobs to fall to the ground. Nutrient flow in the plant may be restricted, resulting in smaller cobs.
  - ***When and How to Monitor:*** Begin looking for European corn borer when field scouting in early July. At 5 locations, examine 10 plants for young larvae and egg masses. Calculate percentage of plants infested. Scout every 5 to 7 days until the end of July or larvae start to tunnel into the stalks.
  - ***Economic Threshold:*** The level of European corn borer where control becomes economical depends on the value of the crop, and cost of control. Information on determining specific economic thresholds for European corn borer in grain and silage corn can be found at **https://www.gov.mb.ca/agriculture/crops/insects/pubs/european-corn-borer-factsheet.pdf**.
    If the majority of larvae have bored into the stalk, DO NOT apply insecticide, as they are ineffective once the larvae have entered the stalk.
- **Armyworm**

Economic Threshold: For corn past the 6-leaf stage, if 50 percent of the plants are showing damage and have larvae smaller than 2.5 cm (1 inch), insecticide treatment may be warranted. As long as the growing point of the plant is not damaged, the corn plant is usually able to recover from moderate feeding.

Corn (Field Corn) Insect Management Chart

Insect	Insecticide (and insecticide group[1])	Rate per Acre	Pre-harvest interval (days)	Application (A=aerial; G=ground)	LD_{50} (Mammalian Toxicity)[2]
Belowground and Surface Feeders					
Cutworms	**Seed treatments**				
	Lumivia (D)[3]	64 mL/unit (80,000 seed unit)	Seed treatment – by commercial treaters with closed transfer systems only		>5000
	Fortenza (D)[4]	83 to 167 mL/ 100 kg seed	Seed treatment – by commercial treaters with closed transfer systems only		>5000
	Foliar Sprays				
	Coragen MaX *Coragen* *Shenzi* (D)	33.5 mL 101 mL 50.6 mL	14 (field corn) 1 (seed corn or sweet corn)	A or G	>5000
	Vayego (D)	61 mL	14	G	>2000
	Matador/Silencer/Labamba/ Zivata (P)	34 mL	DO NOT cut treated fields for silage/ forage, do not graze treated fields.	A or G	56 to 98
	UP-Cyde/Ship (P)	115 mL	21	G	355
	Pounce/Perm-UP /IPCO Syncro (P) *Ambush* (P)	73 to 158 mL 57 to 121 mL	30	A or G (see labels)	789 to 1030
Wireworms	*Cimegra*	250 mL/ha in furrow	In-furrow application		>2000
	Fortenza (D)[4]	Seed treatment			
	Lumivia (D)[3]	64 mL/unit (80,000 seed unit)	Seed treatment – by commercial treaters with closed transfer systems only		>5000
	Cruiser Maxx Corn (N)	83 mL *Cruiser 5FS*/ 100 kg seed	A seed treatment containing *Cruiser 5 FS* and *Maxim Quattro*.		>5000

Insect	Insecticide (and insecticide group[1])	Rate per Acre	Pre-harvest interval (days)	Application (A=aerial; G=ground)	LD_{50} (Mammalian Toxicity)[2]
Wireworms, *continued*	*Poncho 600 FS* (N)	33.3 to 66.6 mL of *Poncho 600*/ 80,000 units of seed	Seed treatment – for use in commercial seed treatment facilities with closed transfer equipment only		2000
	Nipslt INSIDE (N)	33.3 to 66.6 mL/ 80,000 units of seed	Seed treatment	Seed treatment	3044
	Sombrero (N)	0.16 mg/kernel	Seed treatment	Seed treatment	N/A
Seedcorn maggot	*Lumivia* (D)[3] (suppression)	64 mL/unit (80,000 seed unit)	Seed treatment – by commercial treaters with closed transfer systems only		>5000
	Fortenza (D)[4] (suppression)	167 mL/100 kg seed	Seed treatment – by commercial treaters with closed transfer systems only		>5000
	Cruiser Maxx Corn (N)	83 to 166 mL *Cruiser 5FS*/100 kg seed	A seed treatment containing *Cruiser 5 FS* and *Maxim Quattro*.		>5000
	Poncho 600 FS (N)	33.3 to 66.6 mL of *Poncho 600*/ 80,000 units of seed	Seed treatment – for use in commercial seed treatment facilities with closed transfer equipment only		2000
	Nipslt INSIDE (N)	33.3 to 66.6 mL/ 80,000 units of seed	Seed treatment	Seed treatment	3044
Corn rootworm	**Crop rotation** is an effective management strategy.				
	Resistant Cultivars: Some cultivars of Bt corn are resistant to feeding by corn rootworm. A table of registered Bt corn products in Canada (as of April 2024) is available at: https://cornpest.ca/wp-content/uploads/2024/04/Canadian-Bt-Traits-Table-April-2024-English.pdf.				
	Cimegra	250 mL/ha in furrow	In-furrow application		>2000
Sap Feeders					
Aphids	*Sivanto Prime* (B)	202 to 304 mL	7 (silage, forage, sweet corn) 21 (grain)	A or G	>2000
	Closer (S)	30 to 61 mL	7 (forage) 14 (grain)	A or G	>5000
	Vayego (D) (suppression)	61 mL	14	G	>2000
Spider mites	*Oberon* (TT)	162 to 243 mL	5 (green forage) 30 (grain or stover)	A or G	>2000
Defoliators and Borers					
Grasshoppers	*Coragen MaX*	17 to 34 mL	14 (field corn) 1 (seed corn or sweet corn)	A or G	>5000
European corn borer	**Stalk Management:** Primary tillage such as chisel plowing or moldboard plowing in the fall can reduce overwintering populations. Mowing corn stalks after harvest can reduce overwintering populations up to 85 percent. **Resistant Cultivars:** Some cultivars of Bt corn are resistant to feeding by European corn borer. A table of registered Bt corn products in Canada (as of April 2024) is available at: **https://cornpest.ca/wp-content/uploads/2024/04/Canadian-Bt-Traits-Table-April-2024-English.pdf.**				
	Dipel 2X DF (M)	0.23 to 0.45 kg	0	G	>5000
	Bioprotec CAF/ *Bioprotec PLUS* (M)	1.13 to 1.62 L 0.73 to 1.0 L	0	G	N/A
	Coragen MaX *Coragen* *Shenzi* (D)	33.5 to 50.5 mL 101 to 152 mL 50.6 to 76.1 mL	14 (field corn) 1 (seed corn or sweet corn)	A or G	>5000
	Vayego (D)	61 mL	14	G	>2000

Insect	Insecticide (and insecticide group[1])	Rate per Acre	Pre-harvest interval (days)	Application (A=aerial; G=ground)	LD_{50} (Mammalian Toxicity)[2]
European corn borer, *continued*	*Intrepid* (E)	121 to 243 mL	21 (field corn) 3 (sweet corn)	G	>5000
	Delegate (Sp)	49 to 85 g	28	A or G	>5000
	Matador/Silencer/Labamba/ Zivata (P)	34 to 76 mL	21 (field corn) DO NOT cut treated fields for silage/ forage, do not graze treated fields.	A or G	56 to 98
	Voliam Xpress (D+P)	202 mL	21. Do not feed treated crop to livestock	A or G	98
	Decis 100 EC/Advantage Deltamethrin 5 EC/Decimate/ Rauma/Poleci (P)	51 to 61 mL (*Decis 100 EC*) 101 to 121 mL (*Advantage Delta..5EC/ Decimate/Rauma*) 202 to 243 mL (*Poleci*)	1	G	>300 to 2000
	UP-Cyde/Ship (P)	113 mL	5	A or G	355
	Malathion 85E (OP)	0.445 to 0.544 L	5	A or G	>550
Corn earworm	Some cultivars of Bt corn are resistant to feeding by corn earworm.				
	Coragen MaX *Coragen* *Shenzi* (D)	33.5 to 50.5 mL 101 to 152 mL 50.6 to 76.1 mL	14 (field corn) 1 (seed corn or sweet corn)	A or G	>5000
	Vayego (D)	61 mL	14	G	>2000
	Matador/Silencer/Labamba/ Zivata (P)	34 to 76 mL	21 (field corn) DO NOT cut treated fields for silage/ forage, do not graze treated fields.	A or G	56 to 98
	Voliam Xpress (D+P)	202 mL	21. Do not feed treated crop to livestock	A or G	98
	UP-Cyde/Ship (P)	113 mL	5	A or G, see product label	355
	Malathion 85E (OP)	0.445 to 0.544 L	5	A or G	>550
Armyworm	Some cultivars of Bt corn are resistant to feeding by armyworms.				
	Coragen MaX *Coragen* *Shenzi* (D)	33.5 to 50.5 mL 101 to 152 mL 50.6 to 76.1 mL	14 (field corn) 1 (seed corn or sweet corn)	A or G	>5000
	Vayego (D)	61 mL	14	G	>2000
	Matador/Silencer/Labamba/ Zivata (P)	34 to 84 mL (Matador/ *Labamba*) 34 mL (*Silencer/Zivata*)	21 (field corn) DO NOT cut treated fields for silage/ forage, do not graze treated fields.	A or G	56 to 98
	Voliam Xpress (D+P)	202 mL	21. Do not feed treated crop to livestock	A or G	98

Insect	Insecticide (and insecticide group[1])	Rate per Acre	Pre-harvest interval (days)	Application (A=aerial; G=ground)	LD_{50} (Mammalian Toxicity)[2]
Fall armyworm	Some cultivars of Bt corn are resistant to feeding by fall armyworm.				
	Coragen MaX *Coragen* *Shenzi* (D)	33.5 to 50.5 mL 101 to 152 mL 50.6 to 76.1 mL	14 (field corn) 1 (seed corn or sweet corn)	A or G	>5000
	Matador/Silencer/Labamba/ Zivata (P)	34 mL	DO NOT cut treated fields for silage/ forage, do not graze treated fields.	A or G	56 to 98

ALWAYS CONSULT THE INSECTICIDE LABEL BEFORE APPLYING ANY INSECTICIDE.

[1] Insecticide Group: M=microbials, D=diamides, E=ecdysone receptor agonists, B=butenolides, N=neonicotinoids, P=pyrethroids, C=carbamates, OP=organophosphates, TT = tetronic and tetramic acid derivatives.

[2] LD_{50} values represent the relative toxicity of a pesticide. They represent the dose (in milligram per kilogram body weight) that will kill 50 percent of the test animals. Thus the lower the number the greater the toxicity. Values given are for oral LD_{50}.

[3] DO NOT make a subsequent foliar application of any group 28 insecticide (such as Coragen) for a minimum of 60 days after planting seed treated with Lumivia.

[4] DO NOT make any subsequent applications of a group 28 insecticide (such as Coragen) following Fortenza seed treatment.

Faba Bean Insect Management Chart

Insect	Insecticide (and insecticide group[1])	Rate per Acre	Pre-harvest interval (days)	Application (A=aerial; G=ground)	LD_{50} (Mammalian Toxicity)[2]
Belowground Feeders					
Cutworms	*Lumivia CPL* (D)	32 to 64 mL/100 kg seed	Seed treatment		>5000
	Scorpio Ant and Insect Bait (black cutworm) (Sp)	10 to 20 kg	28	G	
	Coragen MaX *Coragen* *Shenzi* (D)	33.5 mL 101 mL 50.6 mL	1	A or G	>5000
	Decis 100 EC (P)	41 mL	7	A or G	633
Wireworms	*Cruiser 5FS* (N)	17 to 50 mL/100 kg seed	May be applied on-farm or by commercial seed treaters.		
	Trilex EverGol Shield (N)	A seed treatment containing *Stress Shield 600* and 3 fungicides.			
	Scorpio Ant and Insect Bait (suppression) (Sp)	10 to 20 kg	Incorporate into the soil at planting to a depth of 10 to 20 cm.		
Pea leaf weevil	*Lumivia CPL* (D)	64 to 96 mL/100 kg seed	Seed treatment		
	Trilex EverGol Shield (N)	A seed treatment containing *Stress Shield 600* and 3 fungicides.			
	Cruiser Maxx *Vibrance Pulses* (N)	A seed treatment combining *Cruiser 5FS* and *Vibrance Maxx RFC*.			
	Cruiser 5FS (N)	50 mL/100 kg seed	May be applied on-farm or by commercial seed treaters.		
	Voliam Xpress (D+P)	91 mL	14. Do not feed treated crop to livestock	A or G	98
	Decis 100 EC (P) (suppression)	30 mL	7	A or G	633

Insect	Insecticide (and insecticide group[1])	Rate per Acre	Pre-harvest interval (days)	Application (A=aerial; G=ground)	LD_{50} (Mammalian Toxicity)[2]
Sap and Fluid Feeders					
Lygus bugs	*Carbine* (F)	81 g	7	G	>2000
	Matador/Silencer/ Labamba/ Zivata (P)	34 mL	14 (Matador/*Labamba*) 21 (*Silencer/Zivata*) DO NOT cut treated fields for hay/forage. Do not graze treated fields.	A or G	56 to 98
	Voliam Xpress (D+P)	91 mL	14. Do not feed treated crop to livestock	A or G	98
	Decis 100 EC (P)	41 mL	7	A or G	633
Potato leafhopper	*Sivanto Prime* (B)	202 to 304 mL	7	A or G	>2000
	Matador/Silencer/ Labamba/Zivata (P)	34 mL	14 (Matador/*Labamba*) 21 (*Silencer/Zivata*) DO NOT cut treated fields for hay/forage. Do not graze treated fields.	A or G	56 to 98
	Voliam Xpress (D+P)	91 mL	14. Do not feed treated crop to livestock	A or G	98
Pea aphid	*Carbine* (F)	49 to 65 g	7	G	>2000
	Sivanto Prime (B)	202 to 304 mL	7	A or G	>2000
	Matador/Silencer/ Labamba/Zivata (P)	34 to 94 mL	14 (Matador/*Labamba*) 21 (*Silencer/Zivata*) DO NOT cut treated fields for hay/forage. Do not graze treated fields.	A or G	56 to 98
	Voliam Xpress (D+P)	91 to 223 mL	14. Do not feed treated crop to livestock.	A or G	98
Defoliators					
Grasshoppers	*Coragen MaX* *Coragen* *Shenzi* (D)	17 to 33.5 mL 51 to 101 mL 25.5 to 50.6 mL	1	A or G	>5000
	Voliam Xpress (D+P)	91 mL	14. Do not feed treated crop to livestock	A or G	98
	Decis 100 EC (P)	20 to 30 mL	7	A or G	633

ALWAYS CONSULT THE INSECTICIDE LABEL BEFORE APPLYING ANY INSECTICIDE.

[1] Insecticide Group: D=diamides, F=flonicamid, N=neonicotinoids, P=pyrethroids.

[2] LD_{50} values represent the relative toxicity of a pesticide. They represent the dose (in milligram per kilogram body weight) that will kill 50 percent of the test animals. Thus the lower the number the greater the toxicity. Values given are for oral LD_{50}.

Field Scouting in Flax

- **Cutworms**
  - ***Typical Damage:*** Notched, wilted, dead, or cut-off plants (weed or crop seedlings). Plants missing from rows, bare patches appearing in field.
  - ***When and How to Monitor:*** Look for cutworm, and evidence of cutworm feeding, when monitoring in May and June. Often cutworm will be close to the cut or shriveled plants that they have just damaged. Cutworm will sometimes be most abundant in patches or a specific area of a field. In areas of the field where cutworm damage is noticeable, check around damaged plants in a 0.25 square metres (50 cm x 50 cm) area.
    Use trowel or shovel to carefully search through top 5 cm of soil for cutworm larvae. Multiply the number of cutworms found by 4 to get the number per square metre. Repeat in several locations to get an accurate assessment of what cutworm levels are.
  - ***Economic Threshold:*** 4 to 5 larvae per square metre. Sometimes it is most economical to just treat infested patches, and not whole fields.
- **Aphids**
  - ***Typical Damage:*** Extract plant fluids from the stems, leaves and developing bolls. Can cause fewer seeds to be produced.
  - ***When and How to Monitor:*** The easiest way to detect aphids in flax is to sample the upper portions of the plant with an insect sweep net when the crop is in full bloom, or tap plants over a white tray or bucket. If aphids are found, fields need to be more closely inspected by randomly sampling plants. To inspect plants, lightly tap the plants on a white surface, such as a tray or the canvas of a sweep net, to dislodge the insects. Plants can be severed at the base prior to tapping if desired. Inspect a minimum of 25 plants at full bloom and 20 plants at early green boll randomly in the field to provide an accurate estimate of aphid density. Record total number of aphids and calculate average per plant.
    - If control is not warranted at full bloom, aphid densities should be assessed again at the green boll stage.
  - ***Economic Threshold:*** Varies with crop value and control costs, but generally about 3 aphids per main stem at full bloom or 8 aphids per main stem at the green boll stage.
    - The yield loss of flax is 0.3346 bushels per acre per aphid per plant for crops sampled at full bloom and 0.1275 bushels per acre per aphid per plant for crops sampled at the green boll stage.
    - The potato aphid is highly susceptible to attack by fungi (especially in years of high rainfall and humidity in late June and July). Aphid populations sampled at full bloom that have many diseased insects should be sampled again at the early green boll stage to determine the effect of the disease on aphid densities.
- **Beet webworm**
  - ***Nominal Threshold:*** >10 larvae per square metre.

Flax Insect Management Chart

Insect	Insecticide (and insecticide group[1])	Rate per Acre	Pre-harvest interval (days)	Application (A=aerial; G=ground)	LD_{50} (Mammalian Toxicity)[2]
Belowground and Surface Feeders					
Wireworms	No insecticides registered for the control of wireworm in flax.				
Cutworms	*Coragen MaX* *Coragen* *Shenzi* (D)	33.5 mL 101 mL 50.6 mL	1	A or G	>5000
	Decis 100 EC/Advantage Deltamethrin 5 EC/Poleci (P)	40 mL (*Decis 100 EC*) 81 mL (*Advantage Delta..5EC*) 162 mL (*Poleci*)	7 (*Decis*) 40 (*Poleci, Advantage Delta..5EC*)	A or G	>300 to 2000
	Matador/Labamba (P)	34 mL	7	A or G	56
	Pounce/Perm-UP/ IPCO Syncro (P) *Ambush* (P)	73 to 158 mL 57 to 121 mL	Treat up to 5 leaf stage	A or G (see labels)	789 to 1030
Sap Feeders					
Potato aphid	*Lagon/Cygon 400EC/ Cygon 480-AG/Diamante 4* (OP)	173 mL (*Lagon, Cygon 480-AG, Diamante 4*) 207 mL (*Cygon 400EC*)	21	A or G	245 to 550
Lygus bugs	*Decis 100 EC* (P)	30 mL	7	A or G	633
	Voliam Xpress (D+P)	91 mL	7. Do not feed treated crop to livestock.	A or G	98

Insect	Insecticide (and insecticide group[1])	Rate per Acre	Pre-harvest interval (days)	Application (A=aerial; G=ground)	LD_{50} (Mammalian Toxicity)[2]
Defoliators					
Grasshoppers	*Coragen MaX* *Coragen* *Shenzi* (D)	17 to 33.5 mL 51 to 101 mL 25.5 to 50.6 mL	1	A or G	>5000
	Decis 100 EC/Advantage Deltamethrin 5 EC/Poleci (P)	20 to 30 mL (*Decis 100 EC*) 40 to 61 mL (*Advantage Delta..5EC*) *Poleci*: 81 to 121 mL (ground), 121 mL (air)	7 (*Decis 100 EC*) 40 (*Poleci, Advantage Delta..5EC*)	A or G	>300 to 2000
	Matador/Silencer/Labamba/ Zivata (young grasshoppers only) (P)	25 to 34 mL (ground) 34 mL (air)	7	A or G	56 to 98
	Voliam Xpress (D+P)	91 mL	7. Do not feed treated crop to livestock.	A or G	98
	Malathion 85E (OP)	0.217 to 0.346 L	7	A or G	>550
Bertha armyworm	*Coragen MaX* *Coragen* *Shenzi* (D)	17 to 50.5 mL 51 to 152 mL 25.5 to 76.1 mL	1	A or G	>5000
	Decis 100 EC (P)	20 to 30 mL	7	A or G	633
	Voliam Xpress (D+P)	91 mL	7. Do not feed treated crop to livestock.	A or G	98
Clover cutworm	*Decis 100 EC/Advantage Deltamethrin 5 EC/Poleci* (P)	20 to 30 mL (*Decis 100 EC*) 40 to 61 mL (*Advantage Delta..5EC*) 81 to 121 mL (*Poleci*)	7 (*Decis 100 EC)* 40 (*Poleci, Advantage Delta..5EC*)	A or G	>300 to 2000
Beet webworm	*Decis 100 EC/Advantage Deltamethrin 5 EC/ Poleci* (P)	20 to 30 mL (*Decis 100 EC*) 40 to 61 mL *(Advantage Delta..5EC*) 81 to 121 mL (*Poleci*)	7 (*Decis 100 EC*) 40 (*Poleci, Advantage Delta..5EC*)	G	>300 to 2000

ALWAYS CONSULT THE INSECTICIDE LABEL BEFORE APPLYING ANY INSECTICIDE.

[1] Insecticide Group: D=diamides, P=pyrethroids, C=carbamates, OP=organophosphates, OC=organochlorines.

[2] LD_{50} values represent the relative toxicity of a pesticide. They represent the dose (in milligram per kilogram body weight) that will kill 50 percent of the test animals. Thus the lower the number the greater the toxicity. Values given are for oral LD_{50}.

Forage Grasses (Timothy, etc.) Insect Management Chart

Insect	Insecticide (and insecticide group[1])	Rate per Acre	Pre-harvest interval (days)	Application (A=aerial; G=ground)	LD_{50} (Mammalian Toxicity)[2]
Belowground and Surface Feeders					
Cutworms	*Coragen MaX*	34 mL	0	G	>5000
Sap and Fluid Feeders					
Plant bugs	*Lagon/Cygon 400EC/ Cygon 480-AG/Diamante 4* (OP)	170 mL (*Lagon, Cygon 480-AG, Diamante 4*) 206 mL (*Cygon 400EC*)	2	A or G	245 to 550
Defoliators					
Grasshoppers	**Spreadable Bran Baits**				
	Nolo Bait	Minimum of 0.45 kg		A or G	
	Eco bran (C)	0.8 to 1.6 kg	1 to 2	G	N/A
	Sprays				
	Coragen MaX *Coragen* *Shenzi* (D)	17 to 33.5 mL 51 to 101 mL 25.5 to 50.6 mL	0	G	>5000
	Matador/Silencer/Labamba/ Zivata (P) (on timothy - seed production only)	25 to 34 mL	14	G	56 to 98
	Sevin XLR (C)	0.49 to 1.42 L	1 to 2	G	699
	Lagon/Cygon 400EC/ Cygon 480-AG/Diamante 4 (OP)	Nymphs: 170 to 220 mL (*Lagon, Cygon 480-AG, Diamante 4*), 267 mL (*Cygon 400EC*). Adults: 340 to 400 mL (*Lagon, Cygon 480-AG, Diamante 4*), 413 to 486 mL (*Cygon 400EC*).	2 (nymphs) 28 (adults)	A or G	245 to 550
European skipper (on timothy)	*Dipel 2X DF* (M)	57 to 111 g	N/A	A or G	>5000
	Bioprotec CAF (M)/ Bioprotec PLUS (M)	0.22 to 0.28 L 0.14 to 0.18 L	0	G	N/A
Armyworm	*Coragen MaX* *Coragen* *Shenzi* (D)	33.5 to 50.5 mL 101 to 152 mL 50.6 to 76.1 mL	0	G	>5000

ALWAYS CONSULT THE INSECTICIDE LABEL BEFORE APPLYING ANY INSECTICIDE.

[1] Insecticide Group: M=microbials, D=diamides, P= pyrethroids, C=carbamates, OP=organophosphates.

[2] LD_{50} values represent the relative toxicity of a pesticide. They represent the dose (in milligram per kilogram body weight) that will kill 50 percent of the test animals. Thus the lower the number the greater the toxicity. Values given are for oral LD_{50}.

Hemp Insect Management Chart

Insect	Insecticide (and insecticide group[1])	Rate per Acre	Pre-harvest interval (days)	Application (A=aerial; G=ground)	LD_{50} (Mammalian Toxicity)[2]
European corn borer	*Bioprotec PLUS* (M)	0.73 to 1.0 L	0	G	N/A

ALWAYS CONSULT THE INSECTICIDE LABEL BEFORE APPLYING ANY INSECTICIDE.

[1] Insecticide Group: M=microbial.

[2] LD_{50} values represent the relative toxicity of a pesticide. They represent the dose (in milligram per kilogram body weight) that will kill 50 percent of the test animals. Thus the lower the number the greater the toxicity. Values given are for oral LD_{50}.

Field Scouting in Lentils

- **Grasshoppers**
  - ***When and How to Monitor:*** Look for when monitoring fields from the early bud stage through pod development.
  - ***Economic Threshold:*** 2 grasshoppers per square metre during the flowering and podding stages, especially if two-striped grasshopper is the dominant species.
- **Lygus Bugs**
  - ***When and How to Monitor:*** Look for lygus bugs when monitoring lentils during blooming and podding by using a sweep net, making 25, 180° sweeps in at least 5 randomly selected places in a field. Afternoon sampling provides more accurate estimates than morning sampling.
  - ***Threshold:*** As a nominal threshold, insecticide treatment is recommended when 7 to 10 Lygus bugs are collected per 25 sweeps.
- **Pea aphid**
  - ***Economic Threshold:*** 20 to 66 aphids per 180° sweep of a 38 cm (15 inch) diameter insect net. This provides a 7-day lead time before aphid populations reach the economic injury level of 78 aphids per sweep.

Lentil Insect Management Chart

Insect	Insecticide (and insecticide group[1])	Rate per Acre	Pre-harvest interval (days)	Application (A=aerial; G=ground)	LD_{50} (Mammalian Toxicity)[2]
Belowground and Surface Feeders					
Wireworms	*Cruiser 5FS* (N)	17 to 50 mL/100 kg seed	May be applied on-farm or by commercial seed treaters.		
	Trilex EverGol Shield (N)	A seed treatment containing *Stress Shield 600* and 3 fungicides.			
	Scorpio Ant and Insect Bait (suppression) (Sp)	10 to 20 kg	Incorporate into the soil at planting to a depth of 10 to 20 cm.		
Cutworms	*Lumivia CPL* (D)	32 to 64 mL/100 kg seed	Seed treatment		>5000
	Scorpio Ant and Insect Bait (black cutworm) (Sp)	10 to 20 kg	28	G	
	Coragen MaX *Coragen* *Shenzi* (D)	33.5 mL 101 mL 50.6 mL	1	A or G	>5000
	Decis 100 EC/Advantage Deltamethrin 5 EC/ Poleci (P)	41 mL (*Decis 100 EC*) 81 mL (*Advantage Delta..5EC*) 162 mL (*Poleci*)	7 (*Decis 100 EC*) 30 (*Poleci, Advantage Delta..5EC*)	A or G	>300 to 2000
	Matador/Silencer/Labamba/ Zivata (P)	34 mL	14 (Matador/*Labamba*) 21 (*Silencer/Zivata*)	A or G	56 to 98
	Pounce/Perm-UP/ IPCO Syncro (P) *Ambush* (P)	73 to 158 mL 57 to 121 mL	7	A or G (see labels)	789 to 1030
Sap and Fluid Feeders					
Lygus bugs	*Carbine* (F)	81 g	7	G	>2000
	Matador/Silencer/Labamba/ Zivata (P)	34 mL	14 (Matador/*Labamba*) 21 (*Silencer/Zivata*)	A or G	56 to 98
	Voliam Xpress (D+P)	91 mL	14. Do not feed treated crop to livestock	A or G	98
	Decis 100 EC (P)	41 mL	7	A or G	633
Potato leafhopper	*Sivanto Prime* (B)	202 to 304 mL	7	A or G	>2000
	Matador/Silencer/Labamba/ Zivata (P)	34 mL	14 (Matador/*Labamba*) 21 (*Silencer/Zivata*)	A or G	56 to 98
	Voliam Xpress (D+P)	91 mL	14. Do not feed treated crop to livestock.	A or G	98

Insect	Insecticide (and insecticide group[1])	Rate per Acre	Pre-harvest interval (days)	Application (A=aerial; G=ground)	LD_{50} (Mammalian Toxicity)[2]
Pea aphid	*Carbine* (F)	49 to 65 g	7	G	>2000
	Movento (TT)	75 to 111 mL	7	G	>2000
	Sivanto Prime (B)	202 to 304 mL	7	A or G	>2000
	Matador/Silencer/Labamba/ Zivata (P)	34 to 94 mL	14 (Matador/*Labamba*) 21 (*Silencer/Zivata*)	A or G	56 to 98
	Voliam Xpress (D+P)	91 to 223 mL	14. Do not feed treated crop to livestock	A or G	98
Defoliators					
Grasshoppers	*Coragen MaX* *Coragen* *Shenzi* (D)	17 to 33.5 mL 51 to 101 mL 25.5 to 50.6 mL	1	A or G	>5000
	Decis 100 EC/Advantage Deltamethrin 5 EC/ Poleci (P)	20 to 30 mL (*Decis 100 EC*) 40 to 60 mL (*Advantage Delta..5EC*) *Poleci:* 81 to 121 mL (ground), 121 mL (air)	7 (*Decis 100 EC)* 30 (*Poleci, Advantage Delta..5EC*)	A or G	>300 to 2000
	Matador/Silencer/Labamba/ Zivata (P)	34 mL	14 (Matador/*Labamba*) 21 (*Silencer/Zivata*)	A or G	56 to 98
	Voliam Xpress (D+P)	91 mL	14. Do not feed treated crop to livestock	A or G	98
	Malathion 85E (OP)	0.336 L	14	A or G	>550

ALWAYS CONSULT THE INSECTICIDE LABEL BEFORE APPLYING ANY INSECTICIDE.

[1] Insecticide Group: F=flonicamid, D=diamides, N=neonicotinoids, P= pyrethroids, OP=organophosphates, TT = tetronic and tetramic acid derivatives.

[2] LD_{50} values represent the relative toxicity of a pesticide. They represent the dose (in milligram per kilogram body weight) that will kill 50 percent of the test animals. Thus the lower the number the greater the toxicity. Values given are for oral LD_{50}.

Mustard Insect Management Chart

Insect	Insecticide (and insecticide group[1])	Rate per Acre	Pre-harvest interval (days)	Application (A=aerial; G=ground)	LD_{50} (Mammalian Toxicity)[2]
Belowground and Surface Feeders					
Root maggots	No insecticides registered.				
Cutworms	**Seed treatments**				
	Lumiderm (D)[3]	Applied combined with a neonicotinoid-based seed treatment.			
	Fortenza Advanced (D)[4]	A co-pack of *Fortenza* and *Rascendo* (sulfoxaflor) that can be combined with neonicotinoid-based seed treatments.			
	Foliar Sprays				
	Coragen MaX *Coragen* *Shenzi* (D)	33.5 mL 101 mL 50.6 mL	1	A or G	>5000
	Decis 100 EC (P)	40 mL	7	A or G	633
Sap Feeders					
Lygus bugs	*Decis 100 EC/Advantage Deltamethrin 5 EC/ Poleci* (P)	30 mL (*Decis 100 EC*) 60 mL (*Advantage Delta..5EC*) 121 mL (*Poleci*)	7	A or G	>300 to 2000
	Voliam Xpress (D+P)	91 mL	7. Do not feed treated crop to livestock	A or G	98
Defoliators					
Flea beetles	**Seed treatments**				
	Lumiderm (D)[3]	Applied combined with a neonicotinoid-based seed treatment.			
	Fortenza Advanced (D)[4]	A co-pack of *Fortenza* and *Rascendo* (sulfoxaflor) that can be combined with neonicotinoid-based seed treatments.			
	BUTEO start (B)	625 to 1042 mL/ 100 kg seed	Seed treatment containing flupyradifurone - applied combined with a neonicotinoid-based seed treatment		1,030
	Helix Vibrance (N)	A seed treatment containing *Helix Xtra* and *Vibrance 500FS*.			
	Prosper EverGol (N)		Seed treatment	Seed treatment	>2000
	Sombrero (N)	0.67 to 1.33 L/ 100 kg seed	Seed treatment	Seed treatment	N/A
	Sprays				
	Decis 100 EC/Advantage Deltamethrin 5 EC/Decimate/ Rauma/Poleci (P)	20 to 30 mL (*Decis 100 EC*) 40 to 60 mL (*Advantage Delta..5EC /Decimate/ Rauma*) 81 to 121 mL (*Poleci*)	7	A or G	>300 to 2000
	UP-Cyde/Ship (P)	56.7 mL	30	A or G	355
	Matador/Silencer/Labamba/ Zivata (P)	34 mL	7	A or G	56 to 98
	Voliam Xpress (D+P)	91 mL	7. Do not feed treated crop to livestock.	A or G	98
	Malathion 85E (OP)	0.217 to 0.346 L	7	A or G	>550

Insect	Insecticide (and insecticide group[1])	Rate per Acre	Pre-harvest interval (days)	Application (A=aerial; G=ground)	LD_{50} (Mammalian Toxicity)[2]
Cabbage seedpod weevil	Note: Yellow mustard *(Sinapis alba)* is resistant to cabbage seedpod weevil; oriental and brown mustards *(Brassica juncea)* are susceptible to feeding by cabbage seedpod weevil.				
	Matador/Silencer/Labamba/ Zivata (adults) (P)	34 mL	7	A or G	56 to 98
	Voliam Xpress (D+P)	91 mL	7. Do not feed treated crop to livestock	A or G	98
	Decis 100 EC/Advantage Deltamethrin 5 EC/ Poleci (for control of adults only) (P)	40 mL (*Decis 100 EC*) 80 mL (*Advantage Delta..5EC*) 162 mL (*Poleci*)	7	A or G	>300 to 2000
Diamondback moth	*Coragen MaX* *Coragen* *Shenzi* (D)	17 mL 51 mL 25.5 mL	1	A or G	>5000
	Decis 100 EC/Advantage Deltamethrin 5 EC/ Poleci (P)	20 to 30 mL (*Decis 100 EC*) 40 to 60 mL (*Advantage Delta..5EC*) 81 to 121 mL (*Poleci*)	7	A or G	>300 to 2000
	Matador/Silencer/Labamba/ Zivata (P)	34 mL	7	A or G	56 to 98
	Voliam Xpress (D+P)	91 mL	7. Do not feed treated crop to livestock	A or G	98
	Malathion 85E (OP)	0.109 to 0.168 L	7	A or G	>550
Bertha armyworm	*Coragen MaX* *Coragen* *Shenzi* (D)	17 to 50.5 mL 51 to 152 mL 25.5 to 76.1 mL	1	A or G	>5000
	Decis 100 EC/Advantage Deltamethrin 5 EC/ Poleci (P)	20 to 30 mL (*Decis 100 EC*) 40 to 60 mL (*Advantage Delta..5EC*) 81 to 121 mL (*Poleci*)	7	A or G	>300 to 2000
	Matador/Silencer/Labamba/ Zivata (P)	34 mL	7	A or G	56 to 98
	Voliam Xpress (D+P)	91 mL	7. Do not feed treated crop to livestock	A or G	98
Clover cutworm	*Decis 100 EC/Advantage Deltamethrin 5 EC/ Poleci* (P)	20 to 30 mL (*Decis 100 EC*) 40 to 60 mL (*Advantage Delta..5EC*) 81 to 121 mL (*Poleci*)	7	A or G	>300 to 2000
Imported cabbageworm	*Coragen MaX* *Coragen* *Shenzi* (D)	33.5 mL 101 mL 50.6 mL	1	A or G	>5000
	Matador/Silencer/Labamba/ Zivata (P)	34 mL	7	A or G	56 to 98
	Voliam Xpress (D+P)	91 mL	7. Do not feed treated crop to livestock.	A or G	98

Insect	Insecticide (and insecticide group[1])	Rate per Acre	Pre-harvest interval (days)	Application (A=aerial; G=ground)	LD_{50} (Mammalian Toxicity)[2]
Beet webworm	*Decis 100 EC/Advantage Deltamethrin 5 EC/ Poleci* (P)	20 to 30 mL (*Decis 100 EC*) 40 to 60 mL (*Advantage Delta..5EC*) 81 to 121 mL (*Poleci*)	7	G	>300 to 2000
Cabbage looper	*Coragen MaX* *Coragen* *Shenzi* (D)	33.5 mL 101 mL 50.6 mL	1	A or G	>5000
	Matador/Silencer/Labamba/ Zivata (P)	34 mL	7	A or G	56 to 98
	Voliam Xpress (D+P)	91 mL	7. Do not feed treated crop to livestock.	A or G	98
Grasshopper	*Coragen MaX* *Coragen* *Shenzi* (D)	17 to 33.5 mL 51 to 101 mL 25.5 to 50.6 mL	1	A or G	>5000
	Decis 100 EC/Advantage Deltamethrin 5 EC/ Poleci (P)	20 to 30 mL (*Decis 100 EC*) 40 to 60 mL (*Advantage Delta..5EC*) *Poleci*: 81 to 121 mL (ground), 121 mL (air)	7	A or G	>300 to 2000
	Matador/Silencer/Labamba/ Zivata (young grasshoppers only) (P)	25 to 34 mL (ground) 34 mL (air)	7	A or G	56 to 98
	Voliam Xpress (D+P)	91 mL	7. Do not feed treated crop to livestock	A or G	98
	Malathion 85E (OP)	0.217 to 0.346 L	7	A or G	>550

ALWAYS CONSULT THE INSECTICIDE LABEL BEFORE APPLYING ANY INSECTICIDE.

[1] Insecticide Group: D=diamides, N= neonicotinoids, P=pyrethroids, C=carbamates, OP=organophosphates.

[2] LD_{50} values represent the relative toxicity of a pesticide. They represent the dose (in milligram per kilogram body weight) that will kill 50 percent of the test animals. Thus the lower the number the greater the toxicity. Values given are for oral LD_{50}.

[3]DO NOT apply any subsequent applications of a group 28 insecticide (such as Coragen) for a minimum of 60 days after planting seed treated with Lumiderm.

[4] DO NOT apply any subsequent applications of a group 28 insecticide (such as Coragen) after planting seed treated with Fortenza.

Oats – See small grain cereals

Pastures and Rangelands Insect Management Chart

Note: Insects for biological control of weeds such as leafy spurge may be introduced and established in some pastures in Manitoba and Saskatchewan. If insect feeding to pastures gets to economic levels, consider using control strategies and insecticides that will minimize harm to these biological control agents where possible.

Insects	Insecticide (and insecticide group[1])	Rate per Acre	Pre-harvest interval (days)	Application (A=aerial; G=ground)	LD_{50} (Mammalian Toxicity)[2]
Grasshoppers	**Reduced Agent and Area Treatments (RAATs):** Grasshoppers on rangelands may be managed by applying certain insecticides in treated swaths, which alternate with untreated swaths. This can reduce the cost of control and amount of insecticide used by more than 50 percent, while resulting in effective control.				
	Spreadable Bran Baits				
	Nolo Bait	Minimum of 0.45 kg		A or G	
	Eco bran (C)	0.8 to 1.6 kg	1 – entry of beef cattle or other livestock. 2- entry of dairy cattle.	G	N/A
	Sprays				
	Coragen MaX *Coragen* *Shenzi* (D)	17 to 34 mL 51 to 101 mL 25.5 to 50.6 mL	0	G	>5000
	Decis 100 EC/Advantage Deltamethrin 5 EC/Poleci (P)	20 to 30 mL (Decis 100 EC) 40 to 60 mL (Advantage Deltamethrin 5EC) 81 to 121 mL (Poleci)	N/A	A or G	>300 to 2000
	Sevin XLR (C)	486 to 931 mL (for nymphs or sparse vegetation 931 mL to 1.4 L (for adults or dense vegetation)	1 to 2 (see label)	G	699
	Malathion 85E (OP)	0.336 L	DO NOT apply to fields occupied by dairy animals, but may be grazed or harvested on the day of application.	G	>550
	Lagon/Cygon 400EC/ Cygon 480-AG/Diamante 4 (OP) (pastures)	Nymphs: 223 mL (Lagon, Cygon 480-AG, Diamante 4), 267 mL (Cygon 400EC). Adults: 344 to 405 mL (Lagon, Cygon 480-AG, Diamante 4), 413 to 486 mL (Cygon 400EC).	2 (nymphs) 7-28 (adults - see labels)	A or G (Lagon) G (Diamante 4, Cygon 480-AG, Cygon 400EC)	245 to 550
Armyworms	Coragen MaX/ Coragen (D)	34 to 51 mL 101 to 152 mL	0	G	>5000

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[1] Insecticide Group: D=diamides, P=pyrethroids, C=carbamates, OP=organophosphates.

[2] LD_{50} values represent the relative toxicity of a pesticide. They represent the dose (in milligram per kilogram body weight) that will kill 50 percent of the test animals. Thus the lower the number the greater the toxicity. Values given are for oral LD_{50}.

Field Scouting in Peas (Field Peas)

- Cutworm
  - ***Nominal Threshold:*** 2 to 3 cutworms per square metre.

Sap Feeders

- Aphids
  - **When and How to Monitor:** Look for when monitoring field peas at the beginning of flowering. Take 180° sweeps or check 10, 8 inch (20 cm) plant tips at each stop. Record total number of aphids and calculate average per sweep or plant tip.
  - **Economic Threshold:** If, at the beginning of flowering, there are 9 to 12 aphids per sweep or 2 to 3 aphids per 8 inch (20 cm) plant tip, an insecticide application when 50 percent of plants have produced some young pods will be cost-effective.

Peas (Field Peas) Insect Management Chart

Insect	Insecticide (and insecticide group[1])	Rate per Acre	Pre-harvest interval (days)	Application (A=aerial; G=ground)	LD_{50} (Mammalian Toxicity)[2]
Belowground and Surface Feeders					
Wireworms	*Cruiser 5FS* (N)	17 to 50 mL/100 kg seed	May be applied on-farm or by commercial seed treaters.		
	Trilex EverGol Shield	A seed treatment containing *Stress Shield 600* and 3 fungicides.			
	Scorpio Ant and Insect Bait (suppression) (Sp)	10 to 20 kg	Incorporate into the soil at planting to a depth of 10 to 20 cm.		
Cutworms	*Lumivia CPL* (D)	32 to 64 mL/100 kg seed	Seed treatment		>5000
	Scorpio Ant and Insect Bait (black cutworm) (Sp)	10 to 20 kg	28	G	
	Coragen MaX *Coragen* *Shenzi* (D)	33.5 mL 101 mL 50.6 mL	1	A or G	>5000
	Matador/Silencer/Labamba/ Zivata (P)	34 mL	14 (Matador/*Labamba*) 21 (*Silencer/Zivata*) Do not cut treated fields for hay/forage. Do not graze treated fields.	A or G	56 to 98
	Decis 100 EC (P)	41 mL	7	A or G	633
	Pounce/Perm-UP/ IPCO Syncro (P) *Ambush* (P)	73 to 158 mL 57 to 121 mL	7	A or G (see labels)	789 to 1030
Sap and Fluid Feeders					
Leafhoppers	*Sivanto Prime* (B)	202 to 304 mL	7	A or G	>2000
	Malathion 85E (OP)	0.445 L	3	A or G	>550
Pea aphid	*Carbine* (F)	49 to 65 g	7	G	>2000
	Movento (TT)	75 to 111 mL	7	G	>2000
	Sivanto Prime (B)	202 to 304 mL	7	A or G	>2000
	Matador/Silencer/Labamba/ Zivata (P)	34 to 94 mL	14 (Matador/*Labamba*) 21 (*Silencer/Zivata*) Do not cut treated fields for hay/forage. Do not graze treated fields.	A or G	56 to 98
	Voliam Xpress (D+P)	91 to 223 mL	14. Do not feed treated crop to livestock	A or G	98
	Malathion 85E (OP)	0.445 L	3	A or G	>550
	Lagon/Cygon 400EC/ Cygon 480-AG/Diamante 4 (OP)	110 to 150 mL (*Lagon, Cygon 480-AG, Diamante 4*) 134 to 185 mL (*Cygon 400EC*)	3 to 21 (see labels)	A or G	245 to 550

Insect	Insecticide (and insecticide group[1])	Rate per Acre	Pre-harvest interval (days)	Application (A=aerial; G=ground)	LD_{50} (Mammalian Toxicity)[2]
Defoliator					
Grasshoppers	*Coragen MaX* *Coragen* *Shenzi* (D)	17 to 33.5 mL 51 to 101 mL 25.5 to 50.6 mL	1	A or G	>5000
	Matador/Silencer/Labamba/ Zivata (P)	34 mL	14 (Matador/*Labamba*) 21 (*Silencer/Zivata*) Do not cut treated fields for hay/forage. Do not graze treated fields.	A or G	56 to 98
	Voliam Xpress (D+P)	91 mL	14. Do not feed treated crop to livestock	A or G	98
	Decis 100 EC (P)	20 to 30 mL	7	A or G	633
Alfalfa looper	*Sevin XLR* (C)	1.90 L	3	G	699
Pea leaf weevil	*Lumivia CPL* (D)	64 to 96 mL/100 kg seed		Seed treatment	
	Cruiser 5FS (N)	50 or 83 mL/100 kg seed	On-farm application at the lower rate only.		
	Trilex EverGol Shield (N)	A seed treatment containing *Stress Shield 600* and 3 fungicides.			
	Matador/Silencer/Labamba/ Zivata (P)	34 mL	14 (Matador/*Labamba*) 21 (*Silencer/Zivata*) Do not cut treated fields for hay/forage. Do not graze treated fields.	A or G	56 to 98
	Voliam Xpress (D+P)	91 mL	14. Do not feed treated crop to livestock.	A or G	98
	Decis 100 EC (P) (suppression)	30 mL	7	A or G	633
Armyworm	*Lumivia CPL* (D)	32 to 64 mL/100 kg seed	Seed treatment		>5000
	Coragen MaX *Coragen* *Shenzi* (D)	33.5 to 50.5 mL 101 to 152 mL 50.6 to 76.1 mL	1	A or G	>5000
	Voliam Xpress (D+P)	202 mL	14. Do not feed treated crop to livestock	A or G	98

ALWAYS CONSULT THE INSECTICIDE LABEL BEFORE APPLYING ANY INSECTICIDE.

[1] Insecticide Group: F=flonicamid, D=diamides, N=neonicotinoids, P=pyrethroids, C=carbamates, OP=organophosphates, TT = tetronic and tetramic acid derivatives.

[2] LD_{50} values represent the relative toxicity of a pesticide. They represent the dose (in milligram per kilogram body weight) that will kill 50 percent of the test animals. Thus the lower the number the greater the toxicity. Values given are for oral LD_{50}.

Scouting and Thresholds for Insects in Potatoes

- **Matador/Aphids**
  - ***Typical damage:*** Several species of aphids are sap feeders on potato leaves. At very high numbers this sap feeding may cause plants to wilt in small localized areas of the field as "aphid holes". The greatest injury is due to transmission of viruses. Identification and control of aphids is critical in potato seed production to prevent virus spread. In commercial production tuber quality may be reduced by net necrosis of tubers.
  - ***When and How to Monitor:*** Aphid identification and scouting should start in early July when aphids begin to be observed in fields. Sample 25 lower canopy leaves from each of 4 areas in the field (100 leaves in total). Count potato aphids and green peach aphids on each compound leaf, using a magnifying device to identify the species.
  - ***Economic threshold:*** For seed potatoes = 3 to 10 green peach aphids per 100 leaves. For processing potatoes = 30 to 100 green peach aphids per 100 leaves. There are no economic thresholds for buckthorn and potato aphids. These thresholds relate to transmission of potato leafroll virus and are not useful in determining infectivity relative to potato virus Y. No economic thresholds have been established for aphids that relate to potato virus Y transmission.
- **Leafhoppers**
  - ***Typical damage:*** the potato leafhopper injects a toxin into the plant which results in hopper burn, a yellowing and curling of the tips and margins of the leaflets, which ultimately turn brown and brittle. Damaged plants die prematurely and yield may be reduced.
  - ***When and How to Monitor:*** Nymphs are scouted by visual inspection; sample 100 plants from 3 to 5 areas of the field. Count the wingless nymphs on compound leaves taken from mid canopy. Adults are sampled with a sweep net (20 sweeps per location at 5 locations for a total of 100 sweeps).
  - ***Economic threshold:*** Nymphs – 1 nymph per 10 leaves. Adults – 1 leafhopper per sweep.
- **Colorado potato beetle**
  - ***Typical damage:*** Larvae feeding may cause extensive defoliation of leaves and is capable of transmitting spindle tuber virus and bacterial ring rot.
  - ***When and How to Monitor:*** Start scouting for larvae 2 weeks after crop emergence. On field edges, count number of beetles on 20 separate plants. Record per cent defoliation of leaves. Repeated scouting is required since beetles have developed resistance to many insecticides and 2 generations may occur during the year.
  - ***Economic threshold:*** Economic threshold based on beetle numbers may vary by cost of treatment, expected returns and variety. Typical thresholds are 18 larvae per 20 plants for Russet Burbank vs 6 larvae per 20 plants for Norland. Treat when defoliation exceeds 10 percent.
- **Potato flea beetle**
  - ***Typical damage:*** Beetle feeding causes "shot holes" in the leaves. Two generations may attack the foliage.***When and How to Monitor:*** Estimate feeding damage on the leaf or numbers of beetles on plants.
  - ***Economic threshold:*** Early in the season treat if greater than 10 percent defoliation. Later in the season (August) treat if greater than 25 percent defoliation or with greater than 65 beetles per plant for Norland or 300 beetles per plant for Russet Burbank.

Potatoes* Insect Management Chart

Insect	Insecticide (and insecticide group[1])	Rate per Acre	Pre-harvest interval (days)	Application (A=aerial; G=ground)	LD_{50} (Mammalian Toxicity)[2]
Belowground and Surface Feeders					
Wireworms	*Cimegra*	250 mL/ha in furrow	In-furrow application		>2000
	Titan (N)	20.8 mL/100 kg potato seed pieces	Seed treatment	Seed treatment	2000
	NipsIt INSIDE (N)	20.8 mL/100 kg potato seed pieces	Seed treatment	Seed treatment	3044
	Thimet 20-G (OP)	105 g/100 m in sandy or light soil 161 g/100 m in silt or heavy soils	DO NOT harvest potatoes before 90 days after planting time.	G	5.1 to 13.5
	Scorpio Ant and Insect Bait (suppression) (Sp)	10 to 20 kg	Incorporate into the soil at planting to a depth of 10 to 20 cm.		
Cutworms	*Scorpio Ant and Insect Bait* (black cutworm) (Sp)	10 to 20 kg	7	G	
	Pounce/Perm-UP/IPCO Syncro (P) *Ambush* (P)	73 to 158 mL 57 to 121 mL	1	A or G (see labels)	789 to 1030
	UP-Cyde /Ship (P)	115 mL	21	G	355

Insect	Insecticide (and insecticide group[1])	Rate per Acre	Pre-harvest interval (days)	Application (A=aerial; G=ground)	LD_{50} (Mammalian Toxicity)[2]
Sap or Fluid Feeders					
Aphids	**Seed Piece Treatments**				
	Actara 240SC (N)	See chart on label	N/A	Seed treatment	>5000
	Admire 240 F (N)	11.79 to 17.69 mL/ 100 pounds (45.36 kg) of potato seed tubers	N/A	Seed treatment	>4870
	Cruiser Maxx Potato Extreme (N)	20 mL/100 kg seed	NA	Seed treatment	3129
	Titan (N)	10.4 to 20.8 mL/100 kg potato seed pieces	N/A	Seed treatment	2000
	Nipslt INSIDE (N)	10.4 to 20.8 mL/100 kg potato seed pieces	Seed treatment	Seed treatment	3044
	In-Furrow Application				
	Minecto Duo (N, D)	178 to 283 g		G	>5000
	Actara 240SC (N)	0.15 to 0.20 L (based on 90 cm row spacing)		G	>5000
	Foliar Sprays				
	Beleaf 50SG (F)	49 to 65 g	7	G	>2000
	Sefina (PP)	81 mL	7	A or G	>2000
	Superior 70 Oil	4 L	14	G	>5000
	Movento	89 to 148 mL	7	A or G	>2000
	Exirel (D)	202 to 607 mL	7	A or G	>5000
	Vayego (D) (suppression)	61 mL	14	A or G	>2000
	Sivanto Prime (B)	202 to 304 mL	7	A or G	>2000
	Closer (S)	20 to 61 mL	7	A or G	>5000
	Cormoran (SB + N)	263 to 304 mL	7	G	>2000
	Actara 240SC (N)	44.1 mL	7	A or G	>5000
	Actara 25WG (N)	42.5 g	7	A or G	>5000
	Admire 240 F (N)	81 mL	7	G	4143 to 4870
	Assail/Aceta (N)	22.7 to 34.8 g	7	G	1064
	Clutch (N)	28 to 43 g	14	A or G	3900 to 4700
	Concept (N + P)	263 mL	7	G	2500
	Decis 100 EC (P) (potato aphid and buckthorn aphid)	51 mL	1	G	633
	Malathion 85E (OP)	0.297 to 0.445 L	3	G	>550
	Lagon/Cygon 400EC/ Cygon 480-AG/Diamante 4 (OP)	220 to 410 mL (*Lagon, Cygon 480-AG, Diamante 4*) 267 to 486 mL (*Cygon 400EC*)	7	G	245 to 550
	Imidan (OP)	0.65 kg	7	G	258 to 275
Potato psyllid	*Beleaf 50SG* (F)	81 g	7	G	>2000
	Agri-mek (A)	49 to 91 mL	14	G	310
	Minecto Pro (A + D)	150 to 271 mL	14	G	451
	Movento (TT)	89 to 148 mL	7	A or G	>2000
	Harvanta (suppression) (D)	324 to 486 mL	7	A or G	>2000

Insect	Insecticide (and insecticide group[1])	Rate per Acre	Pre-harvest interval (days)	Application (A=aerial; G=ground)	LD_{50} (Mammalian Toxicity)[2]
Leafhoppers	**Seed Piece Treatments**				
	Actara 240SC (N)	See chart on label	N/A	Seed treatment	>5000
	Cruiser Maxx Potato Extreme (N)	20 mL/100 kg seed	NA	Seed treatment	3129
	Titan (N)	10.4 to 20.8 mL/100 kg potato seed pieces	N/A	Seed treatment	2000
	NipsIt INSIDE (N)	10.4 to 20.8 mL/100 kg potato seed pieces	Seed treatment	Seed treatment	3044
	In-Furrow Application				
	Minecto Duo (N, D)	178 to 283 g		G	>5000
	Actara 240SC (N)	0.15 to 0.20 L (based on 90 cm row spacing)		G	>5000
	Foliar Sprays				
	Sivanto Prime (B)	202 to 304 mL	7	A or G	>2000
	Closer (S)	121 mL	7	A or G	>5000
	Cormoran (SB + N)	198 to 304 mL	7	G	>2000
	Actara 240SC (N)	44.1 mL	7	A or G	>5000
	Actara 25WG (N)	42.5 g	7	A or G	
	Pounce/Perm-UP/IPCO Syncro (P)	73 to 105 mL	1	A or G	789 to 1030
	Decis 100 EC/ Advantage Deltamethrin 5 EC/Poleci (P)	20 to 30 mL (*Decis 100 EC*) 40 to 60 mL (*Advantage Delta..5EC*) 81 to 121 mL (*Poleci*)	1	A or G	>300 to 2000
	Matador/Silencer/Labamba/ Zivata (P)	34 mL	7	A or G	56 to 98
	UP-Cyde/Ship (P)	57 mL	7	A or G	355
	Concept (N + P)	263 mL	7	G	2500
	Sevin XLR (C)	1.01 L	7	G	699
	Malathion 85E (OP)	0.297 to 0.445 L	3	G	>550
	Lagon/Cygon 400EC/ Cygon 480-AG/Diamante 4 (OP)	220 to 410 mL (*Lagon, Cygon 480-AG, Diamante 4*) 267 to 486 mL (*Cygon 400EC*)	7	G	245 to 550
	Imidan (OP)	0.65 kg	7	G	258 to 275
Lygus bugs	*Closer* (S)	121 mL	7	A or G	>5000
	Pounce/Perm-UP/IPCO Syncro (P) *Ambush* (P)	73 to 105 mL 57 to 81 mL	1	A or G	789 to 1030
	Decis 100 EC/Advantage Deltamethrin 5 EC/ Poleci (P)	20 to 30 mL (*Decis 100 EC*) 40 to 60 mL (*Advantage Delta..5EC*) 81 to 121 mL (*Poleci*)	1	A or G	>300 to 2000
	Matador/Silencer/Labamba/Zivata (P)	34 mL	7	A or G	56 to 98
	UP-Cyde/Ship (P)	81 mL	7	A or G	355
	Sevin XLR (C)	2.12 to 2.59 L	7	G	699
	Concept (N + P)	263 mL	7	G	2500
	Lagon (OP)	0.22 to 0.41 L	7	G	425

Insect	Insecticide (and insecticide group[1])	Rate per Acre	Pre-harvest interval (days)	Application (A=aerial; G=ground)	LD_{50} (Mammalian Toxicity)[2]
Defoliators					
Colorado potato beetle	Note: Colorado potato beetles have been found to be resistant to several families of insecticides in localized areas of Manitoba. Rotation between different families of insecticides is essential.				
	Seed Piece Treatments				
	Fortenza (D)	10 to 22.5 mL/ 100 kg seed	N/A	Seed treatment	>5000
	Actara 240SC (N)	See chart on label	N/A	Seed treatment	>5000
	Admire 240 F (N)	11.79 to 17.69 mL/ 100 pounds (45.36 kg) of potato seed tubers	N/A	Seed treatment	4143 to 4870
	Cruiser Maxx Potato Extreme (N)	20 mL/100 kg seed	NA	Seed treatment	3129
	Titan (N)	10.4 to 20.8 mL/100 kg potato seed pieces	N/A	Seed treatment	2000
	NipsIt INSIDE (N)	10.4 to 20.8 mL/100 kg potato seed pieces	Seed treatment	Seed treatment	3044
	In-Furrow Application				
	Verimark (D)	304 to 405 mL (based on 90 cm row spacing)	N/A	G	>5000
	Vayego (D)	6.75 mL/100 m of row		G	>2000
	Minecto Duo (N, D)	178 to 283 g		G	>5000
	Actara 240SC (N)	0.15 to 0.20 L (based on 90 cm row spacing)		G	>5000
	Foliar Sprays				
	BioTitan WP	809 to 3,238 g	0	G	
	Rimon (SB)	0.17 to 0.33 L	14	G	3914 to >5000
	Entrust (Sp)	68 to 135 mL	7	G	>5000
	Success (Sp)	34 to 67 mL	7	G	>5000
	Delegate (Sp)	65 to 97 g	7	A or G	>5000
	Coragen MaX *Coragen* *Shenzi* (D)	33.5 to 67.5 mL 101 to 202 mL 50.6 to 101.2 mL	1	A or G	>5000
	Exirel (D)	304 to 405 mL	7	A or G	>5000
	Harvanta (D)	324 to 486 mL	7	A or G	>2000
	Vayego (D)	61 mL	14	A or G	>2000
	Sivanto Prime (B)	304 to 405 mL	7	A or G	>2000
	Agri-mek (A)	49 to 91 mL	14	G	310
	Minecto Pro (A + D)	225 to 271 mL	14	G	451
	Cormoran (SB + N)	178 to 283 mL	7	G	>2000
	Actara 240SC (N)	44.1 mL	7	A or G	>5000
	Actara 25WG (N)	42.5 g	7	A or G	>5000
	Admire (N)	81 mL	7	G	4143 to 4870
	Assail/Aceta (N)	16.2 to 32.4 g	7	G	1064
	Pounce/Perm-UP/IPCO Syncro (P) *Ambush* (P)	73 to 105 mL 57 to 81 mL	1	A or G	789 to 1030

Insect	Insecticide (and insecticide group[1])	Rate per Acre	Pre-harvest interval (days)	Application (A=aerial; G=ground)	LD_{50} (Mammalian Toxicity)[2]
Colorado potato beetle, *continued*	*Decis 100 EC/Advantage Deltamethrin 5 EC/Decimate/Rauma/Poleci* (P)	20 to 30 mL (*Decis 100 EC*) 40 to 60 mL (*Advantage Delta..5EC/ Decimate/Rauma*) 81 to 121 mL (*Poleci*)	1	A or G	>300 to 2000
	Matador/Silencer/Labamba/Zivata (P)	34 to 50 mL (ground) 34 mL (air)	7	A or G	56 to 98
	Up-Cyde/Ship (P)	57 mL	7	A or G	355
	Concept (N + P)	263 mL	7	G	2500
	Cimegra	51 to 76 mL	14	G	>2000
	Sevin XLR (C)	0.51 L	7	G	699
	Imidan (OP)	0.65 kg	7	G	258 to 275
Potato flea beetle	**Seed Piece Treatments**				
	Admire 240 F (N)	11.79 to 17.69 mL/ 100 pounds (45.36 kg) of potato seed tubers	N/A	Seed treatment	4143 to 4870
	Titan (N)	10.4 to 20.8 mL/100 kg potato seed pieces			2000
	NipsIt INSIDE (N)	10.4 to 20.8 mL/100 kg potato seed pieces	Seed treatment	Seed treatment	3044
	In-Furrow Application				
	Verimark (D)	In-furrow application: 304 to 405 mL (based on 90 cm row spacing)	N/A	In-furrow application	>5000
	Vayego (D)	6.75 mL/100 m of row		G	>2000
	Foliar Sprays				
	Exirel (D)	202 to 405 mL	7	A or G	>5000
	Vayego (D)	61 mL	14	A or G	>2000
	Minecto Pro (A + D)	150 to 271 mL	14	G	451
	Minecto Duo (N + D)	178 to 283 g		G	>5000
	Pounce/Perm-UP/IPCO Syncro (P) *Ambush* (P)	73 to 105 mL 57 to 81 mL	1	A or G	789 to 1030
	Decis 100 EC/Advantage Deltamethrin 5 EC/Decimate/Rauma/Poleci (P)	20 to 30 mL (*Decis 100 EC*) 40 to 60 mL (*Advantage Delta..5EC/ Decimate/Rauma*) 81 to 121 mL (*Poleci*)	1	A or G	>300 to 2000
	Matador/ Silencer/Labamba/Zivata (P)	34 mL	7	A or G	56 to 98
	UP-Cyde/Ship (P)	57 mL	7	A or G	355
	Concept (N + P)	263 mL	7	G	2500
	Sevin XLR (C)	1.01 L	7	G	699
	Imidan (OP)	0.65 kg	7	G	258 to 275
Variegated cutworm	*Coragen MaX* *Coragen* *Shenzi* (D)	33.5 to 50.5 mL 101 to 152 mL 50.6 to 76.1 mL	1	A or G	>5000
	Exirel (D)	202 to 304 mL	7	A or G	>5000
	Minecto Pro (A + D)	150 to 225 mL	14	G	451

Insect	Insecticide (and insecticide group[1])	Rate per Acre	Pre-harvest interval (days)	Application (A=aerial; G=ground)	LD_{50} (Mammalian Toxicity)[2]
Variegated cutworm, *continued*	*Pounce/Perm-UP/IPCO Syncro* (P) *Ambush* (P)	73 mL 57 mL	1	G	789 to 1030
	UP-Cyde/Ship (P)	115 mL	7	G	355
	Voliam Xpress (D+P)	202 mL	7. Do not feed treated crop to livestock	A or G	98
	Sevin XLR (C)	45 mL/100 m of row	7	G	699
Armyworm	*Coragen MaX* *Coragen* *Shenzi* (D)	33.5 to 50.5 mL 101 to 152 mL 50.6 to 76.1 mL	1	A or G	>5000
	Exirel (D)	202 mL	7	A or G	>5000
	Minecto Pro (A + D)	150 mL	14	G	451
	Cormoran (SB + N)	178 to 304 mL	7	G	>2000
	Matador/Silencer/Labamba/ Zivata (P)	34 mL	7	A or G	56 to 98
Grasshoppers	*Coragen MaX*	17 to 34 mL	1	A or G	>5000
Stem Borers					
European corn borer	*Rimon* (SB)	0.17 to 0.33 L	14	G	3914 to >5000
	Entrust (Sp)	101 mL	7	G	>5000
	Success (Sp)	51 mL	7	G	>5000
	Delegate (Sp)	65 g	7	A or G	>5000
	Coragen MaX *Coragen* *Shenzi* (D)	33.5 to 50.5 mL 101 to 152 mL 50.6 to 76.1 mL	1	A or G	>5000
	Exirel (D)	202 to 304 mL	7	A or G	>5000
	Vayego (D)	61 mL	14	A or G	>2000
	Minecto Pro (A + D)	150 to 225 mL	14	G	451
	Cormoran (SB + N)	263 to 304 mL	7	G	>2000
	Matador/Silencer/Labamba/Zivata (P)	34 mL	7	A or G	56 to 98
	Decis 100 EC/Decimate/ Rauma (P)	30 to 51 mL (*Decis 100 EC*) 61 to 101 mL (*Decimate/ Rauma*)	1	G	633
	Pounce/Perm-UP/IPCO Syncro (P) *Ambush* (P)	73 mL 57 mL	1	A or G	789 to 1030
	Concept (N + P)	263 mL	7	G	2500
	Sevin XLR (C)	1.01 to 2.12 L	7	G	699

*Before using any pesticide on potatoes, consult the list of **Agricultural Pesticides Approved for Use**, available from Simplot Canada and McCain Foods (Canada).

ALWAYS CONSULT THE INSECTICIDE LABEL BEFORE APPLYING ANY INSECTICIDE.

[1] Insecticide Group: A = Avermectins, F=flonicamid, SB=substituted benzoylurea, Sp=spinosyns, D=diamides, S=sulfoxamines, B=butenolides, N=neonicotinoids, P=pyrethroids, PP=pyropenes, C=carbamates, OP=organophosphates, PAD= Pyridine azomethine derivatives

[2] LD_{50} values represent the relative toxicity of a pesticide. They represent the dose (in milligram per kilogram body weight) that will kill 50 percent of the test animals. Thus the lower the number the greater the toxicity. Values given are for oral LD_{50}.

Quinoa Insect Management Chart

Insect	Insecticide (and insecticide group[1])	Rate per Acre	Pre-harvest interval (days)	Application (A=aerial; G=ground)	LD_{50} (Mammalian Toxicity)[2]
Sap or Fluid Feeders					
Lygus bugs	*Closer* (S)	81 mL	14	G	>5000
Stem borers					
European corn borer	*Dipel* (M)	227 to 453 g	N/A	A or G	>5000
	Bioprotec CAF (M)	1.13 to 1.62 L	0	G	N/A
Beet webworm	*Bioprotec CAF* (M)	0.57 to 1.13 L	0	G	N/A

ALWAYS CONSULT THE INSECTICIDE LABEL BEFORE APPLYING ANY INSECTICIDE.

[1] Insecticide Group: M=microbial, S=sulfoxamines

[2] LD_{50} values represent the relative toxicity of a pesticide. They represent the dose (in milligram per kilogram body weight) that will kill 50 percent of the test animals. Thus the lower the number the greater the toxicity. Values given are for oral LD_{50}.

Grasshopper Management on **Roadsides, Headlands and Summerfallow**.

Note: Insects for biological control of weeds such as leafy spurge may be introduced and established in some areas of Manitoba and Saskatchewan. If grasshopper numbers become high, consider using control strategies and insecticides that will minimize harm to these biological control agents.

Insecticide (and insecticide group[1])	Rate per Acre	Pre-harvest interval (days)	Application (A=aerial; G=ground)	LD_{50} (Mammalian Toxicity)[2]
Spreadable Bran Baits				
Eco bran (roadsides, headlands, field borders, right-of-way, wastelands) (C)	0.8 to 1.6 kg	0	G	N/A
Sprays				
Decis 100 EC/ Advantage Deltamethrin 5 EC/ Poleci (P) (roadside)	20 to 30 mL (Decis 100 EC) 40 to 60 mL (Advantage Deltamethrin 5 EC) 81 to 121 mL (Poleci)	N/A	G	>300 to 2000
UP-Cyde/ Ship (P) (roadsides, headlands, and summerfallow) (young grasshoppers only)	33 to 46 mL		G	355
Matador/Labamba (P) (summerfallow) (young grasshoppers only)	25 to 34 mL (ground) 34 mL (air)	Treated areas must not be grazed or cut for hay or forage.	A or G	56 to 93
Sevin XLR (C) (headlands, ditchbanks, field borders, rights-of-way)	486 to 931 mL (for nymphs or sparse vegetation 931 mL to 1.4 L (for adults or dense vegetation)	0	G	699
Lagon/Cygon 400EC/Cygon 480-AG/ Diamante 4 (OP) (wastelands)	Nymphs: 223 mL (*Lagon, Cygon 480-AG, Diamante 4*), 267 mL (*Cygon 400EC*). Adults: 344 to 405 mL (*Lagon, Cygon 480-AG, Diamante 4*), 413 to 486 mL (*Cygon 400EC*).	2 (nymphs) 7-28 (adults - see labels)	A or G (*Lagon*) G (*Diamante 4, Cygon 480-AG, Cygon 400EC*)	245 to 550

ALWAYS CONSULT THE INSECTICIDE LABEL BEFORE APPLYING ANY INSECTICIDE.

[1] Insecticide Group: P=pyrethroids, C=carbamates, OP=organophosphates.

[2] LD_{50} values represent the relative toxicity of a pesticide. They represent the dose (in milligram per kilogram body weight) that will kill 50 percent of the test animals. Thus the lower the number the greater the toxicity. Values given are for oral LD_{50}

Field Scouting in Rye

Information on typical damage, when and how to monitor, and economic thresholds for cutworm, aphids and armyworm in rye can be found in the section on field scouting in small grain cereals (wheat, barley, oats).

Rye Insect Management Chart

Insect	Insecticide (and insecticide group[1])	Rate per Acre	Pre-harvest interval (days)	Application (A=aerial; G=ground)	LD_{50} (Mammalian Toxicity)[2]
Belowground and Surface Feeders					
Wireworms	*Teraxxa F4*	300 mL/100 kg seed	Seed treatment		>2000
	Lumivia CPL (D)	24 to 40 mL/100 kg seed	Seed treatment		>5000
	Cruiser Vibrance Quattro (N)	325 mL/100 kg seed		Seed treatment	>5000
	Cruiser 5FS (N)	17 to 50 mL/100 kg seed	May be applied on-farm or by commercial seed treaters.		
Cutworms	*Lumivia CPL* (D)	8 to 24 mL/100 kg seed	Seed treatment		>5000
	Coragen MaX *Coragen* *Shenzi* (D)	33.5 mL 101 mL 50.6 mL	1	A or G	>5000
	Pounce/Perm-UP/ IPCO syncro (P)	73 to 158 mL	7	A or G (see labels)	789 to 1030
Sap Feeders					
Aphids	*Malathion 85E* (OP)	0.445 to 0.544 L	7	A or G	>550
Defoliators					
Grasshoppers	**Seed Treatments**				
	Lumivia CPL (D) (Suppression only)	40 mL/100 kg seed	Seed treatment		>5000
	Spreadable Bran Baits				
	Nolo Bait	Minimum of 0.45 kg		A or G	>5000
	Sprays				
	Coragen MaX *Coragen* *Shenzi* (D)	17 to 33.5 mL 51 to 101 mL 25.5 to 50.6 mL	1	A or G	>5000
	Malathion 85E (OP)	0.445 to 0.544 L	7	A or G	>550
	Lagon 480 E (OP)	0.22 L (nymphs) 0.34 to 0.41 L (adults)	35	A or G	60
Armyworm	*Lumivia CPL* (D)	8 to 24 mL/100 kg seed	Seed treatment		>5000
	Coragen MaX *Coragen* *Shenzi* (D)	33.5 to 50.5 mL 101 to 152 mL 50.6 to 76.1 mL	1	A or G	>5000
	Delegate (Sp)	40 to 81 g	21	G	>5000
	Matador/Labamba (P)	34 mL	28 days. Do not cut treated fields for hay/ forage. Do not graze treated fields.	A or G	56-93
	Malathion 85E (OP)	0.445 to 0.544 L	7	A or G	>550

ALWAYS CONSULT THE INSECTICIDE LABEL BEFORE APPLYING ANY INSECTICIDE.

[1] Insecticide Group: N=neonicotinoids, P=pyrethroids, C=carbamates, OP=organophosphates, Sp=spinosyns

[2] LD_{50} values represent the relative toxicity of a pesticide. They represent the dose (in milligram per kilogram body weight) that will kill 50 percent of the test animals. Thus the lower the number the greater the toxicity. Values given are for oral LD_{50}.

Safflower Insect Management Chart

Insect	Insecticide (and insecticide group[1])	Rate per Acre	Pre-harvest interval (days)	Application (A=aerial; G=ground)	LD_{50} (Mammalian Toxicity)[2]
Belowground and Surface Feeders					
Cutworms	*Coragen MaX* *Coragen* *Shenzi* (D)	33.5 mL 101 mL 50.6 mL	1	A or G	>5000
Defoliators					
Grasshoppers	*Coragen MaX* *Coragen* *Shenzi* (D)	17 to 33.5 mL 51 to 101 mL 25.5 to 50.6 mL	1	A or G	>5000
	Lagon 480 E/Cygon 480-AG/ Cygon 400EC (OP)	220 to 400 mL (*Lagon* , *Cygon 480-AG*) 267 to 486 mL (*Cygon 400EC*)	21	A or G	425 to 550

ALWAYS CONSULT THE INSECTICIDE LABEL BEFORE APPLYING ANY INSECTICIDE.

[1] Insecticide Group: D=diamides, OP=organophosphates.

[2] LD_{50} values represent the relative toxicity of a pesticide. They represent the dose (in milligram per kilogram body weight) that will kill 50 percent of the test animals. Thus the lower the number the greater the toxicity. Values given are for oral LD_{50}.

Field Scouting in Small Grain Cereals (wheat, barley, oats)

Belowground and Surface Feeders

- **Cutworm**
  - ***Typical Damage:*** Notched, wilted, dead, or cut-off plants. Plants missing from rows, bare patches appearing in field.
  - ***When and How to Monitor:*** Look for cutworm, and evidence of cutworm feeding, when monitoring in May and June. Often cutworms will be close to the cut or shriveled plants they have just damaged. Cutworm will sometimes be most abundant in patches or a specific area of a field. In areas of the field where cutworm damage is noticeable, check around damaged plants in a 0.25 square metre (50 cm x 50 cm) area. Use trowel or shovel to carefully search through top half to 1 inch of soil for cutworm larvae. Multiply the number of cutworms found by 4 to get the number per square metre. Repeat in several locations to get an accurate assessment of what the cutworm levels are.
  - ***Economic Threshold:*** Pale western cutworm – 3 to 4 per square metre; Redbacked and army cutworm – 5 to 6 per square metre. Well established fall-seeded crops or spring seeded crops with good moisture conditions can tolerate higher numbers. Sometimes it is most economical to just treat infested patches, and not whole fields.

Sap Feeders

- **Aphids**
  - ***Typical Damage:*** Visible wilting of plants, yellow patches in fields, plants are sticky.
  - ***When and How to Monitor:*** Look for aphids when monitoring prior to the soft dough stage. While monitoring the field, using a sweep net or tapping plants over a white tray or bucket can alert you to the presence and relative abundance of aphids. If aphid levels appear concerning, a more thorough examination is needed. Count aphids on 20 randomly selected stems in each of 5 areas. Counts should be at least 50 paces apart, and observations should be made well into the center of the field. Too frequently farmers become alarmed after checking a few plants along the margins, especially near shelterbelts, where populations are high. Record the total number of aphids and calculate the average per plant.
  - ***Economic Threshold:*** 12 to 15 aphids per stem prior to the soft dough stage.
    - ***Cereal Aphid Manager*** is a mobile app that helps growers determine aphid populations by predicting what the aphid population will be in 7 days along with beneficial insect pressure on the population and suggests if insecticide application is necessary. **https://open.canada.ca/en/app/cereal-aphid-manager-mobile-app**
- **Barley Thrips**
  - ***When and How to Monitor:*** Sampling should begin when the flag leaf is first visible and continue until the head is completely emerged from the boot. Barley thrips exhibit an edge effect; there are usually more thrips near protected field margins than other areas of the field. Most thrips can be found under the top 2 leaf sheaths. Unroll the leaf sheaths away from the stem to find the thrips.
  - ***Economic Threshold:*** Insecticide treatments are only effective when applied before heading is complete. Treat when thrips are equal to or greater than the number calculated by: Threshold (Thrips per stem) = (Cost of Control ÷ expected $ value per bushel)/0.4

Defoliators

- **Grasshoppers**
  - ***Typical Damage:*** Black strips along margins of newly emerging crops, head clipping later in season.
  - ***When and How to Monitor:*** Look for grasshoppers when monitoring fields from late – May through to harvest. Check along edges of crop, particularly areas adjacent to hayland, pastures and roadsides. Estimate number of hoppers per square yard (m^2).
  - ***Economic Threshold:*** 8 to 13 grasshoppers per square metre. Early in the season, when grasshoppers are small, 18 grasshoppers per square metre and visible crop damage may be a more appropriate threshold.
    - A rough estimate for an economic threshold for grasshoppers in crops to be used as greenfeed has been suggested at 20 grasshoppers per square metre or higher.
- **Armyworm**
  - ***Typical Damage:*** Leaves stripped from plants, awns chewed from heads, heads clipped.
  - ***When and How to Monitor:*** Check the soil surface for armyworm, and the plants for feeding, when monitoring in mid- June through early-August. At each stop shake plants and carefully check soil surface for dislodged larvae. During the day larvae may be under plant trash, soil clods or in soil cracks. Check the backs of armyworms for parasite eggs.
  - ***Economic Threshold:*** Four unparasitized larvae, smaller than 2.5 cm (1 inch) per square foot. If heads are being clipped, treat when two or more armyworms per square foot are present. For migrating armyworms: treat a couple of swaths ahead of the infestation in the direction of movement to form a barrier strip.

Seed Feeders Only

- **Wheat Midge (wheat only)**
  - When and How to Monitor: Monitor wheat in July when crop emerges from boot stage until flowering. Check crop canopy at dusk for signs of wheat midge adult activity. At each stop, examine 10 heads. Record the number of midge adults observed on or near heads. Calculate average number of midge per head.
    - Sticky traps may be used to capture adult midge activity in wheat fields.
  - ***Economic Threshold:*** *For yield only:* 1 adult midge per 4 to 5 heads. At this level of infestation, wheat yields will be reduced by approximately 15 percent if the midge is not controlled. *To maintain optimum grade:* 1 adult midge per 8 to 10 wheat heads during the susceptible stage.

Small Grain Cereals (wheat, barley, oats) Insect Management Chart

Insect	Insecticide (and insecticide group[1])	Rate per Acre	Pre-harvest interval (days)	Application (A=aerial; G=ground)	LD_{50} (Mammalian Toxicity)[2]
Belowground and Surface Feeders					
Wireworms	*Teraxxa F4*	300 mL/100 kg seed	Seed treatment		>2000
	Lumivia CPL (D)[3]	24 to 40 mL/100 kg seed	Seed treatment		>5000
	Fortenza (D)[4]	17 to 50 mL/100 kg of seed	Seed treatment		
	Cruiser Vibrance Quattro (N)	325 mL/100 kg seed		Seed treatment	>5000
	Cruiser 5FS (N) (wheat and barley only)	17 to 50 mL/100 kg seed	May be applied on-farm or by commercial seed treaters.		
	NipsIt SUITE Cereals (N) (wheat only)	326 mL/100 kg seed	Seed treatment	Seed treatment	>5000
	NipsIt INSIDE (N)	17 to 100 mL/100 kg seed	Seed treatment	Seed treatment	3044
	Intego Suite Cereals OF (wheat only) (suppression) (N)	339 mL/100 kg seed	Seed treatment	Seed treatment	
	Sombrero 600 FS (N)	17 to 50 mL/100 kg seed	Seed treatment	Seed treatment	500 to 825
	Raxil PRO Shield (N)	A co-pack of *Raxil PRO* and *StressShield 600*.			
Cutworms	*Lumivia CPL* (D)[3]	8 to 24 mL/100 kg seed	Seed treatment		>5000
	Coragen MaX *Coragen* *Shenzi* (D)	33.5 mL 101 mL 50.6 mL	1	A or G	>5000
	Decis 100 EC/Advantage Deltamethrin 5 EC/ Poleci (P)	40 mL (*Decis 100 EC*) 81 mL (*Advantage Delta..5EC*) 162 mL (*Poleci*)	31 (oats) 40 (barley, wheat)	A or G	>300 to 2000
	UP-Cyde/Ship (P) (barley and wheat only)	115 mL	21	G	355
	Pounce/Perm-UP/ IPCO Syncro (P)	73 to 158 mL	7	A or G (see labels)	789 to 1030
Sap and Fluid Feeders					
Aphids	*Malathion 85E* (OP)	0.445 to 0.544 L	7	A or G	>550
	Cygon 400EC/ Diamante 4 (OP)	170 mL (*Diamante 4*) 206 mL (*Cygon 400EC*)	35	A or G	245 to 550
Thrips	*Lagon 480 E/Cygon 400EC/ Cygon 480-AG/Diamante 4* (OP)	400 mL (*Lagon, Cygon 480-AG, Diamante 4*) 486 mL (*Cygon 400EC*)	35	A or G	245 to 550
Defoliators					
Grasshoppers	**Seed Treatments**				
	Lumivia CPL (D) (Suppression only)	40 mL/100 kg seed	Seed treatment		>5000
	Spreadable Bran Baits				
	Nolo Bait	Minimum of 0.45 kg		A or G	
	Sprays				
	Coragen MaX *Coragen* *Shenzi* (D)	17 to 33.5 mL 51 to 101 mL 25.5 to 50.6 mL	1	A or G	>5000
	Decis 100 EC/Advantage Deltamethrin 5 EC/ Poleci (P)	20 to 30 mL (*Decis 100 EC*) 40 to 60 mL (*Advantage Delta..5EC*) 81 to 121 mL (*Poleci*)	31 (oats) 40 (wheat, barley)	A or G	>300 to 2000

Insect	Insecticide (and insecticide group[1])	Rate per Acre	Pre-harvest interval (days)	Application (A=aerial; G=ground)	LD_{50} (Mammalian Toxicity)[2]
Grasshoppers, *continued*	*UP-Cyde/Ship* (P) (young grasshoppers only) (wheat and barley only)	33 to 46 mL	30 (wheat) 45 (barley)	G	355
	Matador/Silencer/Labamba/ Zivata (P) (young grasshoppers only)	25 to 34 mL (ground) 34 mL (air)	28 days. Do not cut treated fields for hay/ forage. Do not graze treated fields.	A or G	56 to 98
	Malathion 85E (OP)	0.445 to 0.544 L	7	A or G	>550
	Lagon 480 E (OP)	nymphs: 0.22 L adults: 0.34 to 0.40 L	35	A or G	425 to 450
Cereal leaf beetle	A parasitoid of cereal leaf beetle, *Tetrastichus julis*, has been released and established in many areas.				
	Malathion 85E (OP)	0.435 L	7	A or G	>550
Armyworm	*Lumivia CPL* (D)[3]	8 to 24 mL/100 kg seed	Seed treatment		>5000
	Coragen MaX *Coragen* *Shenzi* (D)	33.5 to 50.5 mL 101 to 152 mL 50.6 to 76.1 mL	1	A or G	>5000
	Delegate (Sp)	40 to 81 g	21	G	>5000
	Matador/Silencer/Labamba/ Zivata (P)	34 mL	28 days. Do not cut treated fields for hay/ forage. Do not graze treated fields.	A or G	56 to 98
	Malathion 85E (OP)	0.445 to 0.544 L	7	A or G	>550
Slugs	*Sluggo Professional*	10 to 20 kg		G	>5000
Pests of Seed Only					
Wheat midge (a pest of wheat only)	**Rotate Crops** – Continuous wheat cropping encourages higher wheat midge populations.				
	Resistant Varieties – there are many varieties of wheat resistant to feeding by wheat midge. For an updated list of varieties and information on them see: **https://www.midgetolerantwheat.ca/farmers/**				
	Biological Control - A parasitoid, *Macroglenes penetrans*, was found to control an average of 32 percent of the wheat midge in Saskatchewan.				
	Lagon 480 E/Cygon 400EC/ Cygon 480-AG/Diamante 4 (OP)	400 mL (*Lagon, Cygon 480-AG, Diamante 4*) 486 mL (*Cygon 400EC*)	35	A or G	245 to 550
Stem-Borers					
Hessian fly	• Never plant wheat in the same field 2 years in a row in areas where Hessian flies are a problem. • The spring wheat cultivar *Superb* is partially resistant to the Hessian fly. • Early seeded spring wheat (prior to June) is less susceptible to stem breakage caused by Hessian fly than later seeded wheat. • Winter wheat planted in September will likely be free of Hessian flies.				
Wheat stem maggot	Crop rotation and stubble cultivation may reduce populations.				
Wheat stem sawfly	• Solid-stem wheat varieties can reduce damage by wheat stem sawfly larvae compared to susceptible varieties, however the level of control can vary depending on environmental conditions. • The parasitoid *Bracon cephi* can reduce population of wheat stem sawfly in localized areas. Parasitoids of wheat stem sawfly can be conserved by increasing stubble height at harvest. • Early swathing can reduce losses.				

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[1] Insecticide Group: Sp=spinosyns, D=diamides, N= neonicotinoids, P=pyrethroids, C=carbamates, OP=organophosphates.

[2] LD_{50} values represent the relative toxicity of a pesticide. They represent the dose (in milligram per kilogram body weight) that will kill 50 percent of the test animals. Thus the lower the number the greater the toxicity. Values given are for oral LD_{50}.

[3] DO NOT make a subsequent foliar application of any group 28 insecticide (such as Coragen) for a minimum of 60 days after planting seed treated with Lumivia CPL.

[4] DO NOT make any subsequent applications of a group 28 insecticide (such as Coragen) following Fortenza seed treatment.

Scouting for insects in Soybeans

- **Cutworm**
  - A nominal threshold that may be used for cutworm in soybeans is 1 or more larvae per 3 feet of row and larvae are small (less than 2 cm), or 20 percent of plants cut.
- **Soybean Aphid**
  - ***Typical Damage:*** Soybean aphids suck sap from soybean plants. Infested leaves may wilt or curl when infestations are large. Other symptoms may include plant stunting, reduced pod and seed count, and yellowing of leaves.
  - ***When and How to Monitor:*** Check 30 plants (6 plants in 5 areas) per field. Examine the entire plant and estimate populations of soybean aphids (counting exact numbers will not be possible or practical with higher populations). Once soybean aphid numbers reach 250 aphids per plant, scout the field frequently to determine if soybean aphid numbers are increasing. A population can stay at 250 to 300 aphids per plant and not cause economical yield loss. If the levels are not rising above 250 to 300 per plant, there is a good indication that field conditions are favouring natural enemies (such as beneficial insects and fungi) that are helping control the aphids. An app called Aphid Advisor can be used to integrate common natural enemies of soybean aphids into the management decision (**http://www.aphidapp.com/**).
  - ***Economic Threshold:*** When there are on average at least 250 aphids per plant and the population is increasing, and the plants are in the R1 (beginning bloom) to R5 (beginning seed) growth stages, treatment would be economical. This threshold gives an approximate 7 day lead time before aphid populations are expected to exceed the economic injury level (670 aphids per plant), where cost of control is equal to yield loss. When soybean aphid populations are not actively increasing above 250 aphids per plant, natural enemies are keeping up with the aphid population. DO NOT use an insecticide in this case, as it will kill the natural enemies which may enable the aphid population to increase above the economic injury level.

Soybean Insect Management Chart

Insect	Insecticide (and insecticide group[1])	Rate per Acre	Pre-harvest interval (days)	Application (A=aerial; G=ground)	LD_{50} (Mammalian Toxicity)[2]
Belowground and Surface Feeders					
Wireworms	*Lumiderm* (D)[3]	0.0375 to 0.125 mg ai/seed			
	Fortenza (D)[4]	83 mL/100 kg seed			
	Sombrero 600 FS (N)	Apply 104 to 208 mL/100 kg seed			
	Scorpio Ant and Insect Bait (suppression) (Sp)	10 to 20 kg	Incorporate into the soil at planting to a depth of 10 to 20 cm.		
Seedcorn maggot	*Lumiderm* (D)[3]	0.0375 to 0.125 mg ai/seed			
	Fortenza (D)[4]	41.5 to 83 mL/100 kg seed			
	Cruiser 5FS (N)	50 to 83 mL/ 100 kg seed	May only be applied by commercial seed treaters.		
	Sombrero 600 FS (N)	Apply 104 to 208 mL/100 kg seed			
Cutworms	*Lumiderm* (D)[3]	0.0375 to 0.075 mg ai/seed			
	Fortenza (D)[4]	41.5 to 83 mL/100 kg seed			
	Scorpio Ant and Insect Bait (black cutworm) (Sp)	10 to 20 kg	28	G	
	Coragen MaX *Coragen* *Shenzi* (D)	33.5 mL 101 mL 50.6 mL	1	A or G	>5000
	Vayego (D)	61 mL	14	G	>2000
	Matador/Silencer/Labamba/ Zivata (P)	34 mL	21. Do not feed treated crops to livestock	A or G	56 to 98

Insect	Insecticide (and insecticide group[1])	Rate per Acre	Pre-harvest interval (days)	Application (A=aerial; G=ground)	LD_{50} (Mammalian Toxicity)[2]
Sap or Fluid Feeders					
Soybean aphid	*Sefina* (PP)	81 mL	7	A or G	>2000
	Movento (TT)	75 to 111 mL	21	A or G	>2000
	Sivanto Prime (B)	202 to 304 mL	21	A or G	>2000
	Matador/Silencer/Labamba/Zivata (P)	34 to 94 mL	21. Do not cut treated fields for hay/forage. Do not graze treated fields.	A or G	56 to 98
	Voliam Xpress (D+P)	91 to 223 mL	21. Do not feed treated crop to livestock.	A or G	98
	Concept (N + P)	132 to 263 mL	20	G	2500
	Lagon 480 E (OP)	280 to 400 mL	30	A or G	425
Leafhoppers	*Sivanto Prime* (B)	202 to 304 mL	21	A or G	>2000
	Voliam Xpress (D+P)	91 mL	21. Do not feed treated crop to livestock	A or G	98
	Lagon 480 E (OP)	280 to 400 mL	30	A or G	425
Lygus bugs	*Matador/Silencer/Labamba/ Zivata* (P)	34 mL	21. Do not cut treated fields for hay/forage. Do not graze treated fields.	A or G	56 to 98
	Voliam Xpress (D+P)	91 mL	21. Do not feed treated crop to livestock.	A or G	98
	Lagon 480 E (OP)	280 to 400 mL	30	A or G	425
Spider mites	*Lagon 480 E/Cygon 400EC/ Cygon 480-AG/Diamante 4* (OP)	400 mL (*Lagon, Cygon 480-AG, Diamante 4*) 486 mL (*Cygon 400EC*)	30	A or G (*Lagon 480 E*) G only (*Cygon 400EC, Cygon 480-AG, Diamante 4*)	245 to 550
Defoliators					
Armyworm	*Coragen MaX* *Coragen* *Shenzi* (D)	33.5 to 50.5 mL 101 to 152 mL 50.6 to 76.1 mL	1	A or G	>5000
	Vayego (D)	61 mL	14	G	>2000
	Delegate (Sp)	40 to 81 g	28	G	>5000
	Voliam Xpress (D+P)	202 mL	21. Do not feed treated crop to livestock.	A or G	98
Corn earworm	*Coragen MaX* *Coragen* *Shenzi* (D)	33.5 to 50.5 mL 101 to 152 mL 50.6 to 76.1 mL	1	A or G	>5000
	Voliam Xpress (D+P)	202 mL	21. Do not feed treated crop to livestock.	A or G	98

Insect	Insecticide (and insecticide group[1])	Rate per Acre	Pre-harvest interval (days)	Application (A=aerial; G=ground)	LD_{50} (Mammalian Toxicity)[2]
Grasshoppers	*Coragen MaX* *Coragen* *Shenzi* (D)	17 to 33.5 mL 51 to 101 mL 25.5 to 50.6 mL	1	A or G	>5000
	Matador/Silencer/Labamba/ Zivata (P)	34 mL	21. Do not cut treated fields for hay/forage. Do not graze treated fields.	A or G	56 to 98
	Voliam Xpress (D+P)	91mL	21. Do not feed treated crop to livestock.	A or G	98

ALWAYS CONSULT THE INSECTICIDE LABEL BEFORE APPLYING ANY INSECTICIDE.

[1] Insecticide Group: D=diamides, Sp=spinosyns, N= neonicotinoids, P=pyrethroids, PP=pyropenes, OP=organophosphates, TT = tetronic and tetramic acid derivatives.

[2] LD_{50} values represent the relative toxicity of a pesticide. They represent the dose (in milligram per kilogram body weight) that will kill 50 percent of the test animals. Thus the lower the number the greater the toxicity. Values given are for oral LD_{50}.

[3] DO NOT make a subsequent foliar application of any group 28 insecticide (such as Coragen) for a minimum of 60 days after planting seed treated with Lumiderm.

[4]DO NOT make any subsequent applications of a group 28 insecticide (such as Coragen) following Fortenza seed treatment.

Stored Grain Insect Control-

See Insect Control in Stored Grain; after Insect Management Charts.

Summerfallow-

See grasshopper management on Pastures, etc.

Scouting for insects in Sunflowers

Belowground and Surface Feeders

- **Cutworm**
  - ***Typical Damage:*** Notched, wilted, dead, and cut-off plants (weed or crop seedlings). Plants missing from rows, bare patches appearing in field.
  - ***When and How to Monitor:*** Look for cutworm, and evidence of cutworm feeding, when monitoring sunflowers in May and June. Often cutworms will be close to the cut or shriveled plants that they have just damaged. Cutworm will sometimes be most abundant in patches or a specific area of a field. In areas of a field where cutworm damage is noticeable, check around damaged plants in a square foot (30 cm x 30 cm) area. Use trowel or shovel to carefully search through top half to 1 inch of soil for cutworm larvae. Repeat in several locations to get an accurate assessment of what the cutworm levels are.
  - ***Nominal Threshold:*** 1 cutworm or more per square foot (30 by 30 cm) or if there is a 25 to 30 percent stand reduction. Sometimes it is most economical to just treat infested patches, and not whole fields.

Defoliators

- **Sunflower Beetle**
  - ***Typical Damage:*** Adults: Leaves of seedling plants chewed or completely destroyed late May through June, shot-holes or large areas of leaves chewed July through August. Larvae: Leaves of plants chewed or completely destroyed.
  - ***When and How to Monitor:*** Adults: Look for when monitoring sunflower seedlings in May through June. Examine 10 plants at random at each stop. Larvae: Look for when monitoring sunflowers in July through mid-August. Examine 10 plants at random at each sampling site. Peel back leaves around growing tip and record total number of larvae found. Calculate average number per plant.
  - ***Economic Threshold:*** Adults: 1 to 2 per seedling; Larvae: 10 to 15 per plant or 25 to 30 percent defoliation.

Insects affecting the seeds

Pests of Seed Only

- **Red Sunflower Seed Weevil**
  - ***Typical Damage:*** Seeds partly or completely destroyed, exit hole in hull. Shriveled kernels, kernels completely destroyed.
  - ***When and How to Monitor:*** Monitor fields when ray petals being to form and continue every 2 to 3 days until pollination is complete. When scouting, use the X pattern and begin counts at least 70 to 100 feet into the field to avoid margin effects. Examine 5 plants at each site for a total of 25 plants. For checking individual sunflower heads, brush the face of the head vigorously to bring the weevils to the surface, or use a commercial preparation of mosquito repellent containing diethyl toluamide (DEET) to spray the heads. This will cause the weevils to move out of hiding spots. Record total number of weevils and calculate average per head.
  - ***Economic Threshold:***
    - Confection Sunflowers: 1 to 2 weevils per plant. Control is based on a need to keep seed damage below 3 or 4 percent because of industry standards.
    - Oilseed sunflowers: 12 to 14 weevils per head.
    - The ideal plant stage to treat is when most plants in the field are at 40 percent pollen shed (R5.4).
- **Banded Sunflower Moth**
  - ***When and How to Monitor:*** Look for banded sunflower moth adults when monitoring fields in the late bud (R-4) to early bloom (R5.1) plant growth stage. Count moths on 20 plants from 5 different sites for a total of 100 plants. Sampling in early evening or early morning when the moths are most active gives the most accurate counts.
    - Sampling strategies based on scouting for adult moths during daylight hours, and counting eggs, have also been developed.
  - ***Economic Threshold:*** 1 moth per 2 plants when monitoring in the early evening or early morning.
    - If monitoring for eggs or adult moths during daylight hours, tables for determining economic thresholds can be found at: **http://www.ag.ndsu.edu/extensionentomology/field-crops-insect-pests/Documents/sunflower/e-823-banded- sunflower-moth**. If treatment is warranted, it should be applied at the R5.1 sunflower plant growth stage.
- **Lygus bugs**
  - ***Economic Threshold:*** Confection – One adult lygus bug per 9 heads can result in economic losses through the reduction in seed quality. Lygus bug management should be initiated between when the inflorescence begins to open (R4) to early bloom (R5.1) stages if adult densities reach economic levels. No control is needed in oilseed sunflowers not used for human consumption.

Sunflowers Insect Management Chart

Insect	Insecticide (and insecticide group[1])	Rate per Acre	Pre-harvest interval (days)	Application (A=aerial; G=ground)	LD_{50} (Mammalian Toxicity)[2]
Belowground and Surface Feeders					
Wireworms	Wireworm may sometimes damage sunflowers. Seeding sunflowers when the soil temperature is at least 8 to 10°C at 1 to 1.5 inches depth may minimize damage by wireworm.				
Cutworms	*Fortenza* (D)	16.56 to 32.56 mL/ 10,000 seed	Seed treatment – by commercial treaters with closed transfer systems only		>5000
	Coragen MaX *Coragen* *Shenzi* (D)	33.5 mL 101 mL 50.6 mL	1	A or G	>5000
	Pounce/Perm-UP/ IPCO Syncro (P) *Ambush* (P)	73 to 158 mL 57 to 121 mL	Treat up to 5-leaf stage	A or G (see labels)	789 to 1030
Defoliators					
Sunflower beetle	*Decis 100 EC/Advantage Deltamethrin 5 EC/ Poleci* (P)	20 mL (*Decis 100 EC*) 40 mL (*Advantage Delta..5EC*) 81 mL (*Poleci*)	70	A or G	>300 to 2000
	UP-Cyde/Ship (P)	40 mL	70	A or G	355
Grasshoppers	*Coragen MaX* *Coragen* *Shenzi* (D)	17 to 33.5 mL 51 to 101 mL 25.5 to 50.6 mL	1	A or G	>5000

Insect	Insecticide (and insecticide group[1])	Rate per Acre	Pre-harvest interval (days)	Application (A=aerial; G=ground)	LD_{50} (Mammalian Toxicity)[2]
Pests of Head and Seeds					
Lygus bugs	**Note:** Because the most appropriate timing of insecticides to control Lygus bugs in sunflowers includes flowering stages, steps to minimize harm to pollinators should be taken and insecticides should only be used when economic thresholds are exceeded.				
Sunflower seed weevil	Early planting helps to reduce seed damage by sunflower seed weevils.				
	Note: Because the most appropriate timing of insecticides to control sunflower seed weevils is during the flowering stage, steps to minimize harm to pollinators should be taken and insecticides should only be used when economic thresholds are exceeded.				
	UP-Cyde/Ship (P)	40 mL	70	A or G	355
Banded sunflower moth	Late planting may provide some control.				
	Note: Because the most appropriate timing of insecticides to control banded sunflower moth includes flowering stages, steps to minimize harm to pollinators should be taken and insecticides should only be used when economic thresholds are exceeded.				
	Coragen MaX *Coragen* *Shenzi* (D) (reduces damage)	33.5 to 50.5 mL 101 to 152 mL 50.6 to 76.1 mL	1	A or G	>5000
Sunflower moth	*Dipel 2X DF* (young larvae) (M)	127 to 253 g	N/A	A or G	>5000
	Bioprotec CAF/ *Bioprotec PLUS* (M)	0.32 to 0.65 L 0.20 to 0.40 L	0	A or G	N/A
	Coragen MaX *Coragen* *Shenzi* (D)	33.5 to 50.5 mL 101 to 152 ml 50.6 to 76.1 mL	1	A or G	>5000
Sunflower midge	**Crop rotation:** If a sunflower midge infestation is anticipated, new fields should be established away from fields damaged the previous season.				

ALWAYS CONSULT THE INSECTICIDE LABEL BEFORE APPLYING ANY INSECTICIDE.

[1] Insecticide Group: M=microbial, D=diamides, N=Neonicotinoids, P=pyrethroids, C=carbamates, OP=organophosphates.

[2] LD_{50} values represent the relative toxicity of a pesticide. They represent the dose (in milligram per kilogram body weight) that will kill 50 percent of the test animals. Thus the lower the number the greater the toxicity. Values given are for oral LD_{50}.

Sweet Clover- See clovers (sweet, red, alsike)

Timothy-

See forage grasses

Wheat-

See small grain cereals

Insect Control in Stored Grain

Prevention

Clean in and around storage facilities. Grain storage facilities, and the area around storage facilities, should be cleaned thoroughly prior to storing grain.

Clean equipment used to move grain. Grain left in equipment throughout the summer months can result in new grain that is being placed into storage becoming infested. Combines, truck beds, grain wagons, augers and other equipment used to move grain should be cleaned of grain residue. Other potential sources of grain infesting insects include livestock feeds, old seed bags, spilled grain, etc.

Inspect grain storage facilities for signs of deterioration, especially for leaks or holes through which insects or rodents can gain access to the stored grain. Moving and storing the grain in clean facilities will eliminate one source of infestation. However, grain stored for long periods of time still has the potential for renewed infestations.

Treating storage facilities. Depending on the commodity to be stored, storage facilities may additionally be sprayed or dusted, if needed, with a recommended insecticide before storing grain in the bin (e.g. malathion or diatomaceous earth – refer to product labels for details). ***Note:*** some commodities, such as canola, flax and sunflowers, should not be stored in facilities recently treated with malathion.

Dry and Cool Grain. Ideally, the grain should be dry before being put into storage, and cooled as quickly as possible. For long-term storage, producers are urged to lower the grain temperature below 15°C as soon as possible after the grain is placed in storage. At 15°C the stored product insects stop laying eggs and development stops. Aeration systems used during the night immediately after harvest should have the grain below 15°C in about 2 weeks. Grain that is not moved or aerated after harvest can remain warm enough to allow insects to survive the winter. Convection currents arising from this warm air can also promote condensation, sprouting (heating) and mould growth in unmanaged grain. These conditions are very attractive to stored product pests and support their development.

Once the grain mass is cooled to the desired temperature, fans should be sealed to prevent unwanted air migration through the mass that could result in early grain mass warm-up. Cold grain has a longer storage life than warm grain.

Note, however, that under cool grain temperatures, insect movement is reduced to the point that some insecticides may not be effective.

Monitoring for Insects

Bin probe and Sieves: Stored grain insects can be monitored by taking grain samples with a bin probe, sieving the grain, and looking in the dockage for Insects.

Probe Traps: Another means of detecting insects in stored grain is through placing probe traps (such as the WB PROBE II Trap from Trece) in the grain and monitoring them. Often the first indication of an infestation will be found near the top centre of a storage bin, and therefore, this is where traps should be placed. Monitoring should take place once every 7 to 10 days during the onset of storage (first 60 days) and then the frequency of monitoring may be adjusted.

Identifying insects in stored grain

Correct identification of insects found in stored grain is important in determining the most appropriate control methods. Some of the insects found in stored grain feed directly on the grain, referred to as primary pests, while others feed on grain that is damaged or going out of condition, referred to as secondary pests.

Primary insect pests

Insects that feed directly on the grain include rusty grain beetles, red flour beetles, and sawtoothed grain beetles.

Rusty grain beetles are reddish brown beetles about 2 mm long. Heavy infestations of this insect cause grain to heat and spoil.

The **red flour beetle** is another common insect pest of stored grain in the prairies. Red flour beetles cannot feed on undamaged, dry seed with less than 12 percent moisture content. They prefer grain dust, broken grain and milled stocks.

Sawtoothed grain beetles are more common in stored oats than in stored wheat and barley.

Secondary insect pests:

Insects that feed on fungus in the grain bin or stored grain that is damaged include the foreign grain beetle, hairy fungus beetle, psocids, and grain mites.

Foreign grain beetles resemble the rusty grain beetle, but can be distinguished from it by club-shaped antennae. Also, when placed in a glass jar, foreign grain beetles will climb up the sides, while rusty grain beetles cannot. While foreign grain beetle is considered a fungus feeder, they will feed on grain if the moisture content is in the high end of the acceptable range (e.g. 14.5 percent mc wheat).

Grain mites are whitish, about 0.2 to 0.5 mm long, and can be hard to see with the naked eye. About eight kinds of mites are common in farm granaries and elevators.

Psocids are soft-bodied insects, about 1 mm long, with long antennae relative to the body size.

Fungus feeding insects and mites cannot survive in dry grain. Chemical control is not necessary for fungus feeding pests in stored grain. Practices that result in the grain drying may be all that is needed to control such pests.

Information to help identify insect pests of stored grain can be found on the Canadian Grain Commission website at: **https://www.grainscanada.gc.ca/en/grain-quality/manage/**.

Control Techniques:

The Canada Grain Act states that an elevator operator may reject any grain if the operator has reason to believe it is infested or contaminated. Outlined below are some control techniques and when and how these techniques can be best used.

Cold Temperatures

Rusty grain beetles are cold hardy and can survive subzero temperatures. Rusty grain beetles and other stored grain insects can be killed by reducing core grain temperatures as follows:

Time Required to Kill Insects at Various Grain Temperatures

Grain Temperature	Time required to kill insects
-5°C	12 weeks
-10°C	8 weeks
-15°C	4 weeks
-20°C	1 week

Cooling the grain, through aeration or moving the grain several times during mid-winter, should provide effective control of rusty grain beetles.

Moving Grain

Moving grain using cyclone-based pneumatic conveyors (grain vacs) at about 200 bushels per hour has been shown to be an effective means of controlling insects in stored grain. However, moving too large a volume of grain at a time using a pneumatic conveyor results in the grain protecting the insects and reduces kill of stored grain insects. Loading the grain using a pneumatic grain conveyor removes insects from grain being delivered to elevators.

Phostoxin, Fumitoxin

Company: Degesch America Inc. (*Phostoxin* round tablets – PCP#15736; *Phostoxin* pellets – PCP#15735; *Fumitoxin* tablets – PCP#19227; *Fumitoxin* Pellets – PCP#19226).

Formulation: 55% aluminum phosphide.

Formulation	Primary Use	Container Size
Phostoxin tablets (3 g each) *Fumitoxin* tablets (3g each)	On the farm or country elevator	333 tablets (1kg) (*Phostoxin*) 500 tablets (1.5 kg) (*Fumitoxin*)
Phostoxin pellets (0.6 g each) Fumitoxin pellets (0.6g each)	On the farm or country elevator	1666 pellets (1kg) (*Phostoxin*) 2490 pellets (1.5kg) (*Fumitoxin*)
Phostoxin tablets prepac	Containers	1 to 4 strips of 33 tablets to a pouch

Insects and other pests controlled: Rusty grain beetle, red flour beetle, saw toothed grain beetle, granary weevil, yellow mealworm, lesser grain borer, spider beetles, hairy fungus beetles, Indian meal moth, Hessian fly, nematodes, mice and rodents.

Approved for use on the following stored grains: Barley, corn, dried peas, lentils, millet, oats, rye, soybeans, sunflower seeds, triticale, wheat, straw and hay.

Restricted Product: The use and sale of Aluminum Phosphide (*Phostoxin* or *Fumitoxin*) is restricted to licensed pesticide applicators possessing a valid fumigation license (Saskatchewan) or stored agricultural products license (Manitoba).

Phostoxin or *Fumitoxin* can only be used in conjunction with a detailed fumigation management plan.

Rate and Minimum Exposure Period: Refer to labels to determine rate. For grain bins a dosage of 250 to 500 tablets (or 880 to 2560 pellets) per 100 cubic metres of bin space being treated (not volume of grain) is recommended. It is important to ensure that bins are relatively secure. It is not advisable to use phosphine products in bins that are leaky or not well sealed.

The following table may be used as a guide to determine the minimum length of exposure period to *Phostoxin* or *Fumitoxin* at the indicated temperatures:

Temperature	Exposure Period
Below 5°C (40°F)	DO NOT fumigate
5°C to 12°C (40° to 53°F)	10 days
13° to 15°C (54° to 59°F)	5 days
16° to 20°C (60° to 68°F)	4 days
above 20°C (68°F)	3 days

Aluminum phosphide cannot be used when the grain temperature is below 5°C as the tablets release the gas too slowly. Very dry grain will also slow the release of the gas from the pellets. A shortened exposure period cannot be compensated for by increased dosage. Also ensure that storage is well ventilated for at least 24 hours after the required time for fumigation.

Environmental Hazards: Toxic to birds and mammals. Carefully inspect the outside and inside of the structure prior to application to ensure the absence of nesting or roosting birds. Avoid application if birds are present.

Diatomaceous earth (*Protect-It*)

Company: Hedley Technologies Ltd. (*Protect-It* – PCP#24259)

Formulation: ***Protect-It:*** 74 percent Silicon dioxide, 10 percent Silica aerogel.

Insects controlled: ***Beetles*** – Rusty grain beetle, red flour beetle, rice weevil, granary weevil. ***Moths*** – Angoumois grain moth, Mediterranean flour moth, Indian meal moth.

Approved for use on the following stored products: Feed grains, seed, stored grains, wheat, barley, buckwheat, corn, oats, rye, flax, peas, soybeans and sorghum. Also registered for structural treatment of empty grain storage and transportation containers.

How it works: Diatomaceous earth damages the cuticle of the insect, reducing the insect's ability to retain moisture. The insect eventually dies from dehydration. A 6 week period of treatment above 20°C is needed for maximum efficacy.

Rate, for empty storage structures: Use a dust blower or aeration fan to get diatomaceous earth into the cracks, crevices and void spaces of the structure being treated. Dust areas at a rate of 1 kg per 200 square metres (5 g per square metre).

Rate, while grain is being placed into storage:

- **Protect-It:** The application rate for *Protect-It* varies by crop and insect species, ranging from 100 g per tonne for control of rusty grain beetle in wheat to 1000 g per tonne for red flour beetle in corn. Refer to the label for details.

Precautions: The application of DE will lower the test weight measurement of the grain, but usually not to the point of downgrading. If test weight loss is excessive, the grain can be diluted with untreated grain. DE is non-toxic to humans and animals.

Malathion Grain Protector Dust

Company: Loveland Products Canada (PCP#15896)

Formulation: 2% malathion

Insects controlled: confused flour beetles, flat grain beetles, granary weevil, Indian meal moth, lesser grain borer, rusty grain beetle and sawtoothed grain beetle.

Approved for use on the following stored grains: Wheat, rye, barley and oats as stored grains.

Malathion Grain Dust can be applied to grain when it is in the truck or wagon prior to binning. It can also be used to control surface infestations by applying to the grain surface and raking in to 15 cm depth of the grain. Malathion controls insects by ingestion and contact and insects must be active for it to be effective.

Rate:

Crop	Rate-g/1000 kg (tonne) grain
Wheat	415
Rye	450
Barley	520
Oats	735

DO NOT apply to grain within 7 days of sale.

Be aware that the Canadian Grain Commission allows only 8 ppm of malathion residues in stored grains.

Malathion 85E

Refer to the label for this product for insect and mite control in *empty* grain bins, grain elevators, grain box cars and flour mills.

Note: Some commodities, such as canola, should not be stored in facilities recently treated with malathion. Malathion residue can linger in bins for up to six months after treatment and can be transferred from the bin to canola seed. Canola found with malathion residues is unacceptable for export customers.

Malathion 85E (Loveland Products Canada)

Insect	Rate	Note
Rusty grain beetle, red flour beetle, sawtoothed grain beetle, confused flour beetle, grain mite, granary weevil, Indian meal moth, lesser grain borer, flat grain beetles, rice weevils (empty grain storage facilities)	Mix 490 mL in 15 L of water. Apply 5 L of mixture on 100 m^2	Wait until spray has thoroughly dried before storing grain in treated areas.

Insecticide Product Pages

For rates and pre-harvest intervals for insecticides, see the insect management charts on pp. 638-677.

Acetamiprid

Insecticide Group 4A

Company:

Sharda CropChem Limited (*Aceta 70 WP* – PCP#33298)
Nippon Soda Company Ltd. (*Assail 70 WP* – PCP#27128)
Distributed by Belchim Crop Protection.

Formulations:

70% acetamiprid formulated as a wettable powder.

Insects Controlled and Registered Crops:

Crop	Insect
Potato	Colorado potato beetle, aphids
Seed alfalfa	Alfalfa plant bug, Lygus bug

Application:

- **Ground application:** Apply in a minimum finished spray volume of 200 per hectare. Use the higher rates when the majority of the Colorado Potato Beetle population is in the adult stage and for heavy pest pressure.
  - ***Seed alfalfa*** – Apply in a minimum finished spray volume of 100 L per hectare by ground. Apply prior to bloom up to the time when 50 percent of seed pods are ripe. Begin when adults and/or 4-5th instar nymphs have reached economic threshold levels for your area.
- **Aerial application:** Aerial use on potatoes is permitted in the provinces of Alberta, Saskatchewan and Manitoba only.

How it Works:

Aceta 70 WP and *Assail 70WP* are neonicotinoid insecticides that works by contact or ingestion. They have an anti-feedant effect that can prevent pest damage to host plants prior to the death of the insect. Products rapidly degrades in the soil with no carryover effects.

Restrictions:

- **Potato:** DO NOT make more than 2 applications per crop year. DO NOT apply more than once every 7 days. DO NOT exceed a total of 120 g active ingredient (172 g product) per hectare per season.
- **Seed alfalfa:** DO NOT make more than 3 applications per season. DO NOT apply more than once every 7 days. DO NOT exceed a total of 357 g active ingredient (510 g product) per hectare per season. DO NOT cut treated seed alfalfa fields for hay/forage.
- **Grazing:** DO NOT graze treated seed alfalfa fields.
- **Pre-harvest Interval:**
  - ***Potato*** – DO NOT harvest within 7 days of application.
  - ***Seed Alfalfa*** – DO NOT apply less than 1 day before harvest.
- **Re-Entry:** DO NOT re-enter treated areas for 12 hours after foliar application.
- **Buffer Zones:**

Application method	Buffer Zones (metres) Required for the Protection of:	
	Aquatic Habitats	Terrestrial habitat
Ground (Field sprayer)	20	2

Precautions

If this product is to be applied to a product destined for export to the United States, information on acceptable residue levels are available at **www.croplife.ca**.

Storage: DO NOT store in or around the home. Store unused product in a cool, ventilated, dry, locked area. DO NOT allow prolonged storage in areas where temperatures frequently exceed 46°C.

Environmental Hazards:

Bees: Toxic to bees exposed to direct treatment, drift, or residues in flowering crops or weeds. DO NOT apply this product to flowering crops or weeds if bees are visiting the treatment area. Minimize spray drift to reduce harmful effects on bees in habitats close to application site.

Aquatic Organisms: Toxic to aquatic organisms. To reduce runoff from treated areas into aquatic habitats, avoid application to areas with a moderate to steep slope, compacted soil, or clay. Avoid application when heavy rain is forecasted.

Others: The lower rates allow for maximum beneficial survival and faster rebound of beneficial populations.

Hazard Rating:

Warning – Poison

Refer to the Introduction for an explanation of the symbols.

Actara

Insecticide Group 4A

Company:

Syngenta Canada

Formulations:

Actara 240SC (PCP#28407): 240 g/L thiamethoxam formulated as a soluble concentrate.

- Container size - 2 x 2.04 L

Actara 25WG (PCP#28408): 25% thiamethoxam formulated as a water dispersible granule.

- Container size - 4 x 850 g

Insects Controlled and Registered Crops:

Crop	Insect
Potato	Colorado potato beetle, aphids, potato leafhopper

Application:

Actara 240SC

- **Soil application:** Apply as an in-furrow spray during planting to allow the insecticide to be absorbed by plant roots. For 90 cm row spacing, apply 151 to 196 mL per acre. Use the higher rate for extended control. DO NOT follow a soil application with a foliar application.
- **Potato seed piece treatment:** Choose the appropriate rate from the chart on label, based on seeding rate. Apply only in areas with adequate ventilation or in areas that are equipped to remove mist or dust. Best results are obtained if potatoes are planted immediately after *Actara 240SC* is applied to seed. When transporting cut and treated seed ensure the seed is covered. DO NOT apply a subsequent treatment of in-furrow or foliar application of thiamethoxam or other Group 4 insecticide following seed piece treatment with *Actara 240SC*.
- **Foliar application:** *Actara* may be applied by ground or air. For ground application use a minimum of 40 L per acre unless otherwise indicated on label. A maximum of 2 foliar applications of *Actara* may be made per season. DO NOT exceed a total of 88 grams per acre. Allow at least 7 days between applications. DO NOT use a foliar application of *Actara* following in-furrow or soil application of *Actara*.

How it Works:

Actara is a systemic (taken up into the plant foliage after application), neonicotinoid insecticide.

Restrictions:

- **Rainfastness:** *Actara* is rainfast once spray has dried on treated plants.
- **Pre-harvest Interval:** DO NOT harvest within 7 days of application.
- **Re-Entry:** DO NOT re-enter treated areas for 12 hours after foliar application.
- **Re-cropping:** No restrictions following the harvest of sorghum, wheat, barley, canola, potatoes or cover crops. For all other crops 120 day plant-back interval is required.
- **Tank mix:** According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.
- **Buffer Zones:** Buffer zones are required for the protection of terrestrial and freshwater habitats. Refer to specific label for buffer zones required.

Environmental Hazards:

Bees: *Actara* is highly toxic to bees exposed to direct treatment or residues on blooming crops or weeds. To minimize exposure to bees from foliar application, DO NOT apply this product to flowering crops or weeds if bees are visiting the treatment area.

Aquatic Organisms: Toxic to aquatic organisms. To reduce runoff from treated areas into aquatic habitats, avoid application to areas with a moderate to steep slope, compacted soil, or clay. Avoid application when heavy rain is forecasted.

Others: Toxic to certain beneficial insects.

Hazard Rating:

Actara 240SC: Caution – Poison

Actara 25WG: Caution – Eye and Skin Irritant

Refer to the Introduction for an explanation of the symbols.

Admire 240

Insecticide Group 4A

Company:

Bayer (*Admire 240* – PCP#24094)

Formulation:

240 g/L imidacloprid formulated as a suspension concentrate.

Insects Controlled and Registered Crops:

Crop	Insect
Potato	Colorado potato beetle, aphids, potato leafhopper, potato flea beetle

Application:

Imidacloprid

- **Seed piece treatment:** (*Admire 240*) Refer to Imidacloprid in the seed treatments product pages.
- **Foliar application:** (*Admire 240*) Apply only if insect populations exceed recommended economic thresholds. For optimum control, good coverage of the foliage is needed. A maximum of 2 foliar applications may be made per crop per season. Scout fields and retreat if needed. For aphids, two applications at least 7 days apart may be required to achieve control. DO NOT make a foliar application following a seed treatment of the product in the same crop. Allow at least 7 days after the last application and before harvesting the crop.

How it Works:

Imidacloprid is a neonicotinoid, systemic (within the plant) insecticide that works by contact or ingestion. Control period may vary due to climate and soil conditions

Restrictions:

- DO NOT apply by air.
- DO NOT apply following a soil, in-furrow or seed treatment application of a Group 4 Insecticide.
- **Re-cropping:** Acceptable plant-back intervals for:
  - ***Cereal grains (wheat, barley, oats)*** – minimum 30 days
  - ***Peas and beans*** – 9 months
  - ***All other food and feed crops*** – 12 months
  - ***Green manure and other cover crops*** – can be grown without plant-back intervals but cannot be grazed or harvested for food or feed.
- DO NOT apply in fields where *imidacloprid* has been used during the previous season. DO NOT apply through any irrigation system.
- DO NOT apply this product or allow it to drift to blooming crops or weeds if bees are visiting the treatment area.

Precautions:

DO NOT re-enter treated areas for 24 hours after foliar application. Avoid application when heavy rain is forecast.

DO NOT apply product or plant treated seed pieces within 15 metres of well-heads or aquatic systems, including marshes, ponds, ditches, reservoirs, streams, lakes, etc.

DO NOT mix, load or clean spray equipment within 30 metres of well-heads or freshwater habitats.

For application with air-blast equipment, DO NOT apply within 40 metres of well-heads or aquatic systems.

The use of this chemical may result in contamination of groundwater particularly in areas where soils are permeable (e.g. sandy soil) and/or where the water table is shallow.

Storage: DO NOT store in or around the home. Store unused product in a cool, ventilated, dry, locked area and avoid cross-contamination with other pesticides, fertilizers, food and feed.

DO NOT use treated seed pieces for food, feed or fodder.

If this product is to be applied to a product destined for export to the United States, contact 1-866-375-4648 or **www.croplife.ca**.

Environmental Hazards:

Bees: This product is highly toxic to bees exposed to direct treatment or residues on blooming crops or weeds.

Aquatic Invertebrates: This product is highly toxic to aquatic invertebrates.

Birds: This product is toxic to birds. Any spilled or exposed seeds must be incorporated into the soil or otherwise cleaned-up from the soil surface.

Aquatic organisms: Highly toxic to aquatic invertebrates.

Hazard Rating:

Caution – Poison

Refer to the introduction for an explanation of the symbols.

Agri-Mek SC

Insecticide Group 6

Company:

Syngenta Canada (PCP#31607)

Formulation:

84 g/L abamectin formulated as a suspension concentrate.

- Container size - 2 L containers

Insects Controlled and Registered Crops:

Crop	Insect
Potatoes	Potato psyllid and spider mites

Application:

Agri-Mek

- Can be applied by ground only. Apply when potato psyllids and spider mites first appear. Make first application after approximately 50 per cent of the egg masses of Colorado potato beetle have hatched and larvae are present. If two applications are required, limit them to a single Colorado potato beetle generation per crop. Apply in sufficient in solution to ensure thorough coverage of plant foliage. Avoid application when heavy rain is forecast.

How it Works:

Agri-Mek interferes with neuro-transmission in insects and mites resulting in paralysis, cessation of feeding and eventually death of the pest.

Restrictions:

- DO NOT apply by air.
- **Buffer zone:** DO NOT apply within 30 metres of freshwater habitats.
- Allow 7 days between application.
- DO NOT make more than 2 applications per growing season. DO NOT apply more than 800 mL per acre of *Agri-Mek* per season. DO NOT graze treated crop.
- DO NOT enter or allow entry into treated areas for 12 hours following application.
- **Pre-harvest interval:** 14 days
- **Storage:** Store product in original container only, away from food or feed. Keep container closed.

Precautions:

DO NOT contaminate water, food or feed by storage or disposal.

If *Agri-Mek* is to be used on a commodity that may be exported to the United States and you require information on acceptable residue levels in the United States, visit CropLife Canada's website at **www.croplife.ca** or contact Syngenta Canada Inc. at 1-877-964-3682.

Environmental Hazards:

Bees: *Agri-Mek* is highly toxic to bees exposed to direct treatment or residues on flowering crops and weeds. DO NOT apply this product or allow drift to flowering crops and weeds if bees are visiting the treatment area.

Aquatic organisms: Toxic to aquatic organisms and wildlife. A buffer zone of 30 metres is required between the last point of direct application and the closest downwind end of sensitive freshwater habitats. Avoid application when heavy rain is forecast.

Hazard Rating:

Warning – Poison

Refer to the introduction for an explanation of the symbols.

Bioprotec CAF/Bioprotec PLUS

Insecticide Group 11

Company:

AEF Global Inc. (PCP#26854)

Formulation:

Bacillus thuringiensis subspecies kurstaki, strain EVB113-19, in a water based formulation. Potency - Bioprotec CAF: 11,400 cabbage looper units (CLU)/mg of product (equivalent to 12.7 billion CLU/L) - Bioprotec PLUS: 17,500 Cabbage Looper Units (CLU) per mg of product (equivalent to 20 billionCLU per liter).

- Container size - 10 L

Insects Controlled and Registered Crops:

Crop	Insect
Quinoa	European corn borer, fall armyworm, beet webworm (Bioprotec CAF)
Timothy	Essex skipper
Sunflower	Sunflower moth
Corn	European corn borer
Hemp	European corn borer (Bioprotec PLUS)

Application:

Bioprotec CAF/Biotprotec PLUS

- Use the higher rate for heavy infestations. If egg hatch is extended or re-infestation occurs, repeat applications. Apply every 7 to 10 days.
- Apply at first signs of infestations when larvae are small. Repeat applications, according to economic threshold, as necessary to maintain control. Consult provincial recommendations and regional advisors for monitoring procedures, treatment thresholds, and timing of applications. Monitor for the pest and apply at hatching, before larvae bore into plant tissues. Apply Bioprotec CAF with a high volume sprayer in a minimum of 300 L of water per hectare.
- Apply in sufficient water volume to ensure thorough coverage. A minimum of 121.4 L per acre is recommended. Begin application at hatching before larvae bore into plant tissues. Use diluted spray mixtures within a 12-hour period.
- Bioprotec CAF/Biotprotec PLUS should be applied by aerial equipment undiluted. Dilute with minimal quantities of water only when required to improve deposit. Best results can be expected when Bioprotec CAF is applied to dry foliage with calibrated aircraft capable of obtaining droplet sizes below 300 microns and preferably in the range of 50 to 150 microns.

How it Works:

Bioprotec CAF/Biotprotec PLUS is selectively toxic to some species of lepidopteran larvae. It is a stomach intoxicant only; to be effective, deposits must be ingested by susceptible larvae. Thorough coverage of target foliage where larvae are feeding is essential. In general, larvae should be treated when they are newly hatched and actively feeding. After ingestion of a sufficient dose, larvae cease feeding within a few hours and death occurs in 2 to 5 days.

Restrictions:

- Maximum of 6 applications per year with a 5 to 10 day interval between applications.
- **Pre-harvest Interval:** 0 days
- **Storage:** *Bioprotec CAF/Biotprotec PLUS* should be stored in the original container between 4°C and 20°C. Product should be used within 18 months of the date of manufacture. Re-Entry Interval: When the product is dry.

Precautions:
DO NOT allow the pilot to mix product to be loaded onto the aircraft. However, loading of premixed product with a closed system is permitted. Keep out of reach of children. Avoid contact with skin, eyes or clothing. Avoid breathing dust/spray mist. Wear a long-sleeved shirt, long pants, waterproof gloves, shoes plus socks, eye goggles and a NIOSH-approved respirator with any N-95, R- 95, or P-95 filter for biological products when handling, mixing/loading or applying the product and during all cleanup/repair activities

Hazard Rating:
Caution – Eye Irritant
Potential Sensitizer

BioTitan WP

Insecticide Group
UNF

Company:
Anatis Bioprotection (PCP#33923)

Formulation:
Beauveria bassiana strain ANT-03 as a wettable powder. At least 1 x1010 spores (conidia)/g
- Container size - 500 g to 25 kg

Insects Controlled and Registered Crops:

Crop	Insects controlled
Potatoes	Colorado potato beetle

Application:
Minimum water volume: Use spray volume sufficient to cover foliage infested with insect pests. Crop size and spray equipment will determine spray volume needed. Depending on crop treated, 500 to 1000 L of spray volume will typically be required for 1 ha.

How it Works:
Thorough coverage of infested plant parts is necessary for effective control. BioTitan WP acts via contact and does not have systemic activity. Infection begins with the attachment of conidia to the insect cuticle, followed by germination and penetration of the fungi inside the insect body. Once inside, *B. bassiana* kills the host and if conditions are adequate, it will sporulate outside the insect's body after a few days and produce newly infective conidia.

Effects of Weather on Performance or Safe Use
Apply only when the potential for drift to areas of human habitation or areas of human activity such as houses, cottages, schools and recreational areas is minimal. Take into consideration wind speed, wind direction, temperature inversions, application equipment and sprayer settings. Do not apply in extremely hot weather. On sunny days, apply later in the afternoon; do not apply at mid-day when temperatures are highest and the sun is most intense. For foliar applications, do not apply when heavy rain is forecast.

Tank Mixes
Do not mix with fungicide. If a fungicide must be used, make the application of the fungicide at least 4 days before the BioTitan WP application or at least 2 days after the BioTitan WP application. According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Restrictions
- **Rainfast period:** Avoid application when heavy rain is forecast.
- **Re-entry interval:** DO NOT re-enter or allow re-entry into treated areas for 4 hours or until sprays have dried, unless wearing appropriate personal protective equipment including long-sleeved shirt, long pants, waterproof gloves, socks and shoes.
- **Pre-harvest interval:** 0 days
- **Other restrictions:** To reduce runoff from treated areas into aquatic habitats avoid application to areas with a moderate to steep slope, compacted soil, or clay. Contamination of aquatic areas as a result of runoff may be reduced by including a vegetative filter strip between the treated area and the edge of the water body. Do not apply in extremely hot weather. On sunny days, apply later in the afternoon; do not apply at mid-day when temperatures are highest and the sun is most intense.

- **Buffer zones:** Apply only when the potential for drift to areas of human habitation or areas of human activity such as houses, cottages, schools, and recreational areas is minimal. Take into consideration wind speed, wind direction, temperature inversions, application equipment and sprayer settings.
- **Storage:** Store in a cool, dry place. Can be stored up to 18 months if in the refrigerator at 4^{0}C. Can be stored up to 6 months at 21^{0}C in an unopened package. If the package is open, this product can be stored up to 3 months at 21^{0o}C. Tightly reclose the container of unused product to prevent decrease of the efficacy. The BioTitan WP contains live spores of the naturally occurring fungus, *B. bassiana*. Spores may be damaged by storage at high temperatures (higher than 25^{0}C) or contact with water for more than 24 hours. To prevent contamination, store this product away from food or feed.

Environmental Hazards

Beauveria bassiana strain ANT-03 is considered safe for beneficial insects, although it is recommended to avoid spraying directly in areas where bees are actively foraging. If bees are contacted directly, they can bring fungal spores back to the hive and infect the susceptible brood. Beauveria bassiana strain ANT-03 is toxic and/or pathogenic to daphnia (aquatic invertebrate).

Hazard Rating (Mammalian Toxicity)

Potential sensitizer.
Warning - eye irritant.
Warning - poison

Carbine/Beleaf

Insecticide Group 29

Company:

FMC of Canada - Carbine - (PCP#34659), Beleaf 50SG - (PCP#29796)

Formulation:

50% flonicamid formulated as a water dispersible granule.

- Container size - Beleaf - 6 x 0.68 kg jug per case, Carbine - 4 x 1.587 kg

Insects Controlled and Registered Crops:

Crop	Beleaf 50WG	Carbine
Dry beans, faba beans, chickpea, lentil, field pea	Aphids, reduces the numbers of Lygus bugs including tarnished plant bug	Aphids, reduces the numbers of Lygus bugs including tarnished plant bug
Alfalfa (seed production)	Aphids, tarnished plant bug	Aphids, tarnished plant bug
Alfalfa (forage), clover (Trifolium spp., Melilotus spp.), lupin, sainfoin, trefoil, vetch (crown, milk)	Aphids, tarnished plant bug	Aphids, tarnished plant bug
Potato	Potato aphid, psyllid (suppression)	

Application:

- Thorough spray coverage of plant foliage is essential for optimum control. Apply in sufficient water volumes to ensure good coverage. Use a minimum of 38 litres per acre of water. Rates and finished spray volumes should be increased under extreme pest populations or dense plant foliage.
- For applications to control aphids, use higher rate under extreme pest populations and/or dense plant foliage.
- Scout fields and reapply if necessary.

How it Works:

Flonicamid insecticide is a member of Insecticide Group 29 and controls target pests by contact and ingestion provoking rapid and irreversible feeding cessation. There is translaminar movement in the plant.

Tank Mixes:

Coragen® MaX Insecticide. According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Restrictions:

- DO NOT apply by air.
- DO NOT use seed or forage from alfalfa grown for seed for human or animal consumption
- Allow a minimum of 7 days from alfalfa grown for seed between applications. DO NOT make more than 3 applications per year.
- **Preharvest interval:**
  - DO NOT apply within 7 days of harvest.
- DO NOT apply more than 121 grams per acre per application. DO NOT apply more than 243 grams per acre per season.
- DO NOT use in home gardens.
- **Re-cropping:** There are no plant-back restrictions for any crop listed on the label. All other crops may be planted 30 days after the last application of *Beleaf*.

Precautions:

Avoid overnight storage of spray mixture. Prepare only enough spray mixture required for immediate application. DO NOT use liquid fertilizer as a carrier.

Beleaf insecticide should not be used with spray adjuvants. Avoid application of Beleaf or Carbine Insecticide when heavy rain is forecast.

DO NOT enter or allow entry into treated areas for 12 hours after application.

Storage: Store product in original container, in a secured, dry place separate from other pesticides, fertilizer, food or feed. Avoid the overnight storage of spray mixtures.

If this product is to be applied to a commodity destined for export, visit Crop Life Canada's website **www.croplife.ca** for information on acceptable residue limits.

Environmental Hazards:

Toxic to certain beneficial insects. Minimize spray drift to reduce harmful effects on beneficial insects in habitats next to the application site such as hedgerows and woodland. Toxic to non-target terrestrial plants. Observe spray buffer zones specified on the label. To reduce runoff from treated areas into aquatic habitats avoid application to areas with a moderate to steep slope, compacted soil, or clay.

Hazard Rating:

Caution – Eye Irritant

Refer to the introduction for an explanation of the symbols.

Chlorantraniliprole

Insecticide Group 28

Company:

FMC Corporation (*Coragen* - PCP#28982; Coragen MaX - PCP#34385)
UPL AgroSolutions Canada (*Shenzi* - PCP#28982)

Formulation:

Coragen - 200g/L, Coragen MaX - 600 g/L, Shenzi 400 g/L chloronantraniliprole formulated as a suspension

- Container sizes
  Coragen - 3.79L, 6.0L, Coragen MaX - 4 x 2L, Shenzi 4 x 4L

Insects Controlled and Registered Crops:

Crop	Insect
Alfalfa, clover (Trifolium, Melilotus), lupin, sainfoin, trefoil	Alfalfa weevil (suppression only), grasshoppers, cutworms (Coragen and Coragen MaX)
Bean	Cutworm, European corn borer, (Coragen and Coragen MaX)
Borage	Grasshoppers (Coragen and Coragen MaX)
Buckwheat	Cutworm, grasshoppers
Chickpea, faba, lentil	Cutworms, grasshoppers. Armyworm, European corn borer, corn earworm (Coragen and Coragen MaX)
Canola, mustard, rapeseed	Bertha armyworm, cutworm, diamondback moth, grasshoppers, cabbage looper, imported cabbageworm
Corn	Armyworm, fall armyworm, black cutworm, variegated cutworm, corn earworm, European corn borer, Grasshoppers (Coragen MaX and Shenzi)

Crop	Insect
Flax	Bertha armyworm, cutworm, grasshoppers
Forage grasses (for feed)	Armyworm, grasshoppers, cutworms (Coragen MaX only)
Millet	Armyworm, cutworm, European corn borer, grasshoppers
Pastures	Grasshoppers, cutworms (Coragen MaX only)
Pea	Cutworms, armyworm. European corn borer, corn earworm (Corgen and Coragen MaX)
Potato	Armyworm, Colorado potato beetle, corn earworm, variegated cutworm, European corn borer, cabbage looper, black cutworm (Coragen and Coragen MaX). Grasshoppers.
Safflower	Grasshoppers, cutworm
Soybean	Cutworms, armyworm, corn earworm. European corn borer, grasshoppers (Coragen and Coragen MaX)
Sunflower (seed)	Cutworm, banded sunflower moth, grasshoppers
Wheat, barley, oats, rye, triticale	Armyworm, cutworm, grasshoppers (Triticale - Coragen and Coragen MaX only)

Application:

Coragen/Coragen Max/Shenzi

- May be applied by air or ground equipment.
- Begin application when treatment thresholds have been reached. Thorough coverage is essential for optimal control. Use the high rate under heavy pest pressure and/or when larger larvae are present.
- ***Spray Volume for Potatoes:*** Apply in a minimum finished spray volume of 40 L per acre by ground. Apply in a minimum finished spray volume of 20 L per acre by air.

How it Works:

Chlorantraniliprole disrupts muscle activity in the insects, resulting in paralysis. Treated pests stop feeding quickly after ingestion, become lethargic and lose mobility. Insect death may take several days.

Tank Mixes:

Apply mixes according to the most restrictive use limitations for either product.

- **Insecticides:** *Pounce(R) 384EC insecticide.* According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Restrictions:

- DO NOT make more than 4 applications per season on bean, chickpea, lentil, pea, soybean, potatoes, corn, and forage grasses. DO NOT exceed a total of 455 mL of *Coragen* or 152 mL of *Coragen MaX* per acre per season.
- DO NOT make more than 1 application per cutting on alfalfa and sweet clover.
- **Potatoes, bean, chickpea, lentil, pea, soybean:** DO NOT apply more than once every 3 days.
- **Canola, rapeseed, mustard, flax, sunflower:** DO NOT make more than 3 applications per season. DO NOT apply more than once every 5 days.
- **Corn:** DO NOT apply more than once every 7 days.
- **Wheat, barley, oats, buckwheat, millet:** DO NOT make more than 3 applications per season. DO NOT exceed a total of 455 mL of *Coragen* or 152 mL of *Coragen MaX* per acre per season.
- Forage (grass), fodder or hay may be fed to livestock.
- DO NOT make a foliar application of FMC *Coragen* insecticide for a minimum of 60 days following an in-furrow or soil application or planting of seed or seed pieces treated with any Group 28 insecticide.
- **Restricted Entry Interval:** 12 hours
- **Storage:** Store product in original container only, away from other pesticides, fertilizer, food or feed. Not for use or storage in or around the home. Keep container closed.

Precautions:

DO NOT contaminate irrigation or drinking water supplies or aquatic habitats by cleaning of equipment or disposal of wastes.

Environmental Hazards:

Aquatic organisms: Toxic to aquatic organisms. To reduce runoff from treated areas into aquatic habitats avoid application to areas with a moderate to steep slope, compacted soil, or clay. Avoid application when heavy rain is forecast.
Beneficial insects: May cause harm to some generalist predators, but not harmful to some beneficial insects such as parasitic Hymenoptera.

Hazard Rating:
Very low toxicity to mammals. Keep out of reach of children.

Cimegra

Insecticide Group 30

Company:
BASF Canada Inc. (PCP#33666)

Formulations:
Broflanilide formulated as a suspension concentrate (100 g/L)
- Container size - 2 x 3 L

Insects Controlled and Registered Crops:

Crop	Insect
Potato	Wireworm, Colorado potato beetle
Corn	Wireworm, corn rootworm

MRLs will be established for potatoes across North America (pending registration in the United States), and BASF has submitted for other key markets but is awaiting approvals. Discuss with your potato processor for more information.

Application:
- For *Cimegra* insecticide to be most effective, apply in-furrow or as a T-band at planting. Apply as a dilute concentrate in sufficient water to get good coverage of the seed furrow. DO NOT apply *Cimegra* to the soil surface.
- **Instructions for In-furrow Use to Control Wireworm in Potatoes:**
  - Use 250 mL per hectare of *Cimegra* insecticide in-furrow to control wireworm in potato. Apply at planting as a dilute spray in water. Apply the in-furrow spray to uniformly cover the seed pieces and surrounding soil. The spray pattern should be a 10 to 20 cm (4 to 8 inch) band that is applied to the open seed piece furrow prior to being covered with soil.
  - Dilute *Cimegra* insecticide product in a minimum of 50 L of water per hectare and apply the dilute mixture into the furrow. Use sufficient water to ensure thorough coverage of the seed piece and surrounding seed furrow.
- **Instructions for In-furrow:** Use to control wireworm and corn rootworm in corn.
  - Use 250 mL per hectare of *Cimegra* insecticide in furrow to control wireworm and corn rootworm (*Diabrotica virgifera virgifera* and *Diabrotica barberi*) in corn. Apply at planting as an in-furrow or T-band spray by directing spray pattern to uniformly cover seed and surrounding soil.
    - **In-furrow:** Apply through spray nozzles or microtubes into the open seed furrow, between the planter furrow openers and press wheels.
    - **T-band:** Apply in a 10 to 20 cm (4 to 8 inch) band over the top of the open seed furrow, between planter furrow openers and press wheels. DO NOT T-band over the top of a closed furrow.
- **Instructions for foliar application to control Colorado potato beetle in potato:**
    - Cimegra is not systemic so recommend higher water volume to ensure thorough coverage of the plant.

How it Works:
Broflanilide is a Group 30 insecticide that is a GABA-gated chloride channel moderator that controls listed pest species through contact and ingestion. Broflanilide binds to a specific site of action upon contact that impacts the central nervous system. Causes rapid, irreversible hyperactivity of nerves and muscles leading to convulsions, paralysis and death.

Effects of Weather:
Avoid application when heavy rain is forecast.

Restrictions:
- **Re-entry interval:** 12 hours.
- **Pre-harvest interval:** 14 days.
- **Re-cropping:** Immediate plant-back is permitted for all labelled crops. A plant-back interval of 30 days is required for all crops not on the label.
- **Storage:** Prevent from freezing; however, in the instance that the product freezes, allow to thaw at room temperature for 24 hours and agitate well prior to use. To prevent contamination, store this product away from food and feed. Store in original tightly closed container in a cool, dry, locked, well-ventilated area without floor drain.
- **Other restrictions:** Do not apply more than 2 foliar applications per year. Do not apply more than 50g active ingredient per hectare per year (20g per acre) total. This includes all application types (infurrow, foliar, etc.)

- **Buffer zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:	
	Aquatic Habitats of Depths	
	Greater than 1 m	Greater than 1 m
Field sprayer	5	3

Precautions:
Wear a long-sleeved shirt, long pants, chemical-resistant gloves, shoes and socks during mixing, loading, application, clean-up and repair. Gloves are not required during application within a closed cab. Wash hands before eating, drinking, smoking or using the toilet. Change out of work clothes and take a bath or shower after handling or spraying the product. Launder protective clothing before re-use.

Environmental Hazards:
Bees: Toxic to bees. Avoid application during crop blooming period. If applications must be made during the crop blooming period, restrict applications to evening when most bees are not foraging. However, this product is not systemic and when used according to label directions, minimal exposure or risk is expected.

Aquatic organisms: Toxic to aquatic organisms. To reduce runoff from treated areas into aquatic habitats avoid application to areas with a moderate to steep slope, compacted soil, or clay. Avoid application when heavy rain is forecast. Contamination of aquatic areas as a result of runoff may be reduced by including a vegetative filter strip between the treated area and the edge of the water body.

Hazard Rating:
Warning – Contains the Allergen Soy

Refer to the introduction for an explanation of the symbols.

Closer

Insecticide Group 4C

Company:
Corteva Agriscience (PCP#30826)

Formulation:
240 g/L sulfoxaflor formulated as a suspension concentrate.

- Container size - case contains 12 x 1 L containers

Insects Controlled and Registered Crops:

Crop	Insect
Corn	Aphids
Potato	Aphids, leafhoppers, tarnished plant bug
Quinoa	Lygus bugs

Application:
Closer

- May be applied by ground or air in corn and potatoes. Use low rates for light infestations of target pests and higher rates for moderate to heavy infestations. Apply in sufficient in sufficient solution to ensure thorough coverage of plant foliage. For ground application use a minimum spray volume of 40 L per acre. For aerial application use a minimum spray volume of 12 L per acre.

How it Works:
Closer is a systemic (within the plant) insecticide that causes blockage in the insect's nervous system resulting in paralysis and eventually death, through contact or stomach action.

Restrictions:
- DO NOT make more than 2 applications per growing season. DO NOT apply more than 121 mL per acre per growing season. The 121 mL per acre max is for potatoes and corn. Quinoa is listed at 2 applications per growing season with max of 161 mL per acre per growing season.
- DO NOT apply through an irrigation system.
- **Plant back interval:** A period of 30 days must elapse between treatment of primary crops and the planting of secondary crops not on the *Closer* label.
- **Restricted Entry Interval:** 12 hours.
- **Storage:** Store product in original container only, away from food or feed. Keep container closed.

Precautions:

DO NOT store or ship with food, feeds, drugs or clothing.

DO NOT contaminate irrigation or drinking water supplies or aquatic habitats by cleaning of equipment or disposal of wastes.

If *Closer* is to be used on a commodity that may be exported to the United States and you require information on acceptable residue levels in the United States, visit CropLife Canada's website at **www.croplife.ca**.

Environmental Hazards:

Bees: Toxic to bees exposed to direct treatment, drift, or residues on flowering crops or weeds. Apply early in the morning or late in the evening when bees are not active.

Aquatic organisms: The use of this chemical may result in contamination of groundwater, particularly in areas where soil is permeable (e.g. sandy soil) and/or the depth to the water table is shallow. Avoid application of *Closer* if heavy rain is forecast.

Others: Toxic to certain beneficial insects.

Hazard Rating:

None specified

Concept

Insecticide Group 3A, 4A

Company:

Bayer (PCP#29611)

Formulation:

75 g/L imidacloprid and 10 g/L deltamethrin formulated as a suspension concentrate.

- Container size - 5.26 L jug

Insects Controlled and Registered Crops:

Crop	Insect
Potato	Colorado potato beetle, aphids, leafhoppers, potato flea beetle, tarnished plant bug, European corn borer (suppression only)
Soybean	Soybean aphid

Application:

Concept

- Ground application only.
- Apply when target pest has reached economic threshold levels. Repeat application if pest populations reach economic thresholds.
- Use sufficient water volumes for thorough coverage (e.g. minimum of 40 to 80 L of water per acre).
- For control of tarnished plant bug it is recommended to use *Concept* insecticide only when timing of application coincides with the timing for another pest on the label for potatoes.

How it Works:

Concept insecticide works through contact and systemic activity. Insecticide components: Imidacloprid is a neonicotinoid, systemic (within the plant) insecticide that works by contact or ingestion. Deltamethrin is a non-systemic pyrethroid insecticide that works through contact and ingestion.

Restrictions:

- Allow a minimum of 5 days between applications.
- DO NOT make more than 3 applications of *Concept* in a year.
- DO NOT apply *Concept* through any type of irrigation equipment.
- DO NOT apply *Concept* following a seed treatment or soil application of any Group 4 (neonicotinoid class) insecticide.
- A buffer zone of 8 metres is required between the downwind point of application and the closest edge of aquatic habitats.
- **Re-cropping:** Treated areas may be replanted with any crop specified on an imidacloprid label, or any crop for which a tolerance exists for the active ingredient, as soon as practical following the last application.
- **Acceptable plant-back intervals for:**
  - ***Cereal grains (wheat, barley, oats)*** – 30 days
  - ***Pea and bean (including faba bean, soybean and dry common bean)*** – 9 months
  - ***All other food and feed crops*** – 12 months
  - ***Green manure and other cover crops not intended for human or animal consumption*** – no plant-back interval required following treatment.
- DO NOT graze or harvest cover crops for food or feed.

Precautions:

DO NOT enter or allow entry into treated areas for a period of 24 hours after application of *Concept*.
DO NOT apply *Concept* within 15 metres of well-heads or aquatic systems. DO NOT mix, load or clean equipment within 30 metres of well-heads or aquatic systems.
If this product is to be applied to a commodity destined for export to the United States, visit Crop Life Canada's website **www.croplife.ca** for information on acceptable residue limits.
Storage: DO NOT use or store in or around the home. Store unused product away from feeds, seeds, fertilizer, plants and foodstuffs. *Concept* cannot be stored below freezing.
If stored for one year or longer, shake well before using.

Environmental Hazards:

Bees: This product is highly toxic to bees exposed to direct treatment or residues on blooming crops or weeds. DO NOT apply this product to flowering crops or weeds if bees are visiting the treatment area.
Aquatic organisms: Highly toxic to fish and other aquatic organisms. DO NOT apply where runoff is likely to occur. Runoff from treated areas may be hazardous to aquatic organisms in neighbouring areas. Avoid application when heavy rain is forecast.

Hazard Rating:

Warning – Eye Irritant
Deltamethrin: Danger – Poison
Imidacloprid: Caution – Poison
Refer to the Introduction for an explanation of the symbols.

Cormoran

Insecticide Group 4A, 15

Company:

Adama Canada (PCP#33353)

Formulations:

Acetamiprid and Novaluron formulated as an emulsifiable concentrate. (Acetamiprid – 80 g/L; Novaluron – 100 g/L)
- Container size - 10.08 L

Insects Controlled and Registered Crops*:

Crop	Insect
Potato	Colorado potato beetle, armyworm, cabbage looper, leafhoppers, aphids, European corn borer
Seed alfalfa	Alfalfa plant bug, Lygus bugs

***Refer to label.**

Application:

- Apply in a minimum finished spray volume of 200 L per hectare by ground.
- For Colorado potato beetle, DO NOT apply more than twice to a single generation and DO NOT apply to successive generations.
- For seed alfalfa, apply prior to bloom up to the time when 50 percent of seed pods are ripe. Begin when adults and/or 4th to 5th instar nymphs have reached economic threshold levels for your area.
- Minimum re-application interval of 7 days.
- Apply when insect numbers exceed economic threshold levels and use sufficient water for good coverage. Use higher rates for mature insect stages or severe infestations.

How it Works:

Acetamiprid is a neonicotinoid insecticide that works by contact or ingestion. It has an anti-feedant effect that can prevent pest damage to host plants prior to the death of the insect. Novaluron is an insect growth regulator that must be absorbed by eggs or ingested by insect larvae to be fully effective. The primary mode of action is by disrupting cuticle formation and deposition occurring when insects change from one developmental stage to another, resulting in death at molting.

Effects of Weather:

Drift potential is lowest between wind speeds of 3 to 16 kilometres per hour. However, many factors, including droplet size and equipment type, determine drift potential at any given speed. Application should be avoided below 2 miles per hour due to variable wind direction and high inversion potential. When making applications in low relative humidity, set up equipment to produce larger droplets to compensate for evaporation. Droplet evaporation is most severe when conditions are both hot and dry. Applications should not occur during a temperature inversion because drift potential is high. Avoid application when heavy rain is forecast.

Restrictions:

- **Storage:** Keep in original container during storage. DO NOT contaminate or store near foodstuffs. Store in cool, dry, locked, well-ventilated area without floor drain. Keep away from fire or open flame, or other sources of heat.
- **Restricted Entry Interval:** 12 hours
- **Buffer zones:**

Application method	Crop	Buffer Zones (metres†) Required for the Protection of:		
		Aquatic Habitats of Depths		Terrestrial Habitat
		Less than 1 m	Greater than 1 m	
Field sprayer	Potato	45	25	2
	Seed alfalfa	55	25	3

† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.
  - DO NOT apply directly to water or where runoff could occur to adjacent aquatic sites.
- **Pre-harvest Interval:** 7 days

Precautions:

Wear a long-sleeved shirt, long pants, chemical-resistant gloves, socks and shoes during mixing, loading, application, clean-up and repair. Wash the outside of gloves before removing.

Environmental Hazards:

Bees: Toxic to bees exposed to direct treatment, drift, or residues in flowering crops or weeds. DO NOT apply this product to flowering crops or weeds if bees are visiting the treatment area. Minimize spray drift to reduce harmful effects on bees in habitats close to application site.
Aquatic organisms: Toxic to aquatic organisms and **Non**-target terrestrial plants.

Hazard Rating:

No specific hazard rating specified.

Cypermethrin

Insecticide Group 3A

Company:

UPL AgroSolutions Canada Inc. (*UP-Cyde 2.5 EC* – PCP#28795)
Sharda CropChem Limited (*Ship 250 EC* – PCP#32563)

Formulation:

Cypermethrin formulated as an emulsifiable concentrate (*UP-Cyde 2.5 EC* – 250 g/L, *Ship 250 EC* – 250 g/L).

- Container sizes - 1, 3.79, 5, 10 L

Insects Controlled and Registered Crops*:

Crop	Insect
Wheat, barley (*Up-Cyde* only)	Grasshoppers, cutworm
Canola, rapeseed, mustard	Grasshoppers, flea beetles, bertha armyworm
Roadsides, headlands, summerfallow (*Up-Cyde* only)	Grasshoppers
Sunflower	Sunflower beetle, Sunflower seed weevils
Corn	European corn borer, cutworm, corn earworm
Potato	Colorado potato beetle, flea beetle, leafhoppers, tarnished plant bug, cutworm

***Refer to labels: *Ship* is not registered in wheat, barley, roadsides, headlands, summerfallow, or for grasshoppers or cutworm in any of the crops listed.**

Application:

Cypermethrin

- May be applied by ground application only for control of immature (up to 4th instar) grasshoppers on wheat, barley, roadsides, headlands and canola; for flea beetle control on canola and mustard; and for control of cutworm. After application for cutworm leave soil surface undisturbed for 5 days.
- May be applied by ground or air for flea beetles (aerial application for *Up-cyde* and *Ship 250 EC* only – one aerial application per year) and bertha armyworm in canola, sunflower beetle, sunflower seed weevil in sunflower, corn earworm, European corn borer in corn and Colorado potato beetle, flea beetle, leafhoppers and tarnished plant bug on potatoes.
- Apply when insect numbers exceed economic threshold levels and use sufficient water for good coverage. Use higher rates for mature insect stages (grasshoppers) or severe infestations.

How it Works:

UP-Cyde and *Ship* are pyrethroid insecticides that work as a contact and stomach poison.

Effects of Weather:

Activity of cypermethrin on grasshoppers is reduced as soil temperature increases. Application for grasshopper control should be made at temperatures below 25°C. Spraying for grasshoppers should be delayed until evening if daytime temperatures are above 25°C.

Restrictions:

- **Grazing:** Treated crops must not be grazed or cut for hay except field corn silage derived from corn treated with *Up-Cyde* at the recommended rate and pre-harvest interval may be fed to lactating dairy cattle and beef cattle.
- **Storage:** Keep in original container during storage. DO NOT contaminate or store near foodstuffs.
- **Restricted Entry Interval:** 12 hours
- **Buffer zones:**

Crop	Application method		Buffer Zones (metres†) Required for the Protection of:	
			Freshwater Habitat Depths:	
			Less than 1 m	Greater than 1 m
Corn	Ground		20	10
Canola			15	5
Sunflower			5	3
Potato			15	5
Corn	Aerial	Fixed Wing	800	625
		Rotary	800	500
Canola		Fixed Wing	775	475
		Rotary	425	200
Sunflower		Fixed Wing	750	450
		Rotary	350	175
Potato		Fixed Wing	800	600
		Rotary	725	325

See introduction for an explanation of the different habitats.

† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

- ***Canola, Rapeseed, Mustard*** – Cypermethrin must be applied by ground for grasshoppers.
  - DO NOT apply Cypermethrin more than once per season by air. DO NOT apply *Up-Cyde* to mustard by air.
- ***Corn*** – DO NOT apply more than a maximum of 3 applications by ground. DO NOT make more than 2 aerial applications per season. Repeat as necessary with 4 to 7 day intervals between applications.
- ***Potatoes*** – Ground – Apply as required with 10 to 12 day intervals up to a maximum of 3 applications per season. Air – up to 2 applications per season.
- ***Sunflower*** – Ground – Apply when required with a 5 day interval between applications. A maximum of 2 applications per season. Air – 1 aerial application is permitted per season.
- **Pre-harvest intervals:**
  - ***Barley*** – 45 days
  - ***Canola, Rapeseed, Mustard*** – 30 days
  - ***Corn*** – 5 days
  - ***Potatoes*** – 7 days
  - ***Sunflower*** – 70 days
  - ***Wheat*** – 30 days

Precautions:
Harmful or fatal if swallowed. May be harmful if absorbed through skin. Severely irritating to eyes. Causes skin irritation and sensitization. Wear longsleeved protective clothing and gloves when handling or applying. Wear face shield or goggles when mixing.

Environmental Hazards:
Bees: Very toxic to bees. Avoid spraying when bees are foraging. Spray deposit should be dry before bees commence foraging in treated crop.

Aquatic organisms: Very toxic to aquatic organisms and fish, and overspray or drift into sensitive areas such as sloughs, streams, rivers, dugouts and wetlands must be avoided.

Hazard Rating:
Caution – Poison

Refer to the introduction for an explanation of the symbols.

Delegate

Insecticide Group 5

Company:
Corteva Agriscience (PCP#28778)

Formulation:
25% spinetoram formulated as wettable granules.
- Container size - 840 g

Insects Controlled and Registered Crops:

Crop	Insect
Corn***	European corn borer
Potato*	Colorado potato beetle (time for egg hatch or small larvae), European corn borer (time to coincide with peak egg hatch)
Wheat, barley, oats, rye**	Armyworm (when economic thresholds dictate)
Soybean***	Armyworm

* Maximum 3 applications per year with a minimum retreatment interval of 7 days.
** Maximum 3 applications per year with a minimum retreatment interval of 5 days.
*** Maximum of 3 applications per year, with a minimum of 5 days between applications.

Application:
- Aerial application in potatoes and corn only. Apply in sufficient water volume to cover the entire plant using a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE fine classification*** droplets. DO NOT apply through irrigation systems.
- Spinosyns require a spray solution pH between 6 to 8. This is important for the efficacy of the product. It is recommended that growers test the pH of the spray solution prior to adding a spinosyn to the spray tank.

How it Works:
Delegate is derived from the fermentation of the bacterium *Saccharopolyspora spinosa*, which is then chemically modified to create the active ingredient. Spinetoram affects the insect nervous system. It does not interact with the known binding sites of other classes of insecticides. It works through ingestion or contact with the target insects. Target insects cease feeding within a few minutes, although death may take a few days.

Tank Mixes:
Acapela (Fungicide) is a registered tank mix on corn. According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Restrictions:

- **Re-entry:** DO NOT enter treated field for 12 hours.
- **Pre-harvest:** DO NOT harvest within 21 days of application for wheat (spring and durum), barley, oats and rye, within 7 days for potato or within 28 days for corn or soybean.
- **Forage/Grazing:** DO NOT apply within 28 days of stover harvest or with 7 days of forage harvest.
- **Aerial Application:**
  - ***Potatoes and Corn (field, sweet, seed and popcorn):*** Use a minimum spray volume of 12.1 L per acre. Recommended spray volume is 12.1 to 20.2 L per acre.
- **Storage:** Store in a cool, dry place. Keep from freezing.
- **Buffer Zones:** 1 m required between the point of direct application and the closest downwind edge of sensitive terrestrial habitats (such as grasslands, forested areas, shelter belts, woodlots, hedgerows, riparian areas and shrublands).

Tank Cleaning:

Refer to Introduction.

Environmental Hazards:

Bees: Toxic to bees exposed to direct treatment, drift, or residues on flowering crops or weeds. DO NOT apply this product to flowering crops or weeds if bees are visiting the treatment area.
Aquatic organisms: Avoid application when heavy rain is forecast to reduce runoff into aquatic habitats.
Others: Toxic to small wild mammals. May be toxic to certain beneficial insects.

Hazard Rating:

No specific hazard rating specified.

Deltamethrin

Insecticide Group 3A

Company:

Bayer (*Decis 100 EC* – PCP#33700)
Sharda Cropchem Limited (*Poleci 2.5 EC Western* – PCP#32446)
Advantage Crop Protection Inc. (*Advantage Deltamethrin 5 EC* – PCP#34043)
AgraCity Crop & Nutrition Ltd. (*Decimate* – PCP#35068)
Viking Crop Protection Partners Inc. (*Rauma* – PCP 35144)

Formulations:

deltamethrin formulated as an emulsifiable concentrate.
(*Decis 100 EC* – 100 g/L, *Poleci 2.5 EC* – 25 g/L, *Advantage Deltamethrin 5 EC* – 50g/L, *Decimate*, *Rauma* – 50g/L)

- Container sizes – *Decis 100 EC* (1.2 L jug, 4.8 L jug), *Poleci 2.5 EC* (4.8 L jugs), *Advantage Deltamethrin 5 EC* (4 x 4.8 L), *Decimate, Rauma* (2 x 10L)

Insects Controlled and Registered Crops:

Crop	Insect
Alfalfa (seed crops only)	Alfalfa weevil, Lygus bugs, grasshoppers (*Decis* only)
Field and sweet corn	European corn borer
Potato	Colorado potato beetle, potato flea beetle, Lygus bugs, leafhoppers, European corn borer, potato aphid, buckthorn aphid (*Decis* only)
Canola, rapeseed, oilseed mustard	Beet webworm, bertha armyworm, cabbage seedpod weevil (adults only), clover cutworm, diamondback moth, flea beetles, grasshoppers, Lygus bugs
Sunflower	Sunflower beetle (*Decis, Poleci, Advantage Deltamethrin*)
Wheat, barley, oats, lentils	Cutworm, grasshoppers (*Decis, Poleci, Advantage Deltamethrin*)
Rangeland, pastures, roadside, fence row	Grasshoppers (*Decis, Poleci, Advantage Deltamethrin*)
Flax	Cutworm, beet webworm, grasshoppers, Lygus bugs, bertha armyworm, clover cutworm (*Decis, Poleci, Advantage Deltamethrin*)
Red clover (seed production only)	Lesser clover leaf weevil (suppression only) (*Decis, Poleci, Advantage Deltamethrin*)
Dry beans, faba beans, chickpeas, lentils and field peas (*Decis* only)	Grasshoppers, suppression of pea leaf weevil, cutworm, Lygus bugs (*Decis, Poleci, Advantage Deltamethrin*)

Application:

Deltamethrin

- May be applied by air or ground equipment to all crops with the exception of alfalfa, red clover and corn, which require ground application only. Apply when insects exceed economic threshold numbers with sufficient water for good coverage. Use higher rates for severe infestations, on dense foliage or when a number of insect growth stages are present.
- Alfalfa (seed production) - Use higher rates if alfalfa weevil present.

Tank Mixes:

When in a tank-mix the spray mixture must be constantly agitated throughout application. DO NOT allow the spray mixture to stand in the spray tank for more than 4 hours after mixing.

Deltamethrin may be tank mixed with the following herbicides: *Pardner, Buctril M, Banvel*, MCPA, 2,4-D, *Puma Advance*. **Tank mixes with *Puma Advance* and *Buctril M* are for use in spring and durum wheat only.**

When a tank mix is used the labels of the tank mix partners are to be consulted. According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

How it Works:

Deltamethrin is a non-systemic, synthetic pyrethroid which works by contact and ingestion.

Effects of Weather:

DO NOT spray under a strong temperature inversion, or when temperature exceeds 25°C as this will result in a reduction in control. Best control will be achieved when deltamethrin is applied during cooler periods of the day. DO NOT apply within 1 hour of rain.

Restrictions:

- ***Alfalfa seed production*** – DO NOT apply more than once per year.
- ***Canola*** – *Decis*: Maximum application of 3 applications per season with maximum seasonal load of 500 mL per hectare (202 mL per acre) or 25 g ai/ha. If 3 applications are used, only the first or second application can be at 200 mL per hectare. Allow a 7 day interval between treatments by ground application. Maximum of ONE (1) APPLICATION/YEAR via aerial application.
- ***Corn (field and seed)*** – DO NOT apply more than 3 times per year; ground application only.
- ***Potato*** – (Ground) DO NOT apply more than 3 times per year. (Aerial) DO NOT apply more than 2 times per year. May be used only once per season on high organic (muck) soils.
- ***Red clover*** – DO NOT apply by air. DO NOT make more than 2 applications per year. DO NOT use treated crop for feed or forage. Restricted entry interval – 12 hours
- ***Wheat, barley, oats, flax, lentil*** – (Ground) DO NOT apply more than 3 times per year. (Aerial) DO NOT apply more than 2 times per year.
- ***Dry beans, faba beans, chickpeas, lentils, and field peas (*Decis *only)*** – DO NOT apply more than 3 times per year (field and seed).
- ***Rangeland, pastures:*** Maximum 3 applications per year; only 2 of these may be by air.
- **Pre-harvest Intervals (Days):** alfalfa (20), barley (40), canola (7), flax (40), lentils (30), mustard (7), shelled pea and beans (*Decis* only) (7), oats (31), potatoes (3), sunflower (70), wheat (40), sugar beets (100).
- **Storage:** DO NOT store below freezing. DO NOT store near feed, food, seeds or fertilizer. Keep away from heat, sparks and open flames. If stored for 1 year or longer, shake well before using. Insecticides and fungicides should be segregated from herbicides to prevent the possibility of cross-contamination.
- **Others:** DO NOT apply *deltamethrin* by air when the wind speed exceeds 8 kilometres per hour. In soils with high organic content (muck soils), *deltamethrin* should be applied only once during each crop year, prior to August 1.
- **Buffer zones:**

  Decis 5 EC and *Decis 100 EC*

Application method	Crop	Buffer Zones (metres) Required for the Protection of:				
		Aquatic Habitats of Depths			Terrestrial Habitat	
		Less than 1 m		Greater than 1 m		
		Decis 5 EC	*Decis 100 EC*		*Decis 5 EC*	*Decis 100 EC*
Ground	Alfalfa (seed production only), potato, established red clover (for seed production only), shelled pea and bean (except soybean), wheat, barley, oats, sugarbeets, field corn	1		1	1	

Application method		Crop	Buffer Zones (metres) Required for the Protection of:				
			Aquatic Habitats of Depths			Terrestrial Habitat	
			Less than 1 m		Greater than 1 m		
			Decis 5 EC	*Decis 100 EC*		*Decis 5 EC*	*Decis 100 EC*
Aerial	**Fixed wing**	Shelled pea and bean (except soybean)	90	80	25	10	
	Rotary wing		55	65	20	10	
	Fixed wing	Wheat, barley, oats, sugarbeets	55	50	15	1	10
	Rotary wing		35	45	10	1	10
	Fixed wing	Canola, rapeseed, oilseed mustard	70	65	20	10	
	Rotary wing		45	50	15	10	
	Fixed wing	Potato, pasture, rangeland	40	35	10	1	
	Rotary wing		25		10	5	1
	Fixed wing	Sunflower	10		5	0	
	Rotary wing		10		5	0	

Poleci 2.5 EC Western, Decimate, Rauma

Application method		Crop	Buffer Zones (metres) Required for the Protection of:		
			Aquatic Habitats of Depths		Terrestrial Habitat
			Less than 1 m	Greater than 1 m	
Ground		Alfalfa (seed production only), potato, established red clover (for seed production only), shelled pea and bean (except soybean), wheat, barley, oats, sugarbeets, field corn (all except field corn, *Poleci* only)	1	1	1
		Canola, mustard, rapeseed, sugar beet, barley, flax, lentil, oat, wheat, rangeland, pasture (all except canola,mustard, rapeseed, *Poelci* only)	1	1	0
Aerial	**Fixed wing**	Potato, wheat, barley, oat, flax, pasture, rangeland (all except Potato, *Poleci* only)	40	10	1
	Rotary wing		25	10	5
	Fixed wing	Canola, mustard, rapeseed, oilseed mustard, wheat, barley, oat, flax, lentil, sugarbeet (all except canola,mustard, rapeseed, *Poelci* only)	20	10	1
	Rotary wing		15	10	1
	Fixed wing	Canola, mustard, rapeseed, oilseed mustard, flax, shelterbelt, potato (high organic muck soils) (all except potato, *Poleci* only)	15	10	1
	Rotary wing		10	5	1
	Fixed wing	Sunflower (*Poleci* only)	10	5	0
	Rotary wing		10	5	0

- ***Advanced Deltamethrin:*** Observe 100 metre setback between crop and any body of water or sensitive zones for aerial applications.

Precautions:

Deltamethrin is of high mammalian toxicity and is a severe eye and skin irritant. Avoid contacting or breathing spray mist. Wear protective clothing, including goggles and respirator, when handling or spraying. DO NOT contaminate or store near feed or foodstuffs. Wash thoroughly after using *deltamethrin*.

Environmental Hazards:

Bees: Toxic to bees. Avoid spraying when bees are foraging.
Aquatic organisms: Toxic to fish and aquatic organisms. Avoid contamination of aquatic systems during application.

Hazard Rating:

Danger – Poison

Refer to the introduction for an explanation of the symbols.

Dimethoate

Insecticide Group 1B

Company:

FMC Corporation (*Cygon 480-Ag* – PCP#25651, Cygon 400EC – PCP#35268)
Loveland Products Canada (*Lagon 480E* – PCP#9382)
Sharda Cropchem Limited (Diamante 4 – PCP#34413)
Different trade names refer to different companies. Note that products may have different label recommendations. Check your label for more information.

Formulation:

Cygon 400EC – (400 g/L dimethoate) formulated as an emulsifable concentrate

- Container size – 2 x 9.7L

Cygon 480-AG/Lagon/Diamante 4 – 480 g/L dimethoate formulated as an emulsifiable concentrate.

- Container size –10L

Insects Controlled and Registered Crops:

Crop	*Cygon 480-Ag/Cygon 400EC* Insect	*Lagon 480E* Insect	*Diamante 4*
Peas	Aphids	Aphids	Aphids
Potatoes (ground application only)	Aphids, leafhoppers	Aphids, leafhoppers, Lygus bugs	Aphids leafhoppers
Alfalfa* (rates vary for seed and forage production)	Aphids, leafhoppers, Lygus bugs, plant bugs, alfalfa blotch leafminer, grasshoppers, reduction of alfalfa weevil larvae	Aphids, leafhoppers, alfalfa blotch leafminers, grasshoppers, reduction of alfalfa weevil larvae, Lygus bugs, plant bugs	Aphids, blotch leafminer, grasshoppers, leafhoppers, Lygus bugs, plant bugs, sweet clover weevil, reduction of alfalfa weevil larvae
Canaryseed, canarygrass for human consumption (*Cygon 480-Ag* and *Lagon 480E*)	Aphids	Aphids	
Canola/rapeseed	Aphids, leafhoppers, grasshoppers, Lygus bugs	Aphids, leafhoppers, grasshoppers	Aphids, leafhoppers, grasshoppers
Dry beans	Aphids, leafhoppers, lygus bugs, spider mites		Aphids, leafhoppers, Lygus bugs, mites
Forage crops	Lygus bugs, plant bugs, grasshoppers	Grasshoppers, aphids (suppression only of Russian wheat aphid), Lygus bugs and plant bugs	Grasshoppers, leafhoppers, Lygus bugs, plant bugs
Sweet clover, red clover, alsike clover	Sweet clover weevil	Aphids, grasshoppers, sweet clover weevil	Sweet clover weevil
Pastures, waste areas	Grasshoppers	Grasshoppers	Grasshoppers
Wheat	Aphids (suppression only of Russian wheat aphid), wheat midge, thrips	Thrips, grasshoppers, wheat midge, Russian wheat aphid (suppression only)	Wheat midge, aphids, thrips
Barley, oats	Aphids, thrips	Thrips, grasshoppers,	Aphids, thrips

Crop	*Cygon 480-Ag/Cygon 400EC* Insect	*Lagon 480E* Insect	*Diamante 4*
Flax	Aphids	Aphids	Potato aphid
Rye		Grasshoppers	
Soybeans	Aphids, leafhoppers, lygus bugs, spider mites	Aphids, leafhoppers, Lygus bugs, spider mites	Spider mites

Application:

Dimethoate

- May be applied by air or ground equipment (unless otherwise specified). If adult midges are present (1 midge / 4-5 wheat heads), sprays should be applied when 25 percent of the wheat head has fully emerged from the boot but before flowering has begun. At this stage, wheat first becomes susceptible to attack by the egg-laying females. Applications should be made in the late afternoon or evening when temperatures exceed 15°C and the wind speed is less than 10 km/h. High volume sprays will improve penetration of the crop. Proper timing of application is essential for control. Will not control midge larvae.

How it Works:

Dimethoate is a broad spectrum, systemic (within the plant) and contact, organophosphate insecticide and acaricide.

Restrictions:

- **Grazing:** Remove cattle prior to spraying. Read label carefully to determine livestock re-entry period.
- **Storage:** Store at temperatures between 4°C and 30°C and in areas away from feed and food.
- **Others:** DO NOT treat when bees are foraging. For alfalfa, canola, safflower and clovers, DO NOT apply during the crop blooming period or during the 5 day period before the crop blooms. Wait at least 10 days before placing leafcutter bees in treated fields. DO NOT make more than 2 applications per season. *Canary seed* - Minimum application interval is 30 days. *Beans*, *Peas*, - Minimum application interval is 14 days (7 for *Beans* with *Lagon*). Other listed crops - Minimum application interval is 7 days.

Precautions:

Wear a respirator, goggles, rubber gloves, rubber boots and coveralls when handling concentrate. Avoid contact with skin and eyes. DO NOT inhale spray mist.

Environmental Hazards:

Bees: Toxic to bees. Avoid applications when bees are foraging in the treatment area or in groundcover containing blooming weeds. For applications on crops that are highly attractive to pollinators (alfalfa, clovers, canola, safflower, etc.) DO NOT apply during the crop blooming period or during the 5 day period before the crop blooms.

Aquatic organisms: Toxic to aquatic organisms. Avoid application of this product when heavy rain is forecast.

Others: Toxic to birds, mammals, and certain beneficial insects.

Hazard Rating:

Lagon, Cygon 480 AG, Diamante 4: Warning – Poison

Refer to the introduction for an explanation of the symbols.

Dipel 2X DF

Insecticide Group 11

Company:
Valent Canada (PCP#26508)

Formulation:
Bacillus thuringiensis var. kurstaki strain ABTS-351 fermentation solids, spores and insecticidal toxins - 57.0% Potency: 32,000 cabbage looper units (CLU) per mg (32 billion CLU per Kg)

Insects Controlled and Registered Crops:

Crop	Insect
Sunflower	Sunflower moth
Timothy	Essex (European) skipper
Corn	European corn borer larvae
Potato	Cabbage looper
Quinoa	European corn borer

Application:
Dipel

- Treat when larvae are young (early instars) before the crop is damaged. A spreader sticker such as *Triton B1956* should be used to give thorough foliage coverage.

How it Works:
Dipel is a biological stomach insecticide resulting in the larvae ceasing to eat in a few hours, with death usually occurring within 1 to 3 days.

Restrictions:
- **Storage:** Store at temperatures between 0° and 25°C (cooler temperatures preferable).
- **Others:** DO NOT allow diluted spray to stand in tank for more than 12 hours. Use product within 24 months of date of manufacture if stored at cool temperatures. Final spray solution for *Dipel* should have a pH of 5-7.

Precautions:
Harmful if swallowed, inhaled, or absorbed through the skin. Avoid breathing dust or spray mist. Avoid contact with skin, eyes, or clothing. In case of contact with eyes or skin, immediately flush eyes or skin with plenty of water.

Environmental Hazards:
Aquatic organisms: DO NOT contaminate irrigation or drinking water supplies.

Hazard Rating:
Warning – Contains the Allergen Soy

Caution – Eye Irritant, Skin Irritant, Potential Sensitizer

Eco Bran

Insecticide Group 1A

Company:
Peacock Industries (PCP#25815)

Formulation:
Wheat bran infused with carbaryl insecticide (carbaryl 2%).
- Container sizes - 20 kg bag, 1kg bottle

Insects Controlled and Registered Crops:

Crop	Insect
Beans, canola, pastures, rangelands, forage grasses, field borders, headlands, rights-of-way, roadsides, wastelands	Grasshoppers

Pre-harvest Intervals and Livestock Re-entry Periods:

Crop	Pre-harvest Interval/ Livestock re-entry period
Beans	5
Canola	Treat only seedlings
Field borders, headlands, rights-of-way, roadsides, wastelands	0
Entry of beef cattle or other livestock to pastures, rangelands or forage grasses	1
Entry of dairy cattle to pastures or rangelands, harvest of forage crops	2

Application:
Eco Bran
- For ground application only. DO NOT apply by air.
- Broadcast evenly over treatment area. Use gloves and wash thoroughly following application.
  More information on application and applicators can be found at: **http://www.grasshoppercontrol.com**.

Restrictions:
- DO NOT apply within 50 metres of sloughs, ponds, streams, dugouts or open water. Apply when winds are between 3 to 8 kilometres per hour and do not favour drift.
- May be used in pastures while beef cattle are grazing.

Precautions:
Harmful if inhaled or swallowed. Avoid breathing dust or vapour from bait. Use only in well-ventilated areas. May cause eye irritation. Avoid contact with eyes and skin. Wash thoroughly after handling and before eating or smoking. Avoid contamination of feed and foodstuffs. Keep away from heat, sparks and open flame.

Environmental Hazards:
Bees: Presence of product on flowering crops such as alfalfa and clover will not harm foraging honey or leafcutter bees.
Aquatic Organisms: Toxic to aquatic organisms. Avoid application when heavy rain is forecast.

Entrust

Insecticide Group 5

Company:
Corteva Agriscience (PCP#30382)

Formulation:
Spinosad 240 g/L suspension concentrate
- Container size - 1 L

Insects Controlled and Registered Crops:

Crop	Insect
Potato	Colorado potato beetle larvae and European corn borer larvae

Application:
Entrust
- Apply as a foliar spray by ground only. Apply when scouting indicates the target pest species have reached economic threshold levels. For Colorado potato beetle larvae, target eggs at hatch or small larvae. For control of European corn borer, time the application to coincide with peak egg hatch. Use higher application rate for higher pest pressure or when extended egg hatch is anticipated. If pest populations persist, a repeat application 7 to 10 days after the initial application may be necessary.
- Spinosyns require a spray solution pH between 6 to 8. This is important for the efficacy of the product. It is recommended that growers test the pH of the spray solution prior to adding a spinosyn to the spray tank.

How it Works:
Entrust is in the spinosine class of insecticides. It is a contact and stomach insecticide. It is derived from the fermentation of *Saccharpolyspora spinosa*.

Effects of weather:
This product has the potential for run-off. DO NOT spray immediately after a rainfall or if rain is forecast within 48 hours after application.

Restrictions:
- **Storage:** Avoid freezing. DO NOT store or ship with food, feeds, drugs or clothing.
- **Others:** DO NOT make more than 2 applications per season (maximum of 202 mL per acre).
- **Pre-harvest Interval:** DO NOT apply *Entrust Insecticide* within 7 days of potato harvest.

Precautions:
Buffer Zones: A buffer zone of 2 metres (early season) or 1 metre (late season) is required between downwind edge of spray boom and sensitive aquatic habitats.

Avoid contact with eyes, skin, and clothing.

DO NOT enter or allow worker entry into treated areas for a period of 12 hours after application.

Environmental Hazards:
Bees: Highly toxic to bees exposed to direct treatment, drift or residues on blooming plants. DO NOT apply this product or allow it to drift to blooming plants if bees are visiting the treatment area.

Aquatic organisms: This product is highly toxic to aquatic invertebrates. Avoid application of this product when heavy rain is in the forecast, or immediately after a rainfall.

Others: Harmful to parasitoids and predatory mites and slightly harmful to foliage-dwelling predators.

Hazard Rating:
No specific hazard rating specified.

Exirel

Insecticide Group 28

Company:
FMC Corporation (PCP#30895)

Formulation:
Cyantraniliprole 100 g/L, formulated as a suspension.
- Container sizes - 0.5, 3.79, 100 L

Insects Controlled and Registered Crops:

Crop	Insect
Potatoes	Colorado potato beetle
	Aphids
	European corn borer, variegated cutworm
	Armyworm
	Potato flea beetle

Application:
- Applied as a foliar spray, using ground or aerial application. *Exirel* insecticide is mixed with water for application. Time applications to the most susceptible insect pest stage, typically at egg hatch and/or newly hatched larvae or nymphs, before populations reach damaging levels. When pest populations are high, use the highest listed application rate for that pest. Use the higher rate and high spray volumes for large plants or dense foliage.

How it Works:
Exirel insecticide is a member of the anthranilic diamide class of insecticides which act on insect ryanodine receptors. Although *Exirel* insecticide has contact activity, it is most effective through ingestion of treated plant material. After exposure to *Exirel* insecticide, affected insects will rapidly stop feeding, become paralyzed, and typically die within 1 to 3 days.

Effects of Weather:
Avoid application when heavy rain is forecast.

Restrictions:
- **Storage:** Store product in original container only, away from other pesticides, fertilizer, food or feed.
- **Application interval:** DO NOT apply more than once every 5 days.
  - ***Ground:*** Apply in a minimum finished spray volume of 40 L per acre by ground. Minimum finished spray volume of 40 L per acre. DO NOT apply during periods of dead calm. Avoid application of this product when winds are gusty.
  - ***Air:*** Apply in a minimum finished spray volume of 20 L per acre by air. Minimum finished spray volume of 20 L per acre. DO NOT apply during periods of dead calm. Avoid application of this product when winds are gusty.
- **Pre-harvest interval:** 7 days.
- **Others:** DO NOT make more than 4 applications per season. DO NOT exceed a total of 1.8 litres *Exirel* insecticide per ac per season. DO NOT make a foliar application of *Exirel* insecticide for a minimum of 60 days following an in-furrow or soil application or planting of seed or seed pieces treated with any Group 28 insecticide.

Precautions:
Causes skin irritation. DO NOT get on skin.

Buffer Zones:

Application Method	Crop		Freshwater Habitat of Depths:		Terrestrial habitat
			Less than 1 m	Greater than 1 m	
Ground	Potatoes		2 m	1 m	1 m
Aerial	Potatoes	Fixed wing	5 m	1 m	15 m
		Rotary wing	2 m	1 m	15 m

Environmental Hazards:

Bees: Toxic to bees. DO NOT apply this product to blooming crops or weeds while bees are actively visiting the treatment area. Apply early in the morning or late in the evening when bees are not active. Minimize spray drift to reduce harmful effects on bees in habitats close to the application site.

Aquatic organisms: This product is highly toxic to aquatic organisms. To reduce runoff from treated areas into aquatic habitats avoid application to areas with a moderate to steep slope, compacted soil, or clay. Contamination of aquatic areas as a result of runoff may be reduced by including a vegetative strip between the treated area and the edge of the water body.

Others: Toxic to non-target terrestrial plants. Toxic to certain beneficial insects. Minimize spray drift to reduce harmful effects on beneficial insects in habitats next to the application site such as hedgerows and woodland.

Hazard Rating:

Warning – Skin Irritant
Potential Skin Sensitizer

Refer to the introduction for an explanation of the symbols.

Harvanta 50 SL

Insecticide Group 28

Company:

ISK Biosciences Corporation (PCP#32889)
Distributed in Canada by Belchim Crop Protection Canada

Formulation:

Cyclaniliprole 50 g/L formulated as a suspension.

- Container size - 4 x 3.79 L

Insects Controlled and Registered Crops:

Crop	Insect
Potatoes	Colorado potato beetle, Cabbage looper, Bertha armyworm, Fall armyworm, Potato psyllid (suppression), Leafminers (Liriomyza species), Western flower thrips (suppression)

Application:

- Minimum water volume:
  - ***Ground:*** 200 L per hectare.
- Avoid application during the crop blooming period.

How it Works:

Harvanta 50 SL is effective through contact with the insect and ingestion and has translaminar properties.

Effects of Weather:

Avoid application when heavy rain is forecast.

Restrictions:

- **Storage:** Store product in cool, dry, well ventilated place. To prevent contamination, store this product away from food or feed.
- **Restricted Entry Interval:** 12 hours
- **Pre-harvest interval:** 7 days
- **Others:** Max 3 applications per crop per year. Minimal interval between treatments is 5 days.
- **Buffer Zones:**

Application method	Buffer Zones (metres) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground	1	0	n/a
Aerial	1	0	n/a

See introduction for an explanation of the different habitats.

Precautions:
Avoid contact with eyes. Avoid prolonged contact with skin. Wash exposed areas of skin thoroughly with soap and warm water after handling or using. Remove contaminated clothing and wash before re-use. Wear a long-sleeved shirt, long pants, chemical-resistant gloves, socks and shoes during mixing, loading, application, clean-up and repair. In addition, wear protective eyewear (goggles or face shield) during mixing and loading. DO NOT enter or allow worker entry into treated areas during the restricted entry interval of 12 hours.

Environmental Hazards:
Bees: Toxic to bees.
Aquatic organisms: Very toxic to aquatic organisms. To reduce runoff from treated areas into aquatic habitats, avoid application to areas with a moderate to steep slope, compacted soil, or clay.
Others: Toxic to certain beneficial insects.

Hazard Rating:
Warning – Combustible liquid. Very toxic to aquatic life. Toxic to aquatic life with long lasting effects.

Refer to the introduction for an explanation of the symbols.

Imidan WP Insecticide

Insecticide Group 1B

Company:
Gowan Canada (PCP#29064)

Formulation:
70% phosmet formulated as a wettable powder in water soluble sachets.

Insects Controlled and Registered Crops:

Crop	Insect
Potato	Colorado potato beetle, potato flea beetle, potato leafhopper, potato aphid

Application:
Imidan
- Apply by ground only.
- *Imidan WP* Insecticide is packaged in water soluble sachets that are to be dropped into the spray tank unopened. DO NOT use in low-volume, gear-type spray equipment.

How it Works:
Imidan is an organophosphate insecticide.

Restrictions:
- **Storage:** Keep sachets dry and DO NOT allow sachets to contact any moist surface prior to adding to spray tank.
  Keep water soluble sachets in the protective container and store in a cool, dry place. DO NOT store at temperatures below 0°C or above 40°C.
- Buffer zones required for the protection of freshwater habitat: 35 metres for depth of less than 1 metre and 10 metres for depths greater than 1 metre.
- DO NOT apply within 7 days of harvest.
- DO NOT make more than 5 applications per season.
- **Re-entry Interval (REI):** Hand set/handline irrigation related activities involving foliar contact – 33 days; roguing – 26 days; scouting – 2 days; all other activities 0.5 days.

Precautions:
Harmful if swallowed, inhaled or absorbed through the skin. Wear protective clothing, including rubber gloves and goggles, during mixing, loading and spraying.

Tank Mixes:
According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Environmental Hazards:

Bees: Toxic to bees. Bees may be exposed through direct spray, spray drift, and residues on leaves, pollen and nectar in flowering crops and weeds. Minimize spray drift to reduce harmful effects on bees in habitats close to the application site. Avoid applications when bees are foraging in the treatment area in ground cover containing blooming weeds.

Aquatic organisms: Toxic to aquatic organisms. Avoid application when heavy rain is forecast.

Others: Toxic to birds and small wild mammals. Toxic to certain beneficial insects.

Hazard Rating:

Danger – Poison

Refer to the introduction for an explanation of the symbols.

Intrepid

Insecticide Group 18

Company:

Corteva Agriscience (PCP#27786)

Formulation:

240 grams per litre methoxyfenozide

Insects Controlled and Registered Crops:

Crop	Insect
Corn (field and sweet)	European corn borer
Beans (dry)	European corn borer

Application:

- ***Ground application:*** Thorough uniform coverage of all foliage and fruit is essential for good insect control. Apply in sufficient spray volume to ensure uniform coverage of the treated crop. A minimum of 300 L of water per hectare is generally recommended for ground application.
  - ***Corn*** – Apply at the first signs of feeding damage before the insect enters the fruit. Monitoring of insect populations is key to controlling this pest. Direct application at the whorl for early season (first generation) infestations. Repeat applications after 5 to 10 days if required based on population monitoring. Use the higher rate for heavy infestations, or larger crop canopies
  - ***Beans*** – Apply at the first signs of feeding damage before the insect enters the pods. Repeat applications after 7 to 14 days if required based on population monitoring. Use the higher rate for heavy infestations or advanced growth stages of the target pest.

How it Works:

Intrepid belongs to the diacylhydrazine class of insecticides and mimics the action of the molting hormone of larval Lepidoptera. Upon ingestion, larvae undergo an incomplete and developmentally premature molt which is ultimately lethal. This process interrupts and rapidly halts their feeding. Feeding typically ceases within hours of ingestion although complete mortality of the larvae may take several days. Affected larvae often become lethargic and develop discoloured areas or bands between segments.

Restrictions:

- DO NOT apply during periods of dead calm. Avoid application of this product when winds are gusty. DO NOT apply with spray droplets smaller than the ***ASAE fine*** classification. Boom height must be 60 cm or less above the crop or ground.
- ***Corn:*** Apply a maximum of 3 applications per year.
- ***Beans:*** Apply a maximum of 3 applications per year.
- **Restricted Entry Interval:** 12 hours
- **Pre-harvest interval:**
  - ***Corn*** – DO NOT apply within 3 days of harvest for sweet corn. DO NOT apply within 21 days of harvest for field corn and popcorn.
  - ***Beans*** – DO NOT apply within 7 days of harvest.
- **Storage:** Keep product in original container during storage. To prevent contamination, store this product away from food or feed.

- **Buffer Zones:**

Application method	Buffer Zones (metres) Required for the Protection of Freshwater Habitats of Depths:	
	Less than 1 m	Greater than 1 m
Ground (field sprayer)	2	1

Precautions:
DO NOT apply using aerial application equipment Avoid contact with eyes, skin or clothing. Avoid breathing spray mist. Apply only when the potential for drift to areas of human habitation or areas of human activity such as houses, cottages, schools and recreational areas is minimal. Take into consideration wind speeds, wind direction, temperature inversions, application equipment and sprayer settings.

Environmental Hazards:
Avoid application when heavy rain is forecast. Methoxyfenozide is persistent and will carryover; it is recommended that *Intrepid* not be used in areas treated with this product during the previous season. The use of this chemical may result in contamination of groundwater, particularly in areas where soils are permeable (e.g., sandy soil) and/or the depth to the water table is shallow.
Aquatic organisms: Toxic to aquatic organisms. Observe buffer zones specified under directions for use.
Others: Insecticide use should be based on an IPM program that includes scouting, record keeping, and considers cultural, biological and other chemical control practices. This product is harmful to certain beneficial arthropods.

Hazard Rating:
None listed.

Lambda-cyhalothrin

Insecticide Group 3A

Company:
ADAMA Canada (*Silencer 120 EC* – PCP#29052, *Zivata* – PCP#32427)
Sharda Cropchem Limited (*Labamba* – PCP#33576)
Syngenta Canada (*Matador* – PCP#24984)

Formulation:
120g/L lambda-cyhalothrin formulated as an emulsifiable concentrate.
- Container sizes - 4 x 3.79 L, 4.08 L (Zivata)

Insects Controlled and Registered Crops:

Crop	Insect
Potatoes	Armyworm, Colorado potato beetle, European corn borer, Lygus bugs, potato flea beetle, potato leafhopper, tuber flea beetle, variegated cutworm
Canola, mustard	Crucifer flea beetle, grasshoppers, Lygus bugs, cabbage seedpod weevil (adults), cabbage looper, diamondback moth larvae, imported cabbageworm, bertha armyworm, cutworms (*Matador* only)
Wheat, barley, oats	Grasshoppers, armyworm
Summerfallow (*Labamba* and *Matador* only)	Grasshoppers
Flax	Grasshoppers, cutworms (*Matador* only)
Alfalfa (*Matador* – Ground or Air) (*Silencer* – Ground only)	Alfalfa weevil, Lygus bugs, pea aphid, potato leafhopper, grasshoppers
Corn	European corn borer, corn earworm, cutworm, fall armyworm, armyworm
Beans	Cutworm, corn borer, potato leafhopper, Lygus bugs
Chickpeas	Grasshoppers, potato leafhopper, cutworm
Faba beans (broad beans)	Lygus bugs, potato leafhopper, pea aphid
Lentils	Cutworm, grasshoppers, Lygus bugs, pea aphids, potato leafhopper
Peas	Cutworm, grasshoppers, pea aphids, pea leaf weevil

Crop	Insect
Soybeans	Cutworm, grasshoppers, Lygus bugs, aphids
Timothy (for seed production only)	Grasshoppers

Application:

Lambda-cyhalothrin

- **Aerial:**
  - Apply in spray volume of 10 to 40 L per hectare
  - ***Canola, mustard, sunflower, flax, alfalfa*** – DO NOT make more than 1 application at the 33.2 mL per acre rate per year.
  - ***Corn, wheat, barley, oats, potatoes, soybean, dry edible bean, pea, chickpea, lentil, favabean*** – DO NOT make more than 2 applications at the 33.2 mL per acre rate per year.
  - ***Matador and Labamba***: *Summerfallow* - DO NOT make more than 1 application at the 33.2 ml/acre rate per year.
- **Ground:**
  - Apply in 100 to 200 L per hectare
  - ***Canola, mustard, sunflower, flax, alfalfa, summerfallow (Labamba* and *Matador), corn, wheat, barley, oats*** – DO NOT make more than 3 applications per year at the 33.2 mL per acre rate. DO NOT cut treated fields for hay or forage; do not graze treated fields.
  - ***Potatoes*** – DO NOT make more than 3 applications per year at the 33.2 mL per acre rate. DO NOT make more than 2 applications per year if using the 50 mL per acre rate. DO NOT exceed 100 mL per acre of lambda-cyhalothrin per year.
  - ***Beans, chickpeas, favabeans, lentils, peas, soybeans*** – DO NOT make more than 3 applications per year. DO NOT graze or harvest treated forage straw or hay for livestock feed.
  - ***Timothy*** – For seed production only.
  - ***Alfalfa*** – Seed from treated crops is not to be used for production of 'alfalfa sprouts' for human consumption.

Timing:

For potato insects, timing of application should be based on the presence of vulnerable pest developmental stages and significant populations as determined by local monitoring.

For sunflower beetles, use the high rate to control adults.

For flea beetles, to prevent migration of over-wintering adults throughout the field, spray a 15 metre strip around the field at the first sign of flea beetle feeding.

For grasshoppers, apply the low rate when grasshoppers are up to the 3rd nymphal stage (up to 1 cm in length) or when insect numbers are low. Apply the high rate when insects are larger, up to but not including, winged adults or when insect numbers are high.

For corn borer control apply before the larva bores into the plant stalk or pods.

How it Works:

Lambda-cyhalothrin is a synthetic pyrethroid insecticide. It is a fast acting stomach and contact insecticide effective against a broad spectrum of foliar pests. It has no fumigant or systemic activity.

Effects of Weather:

For best results, apply *Lambda-cyhalothrin* during the early morning before temperatures rise, and during the evening, past the heat of the day.

Tank Mixes:

Herbicides: (Ground only)

- *Horizon* (*Matador*)
- Tralkoxydim[Δ] *(Matador* and *Silencer*)

Fungicides: (Tank mixes on legumes (bean, chickpea, lentil, pea, soybean), corn, barley, oats and wheat may be applied by ground or air). Refer to label for other crops.

- Propiconazole[Δ] (*Matador* and *Silencer*)
- *Allegro* in dry bean (*Matador*)
- *Quadris* (*Matador* only)
- *Quilt* (*Labamba* and *Matador*). Refer to the, *Labamba, Matador* and *Quilt* labels for diseases and insects controlled as well as specific application instructions and precautions.
- *Headline* (*Silencer* and *Zivata*) on dry field pea to control insects and diseases listed on the label of each product. Read carefully and follow all use directions and use precautions on both the *Silencer 120 EC* and *Headline EC* Fungicide labels. Failure to follow the rates of use and timing of application as recommended for each product will result in unsatisfactory control of target pest.
- *Traxion* (*Matador*)

[Δ] **Manufacturers may only support specific mixes. Contact the manufacturer for more information.** According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Restrictions:

- DO NOT apply to flowering crops or weeds if bees are visiting treatment area.
- **Grazing:** DO NOT cut treated fields for hay/forage. DO NOT graze treated fields. DO NOT feed treated crops to livestock. DO NOT feed seed screenings and aftermath to livestock. Corn - DO NOT cut treated fields for silage/forage, do not graze treated fields.
- Alfalfa seed from treated crops is not to be used for production of "alfalfa sprouts" for human consumption.
- **Storage:** Store above 0°C. Storage below 0°C will not impair the effectiveness of *Lambda-cyhalothrin*. However, following such storage, agitate well before use.
- **Others:** Allow a 7day interval between applications. DO NOT apply within 15 metres of productive fisheries, water or waterfowl habitat.
- **Restricted Entry Interval:** 24 hours
- **Buffer Zones:**

Application method	Crop	Buffer Zones (metres†) Required for the Protection of:	
		Aquatic Habitats of Depths	
		Less than 1 m	Greater than 1 m
Fixed wing or rotary airplane	Potatoes, oilseed crops, cereal crops, alfalfa, summerfallow	100	20
Fixed wing airplane	Corn	225	20
Rotary wing airplane		250	15
Fixed wing airplane	Legume vegetables	600	25
Rotary wing airplane		300	20

See introduction for an explanation of the different habitats.

- Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.
- For tank mixes, consult the labels of the tank mix partners and observe the largest (most restrictive) buffer zone of the products involved in the tank mixture.

† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Precautions:

As a result of the completed re-evaluation of lambda-cyhalothrin by the Pest Management Regulatory Agency (PMRA), effective April 29, 2023, changes will affect how all lambda-cyhalothrin-based products may be used in Canada.
Lambda-cyhalothrin has potential for skin and eye irritation. Avoid splashing in eyes or on skin, particularly the face. If hands are contaminated, wash with soap and water before touching other areas of skin.

Environmental Hazards:

Bees: Toxic to bees when exposed to direct treatment, drift, or residues on flowering crops or weeds. DO NOT apply this product to flowering crops or weeds if bees are visiting the treatment area. Spray deposits should be dry before bees commence foraging in treated crop.
Aquatic organisms: Toxic to aquatic organisms. Avoid application when heavy rain is forecast.

Hazard Rating:

Danger – Poison

Refer to the introduction for an explanation of the symbols.

Malathion

Insecticide Group 1B

Company:
Loveland Products Canada (*Malathion 85E* – PCP#8372)

Formulations:
Malathion 85E – 85% malathion formulated as an emusifiable concentrate.

Insects Controlled and Registered Crops:

Crop or Structure	Insect
Alfalfa	Grasshoppers, aphids, lygus bugs, alfalfa weevil larvae, leafhoppers, alfalfa blotch leafminer, spider mites, spittlebugs
Clover	Aphids, grasshoppers, leafhoppers, spider mites
Canola, mustard	Flea beetles, diamondback moth, grasshoppers
Wheat, barley, oats, rye	Grasshoppers, aphids, armyworm, cereal leaf beetle
Potatoes	Colorado potato beetle, leafhoppers, aphids, spider mites
Canaryseed (for seed) (85E only)	Aphids
Sweet clover	Sweet clover weevil
Flax, lentils, hay, pasture	Grasshoppers
Corn (grain, forage)	Earworms, European corn borers
Beans, peas	Aphids, leafhoppers, spider mites
Empty bin spray (grain bins, grain elevators, grain box cars, flour mills)	Confused flour beetles, flat grain beetles, granary weevils, grain mites, Indian meal moths, lesser grain borers, red flour beetle, rice weevils, rusty grain beetles, saw-toothed grain beetle

Application:
Malathion

- May be applied by air or ground equipment. Apply when insect numbers exceed economic threshold levels using sufficient water for good coverage. Use higher rates for heavy infestations, dense canopy or mature stages of insects.

How it Works:
Malathion is a non-systemic, contact, organophosphate insecticide and acaricide of brief to moderate persistence.
Generally non-phytotoxic.

Effects of Weather:
For best results apply when daytime temperatures are above 20°C.

Restrictions:
- **Grazing:** When spraying forages and pastures, cattle should be removed and returned after spraying.
- **Storage:** DO NOT store near food or feed. Store in a cool dry place but not below -10°C. Protect from heat.
- **Others:** Maximum of 2 applications per season. DO NOT apply to any plant in bloom. Apply to crops when bees are absent from field. Avoid contact with automobile paint and wash immediately if exposure occurs.
- **Restricted Entry Interval:** 12 hours

Note: Some commodities, such as canola, should not be stored in facilities recently treated with malathion. *Malathion* residue can linger in bins for up to six months after treatment and can be transferred from the bin to canola seed. Canola found with malathion residues is unacceptable for export customers.

The Pest Management Regulatory Agency (PMRA) has advised that any malathion products over one year old should not be used and should be returned as part of provincial pesticide recycling programs.

Precautions:
Malathion has a low acute mammalian toxicity. Wear protective clothing to reduce skin and eye exposure.

Environmental Hazards:

Bees: Toxic to bees exposed to direct treatment, drift, or residues on flowering crops or weeds. DO NOT apply this product to flowering crops or weeds if bees are visiting the treatment area.

Aquatic organisms: Toxic to aquatic organisms. Avoid application of this product when heavy rain is forecast.

Others: Toxic to birds. Toxic to certain beneficial insects.

Hazard Rating:

Warning – Poison

Refer to the introduction for an explanation of the symbols.

Minecto Duo 40WG

Insecticide Group 4A and 28

Company:

Syngenta Canada Inc. (PCP#30900)

Formulation:

20% thiamethoxam and 20% cyantraniliprole formulated as a wettable granule.

- Container size - 2 x 3.04 kg jugs

Insects Controlled and Registered Crops:

Crop	Insect
Potato	Aphids, Colorado potato beetle, flea beetles, potato leafhopper

Application:

Minecto Duo

- Can be applied by ground only. Apply by closed cab groundboom only.
- Apply as an in-furrow spray at seeding depth or in a narrow surface band above the seedline during planting.
- Apply in sufficient water volume to ensure uniform application and incorporation into the soil. Add half of the required amount of water to the mix tank. With agitator running add the *Minecto Duo* to the tank. Continue agitation while adding the remaining water. Apply once the *Minecto Duo* has completely dispersed into the water mix. Maintain agitation until all the mixture has been applied.

How it Works:

Minecto Duo contains two active ingredients. Thiamethoxam is a neonicotinoid insecticide and cyantraniliprole is a diamide insecticide. Both components have systemic (within the plant) properties and interfere with neuro-transmission in insects. Mode of action is through contact or ingestion.

Restrictions:

- DO NOT apply by air.
- DO NOT use a foliar application of a product containing a Group 4 (neonicotinoid) or Group 28 (diamide) insecticide following in-furrow or soil application of *Minecto Duo*.
- **Restricted Entry Interval:** DO NOT enter or allow worker entry into treated areas for 12 hours.
- **Storage:** Store product in original container only, in a cool, dry place and away from food or feed. Keep container closed.

Precautions:

If *Minecto Duo* is to be used on a commodity that may be exported to the United States and you require information on acceptable residue levels in the United States, visit CropLife Canada's website at **www.croplife.ca**.

Environmental Hazards:

Bees: Toxic to bees. This product is systemic and bees can be exposed to product residues in flower, leaves, pollen and/or nectar resulting from soil applications.

Aquatic organisms: Toxic to aquatic organisms. Avoid application of this product when heavy rain is forecast. The use of this chemical may result in contamination of groundwater particularly in areas where soils are permeable (e.g. sandy soil) and/or the depth to the water table is shallow.

Hazard Rating:

Warning – Poison

Refer to the introduction for an explanation of the symbols.

Minecto Pro

Insecticide Group 6 and 28

Company:
Syngenta Canada Inc. (PCP#33023)

Formulation:
Abamectin and cyantraniliprole formulated as a soluble concentrate.
- Container size - 3.78 L

Active Ingredient(s)	Guarantee	Resistance Group
Abamectin	28.5 g/L	Group 6
Cyantraniliprole	135 g/L	Group 28

Insects Controlled and Registered Crops:

Crop	Insects
Potatoes	European corn borer
	Spider mites, potato psyllids, and flea beetle
	Colorado potato beetle

Application:
- ***Minimum water volume:*** 200 L per hectare, 80 L per acre. Apply with 0.1 to 0.5 percent v/v non-ionic surfactant (NIS).

How it Works:
Minecto Pro is a non-neonicotinoid insecticide that delivers rapid activity through two complementary active ingredients – abamectin (Group 6) and cyantraniliprole (Group 28). Both active ingredients use translaminar movement within the plant to achieve excellent coverage of the crop, providing a reservoir of activity for extended residual control of targeted pests.

Tank Mixes:
According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Restrictions:
- DO NOT apply by air.
- **Rainfast period:** Once dry on leaf. Avoid application if heavy rainfall is forecast.
- **Restricted Entry Interval:** 12 hours
- **Pre-harvest interval:** 14 days
- **Storage:** Store product in original container only, in a cool, dry place and away from food or feed. Keep container closed.
- **Other Restrictions:** For European corn borer, spider mites, potato psyllids and flea beetle, DO NOT make a foliar application of *Minecto Pro* for a minimum of 60 days following an in-furrow or soil application or planting of seed pieces treated with any Group 28 insecticide. For Colorado potato beetle, DO NOT apply *Minecto Pro* for Colorado potato beetle control if any Group 28 was used at planting as an in-furrow, soil or seed-piece treatment.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground	15	20	1
Aerial	N/A	N/A	N/A

Environmental Hazards:
Bees: Toxic to bees exposed to direct treatment or residues on blooming crops or weeds. DO NOT apply this product or allow drift to blooming crops or weeds if bees are visiting the treatment area.
Aquatic organisms: Toxic to aquatic organisms. Contamination of aquatic areas as a result of runoff may be reduced by including a vegetative strip between the treated area and the edge of the water body.

Hazard Rating:

Danger – Poison. Hazard to humans and domestic animals. Fatal or poisonous if swallowed. Harmful if inhaled. Avoid breathing spray mist.

Refer to the introduction for an explanation of the symbols.

Movento 240 SC

Insecticide Group 23

Company:

Bayer (PCP#28953)

Formulation:

240 g/L spirotetramat formulated as a suspension concentrate.

Insects Controlled and Registered Crops:

Crop	Insect
Potato	Aphids
Beans, chickpea, lentil, peas, soybean	Aphids

Application:

Movento 240 SC

- Ground application only in potatoes and soybeans. Ground or air application for beans, chickpea, lentil and peas. Apply in adequate water for uniform coverage, a minimum of 120 L per acre. If needed repeat application with a minimum of 7 to 10 day interval. DO NOT exceed a maximum of 292 mL per acre per season.
- For best results apply when insect populations begin to build and before a damaging population becomes established. Select the appropriate rate depending on the development stage of the insect and level of infestation.

How it Works:

Movento is a systemic, tetramic acid insecticide. Following application to plant foliage *Movento* moves through phloem and xylem to all plant tissues including new shoot, leaf and root growth. Mode of action is primarily by ingestion by immature insect life stages. Insect death occurs due to the inability to progress to the next development stage. Adults produce less offspring following exposure.

Restrictions:

- DO NOT apply this product directly to freshwater habitats (such as lakes, rivers, sloughs, ponds, creeks, marshes, streams, reservoirs and wetlands). DO NOT apply during periods of dead calm. Avoid application when winds are gusty. DO NOT apply droplets smaller that ***American Society of Agricultural Engineers (ASABE) fine*** classification. Boom height must be 60 cm or less above ground.
- **Re-Entry:** DO NOT enter or allow worker entry into treated areas for a period of 12 hours.
- **Re-cropping:** A plant back interval of 30 days is required for all crops not on the label.

Environmental Hazards:

Bees: Toxic to bee brood. Bee brood may be exposed to residues in/on pollen and nectar brought back to the hive by bees foraging on flowering crops and weeds. DO NOT apply this product during crop flowering period or when flowering weeds are present in the treatment area.

Aquatic organisms: Toxic to aquatic organisms. Avoid application when heavy rain is forecast.

Others: Toxic to certain beneficial insects.

Hazard Rating:

Caution – Poison

Refer to the introduction for an explanation of the symbols.

Nolo Bait

Insecticide Group
Biological Insecticide

Company:
M&R Durango, Inc. (PCP#29197)

Formulations:
Wheat bran coated with spores of the protozoan *Nosema locustae*.
Minimum of 2.2 x 10^6 spores of *Nosema (Paranosema) locustae* Canning per gram.

Insects Controlled and Registered Crops:

Crop	Insect
Crop and Rangeland	Grasshoppers

Rates:
- Apply at a minimum rate of 0.45 kg per acre.
- Consumption of a higher number of spores per grasshopper will increase product efficacy and decrease the amount of time required to kill grasshoppers. Where greater efficacy or faster population reduction is required, this may be achieved through multiple applications or a higher application rate to increase the amount of bait available to each grasshopper.

Application:
Nolo Bait
- For best results, apply when most grasshoppers are in the 3rd instar (12 to 19 mm long).
- Apply by hand, seed spreader, turbine spreader or airplane. Concentrate the application in areas of heaviest grasshopper infestation.

How it Works:
Nolo Bait must be consumed by the target insect to be effective. It infects the fat bodies of most species of grasshoppers and some crickets. Infection and sickness of the grasshopper begins upon ingestion of the bait by the grasshopper. As the *Nosema locustae* population increases inside the grasshopper it becomes lethargic, reduces its feeding and has lowered reproductive capacity. Grasshopper death will begin in 3 to 6 weeks. The pathogen may remain in the grasshopper population for several years following treatment.

Restrictions:
- **Pre-harvest interval:** 0 days
- **Storage:** Store product in original container in a cool, dry location (preferably at or below 20°C). Use within 13 weeks from the date of manufacture.

Precautions:
May cause sensitization. Avoid contact with skin, eyes, or clothing. Avoid breathing dust or spray mist.

Environmental Hazards:
Aquatic organisms: DO NOT contaminate irrigation or drinking water supplies or aquatic habitats by cleaning of equipment or disposal of wastes.

Hazard Rating:
Warning – Contains the Allergen Wheat

Caution – Potential Sensitizer

Refer to the introduction for an explanation of the symbols.

Oberon

Insecticide Group 23

Company:
Bayer (PCP#28905)

Formulation:
240 g/L spiromesifen formulated as a suspension concentrate.
- Container size - 2 L jug

Insects Controlled and Registered Crops:

Crop	Insect
Alfalfa (seed production only)	Twospotted spider mite
Corn	Banks grass mite, twospotted spider mite
Dry beans	Spider mites

Application:
Oberon
- May be applied by ground or air.
- Apply as soon as mite populations reach threshold levels. Repeat application if pest populations recover and reach economic thresholds. A minimum interval of 7 days between applications is required.
- Thorough coverage of all plant parts is important for optimum performance. Use sufficient water volumes for thorough coverage - e.g. minimum of 40 to 80 L of water per acre.
- Avoid application when heavy rain is forecast.

How it Works:
Spiromesifen is in the Tetronic acid class of insecticides and works by contact, inhibiting lipid biosynthesis in the insect. *Oberon* has strong adhesion to the leaf surface, and also some translaminar activity providing residual control through contact or ingestion. *Oberon* has activity on all mite developmental stages. Immature mite stages tend to be more susceptible to *Oberon* than adults.

Restrictions:
- Alfalfa – DO NOT exceed 3 applications per season. Keep a minimum interval of 7 days between applications.
  DO NOT exceed a maximum of 1200 mL per acre of *Oberon* per season. Corn – DO NOT exceed 2 applications per season. DO NOT exceed 240 mL per acre per 14 day interval. DO NOT exceed 480 mL per acre per season.
- DO NOT enter or allow entry into treated areas for a period of 12 hours after application.
- *Oberon* is toxic to aquatic organisms and beneficial insects such as pollinators. DO NOT apply this product directly to freshwater habitats such as lakes, rivers, sloughs, ponds, creeks, marshes, streams, reservoirs, ditches and wetlands.
- **Buffer Zones:**

Application method			**Buffer Zones (metres†) Required for the Protection of:**		
			Aquatic Habitats of Depths		Terrestrial habitat
			Less than 1 m	Greater than 1 m	
Alfalfa	**Ground**		10	3	2
	Aerial	**Fixed wing**	800	100	85
		Rotary	675	85	65
Corn	**Ground**		5	2	1
	Aerial	**Fixed wing**	225	30	35
		Rotary	200	25	35

Application method			Buffer Zones (metres†) Required for the Protection of:		
			Aquatic Habitats of Depths		Terrestrial habitat
			Less than 1 m	Greater than 1 m	
Dry beans	Ground		5	2	1
	Aerial	Fixed wing	250	40	50
		Rotary	300	35	45

See introduction for an explanation of the different habitats.

- Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.

† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

- DO NOT mix, load or clean equipment within 30 metres of wellheads or aquatic systems.
- **Rotational plant-back intervals for:**
  - ***Field corn*** – immediate plant back
  - ***Wheat, barley and alfalfa*** – 30 days
  - ***All other crops*** – 12 months

Precautions:

Storage: Store in a cool, dry place in such a manner to prevent cross contamination with other pesticides, fertilizers, food and feed. DO NOT store below freezing.

Environmental Hazards:

Bees: May be toxic to bee brood. Bee brood may be exposed to residues on pollen and nectar brought back to the hive by bees foraging on flowering crops and weeds. To minimize potential exposure to bees, avoid application if bees are visiting the treatment area.
Aquatic organisms: Toxic to aquatic organisms. Avoid application of this product when heavy rain is forecast.
Others: Toxic to certain beneficial insects.

Hazard Rating:

Caution – Poison
Eye Irritant
Refer to the introduction for an explanation of the symbols.

Permethrin

Insecticide Group 3A

Company:

FMC Corporation (*Pounce 384 EC* – PCP#16688)
UPL AgroSolutions Canada Inc. (*Perm-UP* – PCP#28877)
AMVAC (*Ambush 500 EC*– PCP#14882)
Interprovincial Cooperative Limited (*IPCO Syncro* – PCP#33838)

Formulations:

Pounce 384 EC – 384 g/L permethrin formulated as an emulsifiable concentrate.
- Container sizes - 12 x 1 L, 2 x 10 L

IPCO Synchro – 384 g/L permethrin formulated as an emulsifiable concentrate.
- Container sizes - 2 x 10 L, 12 x 1 L, 4 x 6 L, 2 x 7.5 L

Perm-UP - 384 g/L permethrin formulated as an emulsifiable concentrate.
- Container sizes - 12 x 1L, 4 x 6L

Ambush 500 EC – 500 g/L permethrin formulated as an emulsifiable concentrate.
- Container size - 3.8 L

Insects Controlled and Registered Crops:

Crop	Insect
Cereals, corn, flax, lentil, pea, potato, sunflowers (up to 5 leaves)	Cutworm
Canola, rapeseed (up to 5 leaves)	Cutworm, crucifer flea beetle, striped flea beetle (*Ambush* and *Pounce*)
Potato	Colorado potato beetle, potato flea beetle, potato leafhopper, tarnished plant bug, variegated cutworm, European corn borer

Application:

Permethrin

- May be applied by ground or air. Apply when insects exceed economic threshold numbers and use sufficient water for good coverage. Use higher rates for heavy infestations, adult insects and dense foliage. For cutworm control application should be made under warm, moist conditions in the evening or at night. Use high rates if larvae are near maturity or soil conditions are dry. DO NOT disturb soil surface for 5 days after treatment.

How it Works:

Permethrin is a synthetic pyrethroid insecticide. It is a stomach and contact insecticide with no systemic or fumigant effects.

Tank Mixes:

Pounce 384EC Insecticide is registered to tank-mix with Coragen Insecticide. Apply mixes based on the most restrictive use limitations for either label. According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Restrictions:

- **Grazing:** Cover crops or crops treated with *permethrin* should not be used as a green feed for animals.
- **Pre-harvest interval:**
  - ***Corn*** – 30 days
  - ***Sweet corn*** – 1 day
  - ***Lentils, peas, wheat, barley, oats, rye*** – 7 days
  - ***Potatoes*** – 1 day
- **Storage:** Store above -12°C.
- A 16 yard (15 metres) setback distance for ground and 110 yard (100 metres) setback distance by air near water bodies or other sensitive areas.
- **Buffer Zones:** To reduce risk to aquatic organisms from run-off, a vegetative filter strip of at least 10 metres wide between the field edge and adjacent, downhill aquatic habitats must be observed. See label for more details.

Application method			**Buffer Zones (metres) Required for the Protection of:**	
			Aquatic Habitats of Depths	
			Less than 1 m	Greater than 1 m
Canola, barley, field corn, flax, oats, pea, rye, sunflower, wheat, lentil	**Ground**		10	5
Potato			35	15
Barley, field corn, flax, oats, peas, potato, rye, sunflower, triticale, wheat, canola, lentils	**Aerial**	**Fixed wing**	800	800
		Rotary	700	475

Precautions:

Permethrin is of low acute mammalian toxicity.

Environmental Hazards:

Bees: very toxic to bees; avoid spraying when bees are foraging. Spray deposit should be dry before bees commence foraging in treated crop.

Aquatic organisms: Highly toxic to fish and aquatic organisms. DO NOT contaminate ponds, lakes, streams or rivers during sprayer filling or rinsing operations or while spraying.

Toxic to certain beneficial insects. Minimize spray drift to reduce harmful effects on beneficial insects in habitats next to the application site such as hedgerows and woodland. *Permethrin* may impact predatory and parasitic arthropod species used in IPM programs within the treatment area. Unsprayed refugia for beneficial species of at least 1 metre from treatment area will help maintain beneficial arthropod populations.

Hazard Rating:

Caution – Poison

Refer to the introduction for an explanation of the symbols.

Plutex

Insecticide Group 31

Company:
Andermatt Canada Inc. (PCP# 34785)

Formulation:
Plutella xylostella granulovirus (PlxyGV) isolate GV-0020. Minimum of 2.5 x 1013 occlusion bodies (OBs)/L.
- Container size - 100mL-1000L

Insects Controlled and Registered Crops:

Crop	Insect
Canola	Diamondback moth

Application:
- *Plutex* is for ground application only.
- Spray on plants infested with eggs or 1st instar larvae. To be effective, larvae must ingest foliage or fruits with deposits of *Plutex*.
- Apply as a full coverage spray using enough water to sufficiently cover the crop without excess run-off, minimum 200 L/ha. Re-apply every 4-8 days. Within the stated range, use the shorter re-application interval and higher application rate under high pest pressures.
- Dissolve product in the required amount in water. The pH of the solution should range between 5 and 8.5. Depending upon weather conditions and the persistence of the pest infestation, the applications may be repeated every 6-8 days. Between 2 to 5 applications may be required per generation. The use of pheromone traps is recommended to optimize application timing.

How it Works:
The active ingredient in Plutex is a naturally occurring virus of the diamondback moth (*Plutella xylostella*). It is a highly selective pathogen of the diamondback moth. It infects larvae by ingestion and passage through the digestive organs. Topical application has no effect

Tank Mixes:
According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Restrictions:
- **Restricted Entry Interval:** 4 hours or until sprays have dried unless wearing waterproof gloves, long-sleeved shirt, long pants, socks and shoes
- **Pre-harvest interval:** Plutex can be used up to and including the day of harvest. PHI=0 days
- As this product is not registered for the control of pests in aquatic systems, DO NOT use to control aquatic pest.
- DO NOT apply in greenhouses.
- DO NOT apply this product by any type of irrigation system.
- DO NOT contaminate irrigation or drinking water supplies or aquatic habitats by cleaning of equipment or disposal of wastes.
- DO NOT apply by air.
- **Storage:** Plutex® can be stored in the refrigerator (<5°C) for two years from the date of manufacture. Store container upright and keep tightly closed when not in use. Shake vigorously to re-suspend contents immediately prior to addition in water

Environmental Hazards:
To reduce runoff from treated areas into aquatic habitats, avoid application to areas with a moderate to steep slope, compacted soil or clay.
Avoid application when heavy rain is forecast.
Contamination of aquatic areas as a result of runoff may be reduced by including a vegetative filter strip between the treated area and the edge of the water body.

Hazard Rating:
Not Classified; No hazardous components.

Rimon 10 EC

Insecticide Group 15

Company:
UPL AgroSolutions Canada Inc. (PCP#28881)

Formulation:
10% novaluron formulated as an emulsifiable concentrate.
- Container size - 2 x 10L

Insects Controlled and Registered Crops:

Crop	Insect
Alfalfa (for seed)	Lygus bug nymphs
Potato	Colorado potato beetle, European corn borer

Application:
Rimon 10 EC
- For ground application only.
- A minimum spray volume of 40 L per acre for potatoes, a minimum spray volume of 80 L per acre for alfalfa. Higher water volumes will provide better coverage and product performance. Re-application interval of 10 to 14 days in potatoes and 7 to 10 days in alfalfa.
- Use hollow cone, disc-core hollow cone or twin jet nozzles suitable for Insecticide spraying. Drop nozzles may be required to obtain uniform coverage against certain insect pests that develop down in the canopy. Use higher application rates and spray volumes for higher insect pressure.
- Lygus bugs – application should be made when lygus bugs appear
- Colorado potato beetle – Application should be made when the majority of the population is at egg hatch to the second instar of larval development.
- European corn borer – Scout for European corn borer to monitor egg-laying and egg hatch to determine timing of application. The first application should be made just prior to egg hatch.
- Re-application on a 10 to 14 day interval will be required to protect new growth or if monitoring indicates that it is necessary to keep pest populations below economic thresholds.

How it Works:
Rimon 10 EC is an insect growth regulator that must be absorbed by eggs or ingested by insect larvae to be fully effective. The primary mode of action is by disrupting cuticle formation and deposition occurring when insects change from one developmental stage to another, resulting in death at molting. Due to this mode of action, *Rimon 10EC* does not have any effect on adult stages of insects that have completed larval development.

Restrictions:
- DO NOT make more than 2 applications per year per crop per season. DO NOT apply more than 664 mL of *Rimon 10 EC* per acre per season in potatoes. DO NOT apply more than 676 mL of *Rimon 10 EC* per acre per season in alfalfa. DO NOT apply within 14 days of harvest (Pre-harvest interval).

Precautions:
- **Restricted Entry Interval:** DO NOT re-enter treated areas for a period of 12 hours after application.
- **Buffer Zone:** An untreated buffer zone between the last spray swath and the edge of aquatic systems (such as rivers, streams, lakes, and other water bodies) must be established. Refer to label for specific buffer zone requirements.
- **Storage:** To prevent contamination, store this product away from food or feed.

If this product is to be applied to a product destined for export to the United States, information on acceptable residue levels are available at **www.croplife.ca**.

Environmental Hazards:
Bees: May be toxic to bee colonies exposed to direct treatment, drift, or residues on flowering crops or weeds. Avoid applying this product to flowering crops or weeds if bees are visiting the treatment area.
Aquatic organisms: Toxic to aquatic organisms. Avoid application of this product when heavy rain is forecast. DO NOT apply directly to water or to areas where surface water is present.
Others: *Rimon 10 EC* is toxic to immature insects. Minimize spray drift in habitats next to the application site (e.g. hedgerows and woodlands) to reduce harmful effects on beneficial insects.

Hazard Rating:

Warning – May cause substantial but temporary eye injury. Harmful if absorbed through skin.
DO NOT get on eyes or clothing.
Keep out of reach of children.
Refer to the introduction for an explanation of the symbols.

Scorpio Ant and Insect Bait

Insecticide Group 5

Company:

W. Neudorff GmbH KG (PCP#33306)
Distributed in Canada by Belchim Crop Protection Canada

Formulation:

0.07% spinosad formulated as an emulsifiable concentrate.

- Container size - 1 to 800 kg

Insects Controlled and Registered Crops:

Crop	Insect
Potato	Black cutworm, reduces damage caused by wireworm
Dry bean, faba, chickpea, lentil, field pea, soybean	Black cutworm, reduces damage caused by wireworm

Application:

- Granular Bait – Spreader. DO NOT place in piles.
- To reduce damage caused by wireworm: Incorporate into the soil at planting to a depth of 10 to 20 cm at a rate of 25 to 50 kg per hectare (2.5 to 5.0 g per square metre). Use the high rate when wireworm pressure is expected to be high.
- Black cutworm – Reapply after heavy rain or watering. Reapply as the bait it is consumed or every 4 weeks.

How it Works:

Scorpio Ant and Insect Bait in the spinosyn class of insecticides. It is a stomach insecticide.

Effects of Weather:

Avoid application when heavy rain is forecast.

Restrictions:

- **Pre-harvest Interval:**
  - ***Potatoes*** – 7 days
  - ***Dry bean, faba bean, chickpea, lentil, field pea, soybean*** – 28 days
- **Storage:** To prevent contamination store this product away from food and feed.
- **Other:** Maximum of 2 applications per year. DO NOT apply by air.

Precautions:

Avoid contact with eyes, skin and clothing. DO NOT allow adults, children or pets in treatment areas during application. Wash immediately after using this product. Wear long-sleeved shirt, long pants, chemical-resistant gloves, shoes plus socks during loading, application, clean-up and repair.

Environmental Hazards:

Bees: Toxic to bees.

Aquatic organisms: Toxic to aquatic organisms. To reduce runoff from treated areas into aquatic habitats avoid application to areas with a moderate to steep slope, compacted soil, or clay. Avoid application when heavy rain is forecast. Contamination of aquatic areas as a result of runoff may be reduced by including a vegetative strip between the treated area and the edge of the water body.

Others: Toxic to certain beneficial insects.

Hazard Rating:

Warning – May be harmful if swallowed. May be harmful in contact of skin. Causes mild skin irritation. Causes eye irritation.
May be harmful if inhaled.

Refer to the introduction for an explanation of the symbols.

Sefina

Insecticide Group 9

Company:
BASF (PCP#33265)

Formulation:
50 g/L afidopyropen formulated as a dispersible concentrate.
- Container size - 2 x 3.24 L jug

Insects Controlled and Registered Crops:

Crop	Insect
Soybean	Soybean aphid
Potato	Potato aphid, green peach aphid, suppression of potato leafhopper
Alfalfa, clover (*Trifolium* spp., *Melilotus* spp.), lupin, sainfoin, trefoil, vetch (crown, milk)	Pea aphid, spotted alfalfa aphid, potato leafhopper (suppression only)
Grass forage, fodder, hay	Pea aphid, blue alfalfa aphid (suppression), spotted alfalfa aphid (suppression), potato leafhopper (suppression)

Application:
Sefina
- May be applied by ground or air.
- Apply *Sefina* at rates listed in the crop specific application rate tables when insect thresholds are reached. Ensure adequate water volumes are used for optimum coverage.
- **Soybean and Potato:**
  - ***Ground*** – Apply in a minimum of 40.5 to 81 L of water per acre.
  - ***Air*** – Apply in a minimum of 20.2 L of water per acre.

How it Works:
Sefina is classified as an IRAC Group 9D insecticide with no known cross resistance to other chemistries. It is a contact insecticide that stops aphid feeding quickly and can provide control for up to 21 days.

Effects of Weather:
Apply only when meteorological conditions at the treatment site allow for complete and even crop coverage. DO NOT apply during periods of dead calm. Avoid application of this product when winds are gusty. This product has the potential for run-off. Avoid application when heavy rain is forecast.

Restrictions:
- **Restricted Entry Interval:** DO NOT enter or allow worker entry into treated areas for a period of 12 hours after application.
- Allow a minimum of 7 days between applications.
- **Storage:** Store the leftover product in original, tightly closed container. DO NOT ship or store the product near food, feed, seed and fertilizers. Store the product in cool, dry, locked, well-ventilated area without floor drain.
- **Others:**
  - DO NOT apply more than a maximum seasonal rate of 1 L per acre (potato), 0.16 L per acre (soybean), or 0.5 L per acre (alfalfa, clover, lupin, sainfoin, trefoil, vetch).
  - DO NOT apply within 7 days of harvest.
  - DO NOT feed or graze soybean hay or forage.
  - DO NOT apply less than 7 days before harvest for potato and soybean.
  - DO NOT apply more than 2 applications per year (soybean), or 4 applications per year (potato, alfalfa, clover, lupin, sainfoin, trefoil, vetch
  - DO NOT make more than 2 sequential applications of *Sefina* insecticide before using an insecticide with a different mode of action.

Precautions:

Wear a long-sleeved shirt, long pants, chemical-resistant gloves, socks and shoes during mixing, loading, application, clean-up and repair. Gloves are not required during application within a closed cab and/or cockpit. Wash hands before eating, drinking, smoking or using the toilet. Change out of work clothes and take a bath or shower after handling or spraying the product. Launder protective clothing before re-use.

A Vegetative Filter Strip (VFS) of at least 10 metres wide must be observed. The VFS is required between the field edge and adjacent, downhill aquatic habitats to reduce risk to aquatic organisms from run-off. The VFS is to be composed of grasses and may also include shrubs, trees, or other vegetation.

Allow a minimum of 7 days between applications.

- **Buffer Zones:**

Application method	**Crop**		**Buffer Zones (metres) Required for the Protection of:**	
			Freshwater Habitat of Depths:	
			Less than 1 m	Greater than 1 m
Ground*	Soybean		1	1
	Potato		3	2
	Alfalfa, clover, lupin, sainfoin, trefoil, vetch		2	1
Aerial	Soybean	Fixed wing	10	1
		Rotary wing	10	1
	Potato	Fixed wing	75	25
		Rotary wing	65	20
	Alfalfa, clover, lupin, sainfoin, trefoil, vetch	Fixed wing	25	10
		Rotary wing	20	10

Environmental Hazards:

Bees: Application during the crop blooming period may be made only in the evening when most bees are not foraging. Minimize spray drift to reduce exposure to bees in habitats close to the application site.
Aquatic organisms: Toxic to aquatic organisms. Observe buffer zones and vegetative filter strips specified under directions for use.

Hazard Rating:

Caution – Poison

Refer to the introduction for an explanation of the symbols.

Sevin XLR

Insecticide Group 1A

Company:
Tessenderlo Kerley, Inc. (PCP#27876)

Formulation:
466 g carbaryl per litre formulated as a liquid suspension.

Insects Controlled and Registered Crops:

Crop	Insect
Beans	Leafhoppers, lygus bugs, climbing cutworm
Canola	Flea beetles
Forage grasses	Grasshoppers
Ditchbanks, field borders, headlands, pastures, rangelands, rights-of-way, wastelands	Grasshoppers
Peas	Alfalfa looper
Potato	Colorado potato beetle, flea beetle, leafhopper, European corn borer, climbing cutworm

Application:
- Ground application only, except for canola.
- For grasshoppers, lower rates can be used for nymphs or sparse vegetation, and higher rates for adults and application to dense vegetation.
- In canola, applications can be made up to 4 weeks following plant emergence.

How it Works:
Sevin XLR is a carbamate insecticide that works by contact and ingestion.

Restrictions:
- **Storage:** DO NOT store in areas where temperatures frequently exceed 38°C. Store in original container in a cool dry area out of reach of children and animals and away from food and feed.
- **Restricted-Entry Intervals:**
  - ***Beans*** – 7 days for high contact activities such as scouting
  - ***Canola*** – 0.5 days
  - ***Forage grasses and pastures*** – 2 days
  - ***Potatoes*** – 0.5 to 6 days depending on the activity (see label).
- **Number of applications per year:** maximum of 2 applications per year in canola, beans, and potatoes.

Environmental Hazards:
Bees: This product is highly toxic to honey bees exposed to direct treatment on blooming crops or weeds. For applications on crops that are highly attractive to pollinators DO NOT apply during the crop blooming period.

Aquatic organisms: Toxic to aquatic organisms. Avoid application of this product when heavy rain is forecast.

Plants: To avoid possible injury to tender foliage, do not apply to wet foliage or when rain or high humidity is expected during the next 2 days. *Sevin XLR* injures Boston ivy, Virginia creeper and Maidenhair fern.

Others: Toxic to birds and mammals.

Hazard Rating:
Warning – Poison

Refer to the introduction for an explanation of the symbols.

Sivanto Prime

Insecticide Group 4D

Company:
Bayer (PCP#31452)

Active Ingredient:
Flupyradifurone

Formulation:
200 g Flupyradifurone per litre formulated as a liquid suspension.
- Container size - 2 L

Insects Controlled and Registered Crops:

Crop	Insect
Potato	Aphids, leafhoppers, Colorado potato beetle
Corn	Aphids
Chickpea, dry bean, faba bean, field pea, lentil, soybean, alfalfa (forage, silage and hay production only)	Aphids, leafhoppers

Application:
- Apply once the target pest population has reached economic threshold according to local recommendations.
- DO NOT apply within 1 hour of rain. Avoid application when heavy rain is forecast.
- **Potato:**
  - ***Application interval*** – 10 days
    - *Ground* – Apply as a directed foliar spray ensuring thorough coverage. Minimum 40 L per acre.
    - *Air* – Minimum 8 L per acre. DO NOT apply during periods of dead calm. Avoid application of this product when winds are gusty.
  - ***Pre-harvest interval*** – 7 days
  - ***Grazing interval*** – DO NOT graze.
- **Corn:**
  - ***Application interval*** – 7 days
    - *Ground* – Apply as a directed foliar spray ensuring thorough coverage. Minimum 40 L per acre.
    - *Air* – Minimum 8 L per acre. DO NOT apply during periods of dead calm. Avoid application of this product when winds are gusty.
  - ***Pre-harvest interval*** – 7 days (sweet corn, forage, silage, hay cutting); 21 days (grain, stover)
  - ***Grazing interval*** – 7 days
- **Chickpea, dry bean, faba bean, field pea, lentil, soybean:**
  - ***Application interval*** – 10 days
    - *Ground* – Apply as a directed foliar spray ensuring thorough coverage. Minimum 40 L per acre.
    - *Air* – Minimum 8 L per acre. DO NOT apply during periods of dead calm. Avoid application of this product when winds are gusty.
  - ***Grazing interval*** – 7 days
- **Alfalfa (forage, silage and hay production only):**
  - ***Application interval*** – 10 days
    - *Ground* – Minimum 40 L per acre
  - ***Pre-harvest interval*** – 7 days, except – soybean grain 21 days
  - ***Grazing interval*** – 7 days

How it Works:
Sivanto Prime is a broad spectrum systemic insecticide that works by contact and ingestion.

Restrictions:
- **Storage:** Store in cool, dry place and in such a manner as to prevent cross contamination with other pesticides, fertilizers, food, and feed
- **Restricted-Entry Intervals:** 12 hours.
- **Number of applications per year:** maximum of 809 mL per acre per year.

Tank Mixes:

DO NOT tank mix with azole fungicides during bloom. According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Buffer Zones:

Application method	Crop		Buffer Zones (metres) Required for the Protection of:			
			Freshwater Habitat of Depths:		Estuarine/Marine Habitats of Depths:	
			Less than 1 m	Greater than 1 m	Less than 1 m	Greater than 1 m
Ground*	Chickpea, dry bean, faba bean, field pea, lentil, soybean, potatoes, corn, alfalfa		1	1	1	1
Aerial	Chickpea, dry bean, faba bean, field pea, lentil, soybean, potatoes and corn	Fixed wing	10	1	5	1
		Rotary wing	5	1	1	1

For tank mixes, consult the labels of the tank-mix partners and observe the largest (most restrictive) buffer zone of the products involved in the tank mixture and apply using the coarsest spray (ASAE) category indicated on the labels for those tank mix partners.

Environmental Hazards:

Bees: Toxic to adult bees in laboratory studies via oral exposure; however, not toxic to bees through contact exposure, and field studies conducted with this product have shown no effects on honeybee colony development. Minimize spray drift to reduce exposure to bees in habitats close to the application site. Application during the crop blooming period, and when flowering weeds are present may only be made in the early morning and the evening when most bees are not foraging. Toxic to certain beneficial insects. Minimize spray drift to reduce harmful effects on beneficial insects in habitats next to the application site such as hedgerows and woodland.

Aquatic organisms: Toxic to aquatic organisms. The buffer zones for this product can be modified based on weather conditions and spray equipment configuration by accessing the Buffer Zone Calculator on the Pest Management Regulatory Agency website.

Others: *Sivanto Prime* is of low acute mammalian toxicity. Toxic to certain beneficial insects.

Hazard Rating:

Warning – May cause an allergic skin reaction. Harmful if inhaled.

Refer to the introduction for an explanation of the symbols.

Sluggo Professional

Molluscicide – no group

Company:
Belchim Crop Protection (PCP#30025)

Formulation:
0.76% ferric phosphate in a granular formulation.
- Container sizes - 5, 25 kg bags

Insects Controlled and Registered Crops:

Crop	Insect
Field crops	Slugs and snails

Rates:
Apply bait evenly at a rate of 4.9 to 20.2 kg / acre (1.2 to 5 g per square metre).

Application:
Sluggo
- Apply in the evening as slugs and snails travel and feed mostly at night or early morning. DO NOT place in piles. For best results the ground should be moist but with little or no standing water.
- For broadcast application, standard broadcast spreaders may be used. For row application, standard granular spreaders may be used.
- At seeding and later stages, apply the bait between rows and around the perimeter of the field. Treating around the perimeter of crop areas may intercept slugs or snails migrating from daytime refuge sites.
- Apply at the higher rate within the recommended rate range if the infestation is severe, if the area is heavily watered or after long periods of heavy rain.
- Re-apply as the bait is consumed or at least every two weeks if slugs and snails continue to be a problem.

How it Works:
Sluggo must be consumed by the slugs or snails to be effective. After ingesting the bait, slugs and snails stop feeding providing immediate protection to plants. Affected slugs and snails die within 3 to 6 days.

Precautions:
Avoid contact with eyes. May cause eye irritation.
Wear chemical resistant gloves during mixing and loading activities and when applying by hand.

Environmental Hazards:
Aquatic organisms: This product may be toxic to fish and other aquatic organisms. Avoid direct application to ponds, streams and lakes.

Hazard Rating:
Warning – Contains the Allergen Wheat
Refer to the introduction for an explanation of the symbols.

Success Insecticide

Insecticide Group 5

Company:
Corteva Agriscience (PCP#26835)

Formulation:
480 g/L spinosad formulated as a suspension concentrate.
- Container size - 1 L jug

Insects Controlled and Registered Crops:

Crop	Insect
Potato	Colorado potato beetle larvae and European corn borer larvae

Application:
Success 480 SC
- Apply when scouting indicates the target pest species have reached economic threshold levels. For Colorado potato beetle, target eggs at hatch or small larvae. For control of European corn borer, time the application to coincide with peak egg hatch. Use higher application rate for higher pest pressure or when extended egg hatch is anticipated. If pest populations persist, a repeat application 7 to 10 days after the initial application may be necessary.
- Spinosyns require a spray solution pH between 6 to 8. This is important for the efficacy of the product. It is recommended that growers test the pH of the spray solution prior to adding a spinosyn to the spray tank.

How it Works:
Success 480 SC is in the spinosyn class of insecticides. It is a contact and stomach insecticide. It is derived from the fermentation of *Saccharpolyspora spinosa*.

Effects of Weather:
This product has the potential for run-off. DO NOT spray immediately after a rainfall or if rain is forecast within 48 hours after application.

Restrictions:
- **Restricted Entry Interval:** DO NOT enter or allow worker entry into treated areas for a period of 12 hours after application.
- **Storage:** Avoid freezing. DO NOT store or ship with food, feeds, drugs or clothing.
- **Others:**
  - ***Potatoes*** – DO NOT apply more than a maximum seasonal rate of 100 mL per acre. DO NOT apply within 7 days of harvest.

Precautions:
May cause eye and skin irritation.
Buffer Zones: For ground applications, a buffer zone of 2 metres (early season) or 1 metre (late season) is required between downwind edge of spray boom and sensitive aquatic habitats. Avoid contact with eyes, skin, and clothing.

Environmental Hazards:
Bees: Highly toxic to bees exposed to direct treatment, drift or residues on blooming plants. DO NOT apply this product or allow it to drift to blooming plants if bees are visiting the treatment area.
Aquatic organisms: Highly toxic to aquatic invertebrates. DO NOT contaminate aquatic habitats, such as lakes, rivers, sloughs, ponds, coulees, prairie potholes, creeks, marshes, streams, reservoirs, and wetlands, when cleaning and rinsing spray equipment or containers.
Others: Harmful to parasitoids and predatory mites and slightly harmful to foliage-dwelling predators.

Superior 70 Oil

Insecticide Group
NA

Company:
Loveland Products Canada Inc. (*Superior 70 Oil* – PCP#14981)
N.M. Bartlett Inc. (*Superior "70" Oil* – PCP#9542)

Formulation:
Mineral Oil, 99%, emulsifiable concentrate.
- Container sizes - 10 L, 200 L and 1000 L

Insects Controlled and Registered Crops:

Crop	Pest	Application Timing:
Potato	Reduce the spread of Potato Virus Y (PVY) transmitted by aphids.	Maximum 10 applications when aphids first appear; Pre-harvest interval: 14 days.

Application:
Superior 70 Oil
- Ground application only. DO NOT apply by air.
- DO NOT use the spray mixture before the oil has been properly emulsified. Spray at one week intervals as soon as aphid vectors are present.
- Thorough coverage of the plants is essential. Apply at a 10 percent rate (e.g. 10 L per 1000 L water). Boom height must be 60 cm or less above ground or crop canopy.

How it Works:
The mineral oil reduces the spread of potato virus Y (PVY) disease vectored by aphids. The mineral oil does not kill the aphids.

Tank Mixes:
According to the Pest Management Regulatory Agency of Health Canada's Guidance Document on Tank Mix Labelling (March 2023), unlabelled tank mixes of this product are permitted only if the label of this product and the label of the product it might be mixed with include at least general wording on their respective labels indicating they may be mixed with other pesticides. When tank mixes are permitted, apply mixes according to the most restrictive use limitations for either product.

Effects of Weather:
Avoid application when heavy rain is forecast.
DO NOT apply on drought stressed plants, in hot sun or when there is a risk of freezing temperatures.
DO NOT apply during periods of dead calm. DO NOT apply when winds are gusty or wind speed is greater than 16 km/h.

Restrictions:
- **Maximum number of applications:** 10 per season
- **Restricted Entry Interval:** DO NOT re-enter treated areas within 12 hours of application.
- **Pre-harvest interval:** 14 days
- **Storage:** Store in original tightly closed container in a cool dry, well-ventilated area away from feed and foodstuffs. DO NOT store below 0°C.

Precautions:
DO NOT use within 30 days before or after using Sulfur.

Environmental Hazards:
Aquatic organisms: DO NOT contaminate irrigation or drinking water supplies or aquatic habitats by cleaning of equipment or disposal of wastes.

Hazard Rating:
Danger – Poison, Eye Irritant

Refer to the introduction for an explanation of the symbols.

Thimet 20G

Insecticide Group 1B

Company:
AMVAC (PCP#29000)
This product is ONLY for retail sale to and use by individuals holding an appropriate provincial pesticide applicator certificate or license.

Formulation:
20% phorate formulated as a granular.
- Container size - 22 kg SmartBox closed loading system

Insects Controlled and Registered Crops:

Crop	Insect
Potato	Reduction of wireworm damage

Application:
Thimet 20G
- Ground application only at seeding time: This is a restricted product and can only be applied with a *SmartBox* pesticide application system properly calibrated to ensure accurate placement and rate. Distribute granules evenly in furrow at planting time only. Use low rate for sandy or light soils and high rate for silt or heavy soils. For use ONLY in potato fields where wireworm populations have been observed.

How it Works:
Phorate is an organophosphate insecticide that works as a systemic poison, with effective initial residual activity on soil and foliar insects.

Restrictions:
- DO NOT apply *Thimet* more than once per season.
- DO NOT apply *Thimet* to saturated soils or in wet conditions that may prevent the equipment from covering pesticide granules. DO NOT apply while precipitation is occurring and conducive to run-off from treated areas. DO NOT apply if intense or sustained precipitation is forecast to occur within 48 hours as this will favour run-off.
- Leave a 20 metre (66 feet) buffer area if used on highly erodable land adjacent to aquatic bodies. DO NOT apply within 15 metres (50 feet) of any drinking water well.
- **Storage:** DO NOT store in or around the home. Store away from food or feed. All SmartBox containers must be returned per instructions provided.
- **Others:** DO NOT use in muck soils. DO NOT apply later than at planting time. Will provide reduction of wireworm damage.
- DO NOT use on muck soils.
- A plant-back interval of 6 months is required for all crops except potatoes is required. There is no plant-back restriction for potatoes.
- DO NOT enter or allow workers to enter into treated areas for a period of 48 hours. DO NOT harvest potatoes before 90 days after planting time.

Precautions:
Thimet is of high acute mammalian toxicity. DO NOT allow product to contact eyes and skin. Poisonous by skin contact, inhalation or swallowing. DO NOT breath dust. Repeated inhalation or skin contact with *Thimet 20G*, other organophosphorus or carbamate insecticides may, without symptoms, progressively increase susceptibility to poisoning. Wear freshly-laundered, long-sleeved work clothing daily. DO NOT handle *Thimet* with bare hands. Use rubber gloves when transferring from package to equipment. Sleeve cuffs should be worn over gloves to prevent granules from falling into the gloves. Rubber gloves should be washed with soap and water after each use. Destroy and replace gloves frequently. In case of contact, immediately remove contaminated clothing and wash skin thoroughly with soap and water.

Environmental Hazards:
Aquatic organisms: Toxic to aquatic organisms. DO NOT apply while precipitation conducive to runoff is occurring or while conditions favor runoff from the treated area. DO NOT apply when forecasted precipitation event favors runoff from treated area.

Others: Toxic to earthworms. Toxic to birds and small wild mammals. Any spilled or exposed granules must be incorporated into the soil or otherwise cleaned-up from the soil surface. One granule is sufficient to kill a small bird or small mammal.

Hazard Rating:
Danger – Poison
Refer to the introduction for an explanation of the symbols.

Vayego 200 SC

Insecticide Group 28

Company:
Bayer (PCP#33711)
This product is ONLY for retail sale to and use by individuals holding an appropriate provincial pesticide applicator certificate or license.

Formulation:
Tetraniliprole at 200 g/L, formulated as a suspension concentrate.
- Container sizes - 0.25 L to 1000 L

Insects Controlled and Registered Crops:

Crop	Insect
Potato	Foliar application: Colorado potato beetle, European corn borer, flea beetles, aphids (suppression) In-furrow (at planting): Colorado potato beetle, flea beetle
Corn	European corn borer, corn earworm, cutworms, armyworms, flea beetles, aphids (suppression)
Soybean	Cutworms, armyworms

Application:
vayego 200 SC
- **Potato**
  - ***Foliar:*** Minimum application volume:
    - *Ground* – 40.5 L per acre
    - *Aerial (potatoes only)* –20.2 L per acre
    - *Maximum foliar application of* vayego 200 SC *per crop season:*
      - *Potatoes, soybean* – 121.4 mL per acre (24.3 g ai/acre)
      - *Corn* – 242.8 mL per acre (48.6 g ai/acre)
  - ***In-furrow (potato at planting):*** Minimum application volume: 20.2 L per acre
    - *Maximum in-furrow application of* vayego 200 SC *per crop season:* 303.5 mL per acre (60.7 g ai/acre)

How it Works:
Tetraniliprole disrupts muscle activity in the insects, resulting in paralysis. Treated pests stop feeding quickly after ingestion, become lethargic and lose mobility.

Restrictions:
- **Foliar application:** DO NOT apply more than twice per year in potatoes or soybean, four times per year in corn.
- **Minimum interval between applications:** 10 days for potatoes, 14 days for corn and soybeans.
- **Rainfast period:** 1 hour
- **Restricted Entry Interval:** 12 hours
- DO NOT graze after treatment.
- **Pre-harvest interval:** 14 days
- **Storage:** To prevent contamination, store this product away from food or feed. Keep in a closed container.
- **Buffer Zones:**

Application method	**Crop**		**Buffer Zones (metres) Required for the Protection of:**		
			Aquatic Habitats of Depths		Terrestrial habitat
			Less than 1 m	Greater than 1 m	
Ground*	Corn		10	5	0
	Potato, soybean		5	3	0
Aerial	Potato	Fixed wing	55	15	0
		Rotary wing	40	15	0

Precautions:

Wear a long-sleeved shirt, long pants, chemical-resistant gloves, socks and shoes during mixing, loading, application, clean-up and repair. Gloves are not required during application within a closed cab and/or cockpit. Follow manufacturer's instructions for cleaning and maintaining PPE. If no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry. Users should wash hands before eating, drinking, chewing gum, using tobacco or using the toilet. Remove clothing immediately if pesticide gets inside, then wash thoroughly and put on clean clothing. Remove PPE immediately after handing this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

Environmental Hazards:

Bees: Toxic to bees. DO NOT apply during crop blooming.

Aquatic organisms: Toxic to aquatic organisms. DO NOT apply while precipitation conducive to runoff is occurring or while conditions favor runoff from the treated area. DO NOT apply when forecasted precipitation event favors runoff from treated area. Observe buffer zones specified under directions for use.

Others: Toxic to certain beneficial insects. Minimize spray drift to reduce harmful effects on beneficial insects in habitats next to the application site such as hedgerows and woodland.

Hazard Rating:

Low toxicity.

Verimark

Insecticide Group 28

Company:

FMC Corporation (PCP#30892)

Formulation:

Cyantraniliprole at 200 g/L, formulated as a suspension concentrate.

- Container size - 4 x 2.365 L per case

Insects Controlled and Registered Crops:

Crop	Insect	Rate
Potato	Colorado potato beetle, potato flea beetle	In-furrow application: 6.75 to 9 mL/100 m of row (303 to 404 mL/acre based on 90 cm row spacing).

Application:

Verimark

- Apply as a narrow band in-furrow. For best results, direct spray on the seed pieces in the furrow.

How it Works:

The active ingredient cyantraniliprole is a systemic insecticide from the diamides chemical class. Although it has contact activity, it is most effective through ingestion of treated plant material.

Restrictions:

- **Foliar application:** DO NOT make more than 1 soil application per year. DO NOT exceed a total of 0.6 L of *Verimark* per acre per year. Use only a closed treatment system.
- **Minimum interval between applications:** DO NOT make a subsequent foliar application of any Group 28 insecticide for a minimum of 60 days following an in-furrow application of *Verimark* insecticide.
- **Restricted Entry Interval:** 12 hours

Precautions:

Wear a long-sleeved shirt, long pants, chemical resistant gloves, socks and shoes while mixing/loading, applying and during clean up and repair. Follow manufacturer's instructions for cleaning/maintaining personal protective equipment (PPE). If no such instructions for washables are available, use detergent and hot water. Keep and wash PPE separately from other laundry. Users should wash hands before eating, drinking, chewing gum, using tobacco or using the toilet. Remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing. Store product in original container only, away from other pesticides, fertilizer, food or feed. DO NOT use or store in or around the home. Keep container closed. To prevent contamination, store this product away from food or feed.

Colorado potato beetle resistance management: DO NOT apply any Group 28 insecticide for Colorado potato beetle control if *Verimark* insecticide was used at planting as an in-furrow treatment.

Environmental Hazards:

Avoid application when heavy rain is forecast. DO NOT contaminate irrigation or drinking water supplies or aquatic habitats by cleaning of equipment or disposal of wastes. To reduce runoff from treated areas into aquatic habitats, avoid application to areas with a moderate to steep slope, compacted soil, or clay. Contamination of aquatic areas as a result of runoff may be reduced by including a vegetative strip between the treated area and the edge of the water body.

Bees: Toxic to bees. This product is systemic, and bees can be exposed to product residues in flower, leaves, pollen and/or nectar resulting from soil applications. However, when this product is applied and used according to label directions, the risk to bees is expected to be negligible.

Aquatic organisms: Toxic to aquatic organisms.

Hazard Rating:

Low toxicity.

Voliam Xpress

Insecticide Group 3A 28

Company:

Syngenta Canada Inc. (PCP#30325)

Formulation:

50 g/L lambda-cyhalothrin and 100 g/L chlorantraniliprole formulated as a suspension concentrate.

- CContainer size – 4 x 3.78 L pack

Insects Controlled and Registered Crops:

Crop	Insect
Bean, chickpea, faba bean, lentil, pea, soybean	Aphids, armyworms, cabbage looper, corn earworm, European corn borer, grasshoppers, Lygus bugs, pea leaf weevil, potato leafhopper
Canola, rapeseed, mustard (seed and condiment)	Flea beetle, lygus bug, cabbage seedpod weevil, imported cabbageworm, diamondback moth, cabbage looper, bertha armyworm, grasshoppers
Corn	Armyworm, corn earworm, European corn borer
Potato	Cutworms, corn earworm, beet armyworm, leafminers, psyllids
Flax	Armyworms, grasshoppers, Lygus bugs

Application:

Voliam Xpress

- May be applied by ground or air.
- Timing of applications should target the pest and when populations are in a damaging life stage and at economic levels. Ensure adequate water volumes are used for optimum coverage.
- **Potatoes and Corn**
  - ***Ground*** – Apply in a minimum of 60 L of water per acre.
  - ***Air*** – Apply in a minimum of 16 L of water per acre.
- **Bean, chickpea, faba bean, lentil, pea, soybean, canola, rapeseed, mustard (seed and condiment), sunflower – Apply when insect feeding is first seen on foliage. Reapply after 7 days if populations reach economic threshold levels.**
  - ***Ground*** – Apply with a minimum of 40 – 80 L water per acre.
  - ***Air*** – Apply with a minimum of 16 L of water per acre.

How it Works:

Voliam Xpress insecticide works through contact and ingestion. It provides rapid knockdown and residual control of Lepidopteran (e.g. moth larvae) and sucking and chewing insects. After foliar application most of the insecticide stays on the leaf surface with a small amount penetrating into the leaf tissue. Initial and residual control is dependent on thorough coverage of the crop. *Voliam Xpress* is most effective against early developmental stages of surface feeding insects and adults of pest that deposit eggs within plant parts. Insecticide components: lambda-cyhalothrin is a synthetic pyrethroid insecticide and chlorantraniliprole is a diamide insecticide.

Restrictions:

- DO NOT make a foliar application of Voliam Xpress for a minimum of 60 days following an in-furrow or soil application or planting of seed treated with any Group 28 insecticide.
- **Bean, chickpea, lentil, pea, soybean**
  - ***Ground*** – DO NOT apply more than 3 times per season
  - ***Air*** – DO NOT apply more than once per season.
  - DO NOT graze or harvest treated forage, straw or hay for livestock feed. A 7 day interval is required between applications. º Pre-harvest interval – 14 days except – Soybean pre-harvest interval – 21 days.
  - DO NOT exceed the following amount of product per season. This includes Voliam Xpress as well as other Group 3 and/or Group 28 insecticides. Consult the label of other products containing these active ingredients prior to treatment to ensure the annual maximum is not exceeded:
    - 90 g chlorantraniliprole per acre by ground or aerial application and; º 30 g lambda-cyhalothrin per acre by ground application or;
    - 10 g lambda-cyhalothrin per acre by air.
- **Canola, rapeseed, mustard (seed and condiment), sunflower**
  - ***Application interval*** – 7 days
  - ***Pre-harvest interval*** – 7 days
  - Make only 1 application per season by either ground or air for cabbage seedpod weevil. DO NOT make more than 3 applications per season by ground application.
  - DO NOT make more than 1 application per season by air
- **Corn**
  - DO NOT make more than 2 applications of Voliam Xpress per year. º Application interval – 7 days
  - ***Pre-harvest interval*** – 14 days if crop is harvested for silage and 21 days for field corn. DO NOT exceed – 90 g chlorantraniliprole per acre by ground or aerial application and; º 27.6 g lambda-cyhalothrin per acre by ground application or;
  - 20 g lambda-cyhalothrin per acre by air.
- **Potato**
  - DO NOT apply Voliam Xpress Insecticide, which contains a Group 28 insecticide, following a seed piece, in-furrow, or soil application of any Group 28 insecticide.
  - DO NOT make more than 2 applications of Voliam Xpress per year.
  - ***Application interval*** – 7 days
  - ***Pre-harvest interval*** – 7 days
- **Buffer Zones:** The buffer zones specified in the table below are required between the point of direct application of *Voliam Xpress* and the closest downwind edge of sensitive freshwater habitats (e.g. lakes, rivers, sloughs, ponds, prairie potholes, creeks, marshes, streams, reservoirs and wetlands). Spray drift buffer zones can be modified based on weather conditions and spray equipment.

Application method	**Crop**		**Buffer Zones (metres) Required for the Protection of:**	
			Aquatic Habitats of Depths	
			Less than 1 m	Greater than 1 m
Ground*	Bean, chickpea, faba bean, lentil, pea, soybean		25	10
	Canola, mustard, flax		10	5
	Corn, potato		20	10
Aerial	Bean, chickpea, faba bean, lentil, pea, soybean	Rotary wing	800	425
		Fixed wing	800	800
	Canola, mustard, flax	Rotary wing	500	275
		Fixed wing	800	275
	Corn, potato	Rotary wing	800	725
		Fixed wing	800	800

- **Storage:** DO NOT use or store in or around the home. Store unused product away from feeds, seeds, fertilizer, plants and foodstuffs. *Voliam Xpress* must be stored above freezing. In pulse crops (pea, lentil, chickpea, beans and faba beans) if applied according to label rates early in the crop year at a vegetative stage or during flowering there is no need for MRL concerns. In cases of later application during pod development or seed fill to maturity (e.g. late season grasshopper control), consult with your exporter/processor.

Precautions:

As a result of the completed re-evaluation of lambda-cyhalothrin by the Pest Management Regulatory Agency (PMRA), effective April 29, 2023, changes will affect how all lambda-cyhalothrin-based products may be used in Canada.
DO NOT apply during periods of dead calm or when winds are gusty.
Avoid application at temperatures above 25 degrees C. Control of insects may be reduced at higher temperatures. DO NOT enter or allow entry into treated areas for a period of 24 hours after application of *Voliam Xpress*.
If *Voliam Xpress* is to be applied to a commodity destined for export to the United States, visit Crop Life Canada's website HYPERLINK "http://www.croplife.ca/" **www.croplife.ca** for information on acceptable residue limits.

Environmental Hazards:

Bees: Toxic to bees when exposed to direct treatment, drift, or residues on flowering crops or weeds. DO NOT apply this product to flowering crops or weeds if bees are visiting the treatment area. Spray deposits should be dry before bees commence foraging in treated crop.
Aquatic organisms: Toxic to aquatic organisms. Avoid application when heavy rain is forecast. The use of this product may result in contamination of groundwater, particularly in areas where soil is permeable (e.g. sandy soil) and/or the depth to the water table is shallow.
Others: Toxic to certain beneficial insects.

Hazard Rating:

Danger – Poison Potential skin sensitizer.

Refer to the Introduction for an explanation of the symbols.

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Herbicide Rotation - 2025

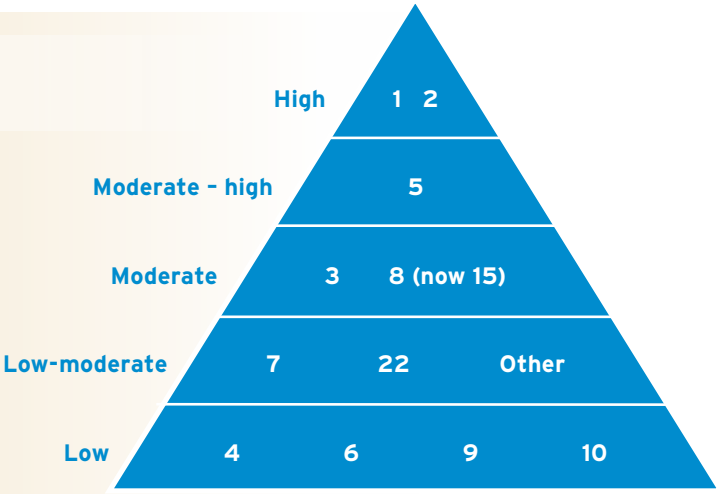
Resistance to a pesticide group will reduce the effectiveness of pesticides in that group over time. Rotation of herbicides and other pesticides is an important measure to delay the onset of resistance to any one pesticide group or mode-of-action.

By rotating herbicides, the risk of developing widespread resistance over a field drops. The illustration below gives a relative ranking of risk of resistance developing from repeated use. The top of the triangle indicates groups that have developed resistance quickly and those at the bottom of the triangle have demonstrated a low risk of resistance developing over long-term use. Be aware that low risk does not mean no risk, since weeds have developed resistance to herbicides in these groups as well.

Herbicide Resistance Development Risk based on Number of Applications

Classification of herbicide group numbers by risk of selection for weed resistance ('Other': all other herbicide groups that pose a low or moderate risk) Adapted from Beckie, H. J., 2006 *Herbicide Resistance Weeds: Management Tactics & Practices*; Weed Technology Vol. 20 Issue 3 (July-September) pp. 793-814

Number of Applications	
High	<10
Moderate	11 - 20
Low	>20



Classification of Herbicides

OTHER GROUPS
clomazone (13), diflufenzopyr (19), dichlobenil (20), indaziflam (29), quinclorac (26 - grassy weeds)

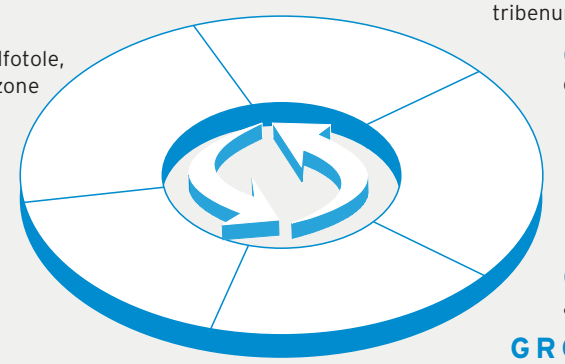
GROUP 27
(Grass & Broadleaf Control)
bicyclopyrone, mesotrione, pyrasulfotole, tembotrione, tolpyralate, topramezone

GROUP 22
(Non-selective harvest aid only)
diquat

GROUP 15
(Grass & Broadleaf Control)
dimethenamid, EPTC, metolachlor, pyroxasulfone, triallate

GROUP 14
(Grass & Broadleaf Control)
acifluorfen, carfentrazone, flumioxazin, fomesafen, pyraflufen, saflufenacil, sulfentrazone, tiafenacil, trifludimoxazin

GROUP 1 (Grass Control)
clethodim, clodinafop, fenoxaprop, pinoxaden, quizalofop, sethoxydim, tralkoxydim



GROUP 2 (Grass & Broadleaf Control)
ethametsulfuron, florasulam, flucarbazone, foramsulfuron, halosulfuron, imazamethabenz, imazamox, imazapyr, imazethapyr, metsulfuron, nicosulfuron, propoxycarbazone, pyroxsulam, rimsulfuron, thiencarbazone, thifensulfuron, tribenuron

GROUP 3 (Grass & Broadleaf Control)
ethalfluralin, propyzamide, trifluralin

GROUP 4 (Broadleaf Control)
2,4-D, 2,4-DB, aminocyclopyrachlor, aminopyralid, clopyralid, dicamba, dichlorprop, fluroxypyr, halauxifen, MCPA, MCPB, mecoprop, picloram, quinclorac

GROUP 5 (Grass & Broadleaf Control)
atrazine, hexazinone, linuron, metribuzin, simazine

GROUP 6 (Broadleaf Control)
bentazon, bromoxynil, pyridate

GROUP 10
(Grass & Broadleaf Control)
glufosinate

GROUP 9
(Grass & Broadleaf Control)
glyphosate

* Trade names of products that contain these active ingredients can be found in the **Trade Names, Active Ingredients,** and **Formulations** table near the beginning of the Guide.