Manitoba Crop Pest Update
Issue 3: June 8, 2022

Manitoba Agriculture

Summary

Insects: Flea beetle levels are high in some areas, and there has been some foliar insecticide applications for flea beetles. High levels of cutworms have been noticed in some fields in the Northwest region.

Diseases: There are no pressing disease concerns now. Winter wheat is a crop that is advancing and leaf diseases are not likely a concerns, but it is important to anticipate heading and flowering for Fusarium head blight risk. Risk forecast maps to be posted before the end of June.

Weeds: A great week of seeding for most of the province also saw good progress with weed control. Many operations were able to keep the sprayer going while planting, getting a good pre-seed or pre-emerge burn-off. We continue to see weeds like biennial wormwood, wild buckwheat, round-leaf mallow, as well as weeds like kochia and foxtail barley that became well-established in the last couple of dry years. Weeds are growing very rapidly and are fast approaching or past the maximum leaf staging for control.

Entomology

Impacts of excess moisture on grasshopper nymphs: In last week's update we discuss excess moisture, and why grasshopper eggs can be quite tolerant to it. In this week's update we will discuss the impacts excess moisture can have should it occur shortly after grasshopper eggs have hatched.

Immediately after grasshoppers hatch from their eggs, they have few fat reserves and are vulnerable to cool, wet weather. If they are unable to feed readily during these early stages, high mortality can result. Grasshopper hatch usually occurs over an extended period, so the level of mortality will depend on the extent of the unfavourable weather and how much of the grasshopper population are in the more vulnerable stages.

When soil moisture is high, younger grasshopper nymphs may be infected by various fungi and bacteria in the soil. Older nymphs are more resistant, but still may be infected by specialized pathogens, notably fungi.

Heavy rain can also result in grasshoppers dying because of drowning or bloating. Older grasshopper nymphs are less susceptible to damage from rain and flooding than younger nymphs. Studies in Nebraska on how long seven species of grasshoppers needed to be immersed under water to be killed found that it took about 3 to 13 hours for 50% of the nymphs to be killed, and 7.5 to 21 hours for 50% of the adults to be killed. Mortality from immersion following seasonal rainfall would thus rarely be high, but is possible in some years.

Weeds

Here are some weeds that we're seeing in fields right now (thanks to Lionel Kaskiw for the first three photos):

American dragonhead – opposite leaves, square stem, veins run to the tip of the leaves. Differs from hemp nettle where veins run to the notch in the leaves.

Cocklebur – long, fleshy cotyledons with prominent midvein, they stay on the plant for a while. Look on the ground for rough, oval-shaped burs with two hooks on one end from last year's plants.

Flixweed – narrow, stalked cotyledons, first true leaves are three –lobed, rapidly grows many finely-divided leaves. Greyish-green in color due to fine hairs.

False ragweed (in the centre, with other weeds around including flixweed) – first true leaves are entire then leaves become deeply lobed with rounded tips, upper leaves become heart-shaped.

Soils

Soil test interpretations – fall vs spring changes in N, P, K and other nutrients.

A number of agronomists and farmers have been comparing fall vs spring soil sample results, primarily to track changes in soil nitrate-N levels. There have been some other unusual results because of the contrasting weather between last year's drought and waterlogged soils this spring.

Firstly, the snowfall and heavy spring rainfall has generally reduced soil nitrate-N levels. I've summarized in Table 1 the results that we measured or have been shared with me.

Table 1. Fall vs spring soil nitrate levels in 0-24" depth.

Soil texture	Average change in nitrate-N lb/ac (std dev)	% change in nitrate-N
Clay-clay loam (eg. Red River, Altamont)	-30 (17)	-18%
Sandy (eg. Almasippi)	-65 (32)	-60%

The losses and movement of N was primarily due to leaching. Some very high nitrate levels seen last fall in the surface 0-6" of clay soils, moved into the 6-24" depth. The portion of nitrate-N in sandy soils was reduced much more than the clay soil, but results did vary substantially from field to field. One of the sandy soils was sampled deeply this spring and contained 140 lb N/ac in the 2-4' depth.

But other levels appeared to change also – increases in phosphorus, potassium, zinc, manganese and reductions in chloride and sulphur. Here is what may be happening:

Phosphorus (P) – under waterlogged conditions P solubility increases substantially, but will return to normal levels as soils dry out. The ill-advised storage of flood water on farmland actually increases the P content of that water.

Potassium (K) – is primarily held on clay surfaces, but in the dry conditions last year, much was trapped or "fixed" between clay sheets and seemed to disappear. As soils rehydrate this K is released.

Zinc (Zn) – under waterlogged conditions, soil pH tends to approach neutrality (7), which increases the solubility and availability of zinc.

Manganese (Mn) – under well aerated (dry) conditions Mn is very insoluble in the oxidized form (Mn_4^+), but under waterlogged, anaerobic conditions, the reduced form (Mn_2^+) is highly soluble. The same process affects iron (Fe).

Chloride (Cl^-) and sulphate-S (SO_4^-) – are anionic compounds with a negative charge like nitrate-N (NO_3^-), so they can be leached similarly. When nitrate-N leaches, these will be reduced accordingly.

If nitrogen has been lost – how much should I apply?

This can be a difficult question since not only have soil nitrate-N levels declined due to losses, but likewise have potential yields with delayed seeding. Perhaps no adjustment is warranted.

Here are some simple techniques to help guide your decision.

1) Soil testing – corn is the only crop that has calibrated N recommendations for the in-season sampling using the PSNT (pre-sidedress soil nitrate) test. Corn should be sampled when 6-12" tall, with a soil tube to 12" depth. Instructions and US or Ontario guidelines are available from soil labs or online.

Soil testing in June can be frustrating for other crops because:

- More recently applied N may still be in the ammonium or urea form, and not detected
- Fertilizer bands cause much variability, requiring many samples to be taken

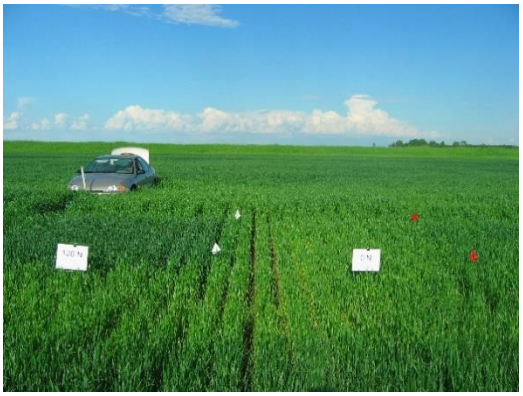
- Some N will be mineralizing from OM, which is like double accounting since it is already presumed in soil test recommendations
- Some N may already be taken up the crop

2) Crop scouting and tissue testing

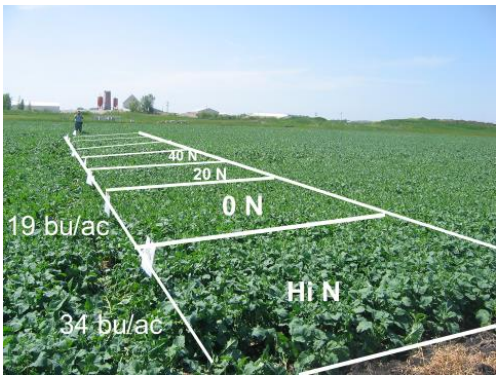
Most crops have an established critical leaf N content to separate sufficient from deficient, but do not generally have fertilizer recommendation to accompany these results.

Scout seeded fields for typical N deficiency – yellowing of older, bottom leaves. Excessive waterlogging may cause similar symptoms. A trained eye can discern severe from slight deficiencies, especially if a high N reference strip or cell is established at seeding. (See Examples below).

Example 1. Fertilized spring wheat, showing no difference in growth or colour. Final yield 68 bu/ac on left (high N) , 65 bu/ac on right (no added N).



Example 2. Winter wheat showing dramatic growth and colour change between no N and high rate. Final yield 88 bu/ac on left, 52 bu/ac on right.



Example 3: Canola showing colour change between no added N and high N. Yield difference was 15 bu/ac.

Since N deficiency affects growth and leaf greenness or chlorophyll, several sensors have been developed to rate level of deficiency. But there has been little use by Manitoba agronomists or farmers.

The SPAD chlorophyll meter determines the relative greenness to a high N reference. If chlorophyll content is 95% of high N = no N, if 90-95% = some N, if <90% = more N.

NDVI or vegetation index can be determined by a number of sensors such as the GreenSeeker here, but most requiring a high N reference. Algorithms are available that provide specific N rate adjustments for canola, wheat and corn. See https://www.nue.okstate.edu/

But the decision will be based on additional conversations with the grower and their practices– such as the risk of loss (N fertilizer timing, placement and form), soil type and amount of rainfall and the crop yield potential.

More details on N losses and these scouting approaches is at:

https://www.gov.mb.ca/agriculture/crops/soil-fertility/wet-soils-influence-soil-fertility.html

Forecasts

Diamondback moth. A network of pheromone-baited traps are being monitored across Manitoba in May and June to determine how early and in what levels populations of diamondback moth arrive. So far, diamondback moth has been found in 25 traps. Levels are generally very low, with the exception that some moderate counts have occurred in the Eastern and Central region, particularly over the past few weeks. The highest cumulative trap count so far is 50 from a trap near Hadashville in the Eastern region.

Table 1. Highest cumulative counts of diamondback moth (*Plutella xylostella*) in pheromone-baited traps for five agricultural regions in Manitoba as of June 8, 2022.

Region	Nearest Town	Trap Count
Northwest	Makaroff,	4
	Grandview, Russell	3
	Inglis, Grandview	2
Southwest	Rivers	2
	All other traps with 0 so far	
Central	Altona	18
	Belmont	14
	Halbstadt	11
	Gnadenfeld	9
Eastern	Hadashville	50
	Stead	25
	Beausejour	18
	Whitemouth	12
	Ste. Anne	7
Interlake	Arborg	1

← Highest cumulative count

Highest counts in each region and a monitoring summary are updated weekly on the Insect Page of the Manitoba Agriculture website at:
https://www.gov.mb.ca/agriculture/crops/insects/diamondback-moth-forecast.html

Armyworms (*Mythimna unipuncta*). A network of pheromone-baited traps are being monitored monitored from early-May until mid-July to determine how early and in what levels populations of armyworms have arrive. Counts so far have generally been quite low, with armyworm moths only being caught in 6 traps. The highest count is 21, from a

trap near Rosenfeld in the Central region. So far there have been no reports of larvae of armyworms being found in Manitoba.

Table 2. Highest cumulative counts of armyworms in pheromone-baited traps for agricultural regions in Manitoba as of June 8, 2022.

Region	Nearest Town	Trap Count
Northwest and Southwest	All traps with 0	
Central	Rosenfeld	21
	Rosebank	18
	Halbstadt	16
Eastern	Dominion City	14
	Beausejour	11
	Lac du Bonnet	14

← Highest cumulative count

A map showing armyworm counts from Manitoba, Eastern Canada, and several Northeast U.S. states is available at: https://arcg.is/0Lry5a. Go to the link "TAW". The highest counts so far have been in the East-Central states, with some higher counts having occurred in Michigan and Wisconsin.

Identification Quiz:

Question: What is the species of cutworm in the photo below?

Answer: This is black army cutworm (*Actebia fennica*). They overwinter as larvae, and larvae feed aboveground in May and June but do not cut stems. They can sporadically be found on field crops in Manitoba but is normally of little economic concern. There can

be exceptions though, and economic damage was noticed in corn and peas this year because of excessive feeding.

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To **report observations** on insects, plant pathogens, or weeds that may be of interest or importance to farmers and agronomists in Manitoba, please send messages to the above contacts.

To be placed on an **E-mail list** so you will be notified immediately when new Manitoba Crop Pest Updates are posted, please contact John Gavloski at the address or numbers listed above.