

Manitoba Grasshopper Forecast for 2022



Two-striped (left) and migratory (right) grasshoppers

Grasshopper surveys have been conducted in Manitoba in various degrees of detail since 1931. The current grasshopper forecast is based on counts of grasshopper populations in August (which estimates the egg-laying population), weather data (which helps estimate whether those female grasshoppers present are capable of laying their optimum level of eggs), and recent trends in grasshopper populations. In some years, natural enemy populations may significantly affect the number of grasshopper eggs that survive and hatch, and such data may be pertinent to the forecast as well. Counts are generally done in or alongside crop fields in Manitoba. The goal is to estimate levels of the four species of grasshoppers that have potential to be pests of crops in Manitoba.

Purpose of a grasshopper forecast

All stages of grasshoppers, except the egg stage, feed on plants. Some species will feed on crops, while other species do not, or rarely will. Older grasshoppers of these crop feeding species can do the most damage to crops, particularly later in the season as these grasshoppers can move greater distances. In annual cropping systems, the young stages of these species are often highly concentrated around field edges early in the season, particularly around fields that had sparse green vegetation late in the previous summer. If grasshopper populations get quite high, these younger, concentrated populations of grasshoppers are much easier to control than older and more dispersed populations later in the season.

Knowing the risk of grasshoppers being a problem alerts farmers and agronomists to the importance of monitoring field edges, vegetation surrounding the fields, and other preferred egg laying areas in late-May and June for these younger grasshoppers. This information can also help farmers choose crops and plan seeding practices for the following year.

Interpreting the grasshopper survey map

The grasshopper survey map for Manitoba is based on counts of adult grasshoppers per m² done by farm production extension specialists, agronomists, and entomologists in August 2021. Grasshopper counts from 97 locations in Manitoba were used to produce the map. The legend on the map shows the average grasshopper counts in an area, and relates these to risk for many of our crops. Factors affecting grasshopper development, survival and behaviour will determine whether these August populations are likely to increase, decrease, or remain fairly stable for the next year and are also important factors in the overall forecast for 2022. The small circles on the map show where data was collected. White areas on the map are areas where data was not collected. Note that the averaging of counts in a region will result in a density category for a region representing the cumulative data, not the value from a specific count.

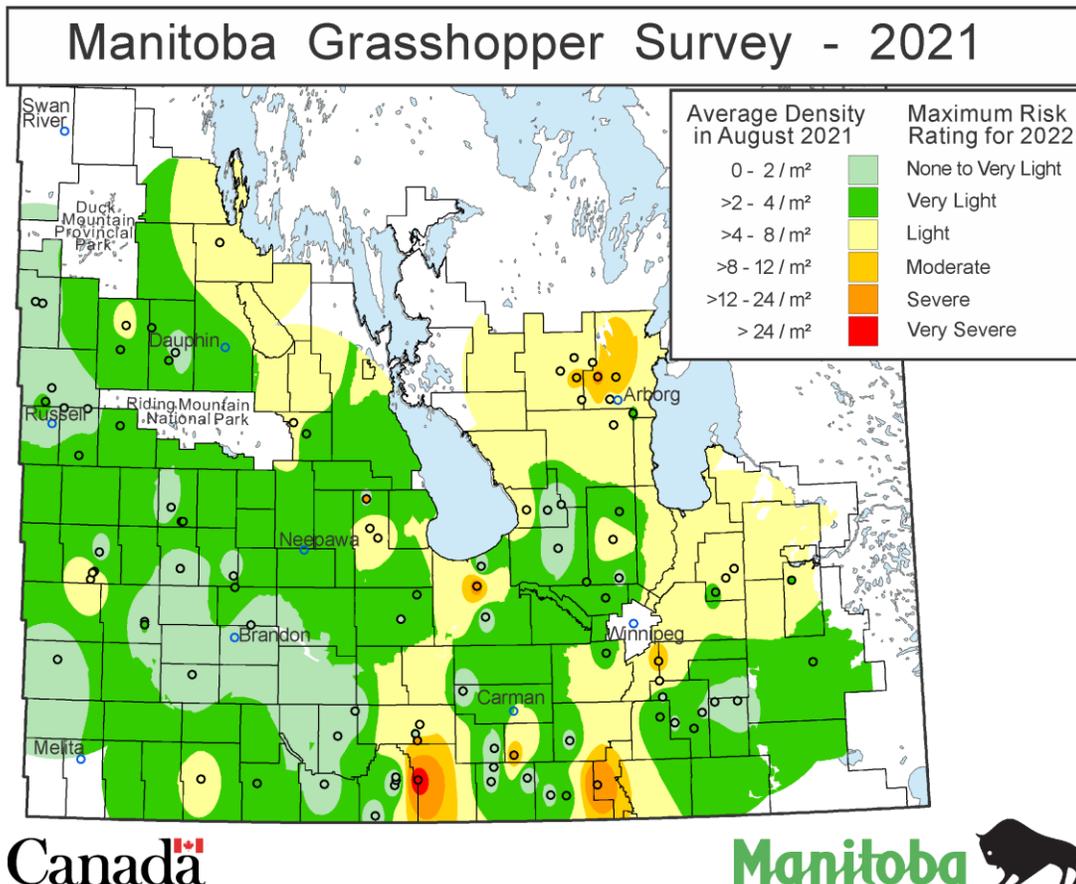


Figure 1. Average density of grasshoppers in Manitoba during August 2021.

The Grasshopper Forecast for Manitoba for 2022

What the grasshopper survey map shows

Just under half of the counts (45 out of 97 counts) were in the none to very light or very light risk categories. Twenty count were in the light risk category (>4-8/m²), three counts were in the moderate risk category (>8-12/m²), six counts were in the severe risk category (>12-24/m²), five of these in the Central region and one in the Interlake (in the RM of Bifrost). There was one count in the Central region in the very severe risk category (RM of Pembina).

Table 1. Grasshopper counts in each risk category for each agricultural regions surveyed.

Region	Counts	Counts in Risk Category					
		Very Severe	Severe	Moderate	Light	Very Light	None to very light
Northwest	14	0	0	0	3	6	5
Southwest	19	0	0	0	3	7	9
Central	31	1	5	0	3	3	19
Eastern	14	0	0	1	3	5	5
Interlake	19	0	1	2	8	4	4
Total	97	1	6	3	20	25	42

The highest count in the survey was an average of 40 grasshoppers per square metre in the Rural Municipality of Pembina in the Central region. The Central region and Interlake generally had the highest counts.

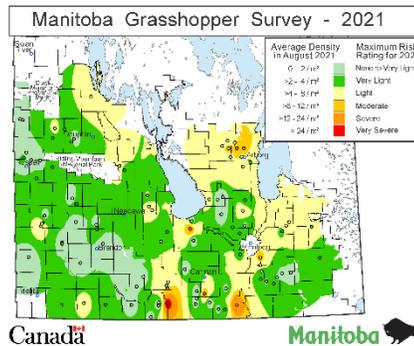
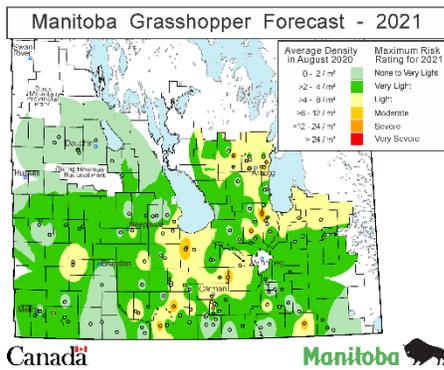
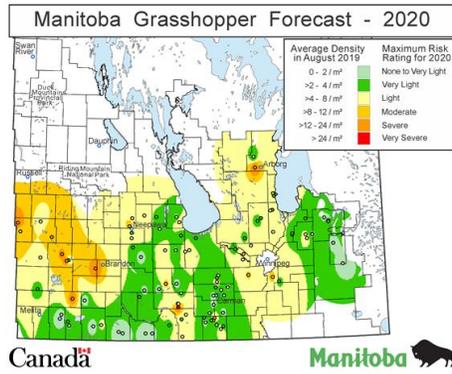
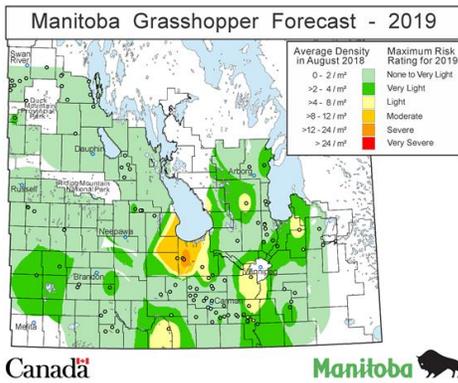
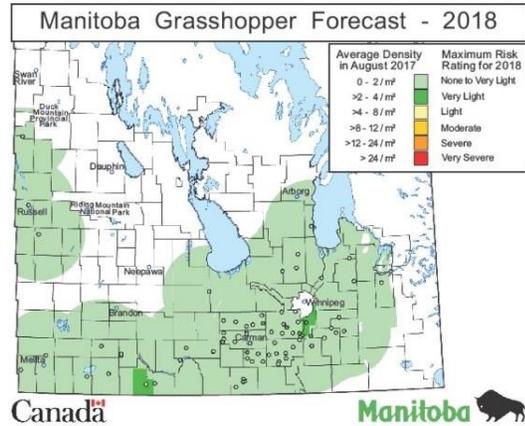
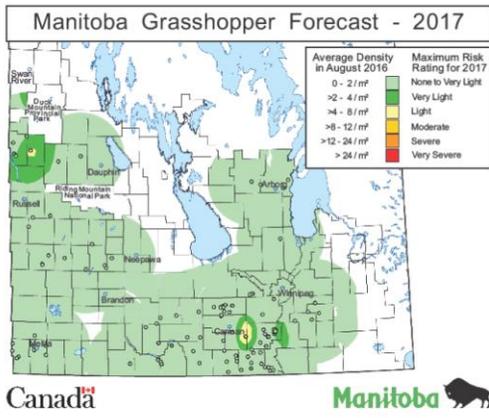
Dominant species: Twostriped grasshopper (*Melanoplus bivittatus*) was generally the most abundant species, but this varied with region. In the Northwest agricultural region, migratory grasshopper (*Melanoplus sanguinipes*) was the dominant species in the most locations, followed closely by twostriped. In the Southwest, twostriped grasshopper was the dominant species in 18 of the 19 locations surveyed (migratory being dominant at one site). In the Central region, twostriped was generally the dominant species, with migratory being dominant at just a few locations. In the Eastern region, both twostriped and migratory were of roughly equal dominance at many sites, and in the Interlake twostriped was generally the dominant species, but there were a few location where clearwinged grasshopper (*Camnula pellucida*) was among the dominant species.

Both migratory and twostriped grasshoppers feed on a variety of types of plants (both crops and non-crop). Clearwinged grasshopper is primarily a grass feeder, and seldom feeds on broad-leaved plants.

Recent trends in grasshopper populations

Grasshopper outbreaks usually develop after a few years of conditions that are favourable for a steady increase in numbers of those species of grasshopper that can become pests of crops. Comparing the current August grasshopper counts with those of previous years can determine if the populations tend to be rising or falling.

The following figures show the area in Manitoba survey maps in each of the grasshopper population density categories for data collected from 2016 to 2021, for the 2017 to 2022 grasshopper forecasts.



Grasshopper counts were quite low in surveys for the 2017 and 2018 grasshopper forecasts. The data collected in the past four grasshopper surveys (for the 2019 to 2022 forecasts) show an overall increased grasshopper population compared to surveys done in 2016 and 2017. Note the similarity between the grasshopper survey maps from the last two years.

Weather for 2021 Growing Season

Report from: Timi Ojo, Ag Systems Modeller, Manitoba Agriculture.

Precipitation: The low soil moisture status in the fall of 2020 coupled with less than 40% of normal snow accumulation set many parts of Manitoba on a dry trajectory at the start of the 2021 growing season. There was barely any snow on field by early March. Many areas received much needed rain during the third week of May as concerns grew about dry seedbeds. However, as crops approached the active vegetative stage in late June into July, the precipitation deficit intensified and many areas were at least 200 mm short of water deficit for the growing season. During the primary egg-laying period for

grasshoppers (August and September) precipitation across all regions was almost exactly at normal (100.9%). Regional breakdown showed that the percent of normal precipitation values ranged from 83.8% in the Eastern region to 114.4% in the southwest.

Temperature: Limited precipitation and intense heat are two sides of the same drought coin. All locations ended the 2021 growing season with above-normal heat units accumulation. Recent warm years typically have locations around 10% above historical average growing degree-days (GDD base 5) accumulation. Some areas such as Arborg, Moosehorn, and Minnedosa were at least 20% above the normal GDD heat accumulation at the end of the 2021 season. August and September air temperature was generally about 1.74°C warmer than average, with the Eastern and Interlake regions being about 2°C warmer than average.

Summary

Grasshopper levels have increased over the past few years. Whether populations continue to increase, and how much damage they do to crops, will depend on factors such as weather and natural enemies. Grasshopper levels should be monitored carefully, beginning in late-May or early-June in 2022.

Grasshopper populations have more successful development in dry years and generally increase more over a series of dry years. In addition, reduced natural vegetation, from dry conditions, can force grasshoppers to move to cultivated crops. Conditions during the growing season were generally favorable for grasshopper movement into crops, and conditions for egg laying in late-summer were generally good.

Our pest species of grasshoppers all overwinter in the egg stage. Some insects, such as larvae of some species of bee flies and *Epicauta* species of blister beetles, feed mainly on grasshopper eggs. Field crickets, which feed on many things, will also feed on grasshopper eggs. All of these insects were quite noticeable in some locations of Manitoba in 2021.

The risk of economical populations of grasshoppers developing in 2022 varies, depending on location. The August survey showed generally light to moderate levels in most areas, but there has been an increase in higher counts in surveys over the past few years. If weather is favourable for grasshopper survival and development there may be areas where grasshoppers are a concern to crops in 2022.

When they have the opportunity, farmers and agronomists are encouraged to monitor grasshopper populations along roadsides, field edges, and other areas where populations tend to be concentrated or at high levels early in the season.

For more information on the grasshopper forecast or monitoring for grasshoppers, please contact John Gavloski at (204) 750-0594.

The protocol for doing the grasshopper counts for this survey can be found at: <http://www.gov.mb.ca/agriculture/crops/insects/mb-grasshopper-survey.html>

A factsheet providing more information on grasshopper biology, species identification, monitoring and management is available at: <https://www.gov.mb.ca/agriculture/crops/insects/grasshoppers.html>

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