Manitoba Crop Pest Update
Issue 8: July 10, 2019

Manitoba Agriculture

Summary

Insects: Thistle caterpillar continues to be noticeable in some soybean fields. They are turning in to pupae, so populations of larvae declining in some areas. Green cloverworm is being noted in some pulse crop fields, but at low levels so far. Grasshopper levels continue to be monitored, and there has been some management of hotspots. Diamondback moth larvae noted at high levels in some canola fields in southeastern Manitoba.

Diseases: A few new diseases have been observed in the field this week on peas, including Mycosphaerella blight, powdery mildew, and above-ground evidence of root rots caused by *Aphanomyces* and *Fusarium*.

Weeds: Another field of waterhemp has been identified, this time in the RM of Rhineland. Continued monitoring and reporting is important, as the waterhemp will sooner be taller than many crops and become increasingly noticeable.

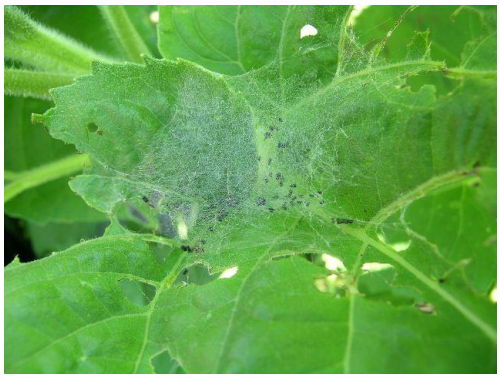
Entomology

Thistle caterpillar:

Thistle caterpillars continue to be noticed in many soybean fields. A suggested threshold in soybeans is 25 to 30% defoliation prior to bloom; 20% after bloom or pod set. Some literature suggests a nominal threshold in the prebloom stages of soybeans as 40% defoliation. Regardless of which is used, soybeans can handle a fair amount of defoliation before yield is significantly impacted. It is rare for a soybean field to on average have economic levels of defoliation from thistle caterpillar. When assessing a plant for level of defoliation, make sure to consider all the leaf material on the plant. Sometimes individual leaves are heavily defoliated, while other leaves have very little.

Thistle caterpillars are now turning into pupae. They will later become a butterfly called painted lady butterfly. Below are photos of some of the stages of thistle caterpillar.

Larva of thistle caterpillar.

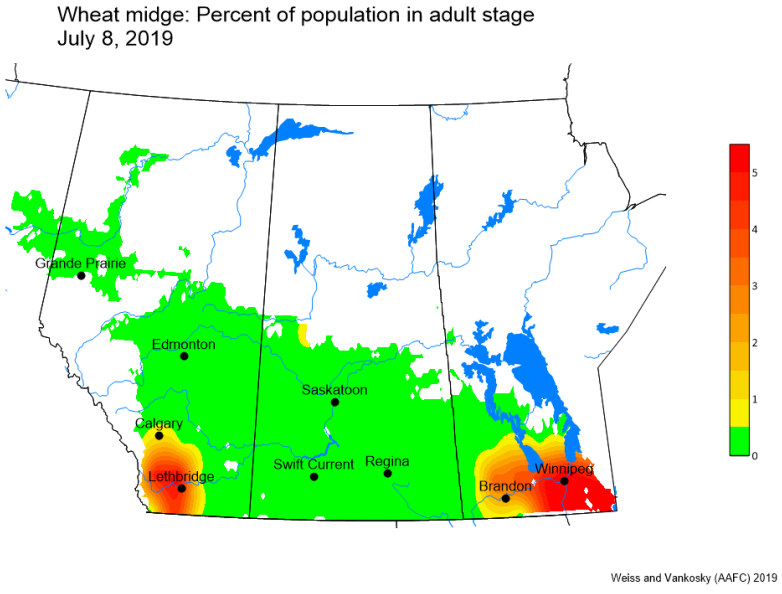


Webbing and frass from thistle caterpillar.

Pupa of thistle caterpillar.

Adult (painted lady butterfly)

Wheat Midge: Based on degree day forecasts, approximately 5% of the wheat midge population was in the adult stage as of July 8th. It looks like wheat midge emergence should begin to occur over the next week.



Wheat heads are most susceptible to damage from wheat midge when egg laying occurs during heading, Zadoks growth stages 51 (ear just visible) to 59 (ear fully emerged). Damage declines dramatically when egg-laying occurs after anthers are visible. Many fields will already be past the susceptible stage. In recent years levels have not been high, but scouting is encouraged when fields are heading. Information on scouting and thresholds for wheat midge can be found at: https://www.gov.mb.ca/agriculture/crops/insects/wheat-midge.html

Dry conditions in May and June can have significant impact on wheat midge emergence. Insufficient rainfall in May and June can result in delayed movement of larvae to the soil surface. Research in Saskatchewan found that wheat midge emergence was delayed or erratic if rainfall did not exceed 20-30 mm during May (Elliott et al. 2009. Crop Protection. 28: 588-594).

Non-Pathogenic Disease

Please refer to John Heard's contributions: Potassium deficiency in corn, Micronutrient deficiencies on peat soils, and a puzzling patterned Sulphur deficiency in canola.

Weeds

2,4-D is registered for application on corn, but as is clearly demonstrated in this photo, late application are yield robbers. This rescue treatment to kill tall waterhemp will have a significant impact on the corn yield but the alternative was allowing a Tier 1 Noxious Weed to grow rampantly, so this was the lesser of two evils.


Same day, same field, same weed – different colored stems and different leaf types may make you think these are different weeds, but they are both tall waterhemp plants. Please report suspicious plants so that they can be identified correctly to help develop appropriate management plans.

Abiotic Stress on Crops

Potassium deficiencies in corn are prevalent now

Another cool dry spring and again potassium deficiencies are appearing in corn on sandier textured soils. (Figure 1-2).

Visual deficiency symptoms are quite characteristic: yellowing or “firing” along the leaf margins of lower leaves.

The usual cause is low soil potassium, but availability is also restricted by:

- Cool, dry soil which reduces diffusion rates
- Soil compaction
- Any condition limiting rooting – such as insect feeding, or herbicide residues
- Zero tilling into dense soil

University of Minnesota and NDSU have recently increased their corn potassium recommendations by raining the critical levels on some soils. Our Manitoba recommendations for potassium for corn have been very aggressive for years, with a critical level of 200 ppm soil test K. And placement is key. Broadcast potash is not as available to the crop and so 2 times as much is required to achieve the crop response offered by banded K. (https://www.gov.mb.ca/agriculture/crops/soil-fertility/soil-fertility-guide/fertilizer-guidelines-for-soil-tests.html#table18)

Several dozen Manitoba farmers look after that side banded K by retrofitting planters with air carts – examples in figures 3-5.

Figures 1 and 2. Potassium deficiency in corn – yellowing when looking down the rows and firing of lower leaves.

Figures 3-5. John Deere planters can pull any colour of air tanks.

Micronutrient deficiencies on Peat soil

Peat soils with organic matter levels greater than 30% have a large affinity for micronutrients like manganese (Mn) and copper (Cu), binding these nutrients so they are unavailable to crop roots.

The following wheat field is in an area with soil organic matter levels of 36-42% and shows green and yellow areas, being diagnostically sampled here by 2 agronomists (Figure 6). Their resulting tissue tests are:

Area	Other nutrients: N, P, K, Ca, Mg, S, Zn, Fe, B	Manganese	Copper
Greener	Sufficient or high	13 ppm Low	4 ppm Low
Yellow	Sufficient or high	5 ppm Deficient	4 ppm Low

Figure 6. Diagnostic tissue sampling of good versus poor areas.

Individual wheat leaves showed typical symptoms of both Mn and Cu deficiency:

- Manganese deficiency = chlorotic streaks and spotting on leaves (Figure 7)
- Copper deficiency = yellowing and twisting or “pig-tailing” of leaf tips (Figure 8).

Tissue sampling is still the best method to confirm such deficiencies.

At this stage foliar applications may still be effective to salvage yield. On peat soils with known deficiencies, soil applications are expensive but often necessary to optimize yield. Repeated copper treatments at tillering and flag leaf stage may be needed when using foliar applications.

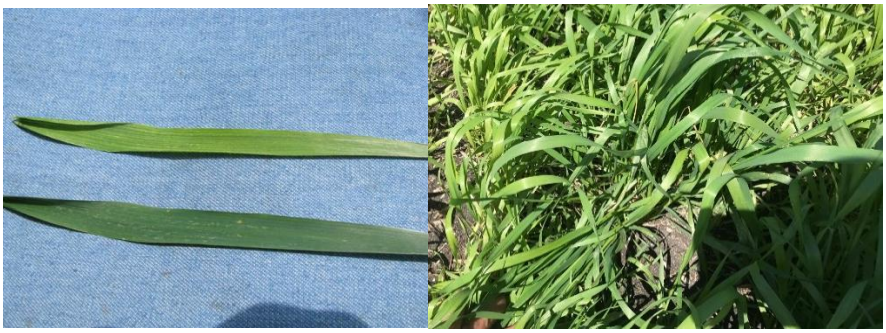


Figure 7 (left). Manganese deficient wheat leaves (top) versus fertilized (below)

Figure 8 (right). Twisted leaf tips characteristic of copper deficiency.

Sulphur deficiencies in late emerging, stunted canola

I was out the other day to visit a stand of stunted canola, where delayed emerging rows were visibly nutrient deficient versus the early emerging rows (Figures 9-10).

The cause for the delayed emergence was not apparent – seeding depth, wheel tracks, compaction? But the “stunted plants” appeared to be lacking apical dominance and had much branching – typical of what we were seeing in areas where flea beetle feeding

was heaviest. It may be that the quicker emerging plants were able to withstand the injury better. This field happened to be the only field the grower did not spray for flea beetles.

Nevertheless, these struggling runts were exhibiting sulphur deficiency symptoms – general yellowing, leaf mottling, cupping leaves and some occasional purpling. Sulphate-sulphur had been applied with a portion of the nitrogen in a mid row band, some 5" from the seed row. It appears that the more vigorous rows had tapped into this sulphur while the poorer rows had not. This was confirmed with tissue sampling (Table 1.)

Figures 9-10. Sulphur deficiency in row patterns.

Table 1. Nutrient analysis of canola.

	N	P	K	S
Green – normal	5.0 % H	0.53 % H	3.1 % H	0.55 % H
Yellow -stunted	4.7 % H	0.52 % H	3.3 % H	0.16 % L

An interesting case where a combination of uneven emergence and subsequent insect injury showed up as a nutrient deficiency.

Forecasts

Entomology:

Bertha armyworm. A network of pheromone-baited traps are monitored across the Canadian prairie provinces in June and July to determine levels of bertha armyworm adult moths, and forecast risk of there potentially being economic levels of larvae somewhere in the region. The traps do not determine risk for the field specifically that the trap is in, but can estimate regional risks, which can help prioritize scouting for larvae. Eighty-seven traps are being monitored in Manitoba.

Table 1. Highest cumulative counts of bertha armyworm (*Mamestra configurata*) in pheromone-baited traps for five agricultural regions in Manitoba as of July 10, 2019.

Region	Nearest Town	Trap Count
Northwest	Ste. Rose	232
	Bowsman	222
	Kenville	196
Southwest	Souix Valley	118
	Miniota	102
	Miniota	94
Central	Glenboro	383
	Halbstadt	372
	Mather	225
Eastern	Tourond	60
	Beausejour	59
	Steinbach	49
Interlake	Warren	184
	Balmoral	93
	Arborg	40

0-300 = low risk
300-900 = uncertain risk
900-1,200 = moderate risk 1,200+ = high risk

Two traps in the Central region are in the uncertain risk range. All other traps have cumulative counts in the low risk range.

Identification Quiz:

Question 1: The two insects in the photos below were found in pulse crop fields recently. What are they?
Hint – Although they look different, they belong to the same family of beetles.

Photos submitted by Serena Klippenstein - Manitoba Pulse & Soybean Growers

Answer: These are ground beetle larvae (Carabidae). They are predators of many other insects. We have 376 species of ground beetles in Manitoba.

Question 2 (Follow-up from last weeks disease mystery):

Last weeks' **disease mystery answer**. That was Crown rust (*Puccinia coronata*) – a single pustule of the uredospores on oats, as well as the pycnial and aecial spore stages on the native alternate host buckthorn.

At the Crop Diagnostic School in Carman this week, a sharp-eyed scout found these more advance pustules (left).

Photo by Brynne Riehl – Manitoba Agriculture

Also at CDS 2019, we spied this notable disease and its classic leaf symptoms on canola. What is it and will it reach the stem in time to have an impact on yield?

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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.