Manitoba Crop Pest Update
Issue 10: July 22, 2020

Manitoba Agriculture

Summary

Insects: Grasshoppers and armyworms continue to be the insects of greatest concern. Twostriped grasshopper is mainly into the later nymph stages with some adults present; clearwinged grasshopper adults are present. Lots of reports of *Cotesia* pupal clusters in some of the cereals, resulting from parasitized armyworm populations. Armyworms seem to be turning to pupae and levels dropping in some areas. Jack pine budworm, a moth whose larvae feed on pines trees, is very abundant this year, and agronomists are noticing the moths around farmyards are enquiring regarding what it is and what it feeds on.

Diseases: We are almost at the point of the season where intervention with fungicides will either be too late to be effective, or be crowding the pre-harvest interval. The PHI is important in keeping the final products of plant-based agriculture free from unnatural residues. Many agronomists reported seeing disease symptoms in the field. However, most reported minor impacts on the crop. There are always exceptions. Read about those below.

Plant Pathology

Some prime examples of what agronomists are seeing right now:

"**Edible beans** being sprayed in the area for **white mold**. Had a field last Monday that was timed to spray, but grower decided to hold off as the canopy seemed like it was drying out during the day. This Monday, went to check and yes, there was white mold in the field. So, pressure continues to be favourable for disease development."

"… sent to me by a local field scout who noticed a few patches like that in more than on field. I asked him to bring samples in so we can get confirmation from the CDC …" [current hypothesis is that this is **Fusarium wilt in flax**, which we have in our plots at the Crop Diagnostic School]. These are pictures of patch in the field and what it looks like when you get close.

"Thoughts?
They have been told it is Septoria or bacterial blight." (picture below)

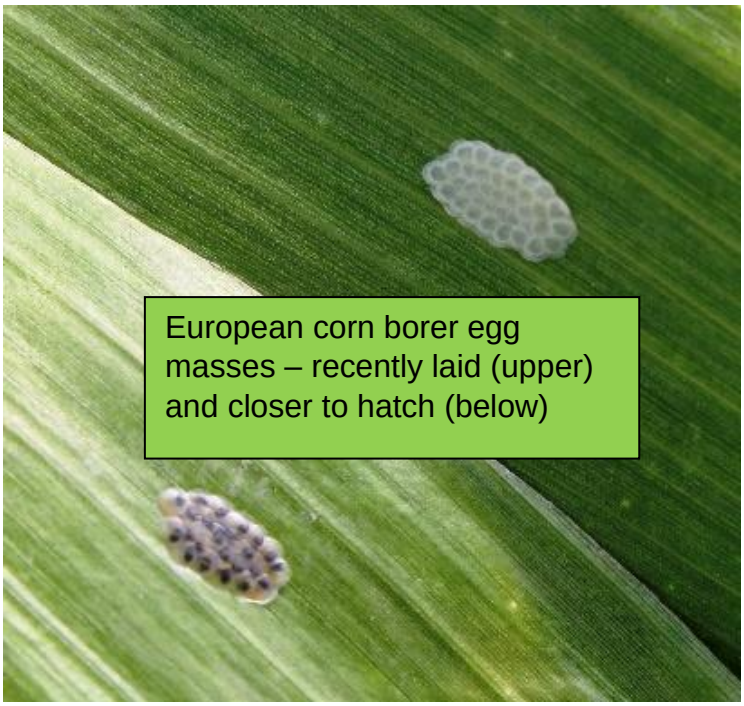
Kaminski: "My best guess it is fungal (like Septoria), rather than bacterial." That's as detailed a response as I can provide based on a picture and no info on context.

Fusarium head blight symptoms are showing up in cereal grains, including oats (picture below courtesy Ingrid Kristjanson). Three weeks after anthesis, or a fungicide application for FHB, is a good time to assess whether or not controls were effective.

Entomology

European corn borer eggs needed: In 2018 a population of European corn borer in Nova Scotia was found to be resistant to the Cry1F strain of Bt, present in some cultivars of Bt corn. It is important that we test populations of European corn borer from across Manitoba to determine if there is any resistance to any of the cultivars of Bt corn grown in Manitoba.

I am thus looking for fields with egg masses of European corn borer that can be collected and tested for potential resistance. If you are scouting for European corn borer, and find egg masses, please contact John Gavloski (see contact information at end of report) so we can get samples for resistance testing. I am trying to collect as many egg masses as possible for this. You can either cut the egg masses from the leaf, place them in a container, and contact me. Or mark the location and let me know of the field location so we can come collect samples.



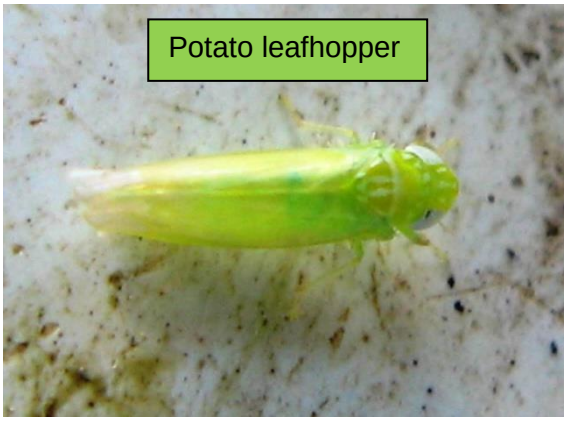
European corn borer egg masses – recently laid (upper) and closer to hatch (below)

Egg masses can be found in any corn field, whether Bt corn or non-Bt cultivars. It is when the larvae start feeding that they are killed by the Bt toxins.

Aphid update: It has been mainly good news regarding aphid populations this year. There have been no reports of economic levels in cereal crops. The first report of soybean aphid came on July 21. They have only been observed in one field so far, near Plum Coulee, and only in low levels. There have only been a couple of reports of field peas being treated for pea aphids.

Potato Leafhopper: A couple of agronomists have commented about finding potato leafhopper in dry bean crops. Potato leafhopper does not overwinter in Manitoba, and is another insect that blows in. They are an infrequent pest in dry beans in Manitoba, and whether they get to economic levels depends on when they arrive and in what levels.

This year they are being noticed in beans that are likely too advanced for there to be risk of economic damage. Economic thresholds for potato leafhopper in dry beans extend to the first bloom stage. Thresholds for potato leafhopper in dry beans are: 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.



Pea aphids - For pea aphids we do use the economic threshold that if at the beginning of flowering there are on average 2 to 3 aphids per 20 cm of plant tip or at least 90 to 120 aphids per 10 sweeps on average, an insecticide application when 50 percent of plants have produced some young pods will be cost effective.

Research from Manitoba has found that yield was enhanced most when a single application was made as soon as 50% of the crop had young pods. Control at the early pod stage provides protection through the pod formation and elongation stages, which are very sensitive to aphid damage. Most of the damage that aphids do to peas is to the pods before they start to fill.

Researchers who worked on developing these thresholds also stated that: “Most of the damage that aphids do to peas is to the pods before they start to fill. If you think that most of the pods have already started to fill, spraying would be too late and would not be economical.”

Crop Diagnostic School Quiz: This year we are learning about 8 orders of insects in our virtual crop diagnostic school. How many orders of insects can you see in the photo on the next page? Hint – there are no adult stages present: but there are eggs, a larva, and pupae representing different orders.

Hint – look on the thorax for insect eggs

Answer: There are 3 orders of insects in the photo.

The caterpillar is an armyworm (*Mythimna unipuncta*) which belongs to the order Lepidoptera. It would be dead due to mass parasitism by the time of the photo.

The cluster that the caterpillar appears to be perched on are pupal cases from a type of parasitic wasp called *Cotesia*, which belongs to a large family of parasitic wasps called Braconidae, and is in the order Hymenoptera. Often *Cotesia* wasps will lay many eggs (20 to 60) into a caterpillar. This genus of Braconids is known to inject polydnaviruses into the host along with the eggs. These suppress the immune system of the host. Infected caterpillars don't form a cocoon. About 2 or 3 weeks after eggs are laid into the caterpillar, the wasp larvae emerge from the caterpillar, which dies when the wasp

larvae emerge. Emergence of the multiple larvae happens over quite a short period of time. Then they spin their cocoons on or near the caterpillar, forming a cluster of pupal cases, which can be quite visible at the top of plants. People often mistake these for eggs. Eventually the adult parasitic wasps will emerge from these cocoons and be looking for more caterpillars to lay batches of eggs into.

If you look on the thorax of this caterpillar, you will see 3 eggs. These are likely from a family of flies (Diptera) with hairy abdomens called Tachinid flies. Eggs are usually laid on the body of their host. Larvae of Tachinid flies are parasitoids of other insects.

Talk about tag-teaming the armyworm! This one didn't have a chance to get past the juvenile stage.

Soils

Post Anthesis Nitrogen and Flagleaf Burn

Growers are sometimes shocked when they see the resulting burn injury to the flagleaf from their post anthesis nitrogen (PAN) application. Following are photos of typical damage from MB Wheat and Barley Grower sponsored on-farm-tests in 2015-16 and 2018 and the less than spectacular effect on yield. All sites were sprayed in the evening to avoid heat of the day (photo), except for Portage, which was sprayed at 3 pm.

Figure 1. PAN application in evening.

Figures 2-7. Percent of leaf area damaged by PAN treatment: Virden (5%), Homewood (10%), Somerset (12%), Thornhill (12%), Swan Lake (15%), Portage (31%).

Table 1. Impact of PAN on leaf burn, yield and protein of wheat.

	Untreated	PAN
Virden		
% leaf burn	0%	5%
Yield bu/ac	51	49.3
Protein%	13.9%	14.4%
Homewood (2018)		
% leaf burn	1%	10%
Yield bu/ac	96.9	97.3
Protein%	14.3%	14.9%
Somerset		
% leaf burn	1%	12%
Yield bu/ac	74.4	79.4
Protein%	13.8%	14.8%
Thornhill		
% leaf burn	1%	12%

Yield bu/ac Protein%	87.0 10.9%	86.2 12.4%
Swan Lake % leaf burn Yield bu/ac Protein%	 1% 80.5 15.0%	 15% 79.3 14.8%
Portage % leaf burn Yield bu/ac Protein%	 0% 65.5 13.7%	 31% 58.9 14.0%

So if the PAN guidelines* are followed, the risk of yield reducing leaf burn is slight. Also note the variable increase in protein, ie ranging from a decrease of 0.2% to an increase of 1.5% (Table 1). Limited MB studies compared application of dissolved urea solution with the UAN solution used in all these studies above. The urea solution tended to cause less burn and had higher protein increase, possibly due to its greater dilution with water.

The PAN guidelines:

1. Apply 10 US gal 28-0-0 (30 lb N/ac) diluted with 10 US gal water/acre
2. Apply 7-10 days post anthesis
3. Use flat fan nozzles
4. Avoid the heat of the day – usually night application is safest.

Sulphur deficiency in canola

There have been reports of sulphur deficiency in canola showing up at this flowering stage (photo below). Some have been from inadequate S rates or the use of elemental forms. Past research has shown partial yield recovery to application at early flowering (Figure below).

Figure 1. Sulphur deficiency is apparent as delayed and pale coloured flowers.

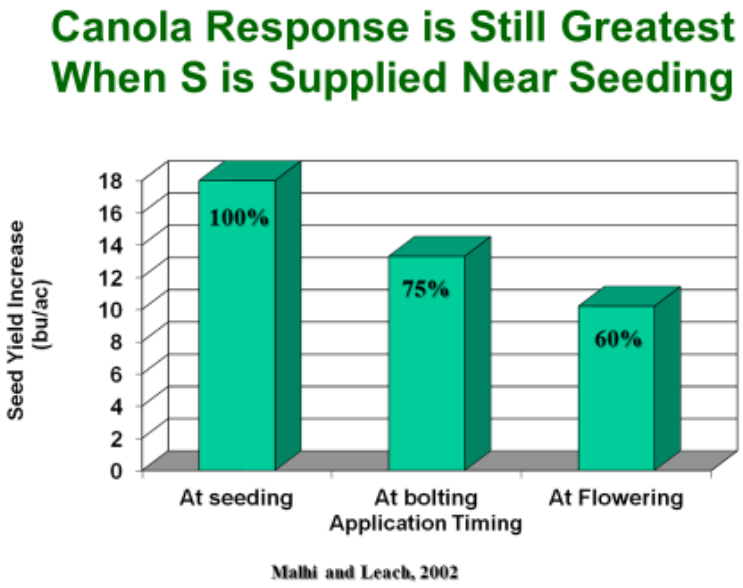


Figure 2. Canola yield response to applied S (from Malhi, S. S., Schoenau, J. J. and Grant, C. A. 2005. A review of sulphur fertilizer management for optimum yield and quality of canola in the Canadian Great Plains. Can. J. Plant Sci. 85: 297–307.)

Forecasts

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 their 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.

Table 1. Highest cumulative counts of bertha armyworm (*Mamestra configurata*) in pheromone-baited traps for five agricultural regions in Manitoba as of July 22, 2020

Region	Nearest Town	Trap Count
Northwest	Swan Valley	433
	Durban	427
	Bowsman	376
	Grandview	217
Southwest	Foxwarren	252
	Minto	140
	Inglis	137
	Elton	112

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

Central	Kilarney	447
	Dunrea	392
	Somerset	371
	Snowflake	246
Eastern	Tourond	179
	Stead	66
	Lac du Bonnet	46
	Beausejour	23
Interlake	Vidir	304
	Teulon	174
	Balmoral	141
	Clandeboye	112

Traps to monitor adult moths of bertha armyworm were set up at 83 locations in Manitoba in 2020. 76 traps currently are in the low risk category (less than 300 cumulative moth count), and 7 traps are in the uncertain risk category. Highest counts so far are in the Western part of the Central Region and the Northwest.

The highest trap count is 447 near Kilarney in Central Manitoba.

Identification Quiz:

Question: Several people have sent in photos of the moth seen in the photo below, indicating they are seeing a lot of them and wondering if they are a threat to their crops. What are they?

Photo by Khris kharoufeh - Easy Pick Strawberry Farm

Answer: These moths are called jack pine budworm (*Choristoneura pinus*). Adults of this moth can be seen from July to September.

The larvae feed on pine trees such as jack pine, red pine and Scots pine. Larvae start to become present in August and they overwinter as larvae. They will not feed on field, fruit or vegetable crops, only pines.

There have been high levels the last couple of years, but mostly up north, in the Interlake and on the northern part east of lake Winnipeg. It seems to have moved south this year.

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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.