The Seed Head
Fact sheet # 17

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Potential Emerging Pests

Adult alfalfa weevil
(Joseph Berger, bugwood.org)

Above: Adult alfalfa weevil
Below: Adult alfalfa weevil

Introduction

With the ever changing landscape of agriculture due to climate, economic and social changes. It should be no surprise that the pest world will see changes in insects that are introduced into the Peace Region. The insects may be beneficial, meaning that they help producers by pollinating or predating on other insects.
On the flip side of there is potential to have new and emerging pest insects. They can enter into an area and without monitoring devastate a producers crop for a season. This has been seen in many areas throughout the country. Insect pests that are new to any area usually go unchecked as they have no natural predator or pathogen in the new area that can help control them.
The pests featured here have been found to be spreading at an alarming rate and may be seen in the Peace Region. Constant monitoring is crucial to identifying new and emerging pests.

Alfalfa Weevil (*Hypera postica*)

Difficult to manage for a few reasons:

1. They overwinter outside fields in many cases so you cannot scout early nor do a burn to take care of the overwintering adult stage.
2. Adults move into the field in the spring and the adult female lays eggs in the stems over a lengthy period of time.
3. This prolonged egg laying results in a prolonged period of egg hatch, so not all weevils are hatched at the same time.
4. The result is that you can have fully grown, mature larvae ready to pupate while more eggs are giving rise to first instar larvae.

This is why a single insecticide application was sometimes not very effective. It certainly worked well on those larvae that hatched early but their brothers and sisters followed later and resumed the damage that their kin had started earlier.

Enemies:

- Natural enemies are small parasitic wasps that are generally unobserved by producers or a fungal disease.
- *Bathyplectes curculionis*
- *Bathyplectes anurus*
- *Zoophthora phytonomi* sporulates is a soil borne fungus and infects the larval stage of the weevil causing death.

Contacts:

For any questions in regards to pests, pathogens or weeds.

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Pea Leaf Weevil (*Sitona lineatus*)

Pea leaf weevil (*Sitona lineatus*) is an insect pest that feeds on the roots (larvae) and leaves (adults) of a wide range of cultivated and wild legume species. The pea leaf weevil (PLW) is native to Europe and was first identified in Alberta by Agriculture and Agri-food Canada entomologist Dr. Bob Byers.

First record of this insect attacking peas in Alberta was in 2000 near Lethbridge, Alberta. Subsequent surveys have revealed considerable range expansion and increasing damage. In southern Alberta peas are the major crop at risk of economically significant damage. PLW adults do feed on dry beans but the damage is usually minor. Most losses result from larval feeding on nitrogen-fixing nodules. In extreme cases adults feeding on the leaves and growing point of seedlings can also cause economic damage


Leaf Damage Caused by Larval Pea Leaf Weevil

Scouting Techniques:

- Scouting is very difficult as adults drop to the ground as you approach.
- Difficult to see once on the ground.
- Select at least 5 locations along the field margin and 5 locations approximately 100 metres into the field to assess pea leaf weevil damage for threshold determination.
- At each location, a row of 10 to 20 seedlings should be selected, and the terminal leaf on each seedling examined for the characteristic crescent-shaped notches.
- If the average proportion of seedlings with terminal leaf damage from all spots exceeds 30% (3/10) then the weevil poses a yield risk and warrants control.


Adult Pea Leaf Weevil

Description:

- The adult is slender, greyish-brown and about 5 mm long.
- Adult PLW can be confused with the sweet clover weevil. PLW can be distinguished by the presence of three light-colored stripes extending length-wise down the thorax and sometimes the abdomen of the pea leaf weevil.
- Pea leaf weevil larvae are “C” shaped, light milky white in color with a dark brown head, legless, cylindrical, soft and fleshy and 3.5 to 5.5 mm in length

Control Tips:

Cultural control practices can be included as part of an integrated pest management strategy. Fields under no tillage system may suffer less damage than those under conventional tillage. Seeding crops early and inoculating the pea crops to maximize yields is recommended. Using crop rotations with a non-host crop other than field pea or faba bean is also recommended (wheat, canola, etc.). Trap cropping of the pea leaf weevil can be done by planting a border in the fall with winter peas or adjacent, earlier planting of a spring cultivar. Close monitoring of the trap crop is needed, so the weevils in the trap crop area can be controlled before they move to the rest of the field.

Chemical control: The most consistent control for pea leaf weevil is obtained with a registered insecticide seed treatment. If high populations of pea leaf weevil were in the area in the previous year, then a registered insecticide seed treatment should be considered. Foliar applications with an insecticide can be used for control of early feeding on pea roots and leaves before the peas reach the sixth node and before the adults lay too many eggs.

Biological control: The ground beetle family, also known as Carabid Beetles have been known to predate upon Pea Leaf Weevil eggs.

References:

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Cabbage Seepod Weevil (*Ceutorhynchus obstrictus*)

The cabbage seedpod weevil, (*Ceutorhynchus obstrictus)* (Marsham) is native to Europe and invaded prairie cropland in canola crops near Lethbridge, AB in 1995 to become a major pest of canola. The first North American observation of the weevil was in southwestern British Columbia and has since spread to encompass most of continental U.S.A., the interior of B.C., as well as the prairies of western Canada. The cabbage seedpod weevil completes its larval development only in certain species of *Brassicaceae*, although adults may feed on nectar and pollen of a wide range of *brassicaceous* species.


Cabbage Seepod Weevil on Canola

Host plants include:

- canola
- brown mustard
- cole crops (such as cabbage, broccoli and cauliflower) and
- cruciferous weeds (such as wild mustard, flixweed and stinkweed).

Host plants are either true hosts or food hosts. Both hosts can provide food, especially pollen, for adult feeding, but only those with large seedpods that can sustain larval development are true hosts. Examples of true hosts are canola, brown mustard and wild mustard while examples of food hosts are flixweed, stinkweed and hoary cress.

Economic Thresholds:

Control is recommended when an average of 3 to 4 adult weevils are collected per one 180° degree sweep sample at 10 to 20 per cent flowering.

Control Tips:

Environmental control: Cooler temperatures and rainfall in August favour the development of the new generation of weevils. Cold winter temperatures can affect the overwinter survival of adults, with survival decreasing as temperatures move from 5 C to -5 C. At soil temperatures below -7 C, the insect freezes. Longer overwintering periods have much less effect on overwinter mortality than cold temperatures.

Biological control: Extensive sampling of canola fields in southern Alberta and Saskatchewan from 2001 to 2006 revealed a total of 15 parasitoid species attacking the weevil, representing 5 families of Hymenoptera. Natural enemy fauna of cabbage seedpod weevil on the prairies is composed of a group of 14 species of larval ectoparasitoids, with more than 90 per cent of all parasitism inflicted by the pteromalids Trichomalus lucidus (Walker), *Chlorocytus sp.,* and *Pteromalus sp.* and the *Eulophid Necremnus tidius* (Walker).

In Europe and the United States, parasitic wasps are effective for reducing both adult and larval weevil populations. The most important species are *Microctonus melanopus*, a wasp that parasitizes adult weevils, and *Trichomalis perfectus,* a wasp that attacks weevil larvae within the pods

Scouting Techniques:

- Scout fields in the fall to assess the size of the adult population.
- Adult populations the preceding fall can be used to predict the risk of infestation the following year.
- Adults emerge from their overwintering sites in spring with peak emergence occurring when soil temperatures reach 15°C. Following their emergence, adults fly to patches of early-flowering *brassicaceous* weeds, and are especially attracted to stands of wild mustard, *Sinapis arvensis L.*, and volunteer canola.
- Before canola crops enter the bud stage, adults can be found on wild mustard, flixweed, hoary cress, stinkweed and volunteer canola. When disturbed, the adults often drop to the ground and play dead. After several seconds they resume activity.


Cabbage Seepod Weevil Larvae in a Canola pod

Cereal Leaf Beetle (*Oulema melanopus L*)


Cereal Leaf Beetle

Cereal leaf beetle was first observed in Alberta in 2005, Saskatchewan in 2008 and in Manitoba in 2009. Computer modeling based on current environmental conditions suggests that the cereal leaf beetle could invade all cereal growing areas of Canada. The beetle is widespread throughout the southern part of Alberta, from Pincher Creek to Medicine Hat and north to High River and Strathmore. A new population was reported south of Edmonton in 2011. The potential economic effect of the pest has not been assessed on the Prairies, but significant yield losses have been observed in other parts of North America.

Economic Thresholds:

Economic threshold levels have not been determined for Alberta, but are established in Montana and North Dakota. In Alberta, cereal leaf beetle has not reached economic thresholds. Growers are cautioned to avoid unnecessary insecticide application as the parasitic wasp, *Tetrastichus julis*, continues to keep the beetle's population low, highlighting the importance of only spraying at economic threshold levels.

In Montana and North Dakota, economic thresholds are an average of three eggs and/or larvae per tiller before the boot stage. At the flag leaf stage, the economic threshold is an average of one larva per flag leaf. Larvae are the target for insecticide treatment.

Life Cycle and Identification:

Currently the Cereal Leaf Beetle has a single generation per year. In Alberta, cereal leaf beetle overwinters in the adult stage and emerges in mid-April to May. Adult beetles are about 6.3 mm long with a brightly coloured orange-red thorax, yellow/orange legs and metallic blue head and wing covers. The adults prefer to overwinter in field debris, crevices of bark and rolled leaves. These areas include edges of crops and woodlots, fence rows, sparse woods and dense woods. After emerging, the adults disperse to host crops, feed, mate and lay eggs.

Peak egg laying occurs in May. Eggs are laid on the upper surfaces of leaves along the margins or close to the leaf mid-rib. Oats and barley are preferred hosts for egg laying, but spring-planted wheat, winter wheat and other grasses are also hosts. Eggs are laid singly or in multiple clusters of two or three, touching end to end. Newly laid eggs are bright yellow, but darken to orange -brown and then black before hatching. Larvae go through four instars (life stages), and they feed mainly on upper leaf surfaces. Larvae have a yellow body with a brown head and three pairs of brown legs. However, the larva may look black on the leaf, like an oil droplet, because the first to fourth-instar larval stages are smeared with a fecal coat.

Scouting Techniques:

Best management practices are:

- Plant crops with good fertility to promote a healthy plant stand that can better overcome feeding damage.
- Monitor for cereal leaf beetles as part of regular crop scouting.
- Pay particular attention during scouting throughout the spring and summer before and during the boot stage to assess for cereal leaf beetle abundance.
- Avoid insecticide applications if at all possible as the parasitic wasp, *T. julis,* continues to keep the beetle's population low.

Above: Cereal Leaf Beetle Larvae on leaf

Conclusion

The emergence of new pest in the BC Peace will continue as climate change continues and producers continue to compete in the global economy. Integrating techniques into pest management is crucial to limiting the potential damage a producer may incur. The first step to pest management is awareness, and with that the ability to identify new potential pests.

It should be mentioned that the insects noted above have the potential to do severe economic damage to a producers crop and have not been established in the region but may be migrating into the region. Any questions in regards to emerging pests, you can contact the BC Pest Monitoring team.

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