



WHEAT WATCH

Early Season Insect Scouting in Wheat

With majority of the seed in the ground, and crops beginning to emerge, scouting season is quickly approaching. Early detection of insect issues through scouting is essential to identifying and determining control options. Wireworms and cutworms are early-season pests that can cause significant damage to wheat crops. Grasshoppers are another pest common in wheat; the adult and late juvenile pest species can start to cause damage in late June, so monitoring populations as they emerge is important. Insect feeding can reduce stand competitiveness and decrease yield.

When scouting fields in the spring there can be many reasons for poor or patchy emergence. Fields that seem to be slow to emerge, have a high presence of birds, or have had insect issues in the past are fields that warrant a closer look.

Wireworms



Figure 1: Wireworm larvae in soil. Source: Haley Tetreault, Sask Wheat.

Wireworms are the larval stage of click beetles. These larvae can cause significant damage to wheat crops through feeding on germinating seeds and young seedlings. The insect is attracted to germinating seeds by the CO₂ given off during respiration. The most common species of concern are prairie grain wireworm, *Ctenicera destructor*, and *Hypnoidus bicolor*.

Scouting: Look for bare patches, severed or wilted plants, shredding of stem below ground, patchy/poor emergence. Wireworm damage can appear as shredded stems (below-ground) and/or holes bored into seeds. Once you have identified a potential area of damage, dig around and look for the larvae. Wireworms do most of their feeding early in the spring while they are closer to the surface. [Bait balls](#) can also be an effective tool, prior to seeding, to indicate the presence of wireworms.

ID: Wireworms have slender cylindrical bodies (10-20mm long) with three pairs of legs on the thorax. They are white to yellowish and have a keyhole-shaped notch on the last segment of the abdomen (**Figure 1**).



Management: Unfortunately, there are no control options once the crop has been seeded, so it is important to make record of fields with wireworm damage. Consider the use of insecticidal seed treatment in fields with a history of wireworm damage. Foliar insecticides will not provide control.

Economic Threshold: None established.

Cutworms

There are many different species of cutworm, however the two that are the most dominant, which can cause issues in wheat are the pale western cutworm (*Agrotis orthogonia*) and the redbacked cutworm (*Euxoa ochrogaster*). Both species of cutworm overwinter as eggs in the top centimeter of soil and larvae emerge in early May. These species feed on lower leaves early in the season and, cut plants below ground as they mature and increase in size. Many cutworm species are nocturnal feeders; scouting for species that feed above ground should be done in the evening when they are active.

Scouting: Begin scouting when the crop emerges. Cutworms are often worse on sandy ridges and eroded knolls. Look for bare spots and thinning areas- which will expand with continued feeding. Look for severed or yellowing plants. Examine the top 2-5cm of soil around a severed plant, or on the edge of a bare patch, near healthy plants. These insects will not remain in areas without plants to feed on. Look for feeding damage; cutworms more often cause complete severing of the plant or leaf, whereas wireworms shred underground stems. Birds are attracted to fields with higher populations of cutworms and can be a signal to examine fields further. Scout for cutworms from crop emergence until mid June.

ID: Redbacked cutworms are above ground feeders when small; during the heat of the day, they hide under debris. As they mature, feeding occurs underground. They are fleshy caterpillars with a brick or reddish-brown coloured strip that runs along their back bordered by a dark strip on each side (**Figure 2**).

Pale Western cutworms are also foliar feeders when young and change to subterranean feeding as they mature, which means they feed below ground and pull leaf tissue below the soil surface to feed. They are fleshy caterpillars with a yellowish-brown head that has two vertical markings, and a pale white-grey body with no distinct markings (**Figure 3**).

Management: Spray infested areas in the morning or evening when cutworms are actively feeding. Subterranean cutworms that do not contact insecticidal residue on soil surface or toxins incorporated into plant tissue, will be exposed when pulling plant material below ground to feed. This effect depends heavily on the insecticide used to control. Pyrethroid residues are not long-lived in the environment. If a field needs to be reseeded, spraying insecticide prior to re-seeding or using a diamide-containing seed treatment is recommended, if cutworms are still present and active in significant numbers.





Economic Threshold:

Redbacked 5-6 larvae/ m²



Figure 2. Redbacked cutworm. Source: John Gavloski, Manitoba Agriculture

Pale Western 3-4 larvae/m²



Figure 3. Pale western cutworm. Source: Frank Peairs, Colorado State University, Bugwood.org

Grasshoppers

Grasshoppers can cause significant damage in wheat; however, the 2021 grasshopper forecast is calling for relatively low population densities across the province. This map can be [found here](#). Grasshopper populations are affected by environmental conditions. Grasshopper damage tends to be most significant in hot, dry years. The species of most concern in wheat production are the migratory grasshopper (*Melanoplus sanguinipes*) and the clear-winged grasshopper (*Camnula pellucida*). Migratory grasshoppers feed on both broadleaf plants, and grasses. Clear-winged grasshoppers prefer cereal grains. It is important to identify which species of grasshopper is present, as not all species cause economic damage. Grasshoppers are not usually “early season” pest, however monitoring populations as they emerge is important.

Scouting: Eggs hatch in May when soil temp reaches 4.5°C. Scout along field margins and sloughs. Start from a headland and work your way in towards the centre of the field; populations are often highest on field borders. Although nymphs can be damaging, these events are relatively uncommon. Like many highly fecund animals, the vast majority of the young are not going to survive to adulthood. If the nymphs are not causing damage, do not control them but rather, continue to monitor.

ID: There are 85 species of grasshoppers in Saskatchewan. Only about five cause economic damage and only do so at high densities, so species identification is very important.





Migratory grasshopper

Nymphs: mottled grey body with a stripe across the head

Adults: greyish-brown with a black stripe across the head. A series of black bands on hind legs (**Figure 4**).



Figure 4. Migratory grasshopper. Photo by Dr. Dan Johnson, University of Lethbridge

Clearwinged grasshopper

Nymph: tan with a white band that goes around the thorax

Adult: yellow or brownish body with clear wings with some dark patches. This species also has two stripes running along its back, but the stripes start at the thorax and meet at the wing tips (**Figure 5**).



Figure 5. Clear-winged grasshopper. Photo by Dr. Dan Johnson, University of Lethbridge

Management: If economic threshold is reached there are many insecticidal sprays and baits, and biologicals available for control. Insecticide rate will depend on grasshopper size and product used, which can be found in the [Saskatchewan Guide to Crop Protection](#).

Economic Threshold: 8-12 grasshoppers/m² in wheat.



Additional Reading and Information

Prairie Pest Monitoring Network <https://prairiepest.ca/>

“Field Guide of Pest Wireworms in Canadian Prairie Crop Production” Written by Haley Catton, Wim van Herk, Julien Saguez, and Erl Svendsen SOON TO BE RELEASED

Wheat School on how to make bait balls for wireworm scouting:

<https://www.realagriculture.com/2012/04/wheat-school-how-to-make-wireworm-bait-balls/>

Grasshoppers in Saskatchewan <https://www.saskatchewan.ca/business/agriculture-natural-resources-and-industry/agribusiness-farmers-and-ranchers/crops-and-irrigation/insects/grasshoppers>

[Grasshopper Identification and Control Methods to Protect Crops and the Environment. Dan Johnson.](#)

[Cutworm Pests of Crops on the Canadian Prairies: Identification and Management Field Guide. Floate, K.D. 2017](#)

[Field Crop and Forage Pests and their Natural Enemies in Western Canada: Identification and Management Field Guide. \(extensive author list\)](#)

Information in this resource was sourced from the following sources:

Floate, K.D. 2017. Cutworm pests on the Canadian Prairies: Identification and management field guide. Agriculture and Agri-Food Canada, Lethbridge, Alberta

https://www.researchgate.net/publication/316551579_Cutworm_Pests_of_Crops_on_the_Canadian_Prairies_Identification_and_Management_Field_Guide

Philip, H., B.A. Mori and K.D. Floate. 2018. Field crop and forage pests and their natural enemies in Western Canada: Identification and management field guide. Agriculture and Agri-Food Canada, Saskatoon, SK

https://prairiepest.ca/wp-content/uploads/2019/01/AAFC-Field-Guide_ENGLISH_HQ_Print_new-cover_June-2018.pdf

Saskatchewan Ministry of Agriculture. Grasshoppers.

<https://www.saskatchewan.ca/business/agriculture-natural-resources-and-industry/agribusiness-farmers-and-ranchers/crops-and-irrigation/insects/grasshoppers>

