

Cutworms in Field Crops



Cutworms are a natural part of the prairie habitat. Some cutworms are likely to be in most crop fields in any given year, but usually at levels well below where they would be an economical concern or worth trying to manage. However, there are some species of cutworms that in some years can get to levels that are of economical concern in field crops.

Most Common Species

In Manitoba, seedlings of crops may be damaged in late May or June by sporadic outbreaks of cutworms. The redbacked cutworm (*Euxoa ochrogaster*), can be one of the most damaging species. Damaging populations often include larvae of other cutworm species, particularly the darksided cutworm (*Euxoa messoria*) and the dingy cutworm (*Feltia jaculifera*). The glassy cutworm (*Apamea devastator*) can sometimes be abundant in grassy crops. Army cutworm (*Euxoa auxiliaris*) may move into Manitoba as it migrates from the Rocky Mountains to lower elevations, but rarely are they at economical levels in Manitoba as they can be in Alberta and Saskatchewan. Knowing the species of cutworm can be important because some species complete the larval stages earlier in the year than others, and some species are more likely to feed on and clip stems than others. All cutworms belong to a family of moths known as Noctuidae. Cutworm larvae have three pairs of legs on their thorax, and typically have five sets of prolegs on the abdomen (four pair near the middle and a pair at the back). They curl up when disturbed.

Redbacked cutworm

Larvae of redbacked cutworms have two broad dull-red stripes along the length of their back (Figure 1) The head is yellowish-brown. Mature larvae are about 38mm long. Young larvae make small holes and notches in the foliage. Older larvae eat into the stems and often sever them.

Adult moths of the redbacked cutworm (Figure 3) have four colour forms. The flight period for moths of the redbacked cutworm in Manitoba extends from mid-July to October. The peak flight period occurs during August.



Figure 1. Redbacked cutworm larvae



Figure 2. Redbacked cutworm pupae



Figure 3. Redbacked cutworm adult

The redbacked cutworm feeds on practically all field crops, vegetables, and home garden plants. It is best known for its feeding on cereals, flax, sunflowers, canola, and mustard.

Darksided cutworm

Larvae of darksided cutworms (Figure 4) feed on leaves, and older larvae may cut plants at ground level. Populations of larvae of the darksided cutworm and the redbacked cutworm are often mixed. Larvae of these two species may be easy to confuse. These two species cause their greatest damage in row crops with low plant/ha ratios.



Figure 4. Darksided cutworm



Figure 5. Redbacked (left) and Darksided (right) cutworms

The flight period for the darksided cutworm in Manitoba extends from early-August to October. The peak flight period occurs during August.

Dingy Cutworm

Larvae of dingy cutworms (Figure 6) have a thin light line down the very middle of the back. On either side of this thin line there is a broader series of somewhat diagonal markings that look like tire tracks, or to form "V's" on the back. They also have four equal-sized black dots on the back surface of each abdominal segment. Dingy cutworms are primarily leaf feeders, and rarely cut plants.



Figure 6. Dingy cutworm larvae

Larvae of the dingy cutworm have been reported from more than 40 plant species including sunflowers, alfalfa, corn, flax, oats, rye, and wheat.

Other Cutworms Found in Field Crops in Manitoba



Figure 7. Glassy cutworm larvae

The glassy cutworm (Fig. 7) sporadically can get to levels that can be economical, but normally causes little or no harm to crops in most areas and years. Host plants can include wheat, oats, barley, corn, and grasses grown for forage and seed.

The pale western cutworm (*Agrotis orthogonia*) can be found in Manitoba, but is not as serious a pest in Manitoba as it is in Alberta and Saskatchewan. Pale western cutworm is generally associated with drier regions. Older larvae of this species will sever plant stems below the soil surface.



Figure 8. Black army cutworm

The black army cutworm (*Actebia fennica*) (Figure 8) can also sporadically be found on field crops in Manitoba but is normally of little economic concern. Larvae feed aboveground in May and June but do not cut stems.

Lifecycle

Cutworm moths may lay several hundred eggs in or on the soil. After the eggs hatch, the larvae feed on the host plants. Larvae normally have six instar stages before they become fully grown, although some species, such as darksided cutworm, may have seven larval stages.

Between each instar stage, the larvae "moult" or shed their skin. During moulting the larvae are inactive and remain several centimeters below the soil surface. Studies from Alberta found 20 to 50% of the populations of pale western cutworms in some fields were in a pre-moult or recent post-moult stage and were not feeding. That can cause a significant delay in control of those individuals when insecticides are used as a control strategy. Laboratory studies have shown the moulting period during which the larvae are inactive comprised approximately 33 percent of the entire larvae life stage. Feeding cutworms can be identified by the presence of greenish mid-gut contents visible through the semi-transparent underside. A moulting cutworm will not have food in its gut.

Once the larvae complete their last instar stage, they burrow deeper into the soil and form earthen cells where they pupate. The new moths emerge, exiting through the soil using the old larval tunnels.

Most of our pest species have only one generation per year.

Overwintering: Some species overwinter as eggs (e.g., the redbacked cutworm and darksided cutworm); others, as partly-grown larvae (dingy, army, glassy, and black army cutworms). Still others do not overwinter in the Prairies but rather re-invade annually from the U.S., aided by southerly winds.

Scouting Techniques

Inspect the seedlings on at least a weekly basis, from mid-May to mid-June. Cutworms are nocturnal, feeding at night and hiding during the day, making them hard to detect. Feeding by cutworms results in notched, wilted, dead, or cut-off plants (weed or crop seedlings). Plants may be missing from rows and bare patches may appear in fields as a result of cutworm feeding. Often cutworms will be close to the cut or shriveled plants they have just damaged and can be found by digging around these plants. A garden trowel and a soil sifter are useful tools for collecting cutworm larvae. Cutworms will sometimes be most abundant in patches or a specific area of a field. Determining the stage of larval development can also be important. Small larvae pose the greatest potential for damage as they still have to feed and grow. Once larvae have reached lengths of 30 to 35mm, most of their feeding may have already occurred and chemical intervention may not be warranted.

How deep in the soil are the larvae? The depth of cutworms in the soil during the day may depend on the age of the larvae and how moist the soil is. A study from Ontario on darksided cutworms found older larvae just under the soil surface in wet weather. However, in dry weather they were found at a depth of 8 to 10 cm (3 to 4 inches) from the soil surface. Most younger larvae rested in the soil during the day at a depth of 6-13 mm ($\frac{1}{4}$ to $\frac{1}{2}$ in.) near the base of the host plant.

Length of time as larvae: How long cutworms spend in their potentially damaging (larvae) stages depends on the species and the temperatures they are exposed to. Redbacked cutworms kept at 15°C took 65 days on average to complete their six larval stages, while at 25°C they completed their larval stages in 29 days. Darksided cutworms took on average 87 days to go through their seven larval stages.

Monitoring adult moths: Pheromone-baited lures which will attract male moths to traps are available for some species of cutworms. However, these have not been found to be a reliable means of predicting the level of cutworms the next season.

Thresholds

Little research has been done to develop economic thresholds for cutworms in field crops. However, nominal thresholds, which are based on experience rather than research quantifying the impact of the insects on the crop, have been suggested for several field crops (Table 1).

Table 1. Some suggested nominal thresholds for cutworms.

Crop	Threshold
Cereal Crops	
Wheat, Barley, Oats	Redbacked and army cutworms: 5-6/m ² . Well established fall-seeded crops or spring seeded crops with good moisture conditions can tolerate higher numbers.
Corn	When 2-4% of plants are cut below the ground or 6-8% of plants are cut above the soil surface, and cutworms less than 1 inch long present
Oilseed Crops	
Canola	A suggested nominal threshold is 25-30% stand reduction
Sunflowers	1 cutworm or more per square foot (30 by 30cm) or if there is a 25 to 30% stand reduction
Flax	4-5 larvae/m ²
Pulse Crops	
Soybeans	1 or more larvae per three feet of row and larvae are small (less than 2 cm), or 20% of plants cut.
Dry Beans	1 or more cutworms per metre of row and the larvae are still small (less than 2cm long)
Peas	2 to 3 cutworms per square metre
Forage Crops	
Alfalfa	4-5 per square foot (new or thin stands - 2/sq ft.)

Plant Compensation:

Some crops, such as flax and peas, have the ability to compensate for some of the feeding by cutworms, while other crops, such as corn, have little ability to compensate for feeding by cutworms. The loss of only some flax plants at lower densities of redbacked cutworms resulted in an increase in per plant yield of remaining plants. Peas cut early and at the soil surface regrew or branched from subsurface nodes.

Control Tips

Insecticides

Both foliar insecticides and seed treatments are available to control cutworms. Consult the [Guide to Field Crop Protection](#) for product information. Best results occur if foliar insecticide applications are made in the evening. Sometimes it is most economical to just treat infested patches and not entire fields. There are differences in susceptibility to insecticides between species of cutworms. Foliar insecticides are less effective against some subterranean cutworm species, where larvae feed almost exclusively underground, such as glassy cutworm.

Natural Enemies

Many predaceous insects, parasites, and birds prey upon cutworms and reduce their populations.

Predators: Ground beetles can be important predators of cutworms. Other insect predators of cutworms include rove beetles and larvae of stiletto flies. Wolf spiders (Lycosidae) may also feed on cutworms.

Parasitoids: A study in Saskatchewan found larvae of redbacked cutworms parasitized by 4 species of bee flies, at least 4 species of tachinid flies, and several species of parasitic wasps. Parasitoid wasps of cutworms include species of braconids, ichneumonids and encyrtids. Braconids and ichneumonids lay their eggs in early-instar cutworm larvae. Encyrtid wasps lay their eggs in their hosts eggs, and the encyrtid egg will divide several times to become many eggs. A study on army cutworms found that one egg laid by the encyrtid wasp *Copidosoma bakeri* may produce up to 2,500 adult offspring from the body of the host. A study from 2012 to 2016 found that *Copidosoma bakeri* was the most common hymenopteran parasitoid of cutworms in Manitoba.

Pathogens: Wet soil conditions during the larval stage promote fungus diseases among cutworms and also force them to feed at the soil surface where they are subject to the attack of parasites and predators.

Disease and parasites were found to be the most important factors causing the rapid decline of redbacked cutworms from the peak of an outbreak.

Tillage

Young cutworm larvae may be starved before spring seeding by allowing volunteer growth to reach three to five centimetres (1.2 to 2 inches), cultivating, and then seeding 10 to 14 days later. Research from Manitoba has shown that minimum tillage practices were associated with greater diversity of cutworms and their parasitoids, including some non-pest species of cutworms, than fields under conventional tillage. This increased diversity suggests a more stable ecosystem in which outbreaks of cutworms would be less common.

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