

Armyworms



Larvae of armyworms (*Mythimna unipuncta*), sometimes also called true armyworms, will feed on many different plants, including many crops. Adults are moths that do not overwinter in Manitoba, but move in from the south, and in some years can get to levels that can cause economic damage to crops.

Host Crops

Lush grasses are preferred for egg laying. Armyworms will feed on wheat, oats, barley, fall rye, pasture and forage grasses, some grassy weeds and in grassy field borders. Armyworms may also feed on field and sweet corn, especially late-planted corn. Though larvae feed primarily on grasses, broad-leaved plants such as soybeans, beans, peas, canola, carrots and cabbage may also be fed on. Risk of feeding in broadleaf crops increases in fields where grassy weeds were present at the time of egg laying, or if they are moving in from adjacent crops they had fed on. Armyworms get their name from the larvae's behavior of moving to new food sources in large groups.

Identification

Larvae: The general body colour ranges from pale green while young, to dark greenish-brown to black for older larvae. On each side, larvae have long pale white, orange, and dark brown stripes running the length of their body. They have a yellowish brown head capsule with a brown network of veins, giving it a netted appearance, and a "V" pattern on it. Armyworm larvae can also be distinguished by a dark band on the outer side of each proleg (the short, fleshy legs on the abdomen of caterpillars).

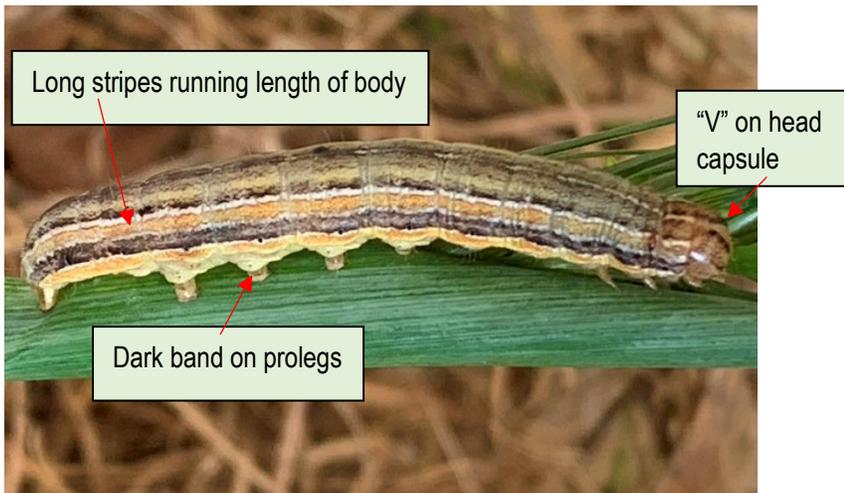


Figure 1. Armyworm larva.



Figure 2. Armyworm larvae.

Adults: The adult moths of armyworms have pale brown forewings, each with a single small white spot (Figure 4).



Figure 3. Armyworm pupa



Figure 4. Adult moth of armyworm

Biology

The moths are active at night, feeding on nectar, mating, and searching for egg laying sites. Lodged plants provide a favourable habitat for moth concealment and egg laying.

Adult female armyworms lay tiny, white eggs at night. Eggs are laid on lower leaves or at the base of grasses in narrow bands of a few to several hundred eggs, in two to five rows, rarely in one row. The eggs hatch in one to two weeks.

The larvae (Figures 1 and 2) feed mainly at night on the leaves and crowns of their hosts. During the day, they rest at the base of the host plants. Larvae typically go through six stages (called instars), except the occasional larva that will go through seven, particularly in cooler temperatures. Mature larvae are 3 to 3.5 cm long.

The length of time armyworms spend as larvae depends on the temperature. In studies where larvae were kept at a constant temperature, larval stages lasted 16 days at 29 degrees Celsius, 26 days at 21 degrees Celsius, and 40 days at 17 degrees Celsius.

First instar larvae loop as they move, and at the slightest disturbance drop from the plant on a fine web and hang suspended and motionless. In the last five instars, when larvae are disturbed they may rear their head and thorax and lash toward the annoying object before moving away. On the ground they usually curl up when disturbed (Figure 2).

When mature, the larvae construct pupal chambers a few centimetres below the surface of the soil. The pupae (Figure 3) are about 20 mm (3/4 in.) long and reddish-brown in colour. The length of time as pupae also depends on temperature; about 9 days at a constant temperature of 29 degrees Celsius, and 24 days at a constant temperature of 17 degrees Celsius. There are usually two generations per summer in Canada with the first generation doing the greatest damage in late June and early July.

Feeding habits: Early instar larvae skeletonize the surface of the leaf blades or the inner surface of the sheath, and later feed from the margins of the leaves, consuming all the tissues. The inflorescence is seldom damaged unless leaf foliage is scarce but in some grasses, notably timothy, the green heads are often consumed by the older larvae even when foliage is abundant. Armyworms do most of their feeding damage to cereals as nearly-mature larvae.

Scouting Techniques

Adults: Influxes of moths from the south, during May and June, can be monitored using pheromone-baited traps. Trap data can not be used to make management decisions, but can be used to guide scouting efforts for the larvae.

Larvae in small grains and forage grasses: A common method of scouting for larvae is to check several areas of the field, and determine the number of larvae per square foot. Larvae hide during the day, which makes assessing levels more difficult. Notched leaves may be a sign that armyworms or other defoliators are or have been present. During the day, at each stop shake the plants and look on the soil for armyworm larvae. Also look under plant debris, lumps of soil, and in soil cracks. When armyworms are found have a quick look at the back for eggs of parasites. Alternatively, late at night, with the aid of a flashlight, shake plants over a one-square metre area and count the dislodged larvae. It is not uncommon for there to be a range of larval sizes in a field.

In cereal and grass crops, check at least five areas of a field in late June. Pay special attention to patches of lodged plants and areas of grassy weeds.

Some birds (grackles and red-winged black birds) commonly search for armyworms in small grain. Any field or areas of fields that have significant bird activity should be scouted. Some species of sparrows and gulls may also feed on large numbers of larvae.

Larvae in corn: Examine 20 plants in five areas of the field and determine the percentage of damaged plants. Also note the number of larvae found and their size. During the day, larvae may be found under plant residue on the soil, or in the whorl of the plant. Early symptoms in corn may include ragged feeding on the top leaves, and wet, brown pellets (feces) in the area.

Economic Thresholds

Threshold for Small Grains

Preheading: Treat when four or more armyworms per square foot are present.

Heading (head clipping): If heads are being clipped, treat when two or more armyworms per square foot are present.

Avoid treating with insecticides when large numbers of parasitized larvae are present.

Studies on wheat leaf consumption by armyworms showed that at the boot and anthesis stages wheat can sustain up to 75% defoliation by armyworms with little loss in yield, and even at population levels that resulted in 75% defoliation head cutting was negligible.

Threshold for Corn: For corn past the 6-leaf stage, if 50% of the plants are showing damage and have larvae smaller than 2.5 cm (1 in.), insecticide treatment may be warranted. As long as the growing point of the plant is not damaged, the corn plant is usually able to recover from moderate feeding.

With early-season feeding, insecticide may be warranted in seedling corn if there are two or more unparasitized larvae per seedling and feeding damage exceeds 10%.

Threshold for Forages: Control is warranted when five or more larvae (smaller than 2.5 cm) per square foot are found. In seedling crops, two to three larvae (smaller than 2.5 cm) per square foot may warrant control.

If counts of larvae above the threshold are found:

- Only infested areas of the field may need to be treated. Levels may vary between locations in a field, so assess how widespread the higher levels are.
- Spraying should be done in the evening when armyworms are feeding on the plants.
- There is little benefit in applying an insecticide once the majority of armyworms are nearly fully grown, pupae are present, parasitism is extensive, or the crop is nearing maturity. By that time most of the damage will have been done.

Control Tips

Biological Controls

Parasitoids: There are species of wasps and flies that can commonly parasitize armyworms. Pupal clusters from a parasitic wasp called *Cotesia* can sometimes be seen on plants in fields that have had armyworms (Figure 5).

Cotesia larvae live inside the armyworms, and once mature, dozens of *Cotesia* larvae can emerge within minutes from a parasitized armyworm. Figure 6 shows an armyworm with the egg of a parasitic fly behind the head (note the white spot a little way behind the head). When scouting, check the backs of armyworms for parasite eggs. For some common parasitic flies the eggs are often laid just behind the head.



Figure 5. *Cotesia* pupal cluster.



Figure 6. Armyworm with egg of parasitic fly.

Predators: Predators such as ground beetles and rove beetles may help reduce armyworm populations.

Cultural Controls: Destroying grassy weeds, one to two weeks before seeding, will minimize the risk of attracting egg-laying moths and subsequent infestations. Avoiding late termination of grass cover crops can reduce the attractiveness of fields to egg-laying moths.

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John Gavloski, Entomologist, Manitoba Agriculture.