



Black Cutworm Management For Corn in Kansas

Life Cycle and Description

Black cutworm adults migrate to Kansas early in the spring and are typically more abundant in the eastern one-third of the state. Infestations west of U.S. Highway 81 are often not of significant concern. Corn is the most commonly attacked field crop. Sorghum, sunflowers, and more rarely, soybeans are sometimes damaged. The chance of significant cutworm infestations is higher in reduced-tillage sites because weed control is less effective than in clean-tilled fields. Heavy spring weed cover or newly broken sod can attract more egg-laying adults to a field. Greatest damage to corn may occur the year after soybeans are grown in the field.

Newly emerged adults are dark-colored moths that are somewhat hairy with dagger-shaped markings on the forewings. Wingspread may reach 1¾ inches.



Male black cutworm moth



Female black cutworm moth

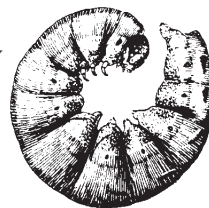
Traps are sometimes used by crop consultants, state department of agriculture survey entomologists, and university researchers to monitor moth activity. Blacklight traps, pheromone traps (which duplicate the attractive odor released by female moths to help males find mates), and confining virgin females in a cage surrounded by an entrapping device such as a sticky material, have been used as survey tools. Blacklights attract male and female moths. Pheromone traps attract males only. Once a peak in moth activity is detected, daily heat units (base 50°F) are tracked. Upon the accumulation of 300 heat units it is possible to have black cutworm larvae mature enough to start cutting plants.

Females can lay up to 1,300 eggs singly or in clusters. Eggs are more prevalent where low, dense plants such as chickweed, curly dock and mustard grow, especially if these weeds occur in fields with significant surface residue. In one study researchers found more eggs in crop or creek bank residue than where bare soil was sampled. The black cutworm's association with high residue areas probably led to another name – the overflow worm. Sometimes Kansas uplands can be as heavily infested as bottomland areas.

During the feeding stage, the black cutworm is a glossy, slick-bodied larva or caterpillar that appears to have rough skin.

Cutworms may exceed 1½ inches in length at maturity. Black cutworms are gray to black in color and speckled with dark raised bumps. These insects have three pairs of regular legs near the head and five pairs of fleshy legs on the underside of the rear body segments (four pair near the middle of the body and one pair at the tail end).

Cutworm larvae curl up in a spiral shape when disturbed. They will play “possum” until they perceive danger has passed. Often, disturbed cutworms will regurgitate material from their mouth as a further attempt to discourage attack.



Cutworm larva

This early season pest is of greatest concern during early development of field crops, typically within 10 to 14 days of crop emergence. Young larvae (up to ½ inch long) feed above ground on various weeds and crops, particularly corn. The first signs of feeding are the appearance of leaves with scattered transparent “windows” chewed in the surface or notches chewed out of the sides by small larvae. Frequently, however, this subtle damage goes unnoticed. As they grow, larvae frequently feed at or just below the ground surface, cutting plants off near ground level. They are more commonly found below ground when the soil surface is dry and crusted.

Temperature affects development of cutworms and corn plants. Cutting-stage larvae may take nearly 20 days to pupate at 70°F, 12 days at 75°F, and 10 days or more at 80°F. Larvae may cut more plants under cool temperatures. Warmer temperatures accelerate corn growth, so plants will be larger and fewer plants will be needed to satisfy the cutworms. Most feeding occurs at night, although on overcast days they may be observed above ground. Black cutworms usually hide



Photo courtesy RINGS, O.D.A.R.C.

Magnified view of the abdomen showing large, dark tubercles on each body segment and rough skin.

beneath plant debris, clods or in loose soil during the day. They remain near the surface if the soil is moist, but may move 2 to 3 inches below the surface if dry conditions persist.

Larvae 1½ inches in length should pupate within one week. During this “resting stage,” pupae mature into adults. About two weeks elapse before adults emerge from the soil.

Typically, one generation causes concern in Kansas. Except for damage from a sporadic second generation feeding on newly emerging sorghum plants, subsequent generations are not of economic concern.

Damage

Window feeding — Very young larvae cannot chew entirely through the leaf. Plants under attack early in the cutworm life cycle often have a scattering of tiny, inconspicuous “windowpanes” where one surface of the leaf remains intact.

Notching of leaves — Larvae up to ½ inch long create small notches at the edges of leaves. This type of feeding, though not very noticeable, usually is confined to corn less than 5 inches high.

Cutting plants above ground — Larvae ½ inch or more in length may cut plants off above the growing point. Severed plants may be scattered around the field. In general, plants with uninjured growing points will attempt to produce new shoots. In corn, for instance, the growing point typically remains below ground until about the five-leaf stage (the leaf collar is visible on five leaves at this stage). Each larva has the potential to cut three or four two-leaf stage plants or about two four-leaf stage plants before pupation.

Cutting of plants below ground — Large larvae may cut plants below ground. Wilted plants may remain standing with this injury. The plant may gradually disappear into the soil as the cutworm continues feeding. Because some diseases may cause plants to wilt, pull or dig up the root system to find the cause. Deteriorating or slimy roots usually mean that disease rather than cutworm feeding has caused death of the plant.

Burrowing into the stem — Older larvae sometimes burrow into the stems of larger plants. Plants appear normal, but several days later the whorl leaves wilt and die, and then the entire plant dies. This damage is uncommon, but typically occurs when infestations remain underground during dry weather.

Management

Biological Control

Opportunistic predators feed on cutworms. These include various birds, small insect-feeding mammals, various ground beetles, caterpillar-feeding insects and ground-dwelling spiders. Some flies and wasps use larvae as hosts for their young and lay eggs on or in the

cutworm. As the parasitoid develops, it consumes the cutworm.

Cultural Control

Planting into weedy or residue-covered fields may make it difficult to establish adequate stands because adult cutworms lay their eggs in those conditions. Newly broken sod may also be attractive to egg-laying adults. Problems typically are greater where cutworm infestations establish before the crop emerges. Tillage and herbicides used in seedbed preparation eliminate natural food sources, and the crop emerges in the midst of many hungry cutworms. Experts in states with routine cutworm problems recommend delaying planting seven days or longer after seedbed preparation to reduce the number of cutworms surviving until crop emergence. Many weedy and residue-covered fields escape infestation in Kansas because moth flights are less intense than in more eastern states. Moth flights in much of Kansas also may not coincide with times when fields are most attractive for egg-laying.

Resistant Hybrids

Some corn hybrids now contain plant-incorporated protectants to help them resist black cutworm damage. Currently, Herculex I corn hybrid labels (containing the Cry1F event) list black cutworm as a controlled pest. It is likely that other hybrids resistant to cutworms will be marketed during the coming years, so growers should ask seed dealers for additional host-resistance options including any special management requirements designed to discourage resistance.

Management with Insecticides

Some seed treatments, planting-time and rescue (postemergence) insecticides are available for suppressing cutworms. Both methods can give effective control, though there may be substantial differences in cost between broadcast and banded applications where the rate is calculated based on treated area. Because infestations in Kansas are spotty and inconsistent, treatments usually can be delayed until infestations are confirmed. Most fields will not need treatment. Some rootworm insecticides are promoted as working well against cutworms. But control typically has been disappointing when heavy cutworm infestations develop and a planting-time application of rootworm insecticide is the only method of protection.

Scout fields to assess damage, cutworm size and feeding location before applying postemergence treatments. Each cutworm has the potential to cut from four to six plants at the two-leaf stage. At least five widely separated groups of 20 consecutive plants should be examined. Consider applying a rescue treatment when 25 percent of plants show leaf surface feeding from very small cutworms or 3 to 5 percent of the plants are being cut. Remember that older larvae (¾ inch or more in length) are harder to kill. Thick stands can tolerate more cutting than sparse stands.

Applying treatment in the evening increases the chance that these nighttime-feeding insects will contact the insecticide. Under dry soil conditions, a light surface tillage such as rotary hoeing may help move the insecticide into the soil zone. Irrigation or rainfall may help move the insecticide into the soil, create moist conditions that are more favorable to cutworm surface movement, help injured plants recover from limited damage, and facilitate greater activation of the insecticide. Warm soil conditions increase cutworm activity so that contact with surface-applied insecticides should be greater.

Insecticide labels and recommendations change frequently. Please refer to the cutworm management discussions in the latest copy of *Corn Insect Management* (www.oznet.ksu.edu/library/ENTML2/Mf810.pdf) for information on specific insecticides and application rates.

Replanting Decisions

In years with heavy infestations, plant populations may be reduced to the point that replanting (rather than applying a rescue treatment) may be a more appropriate decision. Delaying the replant by seven to 14 days should allow most cutworms to starve or pupate and reduce the need for applying a cutworm insecticide during the replant.

Typically, replanting a stand that initially was at an adequate plant population is not necessary unless cutworms cause more than 20 percent stand reduction. As the growing season progresses, greater stand losses are needed to justify replanting because the replanted crop will experience a shorter growing season, which will limit yield potential. Obviously, the earlier the original planting the more likely that replanting can occur without risking loss of grain yield from the shorter growing season.

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