

Black Cutworm in Kansas

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Life Cycle and Description

Migrating Black Cutworm adults enter the state early in the spring. Most concerns in Kansas occur in the eastern one-third of the state, with infestations typically not of significant concern west of U.S. Highway 81. Corn is the most commonly attacked field crop, with sorghum, sunflowers, and more rarely, soybeans, sometimes experiencing damage. As tillage is reduced, the likelihood of cutworm infestations increases, largely because weed control in reduced tillage sites is typically less effective than in clean-tilled fields. Heavy spring weed cover or newly broken sod can attract a greater proportion of 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 a somewhat hairy, dark-colored moth with dagger-shaped markings on the forewings. Wingspread may reach 1¾ inches. Traps are sometimes used by crop consultants, State Board of Agriculture Survey Entomologists, and university researchers to monitor moth activity. Blacklight traps, pheromone traps (which duplicate the mating odor released by females), and actually confining virgin females inside a cage surrounded by an entrapping device such as a sticky material, have been used as survey tools.

Up to 1,300 eggs per female are laid singly or in clusters. More eggs seem to be found where low, densely-growing plants such as chickweed, curly dock, and mustard occur, especially if these weeds occur in fields with significant amounts of surface residue. Many more eggs were found in a research study where crop residue or creek bank residue was present than where bare soil was sampled. Their association with high residue areas probably led to their traditional recognition by another name, "the overflow worm." Sometimes, however, Kansas uplands are just as heavily infested as are bottomland areas.

The feeding stage of the Black Cut-

worm is a glossy, slick-bodied larva or caterpillar that appears to have a rough skin surface (granulated appearance). It may reach or slightly exceed 1½ inches in length at maturity. Background color is grayish to blackish, speckled with dark raised bumps. It has three pairs of regular legs near the head and four additional pairs of fleshy legs on the underside of its rear body segments.

Cutworm larvae curl up tightly 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, apparently a further attempt to discourage attack.

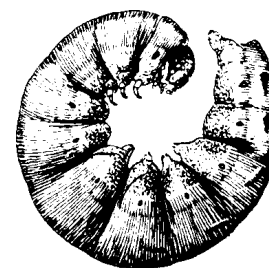
This early season pest is usually of greatest concern during early development of field crops, typically within 10 to 14 days of crop emergence. Young larvae (up to ½ inch long) feed above ground on various weeds and crops, particularly corn. When larger, they frequently feed at or just below the ground surface, and are more commonly found below ground, when the soil surface is dry and crusted, cutting plants off near ground level.

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 at 80°F. Under cool temperatures, larvae may cut more plants, but corn growth accelerates as temperatures warm so it may take fewer plants (in part, because each plant will be larger) to satisfy the food requirements per cutworm. Most feeding occurs at night, although on overcast days they may be seen above ground. Generally, they hide beneath plant debris, clods, or in loose soil during the day. They typically remain near the surface if the soil is moist, but may travel 2 to 3 inches below the surface if dry conditions persist.

Pupae are the resting stage where the transformation to adulthood takes place. Though large numbers are not known to overwinter in Kansas, remaining in the pupal stage would be the most likely strategy for this insect to use in trying to survive sub-freezing temperatures. Larvae



Enlarged portion of abdomen showing large dark tubercles on each body segment and rough skin texture (granulated). This picture is as viewed through a 10 x hand lens. Picture courtesy Rings, O.A.R.D.C.



Cutworm larva playing "possum."

1½ inches in length should be pupating within one week. About two weeks elapse before adults emerge from the soil.

Typically, one generation causes concern in Kansas. Except for damage, which sometimes results 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 surface. Plants undergoing attack early in the cutworm life cycle often will have a scattering of tiny, inconspicuous 'window-panes' where one surface of the leaf remains intact.

Notching of leaves — Larvae up to about a 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 in height.

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, or soon after, the five-leaf stage (the leaf collar is visible on five leaves at this stage). Each larvae has the potential to cut three to four two-leaf stage plants or about two four-leaf plants before pupation.

Cutting of plants below ground — Large larvae may cut plants below ground level. Wilted plants may remain standing where this type of injury is occurring. The plant may gradually disappear into the soil as the cutworm continues feeding. Because some diseases also may cause this type of injury, it can be helpful to 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 often appear normal for several days, but soon the whorl leaves wilt and die, followed by death of the entire plant. Though uncommon, this damage more typically occurs when infestations are kept underground during periods of dry weather.

Management

Biological Control

Opportunistic predators feed on cutworms. These include various birds, small insect-feeding mammals, various ground beetles and other caterpillar-feeding insects, and ground-dwelling spiders. Some flies and wasps use these larvae as hosts for their young, laying eggs on or in the cutworm body. As the parasitoid develops, it consumes the cutworm.

Cultural Control

Because adult cutworms lay eggs in woody and residue-covered fields, planting into these situations may occasionally lead to difficulty in establishing adequate stands. As mentioned, recently

broken sod also may be attractive to egg laying adults. Problems are typically greater where cutworm infestations have gotten established before the crop emerges. Tillage or herbicides used in seedbed preparation eliminates their natural food sources and the crop emerges in the midst of many hungry cutworms. Experts in states routinely faced with cutworm problems frequently recommend delaying planting seven days or longer after seedbed preparation to lessen the number of cutworms surviving at crop emergence. However, many weedy and residue-covered fields escape infestation altogether in Kansas, apparently 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.

Management with Insecticides

Planting-time and rescue (post-emergence) 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 on a treated-area basis. Because infestations in Kansas are spotty and inconsistent, we recommend delaying treatment until infestations are confirmed. Most fields will escape the need for treatment. Some rootworm insecticides are promoted as working well against cutworms. However, control often can be disappointing when heavy cutworm infestations develop and a planting time application of rootworm insecticide is the only protection employed.

Timely scouting of fields to assess actual damage, cutworm size, and feeding location should be undertaken before post-emergence treatments are applied. At least five widely separated groups of 20 consecutive plants should be examined. The rule of thumb is to 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. Keep in mind, however, that older larvae ($\frac{3}{4}$ inch or more in length) are harder to kill.

Thick stands can tolerate more cutting than sparse stands.

Making the application in the evening has been suggested as one method of increasing the likelihood 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 also may be beneficial by moving the insecticide into the soil, creating moist conditions more favorable to surface movement of cutworms, and helping injured plants sustain themselves and have a better chance of recovering from limited damage. Warm soil conditions should result in increased cutworm activity so that contact with surface-applied insecticides should be heightened.

Insecticide labels and recommendations change frequently. Please refer to the cutworm management discussion in the latest copy of, "Insect Management for Corn," or similar publications on other crops for more information on specific insecticides and rates of application.

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, thereby lessening the need for applying a cutworm insecticide during the replant operation.

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



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