

*Providing Leadership in Environmental Entomology*

Department of Entomology, Soils, and Plant Sciences • 114 Long Hall • Clemson, SC 29634-0315 • Phone: 864-656-3111  
email: dpento@clemson.edu

## INSECT PESTS OF SWEET CORN

### CUTWORMS

Cutworms damage a few plants in most gardens every year, but some gardens are so heavily infested as to warrant control by the grower. Bottom land is most frequently the site of damage, although fields that are neither bottom land nor well-drained land commonly have cutworms.

Several cutworm species are involved, but most of the injury is caused by those that feed just above the soil surface or just beneath it. In either case, the top of the plant is severed from its roots, and the larva that did the cutting may usually be found curled up in the soil close to the stub of the cut plant, within two inches of the surface. Most species move from plant to plant on successive nights, while some remain to feed on the roots and underground stem of cut plants.



**Cutworm Larva**

All cutworms pass the winter as partly to fully grown larvae in the soil or under trash or clumps of grass. They start feeding in the spring, continue growth until early summer, pupate in the soil, and emerge as moths during the summer. The moths are grayish or brown "millers" that are attracted to lights in the spring and summer. Each female lays about 1,000 eggs on the ground or on foliage in grassy or weedy areas; these hatch and the young larvae feed on roots and foliage of grasses and weeds, hibernate, and attack whatever vegetation is present the following spring. The larvae are hairless, plump, soft-bodied caterpillars that vary in color and markings, but all have a voracious appetite.

Cutworm damage can often be avoided by not planting on newly broken sod or on land that was grassy or weedy the previous summer. Gardens with a yearly history of

cutworms can be treated with an insecticide before planting.

### SEED-CORN MAGGOT

On sunny days in early spring, many small flies are often seen darting about, hovering, or resting on posts, fences, implements, surface trash, or the ground. These are probably the adults of seed-corn maggots.



**Seed-Corn Maggot**

Photo Source: Entomology Dept., University of Nebraska-Lincoln.

Eggs are laid on the soil surface where there is an abundance of decaying vegetable matter. The eggs hatch and the larvae feed and develop at temperatures as low as 40°F. Injury is usually most severe in wet, cold seasons and on land high in organic matter. The larvae feed on many forms of vegetable matter present in the spring, but are most noticeable when corn fails to germinate or produces weak seedlings, due to the maggots feeding in the kernels. Full-grown yellowish-white maggots are about one-fourth inch long, sharply pointed at the head end, legless, and very tough skinned. They move a short distance from the food to pupate. The body wall thickens to form the puparium, which gradually changes from ivory to reddish brown with a metallic luster. Adults emerge about two weeks later. There are several generations a year.

Injury can be avoided by planting late enough to get quick germination of seed, especially if the soil is rich in organic matter. If damage does occur, prompt replanting will usually result in a good stand, because of quicker germination.

### SOUTHERN CORN ROOTWORM

This insect is often called the corn budworm, which in South Carolina more accurately describes its habits than the name rootworm. It is not usually found in the roots, and as a rule does not feed on them, as is the case with rootworms found elsewhere. This insect eats directly into the heart or bud of the plant, just above the base of the roots. This causes the bud leaves to wilt and die.



**Rootworm Larva**

Several insects injure corn seedlings in such a way that suggests a "budworm" caused the damage. Only by pulling up the plant and examining it carefully can the proper diagnosis be made. If the southern corn rootworm is suspected, look on the stalk near the base of the roots for a clean-cut round hole about one thirty-second inch in diameter. No other corn pest makes such a hole. If one is

found, cut into the stalk or examine the soil for a thin, soft-bodied, ivory-colored larva with a brown head and a brown disc on the last body segment.

The adult corn rootworm is the familiar spotted cucumber beetle, which overwinters in protected spots, flies about whenever the temperature reaches 65° F or above, and feeds on nearly any growing crop or weed during the early spring. Winter legumes are especially attractive to the beetles. On warm days between January 1 and April 15, eggs are laid in the soil near where the adults have fed. After feeding about two weeks, the larvae pupate in the soil.



**Rootworm Adult**

The adults are attracted to gardens that have an abundance of certain plants, and generally avoid clean, bare land. The best way to avoid injury is turning under cover crops at least 30 days before planting corn, or keeping gardens free of weeds for 30 to 60 days before planting. This practice largely eliminates the threat of injury by larvae hatching from eggs laid near these other plants. Late planting would also help avoid injury from this insect, but may result in increased damage by other species.

### **WIREWORMS**

Although several species of wireworms are found in South Carolina vegetable gardens in the spring, only two are serious pests of sweet corn. The tobacco (or corn) wireworm eggs are laid in the summer, hatch into larvae that feed on the roots of a variety of plants, and pass the winter as a larva. When sweet corn is planted in this field the following spring, the wireworms feed on the kernels and cause poor germination and stunted, spindly, sickly plants that often die or are nonproductive. Pupation occurs in the



**Wireworm**

soil, and the new adults, known as "click beetles," emerge during early summer. They may be found hiding in terminal buds of weeds and crop plants, or down in the whorl of young corn. Eggs are laid during June, and the young larvae develop to the second,

third, or fourth instar before going deeper in the soil to overwinter.

Damage varies from year to year, but some injury occurs every year. Some years there are widespread outbreaks, then many years may pass without damage being reported.

Sand wireworms overwinter as larvae, but feed on both the kernels and the roots. Plants over two feet high stop growing, turn yellow, wilt on hot days, and die. During this period they are easily pulled out of the ground, because most of the roots have been severed. Over two dozen sand wireworms may be found per hill of corn in a field heavily infested. Surviving plants do not yield normally. Pupation occurs during May, eggs are laid from June 15 to July 15, and the tiny larvae feed for a while on the roots of various plants but cause no damage to the mature crops.

### **CORN LEAF APHID**

Corn leaf aphids on sweet corn are generally of minor importance in South Carolina. Occasionally conditions will favor the buildup of aphid populations over part of a field. The population peak usually occurs soon after tassel formation. Aphid feeding results in stunted and deformed tassels, development of black mold on the honeydew on the leaves and silk, and poor pollination and grain development. Parasites and predators become established about this time and the population rapidly falls off.

Some varieties of corn are more susceptible than others to leaf aphids.

### **CORN FLEA BEETLE**

The corn flea beetle has a black oval-shaped body, tinged with bronze or bluish green. They overwinter in litter and trash around fields. In early spring, beetles are active on weeds and then move to corn seedlings during May and June. Infestations are more severe when a cold spring follows a mild winter.

Adult beetles leave numerous, small, circular feeding holes and bleached out spots or stripes on the corn leaves. Such direct feeding is insignificant, unless large numbers of beetles attack slow growing corn, especially during a cold spring.

### **CORN EARWORM**

This is the most common of the sweet corn insects, being found in all areas of South Carolina. Infestations are generally uniform throughout the state. In untreated plots, up to 90 percent of the ears can be expected to show feeding signs.

Eggs are laid on the leaves when the plants are small. The larvae go down into the whorl to feed, and by the time this injury is first seen, most of the damage has been done and the worms are covered by a plug of frass which protects them from parasites and insecticides. Injury to the foliage occurs before tasseling. The corn leaves are ragged when they grow out, but this damage usually does not seriously affect the crop. Late-planted corn is likely to be severely damaged, for the egg-laying adults become more numerous as the season progresses.



**Corn Earworm**

The new generation of moths lay eggs on fresh corn silk as it appears. Usually several eggs are laid on the silk of each ear, but only one worm reaches maturity, due to parasites, predators, and cannibalism. Damage to sweet corn is more severe than to field corn, which usually has only the kernels at the tip of the ear eaten. Ears having tight husks extending well beyond the tip of the ear are least injured, since feeding may be completed in the silk channel. Larvae cut a small hole at the side of the ear, through which they emerge. They drop to the ground and pupate beneath the soil surface.



**Corn Earworm Damage**

All of the damage caused by corn earworms is not direct. The indirect damage occurs when other insects and disease organisms use the earworm holes as entrance sites. The resulting damage often exceeds that caused by the earworm.

The moths have a wingspan of about 1 ½ inches. They vary in color, but are usually light tan-brown, marked with dark-gray irregular lines and a dark area near the tip of the wing. Hind wings are light tan with a dark band near the margin. Moths are often found in the daytime resting in the whorl of young corn or at the base of the leaves of older corn. Each female may lay from 1,000 to 3,000 eggs. Larvae vary in color from a light green or pink to nearly black, though most individuals are brownish-green. Usually alternating light and dark stripes run the length of the body. The eyes are yellowish orange with an inverted “Y” between them. Mature larvae are about 1 ½ inches long.

### **FALL ARMYWORM**

This insect is present during most years, but occasionally the fall armyworm is extremely numerous. The larva feeds on corn foliage, stalks, and ears, entering the base of the ears, feeding along the sides of the ears, and even tunneling into the cob. It usually emerges near the base of the ears, leaving round holes three-sixteenth inch in diameter in the shucks.

This insect, unable to overwinter in South Carolina, must fly here from much farther south. When moths emerge from the ground, they fly a considerable distance before laying eggs. Gardens covered with grass are chosen, and the larvae consume great quantities of food. If the appetite of the worms is still unsatisfied when all grass has been eaten, they start to eat the crop. After the crop is consumed, they mass together and crawl or “march” in search of other crops. When mature, they enter the soil to pupate, seeming to disappear suddenly. The moths emerge about two weeks later and fly off to plague another section of the country.



**Fall Armyworm**

Because South Carolina sweet corn is usually mature by the time this pest arrives in great numbers, it is not injured. However, if corn is planted late, or the insects come early, they catch the corn at or just before the milk stage and cause severe damage. The leaves may be stripped from the stalk and the ears so thoroughly damaged that no corn is harvested. Cold wet weather in the spring favors insect development and suppresses its parasites and predators. Furthermore, gardens are usually grassier in cold, wet years and thus attract the moths for egg laying.

The adult fall armyworm is a moth about 1 ½ inches across the wings. The forewings are dull, mottled, brownish-gray, while the hind wings are pinkish-white edged with a smoky-brown line. The dark-eyed larva is about 1 ½ inches long when mature. It is variable in color from light brown to nearly black, and has several narrow lines down the back and sides. It feeds during the daytime, in contrast to larvae of related species which leave the plant to hide, coming back to feed at night.

### **EUROPEAN CORN BORER**

A telltale sign of injury from European corn borers appears as broken tassels caused by the borers feeding in the tassel stems. Much frass is pushed out of the burrows. Later in the season its presence is indicated by small round holes at any location on the stalk. In either case, the point of entrance is usually marked by a protruding mass of white frass that accumulates at the base of the leaves. The tunneling within the stalks weakens them so that plants break over. Feeding on the shank of the ear causes it to fall to the ground. The larvae



**European Corn Borer**

Photo Source: Entomology Dept., University of Nebraska-Lincoln.

also feed on the developing kernels or tunnel into the cobs.

The adults are strong-flying moths with yellowish-brown wings marked with wavy dark lines. Eggs are laid in groups on corn leaves, and the young larvae of the first generation feed on foliage before boring into the stalk. The larvae are flesh-colored, inconspicuously spotted caterpillars, about one-half to one inch long. There are about three generations a year in South Carolina. The winter is passed as fully-grown larvae in the stems where they have been feeding, especially those close to the ground. Pupation occurs in the burrows. Destroying the crop stubble by tillage eliminates this overwintering site and aids in control.

### **CORN (DUSKY) SAP BEETLE**

This is the most common of several species of small, flat, brown and black sap beetles that are present in most corn fields.

Adult beetles are first noticed at about the time tassels appear on the earliest sweet corn. They invade corn borer tunnels and feed on frass. They also feed on the pollen as it ripens on the tassels and later as it lodges in the leaf axils. Mating and egg laying begin when females are five to six days old. Eggs are deposited on worm frass and wet accumulation of pollen, which are suitable for larval development if these sites remain moist for ten to fourteen days.

Sap beetle activity continues to increase as the corn matures, and adults usually invade the ear when the silks begin to turn brown. The majority of eggs are laid on worm frass at the ear tip or scattered through the silk strands. The milky white eggs resemble tiny kernels of rice, about 1/16 inch long. The larva is a yellowish or pinkish-white grub (about 1/4 inch long) with a translucent spiny body and three pairs of short legs near its head. As the larvae hatch, they move deeper into the ear where they penetrate and hollow out the developing kernels.

Sap beetle problems are more severe during June and early July, particularly if corn is damaged by other pests. Ears injured by corn borers or corn earworms attract sap beetles more than ears with no previous injury; however, beetles can enter and severely damage ears that have no previous injury. Bird-damaged ears often are infested with sap beetles.

### **JAPANESE BEETLES**

Japanese beetles often feed on the silking ears of sweet corn from mid-June through July. They cut off the fresh silks and sometimes expose the ear tip to other insects, such as sap beetles. Silk feeding can interfere with pollination if the beetles feed continuously for five to six days after the fresh silks emerge from the ear tip. Infestations usually are limited to scattered "hot spots" rather than distributed uniformly in the field.



**Japanese Beetle**

### **CONTROL OF INSECTS OF SWEET CORN IN THE HOME VEGETABLE GARDEN**

Consider cultural control methods for cutworms, seed-corn maggots, and corn rootworms as outlined in the discussion of these pests. Common vegetable garden insecticides will adequately control caterpillars such as corn earworms and European corn borers as well as the beetles (flea beetles, Japanese beetles, etc.). You will need a different type of material for aphid control. Sweet corn plants can sustain heavy whorl (foliage) feeding prior to tasseling without much loss in yield. For insect-free ears, however, routine sprays on the developing ears and silk are necessary. Follow pesticide label directions closely to avoid killing beneficial insects like honeybees that are highly attracted to the pollen.

Check with your local County Extension Agent for specific insecticide recommendations.

*For other publications in our Entomology Insect Information Series visit our web site at <http://www.clemson.edu/esps>.*

---

Prepared by Randall P. Griffin, Extension Entomologist/Professor, Department of Entomology, Soils, and Plant Sciences, Clemson University.

---

This information is supplied with the understanding that no discrimination is intended and no endorsement by the Clemson University Cooperative Extension Service is implied. Brand names of pesticides are given as a convenience and are neither an endorsement nor guarantee of the product nor a suggestion that similar products are not effective. Use pesticides only according to the directions on the label. Follow all directions, precautions and restrictions that are listed. EIS/FV-4 (New 11/1997) (revised-paz-05/2011).