

# Insects

## Controlling the Southwestern Corn Borer in Tennessee

Charles R. Patrick, Professor and Scott Stewart, Associate Professor, Entomology and Plant Pathology  
Angela Thompson, Assistant Professor, Plant Sciences

### Introduction

The southwestern corn borer was first identified in field corn in Tennessee in the early 1960s. Since the early 1990s, this insect has increased in population and potential for damage, and continues to be one of the most serious pests of corn in Tennessee. Grain and sweet sorghum, in addition to many grass weeds such as johnsongrass, are alternate hosts for this pest, allowing additional over-wintering sites for later southwestern corn borer infestations in corn.

### Description and Life Cycle

There may be a partial third generation, but normally there are only two generations of the southwestern corn borer in Tennessee. Adult moths are dull white without distinctive wing markings, and have prominent mouthparts. Eggs are flat, white and laid in groups of 5-10 eggs per mass, looking similar to fish scales. Southwestern corn borer eggs develop distinctive red bands across the egg surface within 36 hours after being deposited. Newly hatched larvae possess a distinct black head capsule, but this color lightens as the larvae mature. First-generation larvae are off-white and have numerous black spots over the lengths of their bodies. Over-wintering larvae are creamy yellow and lose their spots after they reach full size.

Female moths emerge in early June in Tennessee. Eggs are deposited primarily on the upper and sometimes on the lower surface of corn leaves. First generation larvae appear in late June, feeding on leaves and eventually tunneling into stalks of corn plants. Tunneling by the larvae weakens the plant, as well as causing “dead heart” or death of the growing point in young corn. Second-generation larvae appear in late August. These larvae feed on leaves, but will eventually tunnel down toward the base of the corn stalk, feeding on or “girdling” the interior of the stalk to prepare an over-wintering site.

### Damage

Southwestern corn borer damage is due to the tunneling activity and the girdling of the stalk base by larvae. Tunneling through stalk tissue interferes with the ability of the plant to transport water and nutrients to leaves, resulting in poor ear development. Girdling can result in stalk breakage and lodging prior to harvest.

Signs of **first-generation** southwestern corn borer infestation:

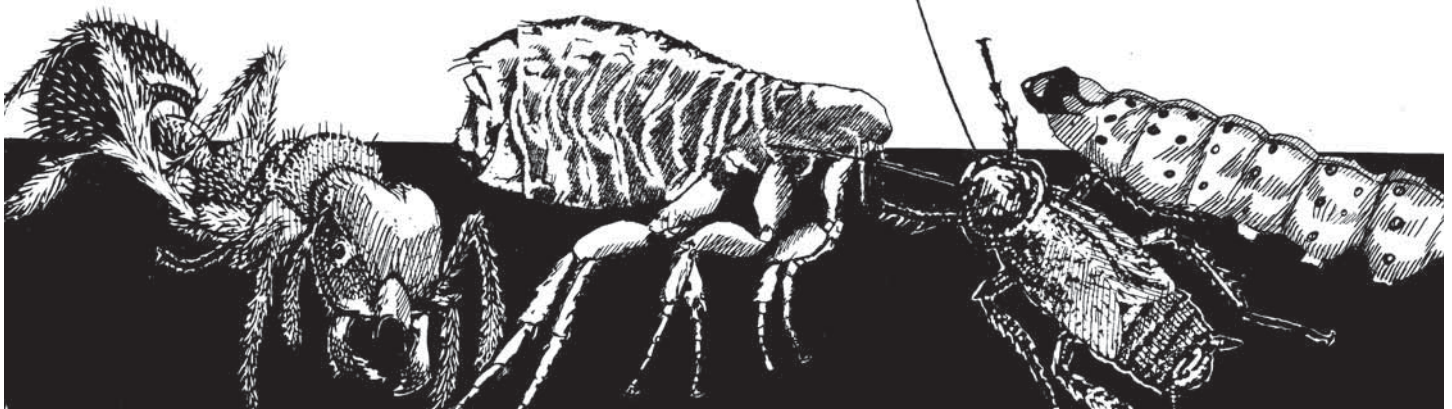
- windowpane feeding in elongated strips parallel to leaf veins
- buckshot appearance in leaves growing out of infested whorls
- “dead heart” or dead growing points in young corn
- broken stalks at lower internodes

Signs of **second and third generation** southwestern corn borer infestation:

- egg masses on or near ear leaf
- frass or small larvae feeding on leaves and ear husks
- stalk breakage 2 to 4 inches above the soil line caused by girdling of the inner stalk



Figure 1. Stalk damage by the southwestern corn borer.



## Pheromone Traps

Pheromone traps are used to detect the presence of adult moths near corn fields. A special lure is placed in the trap that attracts the moth. Trap types common for trapping corn borer moths are called delta-wing sticky traps. The moths become stuck in the trap when they are attracted to the lure. Moth traps are one method to determine when corn borers are present at a specific location. Moth traps do not provide enough information to determine how many moths are present in any cornfield. When moths are found in traps, it is time to begin scouting corn to determine if any larvae are present in the field. Use traps only as an indicator of moths in an area, not as a gauge of specific population dynamics.



**Figure 2.** Second-generation southwestern corn borer larva removed from base of the stalk before reaching full size. Black spots on this over-wintering larva will disappear once full size is reached.

## Scouting and Economic Thresholds

To scout for the larvae, examine a total of at least 100 plants in 10 locations across the cornfield and calculate the percentage of plants with larvae. Treatment should be made when 30 percent of scouted plants have live larvae on them. The number of corn stalks girdled by larvae can be as high as 75 percent.

Insecticides may be applied directly over the plants for control of corn borers. However, they must be applied before larvae bore into stalks. Figure 1 shows a larva that had tunneled into the plant and caused damage to the corn.

## Bt Hybrids

*Bacillus thuringiensis* (*Bt*) corn hybrids were developed to control the European corn borer in the Midwestern United States. Information from research and demonstration trials in Tennessee indicates that some of these hybrids will also control the southwestern corn borer. It should be noted that not all *Bt* hybrids are the same. There are different *Bt* “events” that differ in their ability to control pests other than the European corn borer. For example, BT11 and MON 810 events (YieldGard) both provide protection from the southwestern corn borer.

A *Bt* hybrid is recommended when planting is delayed late into May, particularly in areas where corn borers are present every year. When choosing *Bt* hybrids, select those that yield well and have the disease resistance and other agronomic qualities needed for a specific field.

Growers must plant a non-*Bt* refuge within one-half mile of a *Bt* field to help prevent the development of resistant southwestern corn borers (check with seed company for specific information on refuges). In Tennessee counties where cotton is grown, up to 50 percent of corn acres may be planted with *Bt* hybrids (80 percent in non-cotton growing counties). *Bt* corn seed costs an average of \$8 to \$10 more per acre. If there has not been much activity from either the European or southwestern corn borer in an area, it may not be cost effective to plant *Bt* hybrids.

## Recommended Insecticides for Control of Southwestern Corn Borer

Material	Rate/Acre
Sevin XLR	1.5 to 2 quarts
Furadan 4F	1.5 to 2 pints
Asana XL	7.8 to 9.6 ounces
Mustang Max	2.72 to 4 ounces
Pounce 3.2	4 to 8 ounces
Ambush 2.0	6.4 to 12.8 ounces
Warrior	2.56 to 3.84 ounces
Tracer	1 to 3 ounces
Bt products	See label
Intrepid 2F	4 to 8 ounces
Baythroid	1.6 to 2.8 oz.

**This is a guide and not a label replacement. Do not use any of these pesticides unless you have thoroughly read the label and understand all precautions and restrictions.**