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W196 Sourthwestern Corn Borer in Tennessee

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Corn Insects

Southwestern Corn Borer

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Classification and Description: The southwestern corn borer (*Diatraea grandiosella,* Lepidoptera: Crambidae) is a well-known caterpillar pest of corn. Its biology is similar to European corn borer. The moths are dull white or buff-colored and about 1 inch long, although their size can vary. Southwestern corn borers (SWCB) lay flattened eggs in an overlapping mass reminiscent of fish scales. Egg masses typically range from 2-6 eggs (whereas European corn borer egg masses normally have 8-40 eggs). Eggs are white when initially laid. They then develop red stripes within about 36 hours. Eggs that are totally black have been attacked by a tiny parasitic wasp.

Larvae have brown head capsules. Small larva are initially translucent white or yellowish with black spots on the body. Older larvae are creamy white and have more distinctive black spots. Larvae reach a maximum length of 1¼ inches. Pupae are dark brown, about ¾ inch long and located in the stalk or occasionally in ears or ear shanks. Overwintering larvae are light yellow-white and do not pupate until the following spring. Only faded spots are present on overwintering larvae.

Hosts, Life History and Distribution: Southwestern corn borer has relatively few hosts. Corn is the primary host, but larvae are occasionally found on sorghum and Johnsongrass. The SWCB is primarily distributed in the southern United States and Mexico. Cold winter temperatures in most of the Midwestern Corn Belt limit the northern range of this insect.

A female moth only lives 5-7 days but may lay 250 eggs during her life span. Eggs take about five days to hatch. Except for overwintering larvae, it takes about 20 days for a larva to develop into a pupa. Moths from the overwintering generation mostly emerge in May and produce the first generation of borers. In Tennessee, the next moth flight and a second

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generation of borers typically occurs sometime in mid July. A third moth flight and a third generation of larvae occurs during August and September.

Pest Status and Injury: Southwestern corn borer is an important pest of corn. This species is generally the most common "borer" in the western part of Tennessee. On whorl-stage corn, hatching larvae move into the whorl and feed on leaves. Feeding signs include elongate window-pane lesions on emerging leaves. In tasseling corn, small larvae usually feed behind leaf collars and between ear husks. Most larvae will be found within two leaves above or below the ear leaf. Older larvae tunnel into the stalk, in ear shanks, or feed on ears until they pupate (usually inside the stalk.) Tunneling interferes with nutrient and water flow within the plant and to the ears. Tunneled shanks may break, causing ears to fall on the ground. Most second-generation larvae will overwinter. Overwintering larvae usually girdle the stalk from the inside. Girdles are normally located 1-6 inches above the ground and are capped with frass and plant debris. Girdling often results in lodging, particularly in high winds or when infested corn is not harvested in a timely manner. Lodging can dramatically reduce yield and slow harvesting operations.

Management Considerations: SWCB population levels vary widely from year to year and across different locations. Both first- and second-generation larvae may cause economic damage to corn. A partial third generation is too late to affect fields planted during the recommended planting window. SWCB populations are lowest during the first generation, so widespread infestations are less likely at this time. Moths often concentrate their oviposition in a few fields, especially targeting early-planted fields. The second generation affects more fields, and unlike the first generation, populations are typically highest in late-planted fields. However, depending on the timing of moth flights, many fields can potentially be infested. Planting early in the recommended planting window is suggested to avoid late-season infestations of SWCB and other caterpillar pests (e.g., European corn borer, fall armyworm and corn earworm).

Reduced tillage systems favor SWCB, because larvae overwinter at the base of stalks. However, tillage will have little impact on potential infestations the following year unless it is done across a relatively large area. Moths can re-infest an area from neighboring, untilled fields. Some kinds of Bt corn (e.g., YieldGard® and Herculex®) produce a toxin that is very effective in controlling corn borers. As part of an insecticide resistance management plan, a refuge of non-Bt corn is required for Bt corn. In cotton-growing areas of Tennessee, only 50 percent of a grower's corn acreage can be planted with corn that has a single Bt trait for controlling corn borers. Up to 80 percent Bt corn can be planted in non-cotton areas. Corn varieties having two or more Bt traits (i.e., YieldGard VT Pro®, SmartStax®) are being developed. A smaller refuge of non-Bt corn will be required for these newer technologies, and these technologies also provide improved control of corn earworm and fall armyworm.

It is recommended that non-Bt corn be treated with insecticides if 20-30 percent or more of plants are infested with eggs or small larvae. Insecticide choices for control of SWCB are listed in the *Tennessee Insect Control Recommendations for Field Crops (PB 1768).* It is important to make insecticide applications before most larvae begin tunneling into the stalk; otherwise, poor control will result. In whorl-stage corn, high volumes sprayed directly into the whorl will provide the best results. Aerial applications are typically needed in tasseling corn. Pheromone moth traps are very useful in determining the timing and relative size of moth flights. However, they do not necessarily correlate with subsequent larval populations in individual fields. These traps should be used to help time scouting efforts to when infestations are likely to be present. There is usually a delay of 7-14 days between observing an increase in moth catches and a corresponding increase in egg or larval populations in nearby fields.

References:

Handbook of Corn Insects, K. L. Steffey et al. (eds.), Entomological Society of America, 1999.

Controlling the Southwestern Corn Borer. C. Patrick, S. Stewart and A. Thompson, University of Tennessee Extension, SP503-E.

Eggs of southwestern corn borer

Small larva

Southwestern corn borer moth

Larger larva in stalk

Girdled stalk

Overwintering larva

Leaf feeding damage

This publication contains pesticide recommendations that are subject to change at any time. The recommendations in this publication are provided only as a guide. It is always the pesticide applicator's responsibility, by law, to read and follow all current label directions for the specific pesticide being used. The label always takes precedence over the recommendations found in this publication.

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