Lesser Cornstalk Borer Damage to Forest Nursery Seedlings in Florida

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The lesser cornstalk borer is an insect pest in Florida's forest nurseries. Generally, seedling losses are minimal; however, one nursery in 1981 lost about 1 million seedlings, and seven tree species were attacked. Field diagnosis and control measures are described.

The lesser cornstalk borer (LCB) (*Elasmopalpus lignosellus*) attacks a variety of agricultural crop species such as corn, peanut, sorghum, and soybean (*4*). LCB larvae will also feed on tree seedlings in southern forest nurseries. Known host species are black locust (*Robinia pseudoacacia*), loblolly pine (*Pinus taeda*), (*1*), and Arizona cypress (*Cupressus arizonica*) (*2*).

In Florida, seedling losses to LCB have apparently varied year to year and by species. Forest nursery personnel, responding to a 1980 questionnaire, estimated that the LCB impact rariged from 0 to 2 percent of total nursery production in recent years. Unfortunately, no data were available to develop a comprehensive description of LCB activity. An LCB infestation in one nursery in 1981 has since provided the opportunity to remedy, in part, this lack of knowledge.

Situation

The nursery, located in central Florida, estimated final production to exceed 47 million softwood and hardwood seedlings; however, about 1 million seedlings were subsequently killed by LCB. In addition, nearly 1 million seedlings were injured by LCB, yet survived in the nurserybed. The field performance of these seedlings is unknown. Overall, total production at the nursery decreased 1.8 percent.

Several species were susceptible to LCB attack—baldcypress (*Taxodium distichum*), black tupelo (*Nyssa sylvatica*), flowering dogwood (*Corpus florida*), loblolly pine, southern red cedar (*Juniperus silicicola*), sand pine (*Pinus clausa*), slash pine (*Pinus elliottii*), and sycamore (*Platanus occidentalis*).

Species not attacked were black cherry, catalpa, laurel oak, live oak, longleaf pine, magnolia, spruce pine, and Virginia pine.

Based on the location and number of observed moths, the LCB infestations were probably centered in the millet (*Panicum miliaceum*) and field corn (*Zea mays*) covercrops (about 30 acres) in the nursery. Subsequently, it was found that nearby soybean fields were severely damaged by LCB as well.

In the nursery, LCB moths were first observed in mid-May, predominantly in the covercrops. Not until early July did the magnitude of the problem become apparent in the seedling beds. Thousands of seedlings exhibited discolored foliage and/or stems broken at groundline because of LCB larvae girdling below ground.

Control Action and Results

Two insecticide applications of carbaryl were made in July to affected seedling beds; however, foliage density probably decreased insecticide effectiveness. A soil drench insecticide (carbaryl) application to the covercrops was facilitated by chopping the plants to an 8-inch height. Selected seedling beds and the covercrops were treated again in early August. The covercrops were plowed under and disked repeatedly in late August, primarily as a preventive measure. The lack of additional seedling losses suggests treatment success since LCB damage in agricultural crops typically peaks in August.

The locations of covercrops and predominant seedling species within the nursery are shown in figure 1. Flowering dogwoods in compartment 8 experienced the greatest mortality—nearly 70 percent, and 30 percent of the live seedlings exhibited feeding scars from the LCB. The lesser damage incidence for the coniferous species may have been because resinous sap afforded some seedling protection.

Also, in compartment 7 and east of compartment 2, peanut shells were used as an organic amendment. Peanuts plants are a favored host of LCB, and it has been demonstrated that some insect species use odors associated with host plants to aid in the location of suitable oviposition sites. Thus, seedling losses may have been aggravated because of female moth

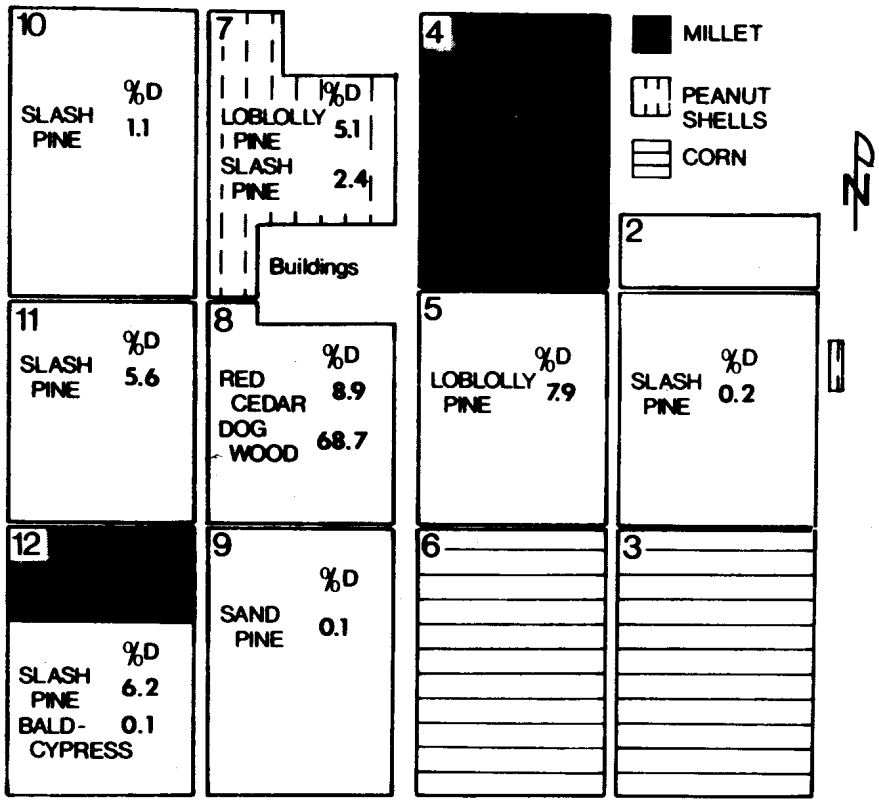

Figure 1.—*Location* of *covercrop and predominant seedling species affected by larvae* of *the lesser cornstalk borer. %D = percent kill; 1-12 = compartment block numbers.*

orientation to residual odors from the shells. Compartment 2 damage was limited to a small area adjacent to peanut shells.

LCB Biology, Diagnosis, and Control Strategy

Insect biology. After emerging from the soil in late spring, adult moths mate and females deposit eggs singly in the soil at the base of host plants or on stems and lower leaves. Eggs hatch within 1 week, and larvae mine lowermost branches or begin semisubterranean feeding on stems and roots. Silk tunnels, radiating from feeding sites, protect larvae. The larval feeding period lasts 2 to 3 weeks. Pupation occurs in the silk tunnels or soil litter, requiring 2 to 3 weeks to complete. The new adults emerge, mate, and may live up to 10 days. Each female lays about 125 eggs. By late summer most life stages can be found because of generation overlap; there are 2 to 4 generations per year. Larvae or pupae survive winter in the soil or soil litter (*3*).

Field diagnosis. Severely damaged seedlings usually die and may either remain upright or fall over; often several seedlings in a drill are attacked. Below ground, larval feeding is indicated by stem girdling (fig. 2), gall-like stem formation (fig. 3), or callous tissue around a feeding wound (fig. 4). The slender larvae (less than 1 in. in length) are pale green with brown banding or stripes. Larvae are difficult to find and wriggle furiously when captured. Moths are brownish gray with a wingspan of about 1 inch. More readily observed than larvae, the moth's flight pattern is short, jerky, and just above seedling tops.

Control. A lesser cornstalk borer infestation is favored by the

Figure 2.—*Below ground girdling* of *a baldcypress seedling by a lesser cornstalk borer.*

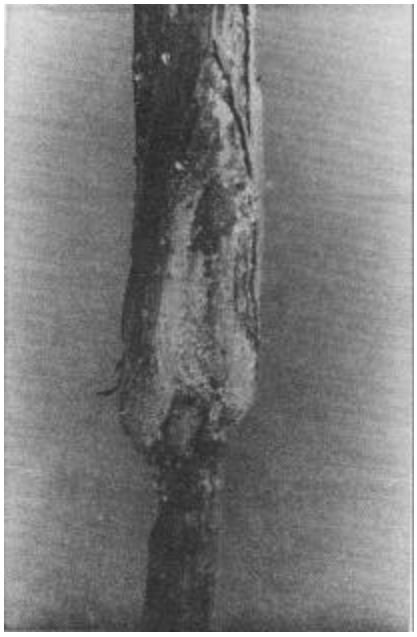

Figure 3.—*Gall-like tissue formation on a baldcypress seedling damaged by a lesser cornstalk borer larva.*

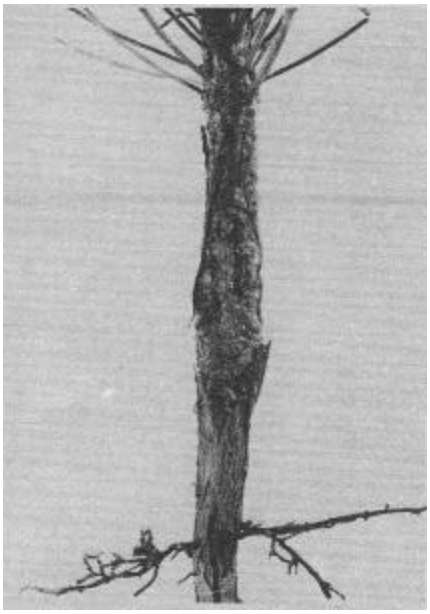

Figure 4.—*Callous tissue and feeding scar on a baldcypress seedling.*

presence of susceptible covercrops, sandy soils, and drought weather-all of which were present in this nursery. Amelioration of these factors, where possible, plus general sanitation measures, late fall plowing, and covercrop rotation should lessen the incidence or impact of the insect. If these measures fail, a preventive insecticide treatment deserves consideration in future nursery efforts (*4*). A granular insecticide (carbofuran, diazinon, chlorpyrifos, parathion) is incorporated into the soil simultaneously with covercrop sowing. The insecticide used will depend on the covercrop being grown. Ultimately, a remedial treatment may become necessary. An insecticide, such as carbaryl, is applied as a soil drench at the first sign of seedling damage. More than one application may be needed because the silk tubes of larvae in the soil make it especially difficult to insure adequate larval exposure to the insecticide.

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