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Eastern Pineshoot Borer

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The eastern pineshoot borer, *Eucosma gloriola* Heinrich [2], also known as the white pine tip moth, American pine shoot moth, white pine shoot borer, and Tordeuse americaine du pin, injures young conifers in Northeastern North America. Because it infests the new shoots of sapling conifers, this insect is particularly destructive on planted trees destined for the Christmas tree market. Affected trees are left with 5 to 10 cm (2 to 4 in) terminals instead of 20 to 30 cm (8 to 12 in) terminals that Christmas tree growers prefer.

Originally discovered in Connecticut, this shoot-boring insect is now known to occur wherever its conifer hosts grow throughout Northeastern United States and Canada—from Maine west to southern Manitoba, and south through the Lake States, northern Ohio, Pennsylvania, and New Jersey.

F–700438

Hosts

This insect has been reared from or recorded on many conifers, especially pines. It prefers eastern white and Scots pines but has been observed feeding on jack, red, Austrian, pitch, and mugo pines. It also occurs occasionally on white spruce and Douglas-fir. Although it attacks trees up to 9 m (30 ft) tall, the eastern pineshoot borer is most injurious to trees 1.0 to 2.5 m (3 to 8 ft) tall.

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[2] Lepidoptera, Olethreutidae.

Injury

Injury by this borer is seldom noticed until after the larva has left the shoot. Both terminal and lateral shoots are attacked. The first evidence of attack occurs about mid-June when the outer 15 to 20 cm (6 to 8 in) of the shoot begins to droop and turn yellow (fig. 1). Frequently the shoot breaks over or drops off near the base of the attack, leaving a distinctive flat stub. Terminals are more susceptible to breakage than laterals. Some shoots, especially on Douglas-fir, may wilt and droop before yellowing and resemble a shepherd's crook.

The pith of the attacked shoot is hollowed out to form a 15- to 20-cm-long (6 to 8 in) gallery. The exit hole made by the larva near the base of the gallery is a characteristic indicator of this insect's damage (fig. 2). Small shoots that die before mid-June are usually those in which the insects have died prematurely. Such shoots contain only a partially excavated gallery filled with hardened pitch.

Pineshoot borer injury causes trees to become stunted and crooked; crooks and forks develop after terminals are killed. The general crown shape of the tree is ruined when laterals are killed. The wound caused by the broken shoot can be an infection court for disease-causing organisms.

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Figure 1.—Off-color shoots of Scots pine damaged by eastern pineshoot borer larvae.

Description

The pineshoot borer egg is yellowish, flattened, and about 0.3 mm (0.1 in) in diameter. It is either circular or slightly elliptical in form and is well camouflaged if deposited on the needle sheath.

The fully developed larva is dirty white to gray and 1.3 to 1.9 cm (½ to ¾ in) long (see cover). Its head is yellowish-brown with a round blackish spot. The thoracic shield behind the head is pale yellow.

The pupa is brown. Pupation takes place in the litter or topsoil within a light brown cocoon covered with clinging soil particles.

The adult is a coppery-red moth with two shiny transverse lead-gray bands on the forewings (fig. 3). The hind wings are gray brown. Total wingspread is about 1.5 cm (⅝ in).

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Figure 2.—Exit hole of the eastern pineshoot borer larva.

Life History and Habits

Depending on locality, the adults emerge in late April to mid-May or soon after the host buds burst. The moths are rarely seen during the day and fly short distances between trees only when disturbed. Then they conceal themselves again between the needles near the orange needle sheaths. Mating and egg laying occur at night.

After mating, each female usually deposits one egg on the needle sheaths on each of several different new shoots. Within 2 weeks the larva emerges from the egg and bores into the shoot adjacent to a needle fascicle, or occasionally behind a cone or bark scale along the shoot. It mines downward in the pith, the gallery widening as the larva grows. Normally, only one larva occurs in each shoot, but up to six have been found in heavy infestations. When several larvae occur together, only one or two, if any, will survive because of competition for food and space.

By mid-June most larvae have moulted four times. These fully developed larvae reverse their direction in the shoot and mine upward for a short distance. When nearly mature, the larva cuts into the woody portion of the stem, usually near the base of the gallery. This weakens the shoot and causes it to break off when touched or exposed to strong winds. Between mid-June and early July the larva bores an exit hole (fig. 2) and drops to the ground. After spinning a cocoon in the litter or topsoil beneath the host, it pupates for overwintering.

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Figure 3.—Adult eastern pineshoot borer.

Control

The pine shoot borer is difficult to control with pesticides because of the extended adult emergence period and the concealed activity of the larvae. If control is necessary, however, pesticides can be

applied about the second week in May to place toxic residues on the surface of the tree to kill larvae before they bore into the shoot. Consult your State agricultural experiment station, your county agricultural agent, or other local pest control source to obtain current information concerning chemical control of this insect.

References

Drooz, A. T.
1960. White pine shoot borer (*Eucosma gloriola* Heinrich). J. Econ. Entomol. 53:248–251.

Newman, J. H.
1968. First records of the white pine shoot borer, *Eucosma gloriola* (Lepidoptera: Olethreutidae), in Michigan. Mich. Entomol. 1:267–270.

Wong, H. R., and A. E. Campbell.
1967. The larval feeding habits of the eastern pine-shoot borer, *Eucosma gloriola* Heinrich (Lepidoptera: Tortricidae), in jack pine regeneration in Michigan. Manitoba Entomol. 1:42–46.

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