

PINE SHOOT BEETLE (OR COMMON PINE SHOOT BEETLE)

Tomicus piniperda
(Linnaeus)



Flagging damage from pine shoot beetle. *Courtesy of Rayanne D. Lehman, PDA*

This is a federally regulated pest. A Compliance Agreement is available to enable growers within the quarantine area to ship trees to other states. Consult your state or federal agency for information on the pine shoot beetle quarantine area and shipping regulations.

Hosts

- Pines, especially Austrian and Scotch
- Occasionally on eastern white pine

Damage Potential

- Moderate–high

Symptoms and Signs

Spring

- Boring dust (reddish in color) on cut trees or stumps
- Egg and larval galleries beneath the bark of cut trees or stumps

June Through December

- Shoots on live trees turn yellow or red
- Drooping shoots and round holes surrounded by pitch
- Shoot completely hollow

Causes of Similar Symptoms

- Other bark beetles
- Diplodia (Sphaeropsis) shoot blight
- Eastern pine shoot borer
- European pine shoot moth

Identification

Pine shoot beetle eggs are approximately 1/25 inch (1 mm) long, oval, smooth, and shiny white. Larvae are legless, white grubs, up to 1/2 inch (5 mm) long, with brown heads. Both eggs and larvae are found inside galleries under the bark of weakened trees or stumps. Reddish sawdust may be apparent as the larvae bore in the inner bark.

Adult beetles are cylindrical, dark brown or black, and generally shiny. They can be up to 1/2 inch (5 mm) in length. Newly

emerged adults are easiest to find in summer as they go through their maturation feeding stage. These new adults will feed inside current-year shoots until fall when they seek overwintering sites. They generally feed within 6 inches (15 cm) or less of the shoot tip, completely hollowing out the shoot. This gallery is completely free of sawdust and frass, in contrast to the gallery of moth larvae. The entrance/exit hole used by the adults is round and frequently ringed with sap and sawdust. Shoots bored by pine shoot beetles turn yellow and may droop or break from the tree (Figs. 1 and 2).



Figure 1. Exit hole from summer maturation feeding site. *Courtesy of Rayanne D. Lehman, PDA*



Figure 2. Symptom of pine shoot beetle infestation. *Courtesy of Rayanne D. Lehman, PDA*

Calendar of Activities

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Symptoms						■	■	■	■	■	■	■
Monitor					■	■	■	■	■	■	■	
Mechanical Control		■	■	■	■				■	■		
Spray Control				■		■						

Biology and Life Cycle

Although they can survive as mature larvae or pupae, pine shoot beetles most often overwinter as adults in the bark or lower stems at the base of trees (Fig. 3). In early spring, adults become active and fly to recently cut trees and stumps, attracted to chemicals released by the trees. Both sexes create a club-shaped chamber called a gallery between the bark and sapwood (Fig. 4). The female beetle carves out the gallery, which runs parallel with the grain of the wood, while the male ejects the debris from the tunnel and blocks the opening so other males cannot enter. Eggs are deposited in niches created along the wall of the gallery and hatch 2–3 weeks later. Larvae feed for 6–8 weeks as they bore horizontally into cambial tissues before pupating.



Figure 3. Adult pine shoot beetle. *Courtesy of Jim Stimmel, PDA, Bugwood.org (#2117021)*



Figure 4. Adult beetles in a breeding gallery. *Courtesy of Louis-Michel Nageleisen, Département de la Santé des Forêts, Bugwood.org (#2101014)*

In early summer, new adults emerge from the breeding site and begin feeding on current or one-year-old growth of living trees. This “maturation feeding” can occur from May through October (Figs. 5 and 6). Beetles may feed on as many as six shoots before overwintering. One generation occurs per year.

Monitoring and Management Strategies

Plantation Establishment

- Plant tree species other than pine.

Preseason

- Chip or burn any culled pines to remove breeding sites.
- Cut pine stumps low to the ground and apply appropriate insecticide to prevent larval development in late April/early May.

Growing Season

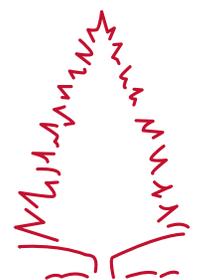
- Scout for dead or bent shoots on the upper half of the tree; shoots may be yellow or red and will have small, round holes where beetles entered and exited.
- Clip off and open suspected shoots to examine for pine shoot beetle.
- At the end of the season, evaluate results and update records.



Figure 5. Adult beetle exiting from a maturation feeding site. *Courtesy of Rayanne D. Lehman, PDA*



Figure 6. Adult beetle inside a feeding gallery within a shoot. *Courtesy of Rayanne D. Lehman, PDA*



Control Options

Biological

- No recommendations are available at this time.

Mechanical

- Sanitation is critical to controlling this pest.
- Cut stumps less than 4 inches (10 cm) from the ground when harvesting trees or in the spring before the new generation completes development.
- Chip or burn any unused or discarded trees or branches to minimize breeding site material.
- Use trap logs to attract breeding parent beetles by systematically placing freshly cut pine trees or logs along the edges of the field in early spring. The trap logs must be chipped or burned after breeding occurs but before new adults emerge. Specific instructions and timetable are provided with the federal compliance program guidelines. See the USDA-APHIS/PPQ Web site on pine shoot beetle (www.aphis.usda.gov/plant_health/plant_pest_info/psb/index.shtml) for further details on regulation of this pest.

Biorational

- No recommendations are available at this time.

Chemical

- Apply appropriate insecticide to stumps to prevent larval development (late April/early May).
- Apply appropriate insecticide to foliage timed with the emergence of the new generation of beetles to help manage the beetle population at 450–550 GDDs (usually early–mid-June).

Next Crop/Prevention

- Only plant pest-free trees from a reputable source.

