

RESEARCH LABORATORY TECHNICAL REPORT



Pests of Pines

Bark Beetles and Borers

By The Bartlett Lab Staff

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More than 100 species of pine (Genus *Pinus*) are used as landscape plants in North America. The most common native species include white pine, shortleaf pine, red pine, pitch pine, and Monterey pine. The common introduced pines include Mugo pine, Scots pine, Austrian pine, and Japanese black pine.

All species of pines are attacked by insects known as borers. As a group, these insects are highly damaging because they feed under tree bark. Bark beetles also bore under the bark of pines, but do not tunnel into the wood. Both groups interrupt vascular tissue and damage phloem where feeding occurs. Pines that become stressed by drought or root damage are often rapidly killed by borers. Many pine borers carry fungi, which cause additional vascular plugging problems within the trees.

Types of Bark Beetles and Borers Attacking Pines

Pine Bark Beetles

Several species of bark beetles (Scolytids) attack pines including turpentine beetles, pine engraver beetle, and southern pine beetle. A new species, the **pine shoot beetle**, *Tomicus piniperda*, was discovered near Cleveland, Ohio in 1992. It has quickly spread to Illinois, Indiana, Michigan, New York, Ohio, and Pennsylvania.

The larval stages of these insects tunnel beneath the bark, often causing enough damage to kill the tree before the owner is aware that a problem exists. As the larvae tunnel in the conductive tissue of the tree, they interfere with sap flow and destroy the cambium.

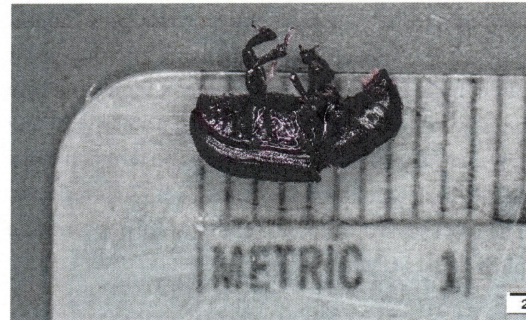
Turpentine Beetles

Attacks by this large Scolytid beetle start low on the trunk of the tree, large lateral roots are also attacked. Adult turpentine beetles (Figure 1) bore through the outer bark and excavate galleries between the bark and the wood. Eggs are laid in groups on the sides of the gallery.

Multiple attacks quickly lead to death of the tree, and may be a source of pheromone odors to draw large

numbers of beetles to nearby trees. Trees are killed most rapidly when the beetles carry a fungus, *Leptographium* sp., (a "blue-stain" fungus).

Figure 1: Adult turpentine beetle



Pine Engraver Beetles

The pine engraver, *Ips pini* (Say), is one of the most common and widely distributed bark beetles in North America. Attacks are initiated by male beetles that bore through the outer bark into phloem (Figure 2).

Pheromone attractants released by the male attract many more beetles to the area. Outbreaks are usually during droughts, with beetles killing groups of pines. Unless dying trees are quickly removed, outbreaks may continue for 2 to 3 years.

Figure 2: Holes made by males boring through the outer bark



Moths

Pine tip moths, pitch mass borer, and pine shoot borers all damage landscape pines. The tunnels they make can girdle the trunk and weaken limbs so they are easily broken by storms. Heavily infested trees are often deformed and killed.

Zimmerman Pine Moth: Caterpillars of the Zimmerman pine moth tunnel into pine bark, damaging the phloem and cambium regions of the trunk, especially at whorls. Austrian and Scotch pines are preferred hosts though mugo, white, jack and red pine are also attacked. Dead and dying branches, most often in the upper half of the tree, commonly indicate infestations. Adult moths are active primarily in late July and August. The moths lay eggs on terminal buds, on the bark and around wounds with pitch residues. The first external symptoms of injury are popcorn-like pitch masses at wound sites.

Symptoms of Bark Beetle and Borer Injury

Pines at highest risk of bark beetle and borer damage are those with root damage or bark injuries. Newly transplanted pines are frequently attacked. Although pines are generally able to withstand drought, moisture stressed trees are at high risk of borer attack. Vigorous, well-watered pines are at risk only if borer populations are high in the area. Bark beetle and borer infestations may not be discovered until advanced

symptoms appear and it may be too late to save the first trees attacked. Symptoms include yellowing of the needles, holes in the bark that exude sap or sawdust (Figure 3), and emergence holes of the beetles through the bark.

Figure 3: Exuding sap and sawdust from borer



Integrated Pest Management

A program that routinely monitors pines for borer attacks and injury is recommended to reduce tree losses. Examination of all woody plants by a trained PHC Specialist is the most effective method of timing control measures. Integrated pest management programs are particularly important for recently transplanted trees and pines on construction sites. Bark treatments are applied if plant inspections identify plant stress or borer populations are above action thresholds. Several preventative treatments each year are recommended for plants at risk of borer attack.

Keep pines in good condition with cultural practices including pruning, root collar excavation, and fertilization. Minimize tree stress by deep watering in times of drought. Borer problems may be aggravated by root damage, foliage diseases, transplanting, root collar injury, nutrient deficiency, or stem cankers.

On construction sites, the roots of trees that are to be left as ornamentals should be protected. Damage to the soil under trees will weaken pines and render them susceptible to beetle attack. Weakened or badly

damaged trees should be removed prior to completion of construction.

A key to borer management is sanitation, the rapid removal of dying trees and infested limbs. Pine slash should not be left near high-value landscape pines. Avoid stacking fresh firewood near landscape trees. Many insect parasites or predators feed on pine borers. Woodpeckers feed on the larvae and pupae. However, none of these natural or biological means can be counted on to control the borers. Please contact your Bartlett Arborist Representative to learn about effective control of these pests.



Founded in 1926, The Bartlett Tree Research Laboratories is the research wing of Bartlett Tree Experts. Scientists here develop guidelines for all of the Company's services. The Lab also houses a state-of-the-art plant diagnostic clinic and provides vital technical support to Bartlett arborists and field staff for the benefit of our clients.