

## Pine Shoot Beetle

The pine shoot beetle (*Tomicus piniperda* L.), a serious foreign pest of pines, was discovered at a Christmas tree farm near Cleveland, OH, in July 1992. A native of Europe, the beetle attacks new shoots of pine trees, stunting the growth of the trees.

The pine shoot beetle may also attack stressed pine trees by breeding under the bark at the base of the trees. The beetles can cause severe decline in the health of the trees, and in some cases, kill the trees when high populations exist.

The U.S. Department of Agriculture's (USDA) Animal and Plant Health Inspection Service (APHIS) has taken steps to prevent this insect from moving to major pine tree-production areas. To date, APHIS, in cooperation with State officials, has quarantined counties in Illinois, Indiana, Maryland, Michigan, New Hampshire, New York, Ohio, Pennsylvania, Vermont, West Virginia, and Wisconsin. Surveys are completed each year to monitor the natural spread and artificial movement of the pine shoot beetle.

Through detection surveys, the beetle has been found in pine tree-production areas including Christmas tree farms and nurseries. Pine shoot beetle has also been detected in mature pine stands and areas surrounding mill yards that process pine logs. The beetle prefers Scotch pine, but it will feed and reproduce on most, if not all, species of pine.

Natural dispersal of the pine shoot beetle can occur when the beetles emerge from their overwintering sites. Studies show beetles are capable of dispersing 2 km in the wind.

Artificial dispersal to uninfested areas can occur through the movement of infested pine Christmas trees, pine nursery stock, bark mulch, and pine logs.

### Appearance and Life Stages

Adult pine shoot beetles are 3 to 5 mm long, or about the size of a match head. They are brown or black and cylindrical. The legless larvae are about 5 mm long with a white body and brown head.

Pine shoot beetles complete only one life cycle per year. They spend the winter months inside the thick bark at the base of living pine trees.

The beetles become active and leave their overwintering sites in March and April (when temperatures reach 54 °F) to mate and lay eggs in dying or stressed pine trees, pine trees and stumps which have been recently cut, logs, and bark mulch. Adults have been shown to fly several kilometers during this

period in search of a suitable host. To create a place to lay their eggs, females bore gallery systems between the inner bark and outer sapwood of the host. Egg galleries are 10 to 25 cm long.

From April to June, larvae feed and mature under the pine bark in separate feeding galleries that are 4 to 9 cm long. When mature, the larvae stop feeding, pupate, and then emerge as adults. From July through October, adults tunnel out through the bark and fly to new or 1-year-old pine shoots to begin maturation feeding. The beetles enter the shoot 15 cm or less from the shoot tip, and move upwards by hollowing out the center of the shoot for a distance of 2.5 to 10 cm. Affected shoots droop, turn yellow, and eventually fall off during the summer and fall.

Feeding adults attack shoots of living pine trees of all sizes, mainly in the upper third of the tree. This is the most destructive stage of the life cycle. When shoot feeding is severe, tree height and diameter growth are reduced. The tree can be weakened to the point where the beetles can attack the trunk of the tree and use it for egg laying.

### History

The pine shoot beetle is reported to be the second most destructive shoot-feeding species in Europe. It is also established in Asia. The only previous U.S. infestation of the beetle occurred in New Jersey in 1913.

The beetle was probably introduced into the United States in 1992 by foreign ships carrying beetle-infested wood as dunnage. (Dunnage is packing material used to protect a ship's cargo from damage during transport.) Since the 1992 introduction, pine shoot beetle has been detected in 11 northeastern States. Quarantines have been enacted in these States to restrict the movement of regulated articles in order to prevent the artificial spread of the beetle.

### APHIS Involvement

In cooperation with State officials, APHIS is requiring the inspection of cut pine Christmas trees, pine nursery stock, pine logs, stumps, and lumber with bark attached, and pine bark mulch before these regulated articles can move out of quarantined areas. (Lumber and logs without bark attached are not regulated.)

Additionally, APHIS and cooperating officials are conducting detection surveys for the pest. State and Federal scientists are working with the affected industries to develop appropriate control and management strategies.

Two methods to detect the beetle in noninfested areas are visual surveys and traps baited with attractants. Visual surveys take place primarily in the summer and fall when adult beetles feed in the pine shoots. Traps attract and capture beetles in late winter and early spring while they fly from their overwintering sites to mating and egg-laying sites.

To manage pine shoot beetle populations in Christmas tree farms and nursery stock plantations, APHIS implemented a State-managed compliance management program. Using an intricate series of management protocols throughout the production cycle of the plants, this integrated pest management program reduces pine shoot beetle populations in host plants and growing areas. The program's protocols include sanitation practices to remove breeding material from the fields, chemical controls to reduce adult shoot feeding, and visual and trap surveys to monitor population levels.

### **Additional Information**

For more information about the pine shoot beetle, contact one of the following:

1. Your State's regulatory officials, usually listed under department of agriculture, plant protection or regulatory division, in the State government section of your telephone directory.
2. A U.S. Federal regulatory official, listed in the Federal Government section of your telephone directory under USDA, APHIS, Plant Protection and Quarantine. If you have access to the Internet, point your browser to <http://www.aphis.usda.gov/ppq> and click on "directories" for a list of offices.

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