

# SHOTHOLE BORER and AMBROSIA BEETLES

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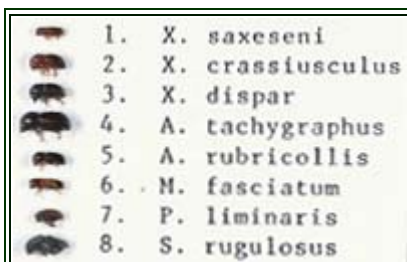
The shothole borer, *Scolytus rugulosus* (Müller), sometimes called the fruit tree bark beetle, is a native of Europe, but now occurs throughout the United States. It attacks a wide variety of deciduous tree fruits and other trees. Shothole borer infestations are usually associated with stressed trees; frequently, trees that are attacked are visibly stressed. Drought, disease, borers, scale, and other stresses predispose peaches to shothole borer attack. Enormous numbers of shothole borers can develop in the large limb piles (Figure 1) sometimes stacked adjacent to orchards.



**Figure 1.** Shothole borer breeding site.

Several species of ambrosia beetles attack peach trees. The four most common species attacking peach trees are *Xyleborinus saxeseni*, *Xylosandrus crassiusculus*, *Monarthrum fasciatum*, and *Ambrosiodmus tachygraphus*. *X. saxeseni* and *X. crassiusculus* are introduced pests. *X. saxeseni* arrived from Europe in the early 1900s, and *X. crassiusculus*, a native of east Africa and southern Asia, was first reported in the United States in 1974 from Dorchester and Charleston Counties, South Carolina. The other two species are native to the United States. Ambrosia beetles also attack trees under stress. Stress factors associated with ambrosia beetles include low soil pH, poor fertility, cold injury, plant parasitic nematodes, and poor drainage. Ambrosia beetles may also develop in limb piles adjacent to the orchard. However, *X. crassiusculus*, frequently referred to as the Asian ambrosia beetle, very often attacks young trees with no apparent stress factors.

## DESCRIPTION



**Figure 2.** The common ambrosia beetles and bark beetles associated with peach trees. Image by Clyde S. Gorsuch.

Adult shothole borers and ambrosia beetles are dark brown to black beetles. The shothole borer is blunt on both ends and about 1/10 inch (2.5 mm) long. The tips of the antennae, legs, and wing covers are reddish-brown. Wing covers are striated with rows of shallow punctures. The ambrosia beetles are similar in appearance, but are more rounded at the rear end than the shothole borer. Sizes range from slightly less than 1/10 inch (2.5 mm) to about 1/7 inch (3.8 mm). The larvae are similar, with a white body and a reddish head, legless, and about 1/8 inch (3.2 mm) long when fully grown. Adult ambrosia beetles and bark beetles are shown in Figure 2.

## PLANT INJURY

Adult shothole borers drill holes, such as might be made by small birdshot, in the bark and wood of twigs, branches, and trunks of infested trees. The holes usually occur in clusters and may be either entrance holes or exit holes (Figure 3). Entrance holes are often near a lenticel and thus can be identified. Adults feed and reproduce beneath the bark. Shothole borer females create small tunnels about two inches in length, which usually run parallel with the grain (Figure 4). Larval galleries leave the main tunnel and radiate out across the grain. Galleries are easily visible when the bark of infested trees is removed.



**Figure 3.** Shothole borer entry and exit holes, old wood.



**Figure 4.** Shothole borer, adult galleries under the bark, parallel to grain. Image by Clyde S. Gorsuch.



**Figure 5.** Shothole borer will attack apparently healthy trees when beetles are very abundant, green wood is attacked at the buds, which often gum.

Shothole borer attacks are usually limited to visibly weak, declining trees.

Infestations frequently

hasten tree or limb death, but shothole borers are rarely the primary cause of tree death. However, where borers are very abundant, they will occasionally attack apparently healthy trees nearby. Attacks on healthy trees may be evident on small twigs where adults bore in or around buds (Figure 5). This injury usually is indicated by small droplets of gum exuding from the tiny, round feeding sites. Buds are often destroyed and twig die-back can result.

Ambrosia beetles differ from bark beetles by boring through the bark and into the wood (Figure 6). Entry is usually at a

lenticel. Galleries are excavated and, in the process, the female pushes sawdust-like particles from the entry hole. At times the sawdust forms strands that protrude from the hole like a toothpick (Figure 7). The female beetle carries a special fungus that is spread on the walls of the gallery. As the fungus colonizes the gallery walls, the female and the larvae feed on the fungus. The fungus also spreads into the xylem causing staining of the wood. Fungal growth can also plug the xylem, causing the limb or tree to die. In the spring, healthy, vigorous trees may produce enough sap to drown the female beetle and larvae. Many of these trees ultimately recover.



**Figure 6.** Ambrosia beetles tunnel through the bark and vascular tissues into the wood, ambrosia fungus may establish in the galleries. Image by Clyde S. Gorsuch.



**Figure 7.** Sawdust "toothpicks" protruding from peach tree. Image by Clyde S. Gorsuch.

## SEASONAL HISTORY AND HABITS

Shothole borers overwinter as larvae beneath the bark. They pupate in early spring and adults emerge, usually in April to May in the Southeast. Adults can fly considerable distances. Females mate, then locate and bore through the bark of unhealthy trees. They excavate egg-laying tunnels beneath the bark that parallel the grain. Eggs are deposited along the sides of the parent gallery. Larvae hatch and burrow across the grain, away from the parent gallery. Larvae burrow and feed on sapwood for about a month. Larval galleries are usually packed with frass and sawdust. Parent galleries are clean. Pupation occurs at the end of the larval gallery and adults exit directly through the bark. Soon after emergence, beetles reinfest trees to deposit eggs for the next generation. There are two to four generations per year in the Southeast. Two

generations or more may develop in a tree after it dies.

Ambrosia beetles may have one or more generations per year depending on the species. There usually is a significant emergence in the spring following several days of 70°F (21.1°C) temperatures. This usually is in early March. While *X. saxeseni* may have at least four major flights a season, *X. crassiusculus* has a major flight in early spring and very little activity during the season.

## **CONTROL**

Good cultural practices are the key in preventing shothole borer infestations. Keep trees healthy and vigorous. Eliminate breeding sites by removing and destroying infested trees or limbs as soon as they are found. Prunings should be disposed of promptly. Pruning debris that is small enough should be flailed. Larger wood should be ground-up on-site, or removed and burned. Always destroy limb piles before adults emerge in March and April. Wild fruit trees and other potential breeding sites near the orchard should also be removed.

Painting tree trunks and scaffold limbs with whitewash or white water-based latex paint may help repel adult beetles, especially on young trees. Painting with latex paint may also prevent sun scald and winter injury that would attract beetles the next season. Infested trees can be sprayed with a residual insecticide to prevent reinfestation by shothole borers. Insecticides have little impact on ambrosia beetles. There are no effective controls for shothole borers or ambrosia beetles already in the trees.