Not all Pine Beetles are the Notorious Southern Pine Beetles!!

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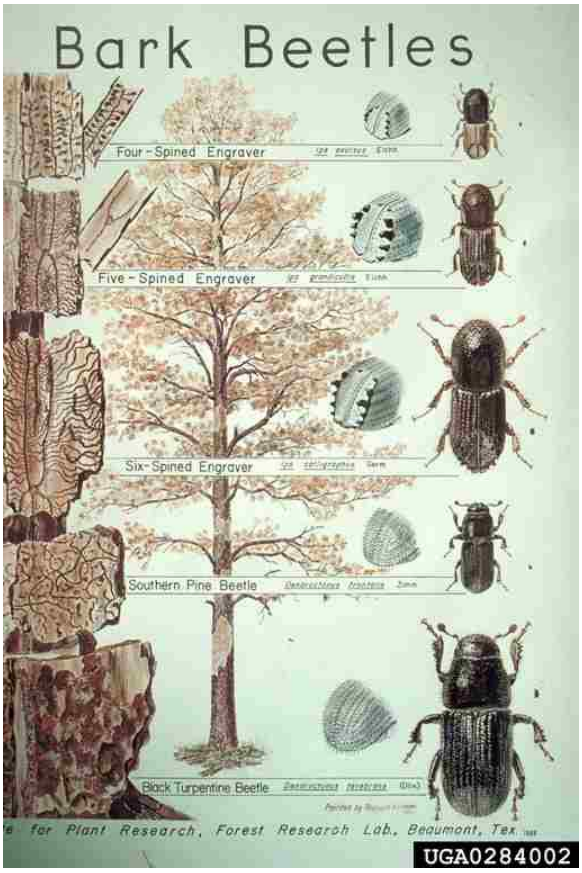
When pine trees die, often the first thought to pass the landowners' mind is that the Southern Pine Beetle attacked the trees. This is not always the case.

In South Carolina, there are five species of pine beetles that will attack, and sometimes kill, pine trees; three species of *Ips* engraver beetles, the Southern Pine Beetle, and the Black Turpentine Beetle. These beetles attack a different portion of the tree; some have characteristic galleries under the bark, and pitch tubes that will aid in identification. Correctly identifying the species of pine beetles is very important as there are different control strategies. In addition to these five species, Ambrosia Beetles and Southern Pine Sawyer Beetles, often considered secondary pests, will attack stressed, dying, or recently killed pine trees.



Five species of bark beetle that can attack and kill pine trees in SC showing characteristic galleries and location of attack. (photo—bugwood.org)

***Ips* Engraver Beetles**

Ips beetles attack stressed trees, such as lightning struck, fire and storm damaged trees, logging slash or stumps, or trees that are stressed due to drought. These beetles can build up in numbers rapidly, sometimes completing their life cycle in as little as 20 days in the summer, allowing for multiple generations per year.

Each of the three species of *Ips* beetles attacks a distinct portion of the bole. *Ips* beetles are named for their size and the number of spines on the scooped out portion of their wings. The small (or 4-spined) *Ips* beetle usually attacks the upper portion of the tree, such as limbs and tops, and can be found in logging slash. The medium (or 5-spined) *Ips* beetle usually attacks the middle to upper portion of the bole, and can be found in logging slash. The large (or 6-spined) *Ips* beetle usually attacks the bottom half of the tree.

When these beetles tunnel under the bark, the resulting galleries are typically in I-, H- or Y-shaped patterns, as opposed to the S-shaped Southern Pine Beetle galleries. *Ips* beetles introduce blue stain fungi into the trees when they attack. The fungus blocks the flow of water to the tree crown, causing the tree to wilt and die. The foliage turns from dull green, to yellow green, to a red-brown color. During the summer months when the foliage turns red, the new generation of adult beetles has emerged from the tree.

If the tree is healthy enough, creamy white to red-brown, dime or smaller-sized pitch tubes are present in the bark crevices. However, if there are no pitch tubes present, due

to tree health or drought, a fine red-brown boring dust in bark crevices or trapped in spider webs near the tree base can be found.

Maintaining tree health, delaying thinning during drought, salvaging storm damaged trees, minimize damage to trees and roots during logging, and reducing the amount of slash left after logging will help to minimize the damage due to *Ips* beetles. *Ips* killed trees should be promptly salvaged or at least removed from the stand. Trees that cannot be removed from the site should be debarked, burned (during low fire danger), or chipped.

Black Turpentine Beetles

The Black Turpentine Beetle (BTB) most frequently attacks stumps, trees damaged by logging or landscaping equipment, or lightning, drought, or flood stressed trees. BTB are very attracted to the turpentine odor from tree wounds. They can complete the life cycle in 70-90 days in summer months and there can be 2-4 generations per year.

Black Turpentine Beetle pitch tubes on heavily infested pine.

BTB generally attack from the ground up to 12 feet on the tree bole. The quarter-sized pitch tubes are reddish-brown to purple in color. Creamy white irregularly shaped boring particles are found at the base of the tree. The galleries under the bark are a relatively shapeless vertically excavated area. Larval feeding girdles the tree.

Black Turpentine pitch tube and characteristic boring particles at base of tree.

Reducing damage to trees and roots during logging and in the landscape will help to minimize the damage due to BTB. Trees are damaged during logging should be removed.

Ambrosia Beetles

There are several species of Ambrosia Beetles, some of which attack pines and some attack hardwoods. Ambrosia Beetles that typically attack dying pines are found in association with one of the previously mentioned pine beetles. These beetles carry a fungus into the tree when they attack. The fungus grows in the galleries and is eaten by the developing larvae. The fungus blocks the flow of water to the tree crown, causing the tree to wilt and die.

Ambrosia beetle boring dust at base of tree.

Ambrosia Beetle damage can be quickly identified by the fine, flour-like boring dust at the base of the tree. When the boring dust is

fresh, it is white in color, but fades to a yellow-tan color with time. If the Ambrosia Beetle boring dust is found at the base of the tree, even if the needles are green, the tree is dead. Trees in the landscape that have been attacked by these beetles should be removed especially if they pose a safety hazard.

Southern Pine Sawyer Beetle

The Southern Pine Sawyer Beetles are large beetles, often 1-1 $^{1}/_{2}$ inches in length, with antennae that are longer than their bodies. Pine Sawyers attack recently killed pines and, in forested situations, should be considered beneficial insects as they hasten the decomposition of dead trees.

Pine Sawyer adult beetle. (photo—Bugwood.org)

Presence of these beetles can be identified by the football shaped excavated area on the bark. The female Pine Sawyer beetle chews the oval shaped, concave egg niches into which she lays one to several eggs. The larvae tunnel under the bark where they begin feeding on the cambium. As the larvae develop and grow larger, the chewing sound from their feeding can be easily heard. Larvae tunnel into the sapwood to pupate. If the bark is peeled back, creamy white larvae with a tan, flattened area behind the head, finely shaved wood particles, and excavated galleries can be found. The adult exit holes are perfectly round.

Pine Sawyer egg niches.

If your pines have been killed, a little investigation into the cause of death can help you decide what, if any, control strategies need to be employed. By simply looking for pitch tubes and their location, looking for boring dust, or by peeling the bark off, you will be able to determine if your trees were attacked by pine beetles and by which beetle. For more information and pictures, please visit: http://www.barkbeetles.org. Or contact djenkins@scfc.gov or contact your local South Carolina Forestry Commission office.