Pine Bark Beetles

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Pine bark beetles not only kill individual trees, but when conditions are favorable their populations can build up rapidly and cause extensive damage. In outbreak years, their activities can be extremely disruptive to forest management practices aimed at wood and fiber production.

Bark beetles are small, ranging in size from about 1/10 to 1/4 of an inch in length. The pine bark beetles found in the southeast belong to the Order Coleoptera, Family Scolytidae and are:

- the black turpentine beetle, *Dendroctonus terebrans* (Olivier)
- the southern pine beetle, *Dendroctonus frontalis* Zimmermann, and
- four species of *Ips* beetles *(*and *Ips pini* which only attacks white pines).

In natural forest situations, bark beetles prepare the way for ecological succession by selectively removing mature, senescent, stressed or damaged pines. Consequently, bark beetle infestations often begin on damaged and/or stressed trees. Once established, the beetles reproduce and move to nearby trees.

As attacking beetles bore into the bark, the tree tries to protect itself by exuding pitch, resulting in the formation of the characteristic ”pitch tubes“. Weakened trees may not be able to produce sufficient pitch flow to prevent colonization and pitch tubes may not form. In these cases, the only outwardly visible signs of attack is boring dust on the bark. When beetle populations are high, the number of beetles attacking trees may be so large that even healthy trees cannot withstand infestation.

Both adult and larval bark beetles feed on the phloem tissue under the bark. Feeding can result in tree death. Southern pine beetles and the *Ips* beetles also carry blue stain fungi on their bodies which, when introduced into a tree, colonizes the sapwood and disrupts the flow of water to the tree crown. Once the blue-stain fungi is established, trees cannot be saved, even if the beetle larvae are killed or die.

If you suspect a bark beetle attack, check for pitch tubes or boring dust in the lower, middle and upper trunk and at the base of large limbs. The initial attack of some bark beetles occurs at mid-trunk height or above (you many want to use binoculars). Simply relying on an observed change in tree crown color is not a good method of locating beetle attacks. It may take several weeks after the initial attack for the crowns to “fade” from bright-green, to yellowish-green and finally red.

Each species of bark beetle behaves differently and has different damage potential. Correct identification of attacking beetles is crucial. If you see pitch tubes or boring dust, remove one-or-more patches of bark and observe the adult beetles and the pattern of the galleries to identify the beetles. It is common for more than one species of bark beetle to infest a single tree, especially during outbreaks.

Southern pine beetles (SPB) are the most destructive bark beetles and infest all species of pine indigenous to the South. *Ips* beetles and black turpentine beetles are present throughout the southeast virtually every year but seldom kill large numbers of trees in one spot. However, under certain conditions, both the southern pine beetle and *Ips* beetles can reach outbreak levels and cause widespread damage.

Southern pine beetle (SPB) adults are about 1/8 of an inch in length and have a rounded rear-end. SPB galleries are S-, or serpentine in shape. The SPB life cycle is 35 to 60 days, and there may be as many as six generations each year. Shortleaf and loblolly pines are most susceptible, while slash and longleaf pines are generally considered to be more resistant to attack. SPB often build up very large populations and kill from several dozen to many thousands of trees in an area. SPB attacks usually move in one general direction over time as successive generations move to other trees. A corresponding

[1]Forest Landowner. 57:4 (July-August 1998). In Press.

progression in color of the needles on infested trees can be observed, resulting in the "beetle spots" associated with SPB attack sequence. SPBs infest open trunks of trees, from the base to the crown, usually attacking first at mid-trunk or in the lower crown.

Southern pine beetle populations are cyclic in nature. With the exception of Alabama and a few other isolated southern locations, so far this year there has been only limited SPB activity. However, since much of the region has experienced hot dry weather and/or severe fires, more activity and infestations may be detected in the near future.

Black turpentine beetles (BTB) are the largest of the southern pine bark beetles. They have rounded abdomens, are dark reddish brown-to-black and are about 1/4 inch long. BTB normally attacks the lower eight-foot portion of the tree trunk (sometimes attacks are below ground level) and produce large, often purplish-colored pitch tubes an inch-or-more in diameter. BTB larvae feed side by side in large groups in "feeding patches". The BTB life cycle lasts for 10 to 16 weeks depending on temperature. Trees that are not completely girdled by the BTB larvae may survive attacks since BTBs do not carry the blue-stain fungi.

Ips beetles vary in size by species. Adults are cylindrical in shape, usually dark brown-to-black and range in length from 1/10 to 1/4 of an inch. The rear end of *Ips* beetles are sunken, or "scooped-out" in appearance, with four-to-six spines along each side of the sunken area. The number of spines in this area is species specific. *Ips* pitch tubes are normally less than ½ inch in diameter and look like those associated with SPB attacks. *Ips* egg galleries are roughly Y-, H- or I-shaped and radiate out from a central chamber. *Ips* beetles complete their life cycle in as few as 25 days, depending on species and temperature.

Although bark beetles can be extremely destructive, landowners can take steps to manage them and reduce losses.

Keep trees growing rapidly and promptly remove damaged trees. Trees damaged by lightning, hail, wind, fire, construction or harvesting equipment, heavy pruning or other stresses causes them to emit odors that attract bark beetles. Remove damaged trees promptly to prevent establishment and development of beetle populations that could build up and attack other trees. Maintain recommended stocking rates. Overstocking results in reduced diameter growth and creates conditions favorable to beetle infestations.

Know how to identify possible bark beetle infestations, especially those in early stages.

Keep in contact with your state Forestry Commission or Department county office. Most of these agencies routinely conduct aerial bark beetle detection surveys. These aerial surveys provide important information for bark beetle prevention and suppression programs. The survey results are available from the forestry unit offices, and can help you locate beetle spots. However, for this information to be useful to you, these agencies must know where your land is and how to get in touch with you.

If bark beetles are found on trees under your management, you must identify the beetle(s) causing the damage and know what action to take, or find someone who can help you. Most importantly, you must promptly initiate the appropriate management action for the beetle(s) involved.

If you have any questions or need assistance, contact your county Extension Service or state Forestry Commission or Department office. You may also want to visit your State Extension Service World Wide Web site, or for specific forest entomology information you might want to visit one of these two sites:

The Entomology and Forest Resources Digital Information "**BUGWOOD**" site, College of Agricultural and Environmental Sciences and D. B. Warnell School of Forest Resources, The University of Georgia
at: http://www.bugwood.caes.uga.edu/

or

The Southern Pine Beetle Information Directory, Virginia Tech, Department of Entomology
at: http://everest.ento.vt.edu/~salom/SPBinfodirect/spbinfodirect.html/ .

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Fig. 2. Drawing by UGA Col. Agr. & Env. Sci.

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Figure 1. The common southern pine bark beetles. Top to Bottom: *Ips avulsus, Ips grandicollis, Ips calligraphus, Dendroctonus frontalis* (SPB) and *Dendroctonus terebrans* (BTB).

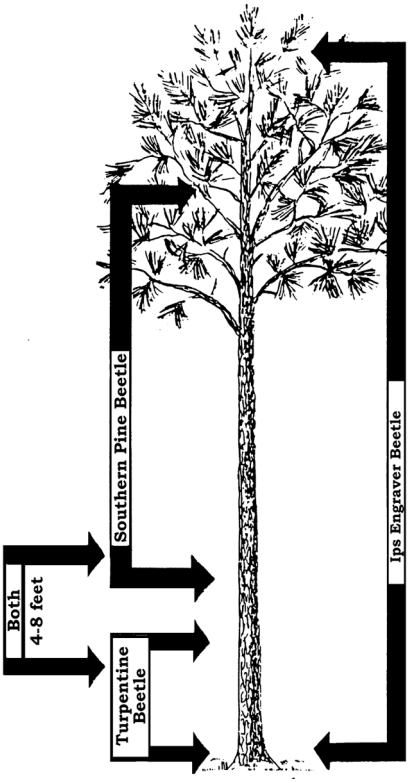

Figure 2. Area of tree trunk where each of the pine bark beetle groups commonly attack.

Figure 3. Typical southern pine beetle ”spot“ of dead and dying trees. The infestation began in trees on the right side and progressively moved toward the left side of the picture.