

# *Southern Pine Beetle*

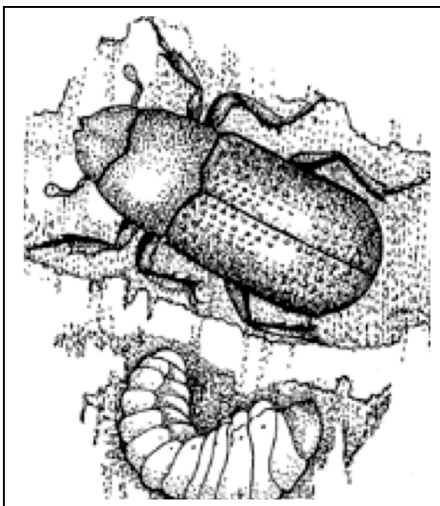
## *Identification, Biology and Management*

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**Introduction:** The southern pine beetle, *Dendroctonus frontalis*, is a small insect native to North America. The scientific name *Dendroctonus* means "tree killer"- a well deserved name since this species is the most destructive forest insect pest in the United States.

**Range:** The southern pine beetle occurs in the southern and southeastern United States, extending as far west as Arizona and as far south as Central America. The northern range extends to New Jersey and Pennsylvania, west to Missouri, south to Texas, and east into Florida.

**Host Plants:** Southern pine beetles infest all species of pines indigenous to the South. Shortleaf and loblolly pines are most susceptible, while slash and longleaf pines are generally considered to be more resistant to attack.



**Description:** Southern pine beetle characteristics include:

- **Adults** 1/8 inch long; declivity (hind end) rounded, without spines.
  - **Parental galleries** winding, frequently overlapping, and packed with frass except for the portion where the male and female are working; eggs laid in individual niches at intervals of about 1/4 inch.
  - **Larval galleries** short (1/4-1/2 inch), and then curving into the outer bark where pupal cells are formed.
- **Pitch tubes:** 1/4-1/2 inch in diameter; yellowish-white on loblolly pine, brownish on slash and longleaf pines; more likely to be in bark crevices rather than on bark plates.
  - **Attacks** generally begin below the lowest branches and may eventually extend from the lower bole up into the lower crown.

## Symptoms of Southern Pine Beetle Attack During Three Stages

Tree Stage	Symptom				
	Foliage	Pitch Tubes	Bark	Exit Holes	Ambrosia Beetle Dust
<b>Freshly Infested</b>	Green	Soft, white, light pink	Tight, hard to remove	None	None
<b>Infested with Developing Brood</b>	Green trees with larvae; fade to yellow before brood emerges	White, hardened	Loose, peels easily	Few, associated with attacking adult reemergence	White, localized areas around base of trees
<b>Vacated, Dead Tree</b>	Red, needles falling	Hard, yellow, crumbles easily	Very loose, easily removed	Numerous	Abundant at base of trees



**Life Cycle:** The southern pine beetle life cycle is 35 to 60 days, and there may be as many as six generations each year. Southern pine beetles overwinter in all life stages in the bark of trees. Development continues throughout the year, although it is much slower in winter.

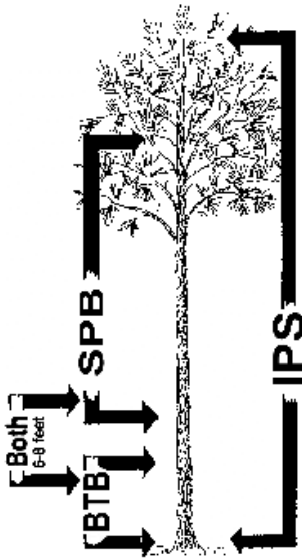
In the spring, beetle flight to new pines peaks when flowering dogwoods are in bloom. Attacks on pines may occur at any time of year from early spring to fall. Females initiate the attacks and emit a pheromone that attracts males and additional females.

Within a few days thousands of beetles may colonize the tree and overwhelm its defenses. Excess beetles often land on and colonize nearby trees.

Adults bore through the bark and lay eggs in their excavated galleries. Eggs hatch in two to nine days and the larvae enter the inner bark, enlarging their galleries as they grow. When mature, larvae bore to the outer dead bark, create a cell and pupate. Emerging adults bore out of the pupal cell directly through the outer bark, leaving a clear-cut, open hole. Adult

emergence may continue for an extended period of time. Generally, emerging adults leave the host tree and aggregate on an adjacent tree or leave the area to find a suitable new host tree.

**Damage:** Southern pine beetles not only kill individual trees, but also when conditions are favorable, their populations can build up rapidly and cause extensive damage. When beetle populations are high, the number of beetles attacking trees may be so large that even healthy



trees are killed. It is common for more than one species of bark beetle to infest a single tree, especially during outbreaks. The other bark beetles present during outbreaks are the black turpentine beetle and four species of *Ips* engraver beetles.

Adult beetles first fly to the trunks of pines, usually attacking at midtrunk or in the lower crown. Both adult and larval southern pine beetles feed on the phloem tissue under the bark of attacked pines. This feeding alone often results in tree death. Galleries excavated under the bark by southern pine beetles are commonly S-shaped.

Southern pine beetles carry blue stain fungi on their bodies, which colonize the sapwood and disrupts the flow of water to the tree crown. Once the blue-stain fungi are established, trees cannot be saved, even if the beetle larvae are killed or die. As attacking beetles bore into the bark, pines exude pitch, resulting in the formation of the characteristic "pitch tubes".

**Management:** Although bark beetles can be extremely destructive, the following will reduce losses:

1. **Keep trees healthy and growing rapidly.** Infestations often start on stressed and injured trees, so cultural practices that promote healthy trees will reduce the frequency and severity of infestations. An Integrated Pest Management (IPM) program of regular inspections, fertilization, mulching and watering is recommended. Popcorn-like pitch tubes, running pitch, boring dust, and numerous holes through the bark are the signs of bark beetle infestation to watch for during inspections.
2. **Promptly remove damaged trees.** Trees damaged by lightning, construction, or other stresses emit odors that attract bark beetles. Remove beetle attacked trees promptly to prevent establishment and development of beetle populations that could build up and attack other trees. Once heavy populations develop in weakened trees, the beetles may spread to healthy trees that normally would resist attack.
3. **Preventive bark treatments** may often be the most practical and economical solution, particularly where high-value trees are involved. The techniques for safe and effective bark applications are recommended by state and federal agencies during outbreaks. According to entomologists at the University of Georgia, the cost of spraying is often small when weighed against the value of the tree, the cost of tree removal, and potential expanded beetle infestations. The first application should be applied in early spring, followed by repeat applications at least every three months until fall. To effectively protect trees, preventive treatments must be applied prior to beetle attack.