

Bug-Wise

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Pine Beetles on Urban Pines: There are many different species of beetles that attack southern pines. The term ‘pine beetle’ may refer to southern pine beetle (SPB), *Dendroctonus frontalis*, the black turpentine beetle (BTB), *Dendroctonus terebrans*, or one of several species of Ips engraver beetles, *Ips spp.* In commercially grown pines the most destructive of these is SPB. During outbreak years this insect can cause significant losses of commercial timber by attacking and killing trees in isolated patches, referred to by foresters as ‘bug spots’. Pines are less densely spaced in most urban situations, making them less prone to attack by SPB. Although SPB also can occur in urban landscapes, black turpentine beetles and *Ips* are more commonly encountered in this setting. Biology and management of these pests are similar, but there are some key differences.

Adult SPB are brown to black beetles that are approximately 1/8 inch long. Initial symptoms of SPB attack are accumulations of pine resin on the surface of the bark. These ‘pitch tubes’ are roughly the size and shape of a piece of popcorn. They are the result of the tree’s natural defensive attempt to ‘pitch out’ the beetle as it attempts to bore into the tree. Healthy trees can usually fend off an attack by one or only a few beetles. However, the beetles counter this by producing an aggregation pheromone that attracts other beetles to the tree being attacked. The more holes being punched in the tree, the less likely the tree will be able to produce enough resin to successfully defend itself. Obviously trees that are under drought stress, have been struck by lightning, or are experiencing other types of stress will be most susceptible to successful attack. This is why pine beetle outbreaks tend to be most common during periods of prolonged drought. This is especially true for *Ips* in urban settings.

If they are successful in entering the tree, adult SPB bore winding galleries in the inner bark. Eggs are deposited along these galleries. These galleries can effectively girdle the tree, resulting in death. However, SPB also inoculate the sapwood of host trees with blue stain fungus, which contributes to the death of the tree. SPBs normally confine their attacks to the bare bole of the tree, from the base of the tree up to the first live limbs. SPBs normally produce several generations per year, and trees located near a brood tree are most susceptible to being attacked by subsequent generations. This is why SPB infestations can be seen in expanding spots in commercial pines.

Black turpentine beetles are similar to SPB in appearance but are considerably larger, approximately 3/8 inches long. BTB normally confine their attacks to the lower 8 to 10 feet of the trunk, with initial attacks often occurring within 2 to 3 feet of the ground, and the resulting pitch tubes are larger than those caused by SPB, often over an inch in diameter. Rather than the long winding galleries produced by SPB, BTB makes short galleries, usually just below the point of entrance, and deposits its eggs in relatively large groups. The resulting larvae feed together on the inner bark, creating a roughly palm-sized, pocket-shaped gallery. BTB often reproduce in freshly cut stumps, but will readily attack injured trees as well. They also commonly attack large, over-mature trees, the kind that are so highly valued in landscape plantings.

Ips engraver beetles are similar to SPB in size, but can be readily distinguished by the row of spines that they have along either side of the wing covers at the end of the abdomen. There are several different species of *Ips* beetles. *Ips* beetles are commonly found in logging slash or recently felled trees, but will readily attack standing trees that are drought stressed or injured. In standing trees *Ips* beetles specialize in attacking the trunk and limbs in the upper portion of trees, but *Ips* can occur on the main trunk as well. *Ips* beetles tend to lay their eggs individually along Y or H-shaped galleries. Upon hatching, the larvae bore individual galleries that radiate

away from the egg gallery, making the overall shape of *Ips* galleries rather distinctive from those of SPB or BTB.

What's the best thing to spray to control pine beetles in the urban landscape? Water! Apply about an inch per week to the soil around the tree during dry periods. Based on the biology and habits of these beetles, it should be obvious that keeping trees healthy and avoiding mechanical injury is the most effective means of preventing and controlling pine beetles. Healthy, well-watered trees are less likely to be attacked and more likely to be able to successfully defend themselves against pine beetle attack. This is especially important in protecting trees from attack by *Ips* beetles.

What steps can a homeowner take in response to a pine beetle attack? First, if a pine has been seriously attacked by SPB or *Ips*, it should be cut and removed or destroyed to prevent the infestation from spreading to other pines in the landscape. These beetles can complete a generation in as little as 4 weeks, so prompt action is necessary. If a tree has numerous pitch tubes on the trunk and the needles are beginning to turn yellow or brown, there's no point in 'waiting to see if it is really going to die'. Neither SPB nor BTB re-infest dead trees, instead subsequent generations move to adjacent trees. Thus, in situations where one tree in the landscape has been attacked and there are other valued pines located nearby, it may be worthwhile to apply protective insecticide sprays to the remaining trees. Unlike SPB, attacks by BTB are not necessarily fatal, especially when the attack is confined to one side of the tree or involves only a few insects and insecticide sprays can sometimes be helpful in salvaging a tree from attack by BTB, as well as protecting surrounding trees.

There are several brand names of **permethrin** that are available to homeowners and are labeled for use as **trunk sprays** to aid in control of wood-boring insects. Astro is one example, and it is one of the few permethrin labels that allows a high enough rate to be really useful. However, because the residual control provided by permethrin may not last all season, repeated treatments may be necessary. When using these treatments be sure to use the maximum rate allowed on the label in order to maximize residual control. The maximum rate for Astro, which is 36.8% permethrin, is 5 quarts per 100 gallons.

Another, longer-lasting trunk treatment that has just become available for use in the landscape is a product called Onyx (active ingredient is **bifenthrin**). Onyx is not labeled for use by homeowners, but it can be applied in home and commercial landscapes by properly licensed commercial applicators. Therefore, **homeowners who wish to use Onyx will need to hire a properly licensed professional applicator to make the treatments**. Onyx is 23.4% bifenthrin and is applied at a rate of 1 to 2 pints per 100 gallons of water. Results of recent trials conducted in South Carolina and Georgia show that, when used properly, this product can provide a high degree of protection, but not 100% protection, against pine beetles. During periods of prolonged susceptibility repeated applications may be necessary.

When applying trunk sprays to prevent pine beetle attacks it is important to thoroughly cover the area of the trunk that is subject to attack. For black turpentine beetles, this is the lower 10 to 12 feet of the trunk, but for southern pine beetles, **it is important for the spray to reach at least to the lower live limbs, and ideally the spray should be applied halfway into the crown area**. Few homeowners have the necessary equipment to effectively treat large trees for SPB. It is important to wet the bark to the point of drip when applying trunk sprays. Depending on the size of the tree, this takes from 1 to 4+ gallons of finished spray per tree. Obviously when applying such treatments in urban settings proper precautions must be taken to prevent spray from drifting onto adjacent property and other non-target sites.

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