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Improved Resistance to, and Recovery from, Pine Bark Beetles

What is it? While there are several varieties and species of Pine Bark Beetles which are having an impact on pine forests nationwide, two of the most devastating are the Southern Pine Beetle (*Dedroctonus ponderosae*) and the Mountain Pine Beetle (*Dedroctonus frontalis*). The former is currently located from Vermont to Florida and east to Texas. The latter, once confined primarily to British Columbia, is now spreading rapidly throughout the Rocky Mountain west. While the mountain version is black in color, about the size of a finger tip, its smaller southern counterpart is brown-black in color and ranges from the size of a grain of rice to about ¼ inch.

How do they impact trees? Adults burrow into the bark of primarily weakened or stressed trees to construct galleries in which they will deposit eggs which will hatch into grubs in 3 to 34 days. The grubs will mature from larvae to adult in 26-54 days at which point they will either lay their own eggs in a colonized tree or emerge and locate another host tree. Once inside a tree, adults release a pheromone which attracts other beetles en masse to colonize the tree from the base to the upper reaches of the trunk. The tunnels and galleries which they construct throughout the inner bark, or cambium layer, interrupt the phloem of the tree, making it difficult for the tree to transport moisture and nutrients throughout the plant or to mount a defense against continuing invasion. Adult beetles also carry a particular fungus which further impedes the plant's natural processes. This combination ultimately will lead to death in all heavily infested trees. Because of their colonizing nature and short life-cycle, beetles can deforest an entire area in a relatively short period of time.

How can you identify infested trees? This depends largely on the health of the tree and the degree of infestation. However, the most notable signs of infestation are pitch tubes on the bark of dying trees and yellowing or browning of the crown. Pitch tubes are formed as the tree tries to defend itself by flooding galleries with pitch or resin (sap). Healthy trees with adequate moisture can produce enough sap to flood and entomb the invaders. However, weakened trees cannot and the pitch is excavated by the beetles and left in small piles outside their entrance holes, forming tubes.

In areas of heavy drought stress or in the later stages of invasion, when the tree cannot produce and transport enough sap and resin to combat the beetles, all that you may see are small holes on the exterior bark with fine powdery saw dust piled on bark ledges beneath and around the holes.

On dead trees or in trees with heavy infestations, you likely can remove sections of the outer bark easily, and beneath you will see winding S-shaped tunnels packed with boring dust. Examination of the cambium layer will also reveal staining from the fungus which tends to colonize with the beetles.

How can you treat infested trees? Again, this depends largely on the severity of the outbreak and how far gone the host tree is. However, there are some treatments available. Traditionally the host tree would be sprayed with Lindane or Dursban. Regulations, though, have made these and other products hard to locate. While new chemistries are on the market, most have not been tested long enough to know their ultimate impact.

First, determine the severity of the infestation on particular trees – the more holes and pitch tubes you see, the greater the infestation. Then determine the number of trees impacted. Trees that are too far gone will likely have to be destroyed as they generally will not recover and will produce a risk to lives and property as they decay and ultimately fall.

To destroy a tree properly it needs to first be treated with an insecticide, otherwise the adults will emerge from the fallen tree and immediately find a new host nearby, worsening your problem. Once felled, the tree should be removed from the site and either burned or mulched. Never use these trees for firewood because the stacks of curing wood can serve as a place for the adults to over-winter or will merely transport them to a new region, where they will emerge from the drying wood to infest other trees.

How can Monty's help in treatment of infested trees? First, it should be stated that MONTY'S PRODUCTS ARE NOT AN INSECTICIDE and will do nothing to destroy the beetles. Our goal is to work with the plant, to augment natural defense systems, and to, in some cases, restore an infected tree to relative health.



For more information call (800) 978-6342

1) Monty's Products May Improve the Overall Health of the Tree

To understand how Monty's products can help in this situation, it must first be understood that both species of pine beetles are opportunistic. According to Ric Bessin, entomologist with the University of Kentucky, "Like most predators, they prey on weakened species. They look for trees that are already stressed either by drought, lightning, or man-made causes." Stressed trees are easier to enter, and with fewer defenses, are less likely to 'fight back.' Certified Crop Advisor Joe Dedman indicated that one way to determine the overall health of any plant is with a brix meter. While elevated brix levels themselves are not able to thwart an attack, it is an indication that the tree is otherwise healthy and less likely to become a victim of colonization. With applications of Monty's products, you are able to optimize the health of the tree. Bessin concluded, "Healthy plants have within them natural defense systems, like the flooding nature of resin in pine trees or the chemicals in a tobacco plant. The healthier a plant is, the better it is able to use these defenses against potential attack."

2) Monty's Products May Improve Survivability During Infestation

Pine beetles do their damage by interrupting the flow of water and nutrients through the phloem of the plant, making it impossible for the tree to feed itself. By increasing and improving the root structure, by increasing water and nutrient uptake, and by increasing growth, Monty's helps develop new tissue and new conduits to offset the loss of other transport systems. "We know that Monty's improves the root structure of plants when it is applied. The number of feeder roots and the ability to transport water and nutrients throughout the plant is critical. If we can boost these systems, we can help plants survive most forms of stress, including insect damage." According to Dennis Stephens, president of Monty's Plant Food Company

3) Monty's May Reduce the Over-all Impact of Infestation

"Sadly," says arborist Drew Andrew "not all trees can be saved. Some are too badly damaged." These trees will have to be destroyed to reduce collateral damage to neighboring trees or woodlands. However, after four years Andrew says he has been able to rescue many trees and prevent the spread to others by following a protocol which he developed using Monty's products. "By saving those that I can and providing preventative treatments to adjacent trees, we have had a lot of success using Monty's. My business is thriving because we are successfully rescuing and preventing damage to trees."

Monty's Protocol for Treating Infested Trees

The following is a protocol which Drew Andrew developed in his business as an arborist in Idaho over the past four years. This is the sole treatment he uses on his customers' trees and woodlands. He does not use insecticides which require strict licensing requirements and can further harm the environment. While this treatment has not been validated by replicated academic trials, anecdotal evidence would support his success in a variety of settings.

Again, this treatment will not treat nor destroy the insects themselves but has shown promise in preventing attack and saving trees already infested with pine beetles. For complete treatment, we advise that you consult with an arborist, your local county extension or other professional for insecticides approved for use in your area for treatment of pine beetles.

As a rescue treatment, follow the guidelines below two to three times per year. As a preventative, or to discourage re-infestation of previously affected trees, apply annually in the spring as the trees break dormancy.

- Prepare 18-24 ounces of Monty's 2-15-15 Formula in 25 gallons of water in a spray tank suitable for spraying trees.
- Set PSI to 35 lbs of pressure on spray tank.
- Thoroughly saturate the trunk of the tree from the base to as high as you can reach.
- Spray mixture into any visible holes where possible.
- Combine bark treatment with a foliar application to the needles or crown of the tree when possible.

For heavy infestations and if the tree is already showing significant signs of browning at the crown, combine all above steps with the following:

- Root drench the above mixture with a deep feeder from the base of the tree to the edge of the drip line.
- Additionally, drill small ¼ inch holes into the trunk of the tree just past the outer bark layer and inject 1-2 ounces of solution per hole.

Additional results may be noticed by adding 16 ounces of Monty's Liquid Carbon or by using this as a tank-mix with your insecticide of choice. Always read and follow label directions on any insecticide you may use.

