



U.S. Forest Service Rocky Mountain Region Forest Health Tips



Date: 9/1/2010

Topic: Mountain Pine Beetle in the Black Hills and Control Methods for Single Trees

Background: The mountain pine beetle is a small insect that lives most of its life in the inner bark of pine trees. The adult beetles are black to dark brown and about the size of a wooden match head. They fly from infested trees to new host trees in late July to early August. Once they locate a favorable live pine, the adults bore through the bark and lay eggs. After the eggs hatch the larvae feed under the bark until the following spring and early summer when they pupate and become new adults. The adults emerge from the dead trees and seek a new tree.



Mountain pine beetle egg and larval galleries (left), larvae (top center), pupae (top right), and adult (bottom right). Mature larvae and adults are about the size of a grain of rice.

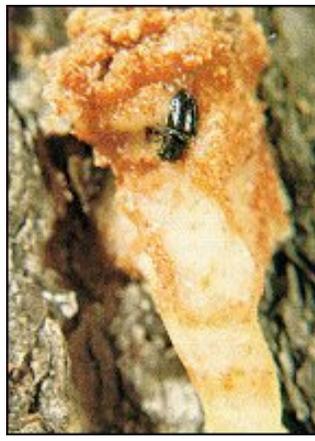


Mountain pine beetle is native to the Black Hills and has inhabited the Hills as long as there has been a pine forest. This insect, as with many other insects, goes through cycles where they become very abundant and then relatively rare. When the beetle population is very low, stressed or weakened trees, such as those struck by lightning, are the ones that are attacked. However, roughly every 20 years the beetles increase and the beetles begin attacking all host trees. Outbreaks can last anywhere from 10 to 20 years.

During outbreak conditions, all trees are susceptible. In the summer when a tree is attacked (in July-August) until the following May or June the tree's needles will still appear green. The first signs that a tree has been attacked will show up by late summer. Some of the signs of beetle attack are:

1. Small (1- to 2-inch) masses of resin (pitch tubes) that look like pieces of chewed bubble gum will be found all over the trunk. Pitch tubes on newly attacked trees will be soft and sticky, as opposed to older ones that are hardened.
2. Red boring dust in bark crevices and on the ground around the tree. This boring dust will have a size and consistency of fine sawdust.
3. If the attacks are successful, white C-shaped grubs can be found beneath the bark by September.

Sometimes if the tree is healthy and the number of attacking beetles is small, the tree can pitch out the beetles. These trees can be identified by the presence of a few (less than 10) large, very moist, pitch tubes. These are unsuccessful attacks on the tree, but trees that pitch out beetles one year are often the first trees targeted for attack the following year.



Pitch tubes caused by attacking mountain pine beetle and adult beetle pitched out by tree

Issues: The question is, if you find trees attacked by mountain pine beetle, what can be done about it? The best method of control will be dependent on what the beetle situation is and what your objectives are.

1. Removing trees that are infested with the beetle (trees that still have live beetles in them will still have green needles) can help reduce the local beetle population. Infested trees can be removed from the site or treated on site to kill the beetles in them.
2. There are chemicals that can be applied to prevent the beetles from successfully attacking your trees (these must be applied before beetles have attacked your trees).

Status: For treating individual trees that are infested, the best approach is to have them cut down and removed from the site to a place that can de-bark them, killing the maturing beetles. Cut and remove may not always be possible. If the infested tree cannot be removed from the site then it needs to be treated on site. The goal of treating infested trees is to dry out the tissue under the bark, thereby killing the maturing beetles. Trees can be cut and chipped or completely de-barked on site. Both of these methods will produce near 100% beetle kill, but can be very labor intensive. Probably the most reasonable treatment that leaves the trees on site is cutting the infested tree down and then cutting the log into 2 foot lengths. The cut pieces should not be stacked and should be left exposed to as much sun as possible. This will cause drying of the inner bark tissue and beetle death. The part of the log that is in contact with the ground will remain somewhat protected and will produce some beetles. Generally, the amount surviving on the underneath side is relatively low, 10-20% of the total. If there is concern about killing these beetles the logs can be rotated at least once after cutting to ensure all sides of the log dry. Treatments should be done as early as possible to allow for maximum drying time. Once beetles reach the pupal stage (typically June), this type of control will not be effective at killing beetles. Infested trees can be cut and burned, however, infested trees are green and wet and so are difficult to get temperatures hot enough to kill the beetles inside.

Trees that have not been infested, that are of susceptible size (at least 4 inches in diameter) and are in close proximity to mountain pine beetle infestations can be protected using chemical sprays. These preventative sprays need to be applied yearly by the end of May-early June. If other bark beetles, such as pine engravers are a concern the preventative sprays will need to be applied by the first of May.



Infested trees that have been cut to kill the maturing beetles and spraying uninfested trees to prevent beetle attack.

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