The Mountain Pine Beetle in the Black Hills

Identification and Biology

(click on photos for a larger view)

What Is the Mountain Pine Beetle?

The mountain pine beetle (Dendroctonus ponderosae) is a small insect that lives most of its life in the inner bark of pine trees. The adult beetles are black to rusty brown and 1/4 inch in length. They fly from infested trees to new host trees in late June or July. Once they have located a favorable living host pine, the adults tunnel beneath the bark to lay eggs. After the eggs hatch the young, known as larvae, feed within the tree until the following spring when they pupate, a resting stage, for several weeks before becoming adults. The adults emerge from the dead, yet often still green, host and seek a new tree to begin the cycle again.

Mountain Pine Beetle

The beetles can colonize trees in large numbers. The tunneling beneath the bark by the adult beetles and their larvae harms the tree by disrupting the movement of food, produced by the needles, to the roots. The adult beetles also can carry a blue-stain fungus from tree to tree. This fungus stops the movement of water from the roots to the needles. The combination of these two factors results in the tree's death.

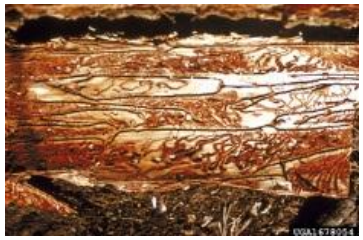
Is the Pine Engraver Beetle (Ips) the Same Insect?

Pine Engraver Beetle

While the pine engraver beetle is closely related to the mountain pine beetle, it is an entirely different insect. The pine engraver beetle is common to the Black Hills and it also attacks pines, but its life cycle and the management recommendations are different.

Mountain Pine Beetle Galleries

The pine engraver beetle often first attacks the tops of the trees while mountain pine beetle attacks are along the lower 3/4 of the tree. Mountain pine beetle attacks generally result in the formation of pitch tubes while pitch tubes are rare with pine engraver beetle attacks. The galleries created beneath the bark are different. Mountain pine beetles form one large gallery with many smaller ones constructed perpendicular from the main one. Pine engraver beetles have several large galleries radiating out from a central location .

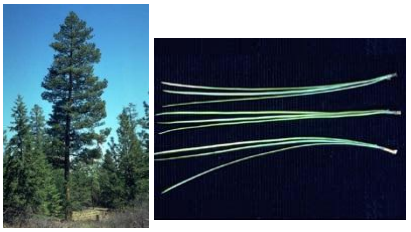


Pine Engraver Beetle Galleries

Where Is the Mountain Pine Beetle Found?

The mountain pine beetle is found throughout western North America from British Columbia to northern Mexico. It can be found throughout the B lack Hills.

What Tree Species Does the Mountain Pine Beetle Attack?



Ponderosa Pine Tree and Needles

The most common host in the Black Hills is ponderosa pine.This tree occurs on more than 1 million acres of forestland in western South Dakota. Ponderosa pine is also extensively planted in shelterbelts and landscapes. Ponderosa pine can be separated from other pines by its bundles of needles in two's and three's (most other pine trees will have needles in bundles of only two or only three). The needles are typically 5 to 11 inches long.

Lodgepole, sugar and western white pine, though far more common in western states, are also susceptible wherever they are found. The pines we frequently use in the ornamental landscape, Scots (Scotch) and Austrian pine, are generally not hosts due to their smaller size and distance from mountain pine beetle infestations.

However, these trees are highly susceptible to attack and large trees near infestations are vulnerable. Spruce, fir or Douglas-firs may be attacked if in the vicinity of infestations but these attacks are rarely successful.

Why Is There So Much In the News About This Insect?

Mountain pine beetle is native to the Black Hills and has probably 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 only stressed or weakened trees, such as those struck by lightning, are colonized. However, about every ten years or so the beetle population increases and the beetles begin colonizing healthy as well as stressed trees. These outbreaks last for about five to 13 years after which the beetle population once again declines.

The first recorded outbreak in the Black Hills occurred in the late 1890s. An estimated 10 million trees were killed during this outbreak. Approximately five outbreaks have occurred since that time though none has reached the same magnitude. The outbreak in the early 1970s resulted in the loss of more than 440,000 trees. The last outbreak occurred from 1988 to 1992 and resulted in the death of approximately 50,000 trees. Beetle populations are increasing and are expected to continue to increase during the next five years.

Severe outbreaks can increase fire hazard as well as stream flow. The snags, however, are also beneficial as habitat for cavity-nesters.

How Can I Tell If Mountain Pine Beetle Is Infesting My Trees?


Pitch Tube

During outbreak conditions, all trees - weakened and healthy - are susceptible. The summer that a tree is attacked it will appear green and healthy. The first signs of the attack will be noticeable by late summer.

- Pitch tubes, or small (1- to 2-inch) masses of resin will be present on the trunk.
- There will also be red boring dust in bark crevices and on the ground around the tree. This boring dust will have a size and consistency ranging from flour-like to sugar-like.
- Sometimes if the tree is very healthy and the attacks are limited, the tree can "pitch out" the beetles. These trees can be identified by larger pitch tubes with the adult beetle often stuck in the resin.
- If the attacks were successful, white C-shaped grubs can be readily found beneath the bark by August or September.


Mountain Pine Beetle Larvae

At this point the trees are usually beyond recovery. The following spring the needles on these attacked trees will turn a yellow to a bright red. The wood will show blue-staining by the fungus Ceratocystis montia. After the adult beetles emerge, the dead trees turn a dull red, becoming gray the following year. There are other insects and disorders that can be confused with some of the symptoms and signs of mountain pine beetle colonization.

Consult with a professional forester or South Dakota certified arborist to be sure the problem has been correctly identified.

What Can Be Done to Manage This Insect?

For strategies that can be used to manage this insect in both forest and residential areas please see the bulletin Management Strategies for the Mountain Pine Beetle also available from a forester at your nearest South Dakota Resource Conservation and Forestry Division office.

*The use of trade names is for reader convenience and does not imply product endorsement.