



South Dakota Cooperative Extension Service

Identification of Mountain Pine Beetle Infested Trees

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The mountain pine beetle (*Dendroctonus ponderosae*) is a pine bark beetle native to the Black Hills and much of western North America. The Black Hills has experienced landscape level outbreaks of mountain pine beetles beginning in the late 1990s with the losses now totaling into millions of trees. Many landowners are concerned that their ponderosa pine trees have been, or may become, attacked. This bulletin will answer some of the most common questions regarding identification of mountain pine beetle infested trees.

WHAT IS THE MOUNTAIN PINE BEETLE?

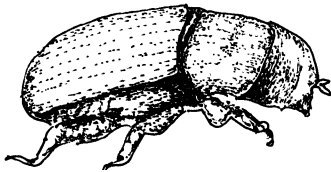


Figure 1. Mountain pine beetle adult (not to scale).

The mountain pine beetle is a small insect that lives most of its life just beneath the bark of living pine trees. The adult beetles (figure 1) are black to rusty brown and about 1/5- to 1/3-inch long, about the size of the lead point of a pencil. They emerge from dead trees beginning in early to mid-July. The emergence reaching its peak near mid-August, though some beetles continue to fly into mid- to late September. The adults burrow into living pines and construct tunnels, known as galleries, just beneath the bark in which to lay eggs. The eggs begin to hatch in late summer and the yellowish white, legless larvae (figure 2), about the size of a rice grain, feed within the inner bark of the tree until the following spring. In late spring they begin to pupate, a resting stage, for several weeks before becoming adults. The adults will often remain beneath the bark for a short time period before they begin to emerge in large numbers from the now dead host tree and seek a new living pine tree to begin the cycle again. Generally the beetles find a new host within several hundred feet of the tree from which they emerged though longer flights are possible. Flights of several miles are common while flights in the tens of miles and even hundreds of miles have been recorded though are very rare.



Figure 2.
Mountain pine
beetle larvae
(not to scale).

The beetles attack individual trees in large numbers, often in the hundreds. This mass attack allows them to overwhelm the defense of the tree which consists of producing vast quantities of resin. This sticky material often referred to as pitch, thaws the adults attempt to bore into the tree. If the beetles are successful in penetrating the bark, the tunneling activity by the adult beetles and their larvae injures the tree by disrupting the movement of food from the needles to the trunk and roots. In addition, the adult beetles also carry a bluestain fungus *Ceratocystis spp* with them as they fly out of their host. This fungus once carried into the tree by the beetle develops and also contributes to the tree's death. These two organisms, the beetle and the fungus, combined efforts are why a tree dies within a year of the attack.

HOW CAN I TELL IF MOUNTAIN PINE BEETLE IS INFESTING MY TREES?



Figure 3. Pitch tube on the bark of a tree.

The first sign of an attack are pitch tubes (figure 3), small (1/4 to 1/2-inch) masses of cream to reddish popcorn-shaped masses of pitch, usually from about 2 or 3 feet from the ground to 20 or 30 feet up along the trunk. There will also be red boring dust in bark crevices and on the ground around the infested tree. If the tree is very weak sometimes the red boring dust is the only sign of the attack as the pitch tubes are very small or nonexistent. If the tree is very healthy and the attacks were few, the tree can “pitch out” the beetles. These unsuccessful attacks can be identified by larger 3/4 to 1 inch pitch tubes that are runny or gooey and often contain the trapped adult beetle. Pitch outs are the *exception* rather than the rule so landowners finding pitch masses along the trunks of their pine trees should assume these marked a successful attack.

If the attacks were successful, the following spring the needles on these infested trees begin to turn begin yellow to a bright red. After the adult beetles emerge later in the summer, the needles on the dead trees turn a dull red. These needles become gray the following year.

ARE THERE ANY OTHER BEETLES THAT ATTACK PINES?

Mountain pine beetle is not the only beetle that infests pines. Two other common insects are the pine engraver beetle (*Ips pini*) and the turpentine beetle (*Dendroctonus valens*). The pine engraver beetle is usually found in dead and dying pine trees as well as slash, the branches left as logging debris. Generally these insects do not attack healthy trees, relying



Figure 4. Galleries made by the pine engraver beetle

instead upon host tree stressed or recently killed by drought, snow-breakage, lightning strikes or other agents. Attacks by this insect may not result in the formation of pitch tubes as the host is frequently dead, those on living host small tubes may appear. Attacks do, however, result in the appearance of a red boring dust near the holes or on the ground beneath the infested slash. If the bark is removed from an infested tree, the galleries differ from those constructed by the mountain pine beetle. The pine engraver beetle constructs three or four galleries that radiate out from a central chamber forming a ‘Y’ or ‘X’ pattern (figure 4). Galleries created by the mountain pine beetle are generally ‘I’ or ‘J’ shaped (figure 5). Both will have smaller larval galleries extending out from these larger galleries.



Figure 5. Galleries made by the mountain pine beetle



Figure 6. Gallery made by the turpentine beetle

The turpentine beetle is generally found in weakened pines or freshly cut stumps. Trees injured by fire as well as stressed by construction or soil disturbances around homes and campgrounds are also vulnerable to attack. Attacks by this insect are often confused with those by mountain pine beetle. The pitch tubes made by the turpentine beetle are often larger than those associated with attacks by the mountain pine beetle and may be more pinkish white. The location of the pitch tubes associated with the turpentine beetles are generally within three feet of the tree’s base while those from mountain pine beetle attacks often begin at that height and continue up for another 20 or 30 feet. The galleries of the turpentine beetle are often short and irregular, becoming larger, almost cavern-like, at the very base of the tree (figure 6).