

# Landowner Guide To Mountain Pine Beetle



A Publication of the:

**SOUTH DAKOTA DEPARTMENT OF AGRICULTURE  
DIVISION OF RESOURCE CONSERVATION & FORESTRY**

## What Is the Mountain Pine Beetle?



(USDA Forest Service Image)

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 host trees beginning in late June or early 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.

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 carry a blue-stain fungus (*Ceratocystis spp*) from tree to tree. This fungus disrupts the vascular system of the tree. The combination of these factors results in the tree's death.

## Signs of a Mountain Pine Beetle Infestation

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 boring dust and pitch masses. These will occur once the beetles begin to fly.



Pitch tubes, or small (1- to 2-inch) masses of resin will be present on the trunk.

(USDA Forest Service Images)



Red boring dust will appear 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.

(USDA Forest Service Image)

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 are successful, C-shaped white grubs can readily be found beneath the bark by August or September.

(USDA Forest Service Image)

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. 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 to be sure the problem has been correctly identified.

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## **Protecting single trees on a residential lot**

Homeowners may want to consider treating large diameter or newly planted ponderosa pine trees with a preventive spray. Contact the division, or your local commercial applicator, to find out more about preventive spraying. Be sure that whatever formulation is chosen is labeled for mountain pine beetle control.

As of the spring of 2010 the South Dakota Department of Agriculture, Division of Resource Conservation and Forestry recommends the following treatments:

**Treat trees vulnerable to mountain pine beetle attack with pesticides labeled specifically for bark beetle control and containing *carbaryl* or *permethrin* as the active ingredient. 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 April. Note: once a tree has been attacked, it is too late for effective control.**

The formulations mentioned above contain additives that "hold" the pesticide on the bark longer. The pesticide should be applied following label instructions from ground level to about 35 feet or where the trunk is less than 5 inches, whichever occurs lower. It is strongly recommended that homeowners contact a professional service to provide this treatment to be sure that the tree is thoroughly covered. These products will provide one season of protection so they must be reapplied every year that outbreak conditions persist.

Green infested trees should be removed and treated prior to beetle flight that begins in late June or July. If the infested tree is felled before the beetle pupates, about the middle of May, the tree can also be either chipped or debarked and left on site.

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.

Burning within the Black Hills Forest Fire Protection District requires a permit. Permits are available from your local Wildland Fire Suppression office. Offices are located in Hot Springs (605-745-5820), Lead (605-584-2300) and Rapid City (605-393-8017); or by calling 1-800-275-4955.

## **Protecting large numbers and/or entire forestlands**

The most effective defense against the mountain pine beetle is maintaining well-managed tree stands. The most susceptible stands are those with trees more than eight inches in diameter and a basal area greater than 80 square feet. As the average diameter and density decreases, the risk of mountain pine beetle attack also decreases. Adults may select trees as small as one-inch in diameter for attack but will not reproduce in them. Attacks in four to six inch trees are common during outbreak conditions and they can complete their life cycles within trees of this size. The primary focus trees, the ones initially attacked and from which the infestation spreads, are usually greater than 10-inches in diameter. Greater importance, however, should be placed on the density of the stand. Crowded trees, those in stands with a basal area exceeding 80 square feet, are much more susceptible to attack due to two reasons. First, the trees are competing with one another for water, nutrients and light and are generally not growing as vigorously as more open-grown trees. Second, the lower light intensities and cooler temperatures found in dense stands influence the attack behavior of the insect. Stands that have a basal area less than 60 square feet are much less susceptible to attack due to the more open light conditions and individual health of the trees. A professional forester can help you determine the overall condition of your forested land and provide you with management advice.

Due to numerous pesticide labels and/or label changes, be sure the product label includes the intended use prior to purchase or use. Please read and follow all pesticide label instructions and wear the protective equipment required. Spraying pesticides overhead increases the risk of exposure to the applicator and increases the likelihood of drift to non-target areas. Consider the use of a commercial applicator when spraying large trees due to the added risk of exposure and equipment needs. The mention of a specific product name does not constitute endorsement of that product by the South Dakota Department of Agriculture.

For further information contact your nearest South Dakota Division of Resource Conservation and Forestry office. Hot Springs 605-745-5820; Huron 605-353-7187; Lead 605-584-2300; Mitchell 605-995-8189; Pierre 605-773-3623; Rapid City 605-394-2395; Sioux Falls 605-362-2830; Watertown 605-882-5367.

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