



UI Extension Forestry Information Series II

Insects and Diseases No. 16

Mountain Pine Beetle

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I get a lot of calls regarding dead or dying trees, and recently many of those calls are in regards to pines that are dying across the mountains. I happened to be driving across Montana and Colorado recently, and noticed thousands, if not millions of dying trees. It seems as if the mountain pine beetle (*Dendroctonus ponderosae* Hopkins) has hit epidemic proportions and is doing what it does best: kill trees.

Bark beetles, especially the mountain pine beetle (MPB) are a major cause of timber losses throughout the Rockies and the West. These pests are ready to move in to susceptible conifer stands. During early stages of an outbreak, attacks are limited largely to trees under stress. However, as beetle populations increase, MPB attacks most mature trees in the outbreak area. Factors leading to tree stress and possible bark beetle outbreaks include: 1) Prolonged moisture or drought stress. 2) Slow tree growth-common to overcrowded and older, over-mature stands. 3) Diseased, fire, and storm-damaged stands.

The MPB is the most destructive forest insect in western North America. Mountain pine beetle can attack any pine species (native or ornamental), but in Idaho is particularly destructive in lodgepole, ponderosa, whitebark, and limber pines.

MPB typically have a one year life cycle. In late summer, adults emerge and seek out large diameter, living, green trees, tunneling under the bark

to mate. If successful, each pair will form a vertical tunnel and produce about 75 eggs. Following egg hatch, larvae (grubs) tunnel away from the egg gallery, effectively girdling the tree. The beetles also introduce a blue stain fungus into the sapwood which impedes water transport. Larvae overwinter and pupate in late spring with adults emerging from the bark in midsummer to attack new trees and start the cycle over again.

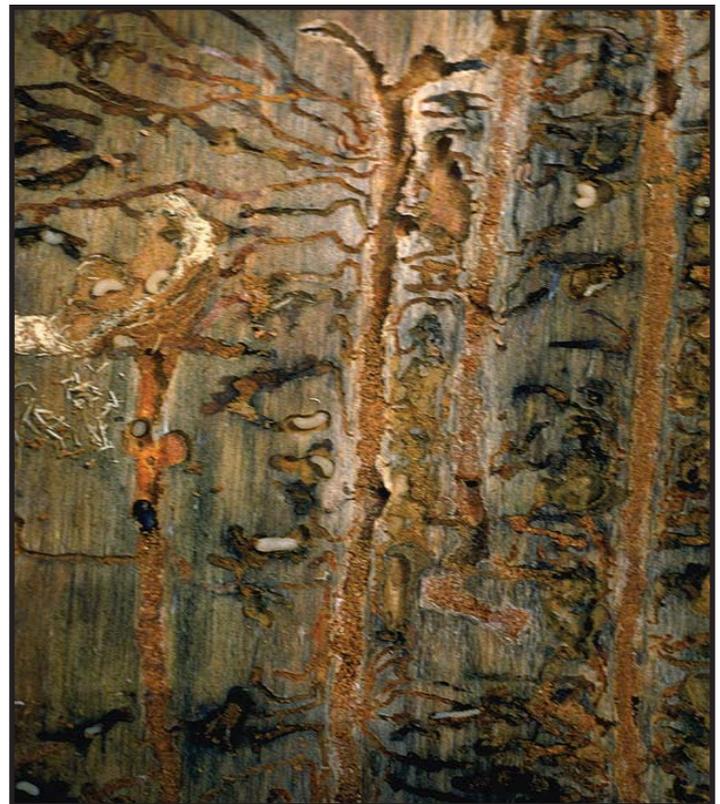


Figure 1. Mountain pine beetle galleries with larvae. (Photo by Tom Eckberg.)

Signs and symptoms of MPB attack include:

- 1) Popcorn shaped masses of resin (pitch tubes) on the trunk where the beetle enters the tree, though pitch tubes are not always present.
- 2) Boring dust or frass in the cracks and crevices of the bark.
- 3) Foliage turning yellowish to reddish throughout the crown of the tree. This usually occurs 8-10 months after a successful attack.
- 4) Presence of live MPB (eggs, larvae, pupae, and/or adults) as well as galleries under the bark. Galleries will have a "J" hook at the start of the gallery.
- 5) Evidence of woodpeckers feeding on the trunk. Pieces of bark are removed and are often visible on the ground below the tree.
- 6) Blue stained sapwood.



Figure 2. Mountain pine beetle pitch tubes. (Photo by Tom Eckberg.)

So, what options are available to the private landowner for managing this insect? The following answer generally is not what the landowner wants to hear, but, here goes: Thin, sanitize, thin, and actively manage your forest. Oh, and did I mention thin?

Basically, there are two approaches to reducing losses from MPB in pine forests: (1) long-term (preventive) forest management, and (2) direct control. Preventive management strives to keep beetle populations below injurious levels by limiting the beetles' food supply through forestry practices designed to maintain or increase tree/stand resistance. Preventive management addresses the basic cause of epidemics, which is stand susceptibility, and is considered the most satisfactory long-term solution. It includes a combination of hazard rating, priority setting, and silvicultural manipulations. Situations where MPB instead of forest managers set priorities and dictate management options should be avoided. Silvicultural treatments are most effective when they are in place before a MPB outbreak. Thinning in an area during a current outbreak is not always effective.

Insecticides can be applied to the bark of individual, high-value trees to protect them from bark beetle attack. This approach is only practical on a small scale such as around home or cabin sites, and must be reapplied periodically. Realize that it does not change the susceptibility of the tree to bark beetle attack. Consult with a forest health professional if you decide to take this approach.

Although direct control measures such as chemical sprays, pile and burn and sanitation may prevent additional tree losses in individual spots, area-wide control of the beetles has not been very effective. Natural enemies such as parasites and predators and disease agents provide some small measure of control. Subzero temperatures and long winters may kill many beetles - but don't count on this help. Although all these factors may help they will not prevent future bark beetle outbreaks.

Management must focus on forests and not MPB. Management should alter stand conditions that favor buildup of beetle populations. However, alternative strategies for reducing losses from MPB must emphasize biologically sound silviculture that includes concern for other resource values.

Research shows that bark beetle problems are directly related to forest stand conditions. Keep this in mind when you develop your forest management plans. Good stand management offers the cheapest, most practical, and longest lasting means of control, especially where beetle epidemics occur frequently.

For more information on MPB and other insects and diseases, check out the following websites

for information on forest insect and disease identification and management.

- Insect and Disease Field Guide: http://www.fs.fed.us/r1-r4/spf/fhp/field_guide/58mntpb.htm
- Insect and Disease Management guide: http://www.fs.fed.us/r1-r4/spf/fhp/mgt_guide/index.htm

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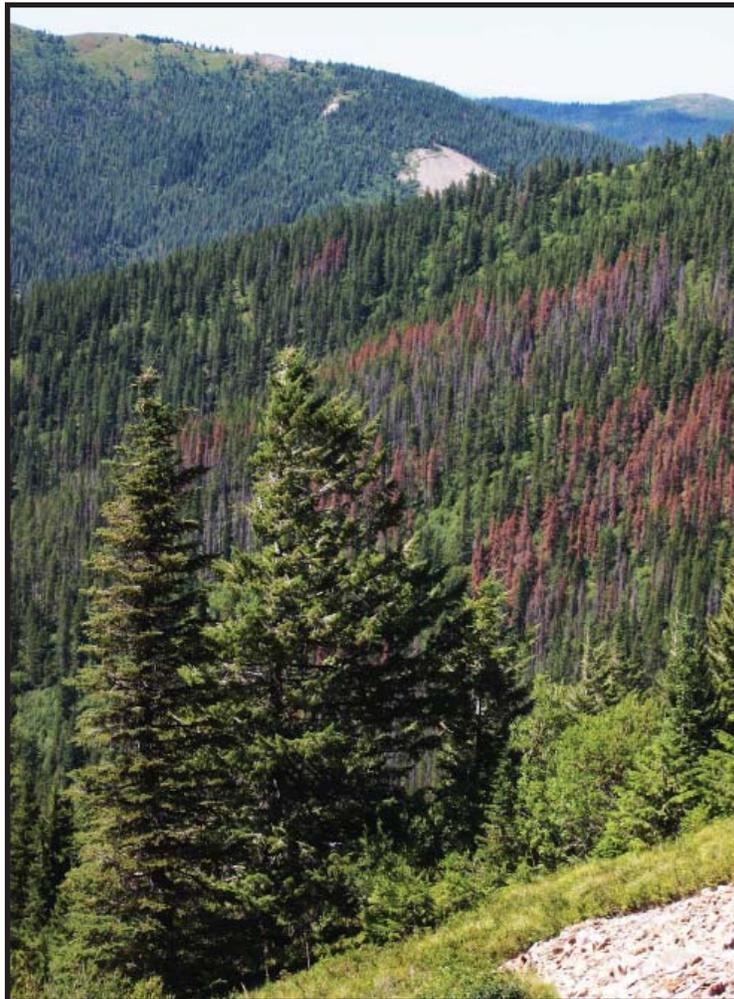


Figure 3. Mountain pine beetle infestation, St. Joe National Forest, ID. (Photo by Tom Eckberg.)