



Protecting Your Landscape Pines From Mountain Pine Beetle

USDA Forest Service, Rocky Mountain Region
Forest Health Protection

High-value landscape pine trees can be attacked and killed by mountain pine beetles that are currently at epidemic levels across western pine forests. Many treatment products are sold to protect or save pine trees from attacking beetles. Unfortunately, many of these treatments have not been fully tested. Products which have been officially registered for use by the Environmental Protection Agency (EPA) have been proven safe (if used according to the label directions), but this registration does not imply that the material has been tested for effectiveness in protecting trees.

Chemical insecticides are effective as a preventive treatment. Forest Service Research entomologists have conducted rigorous controlled studies to test the effectiveness of specific insecticides on lodgepole and ponderosa pine trees under intense pressure from high numbers of mountain pine beetles. There are three currently registered insecticides that reliably prevent bark beetle infestation at rates greater than 95%. These are the organophosphate carbaryl, and the pyrethroids permethrin and bifenthrin. To be effective they must be applied to the bark before bark beetle attack.

No registered insecticide formulations are available that successfully prevent tree mortality after a tree has been infested.

Synthetic pheromones, like verbenone, can sometimes fool beetles, but not always. Forest Service researchers have experimented with bark beetles' pheromones and tree volatiles that may attract or repel beetles. The anti-aggregation pheromone verbenone has been tested extensively for pine bark beetles including mountain pine beetle and has shown inconsistent results. Often it is effective early in an outbreak when beetle populations are still low, but over the course of an extended outbreak or under high beetle populations it is less effective. In the current central Rockies epidemic, high numbers of beetles have devastated entire stands in a single year. The effectiveness of verbenone under these circumstances has been poor. Verbenone has the advantage of being able to be used on trees next to water where you should not use chemical insecticides.

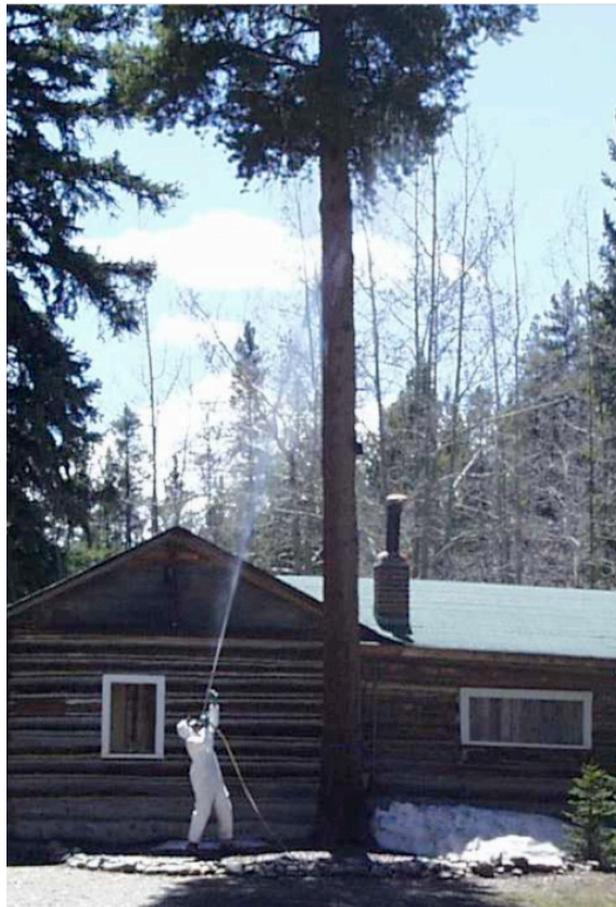
Systemic insecticides evaluated under rigorous controlled studies do not protect trees from mountain pine beetle. Although, intuition suggests that delivering a systemic insecticide below the bark should target beetles feeding beneath the bark, studies with soil-applied or trunk-injected systemic insecticides have consistently failed to protect trees from being attacked by mountain pine beetles. Systemic insecticides move up the tree through the water conducting vessels (xylem) of the sapwood eventually to the leaves. The beetles however, feed in the sugar conducting cells of the phloem tissue found just below the bark of the tree. There appears to be little or very poor movement of the systemic insecticides from the sapwood to the phloem tissue or from the leaves to the phloem tissue. New formulations of systemic insecticides are currently being evaluated against various bark beetle species, but results against mountain pine beetle continue to fail.

Products designed to repel beetles by enhancing a tree's natural defense mechanisms have not been evaluated for effectiveness against mountain pine beetle. Such treatments may not be helpful in serious outbreaks since healthy trees have succumbed



to high numbers of beetles regardless of vigor or site quality. Native pines are adapted to native soils and adding fertilizer salts is usually unnecessary and sometimes stressful to the tree, especially if drought stressed. Products claiming to protect trees by increasing resin production have not been tested with bark beetles. Simply providing supplemental water during droughty periods may provide the best support of the tree's natural defense processes.

For more information about mountain pine beetle and other forest insects and tree diseases contact your USDA Forest Service, Rocky Mountain Region, Forest Health Protection Office or your State forest health specialist. Due to rising bark beetle populations, the number of inquiries from the public regarding mountain pine beetle has increased. The following tables provide a few sources of information. These sources can also assist with other forest insect and tree disease matters. Inquiries regarding state owned or private lands are best directed to the state forestry organizations.



Organizations

Colorado State Forest Service	970-491-6303	csfs.colostate.edu and www.frontrangepinebeetle.org
Nebraska Forest Service	402-472-2944	www.nfs.unl.edu
South Dakota Resource Conservation and Forestry Rapid City Office	605-394-2395 800-275-4954	www.state.sd.us/doa/forestry/
Wyoming State Division of Forestry	307-777-7586	slf-web.state.wy.us/forestry.aspx
United States Department of Agriculture, Forest Service		
National Office – Forest Health Protection		www.fs.fed.us/foresthealth see Forest Insect & Disease Leaflet section via “technical assistance” link
Rocky Mountain Regional Office		
Forest Health Protection		www.fs.fed.us/r2/fhm Information, publications, links, bulletin board, and more. Section “Training Manual” has a leaflet on mountain pine beetle and more.
Lakewood Service Center	303-236-9541	serving northern Colorado, southern Wyoming, and Kansas
Gunnison Service Center	970-642-1199	serving southern Colorado
Rapid City Service Center	605-343-1567	serving northern Wyoming, South Dakota, and Nebraska
Rocky Mountain Research Station	970-295-5923	www.fs.fed.us/rmrs/bark-beetle/ www.fs.fed.us/rm/landscapes/Solutions/Pinebeetle

Publications & Mountain Pine Beetle (Mpb) and Ips Beetle Leaflets Online

Colorado State University Cooperative Extension Service Main Office: 970-491-6281 Resource Center for Publications: 970-491-6198, toll free 877-692-9358		www.ext.colostate.edu
MPB	USDA Forest Service	www.fs.fed.us/r6/nr/fid/fidls/fidl-2.pdf
	South Dakota Resource Conservation and Forestry	www.state.sd.us/doa/forestry/publications/mpb.htm
	Colorado State Forest Service	www.ext.colostate.edu/pubs/insect/05528.html
Ips	USDA Forest Service	www.fs.fed.us/r6/nr/fid/fidls/f122.htm
	South Dakota Resource Conservation and Forestry	www.state.sd.us/doa/
	Colorado State Forest Service	www.ext.colostate.edu/pubs/insect/05558.html