



Forest Insect & Disease Leaflet

Western Pine Beetle



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Importance: In Utah the western pine beetle, *Dendroctonus brevicomis*, can attack and kill ponderosa pine trees. The beetle usually prefers older, slow-growing, decadent or diseased trees, trees weakened by drought, lightning, fires, wounding, construction, or trees top-killed by pine engraver beetles. During outbreaks, it can kill trees of all ages and vigor class.

Host: Ponderosa pine

Life cycle and damage: Western pine beetle passes through egg, larval, pupal, and adult stages during a life cycle. All stages are spent under the bark, except during the brief period when adults fly to find



Typical winding gallery pattern of the western pine beetle

a new host tree. In the northern range or at high elevations, this beetle has two generations per year. Beetle attacks usually begin in early June. In the south and lower elevations the beetles produce three, sometimes four generations per year, with attacks beginning as early as March. Attacks may continue through late fall. Damage occurs when adult beetles colonize and reproduce in the phloem tissue of suitable host trees. Female beetles construct a tunnel just under the bark to lay their eggs. After the eggs hatch, the larvae feed and destroy phloem tissue, which prevents the transport of nutrients throughout the tree--eventually girdling and killing the tree. The larvae then move into the outer bark to complete development. Pupae and adults are usually found in the outer bark, rather than in the phloem tissue beneath the bark. New adults will either re-attack uninfested or undamaged portions of the same tree or attack another susceptible host tree.

How to tell if a tree is infested: A tree's best defense is sap, or pitch. When the beetle chews through the bark, the tree oozes pitch into the wound. Clumps of pitch or "pitch tubes" may be seen on the trunk. Pitch tubes range in color from cream to red. Successful insect attacks generally produce pitch tubes about 1/2 inch in size and dark-pinkish to red when fresh, older pitch tubes may be yellow to white. Unsuccessful attacks produce pitch clumps about 3/4 inch in size and are cream colored or light pink in color. Western pine beetle adults generally attack mid-trunk. Another sign of a successful attack is reddish boring dust in bark crevices and near the base of the tree. Needles on trees killed by the beetle generally turn yellow to red within one year of attack.

Control: The best method to prevent damage is by maintaining healthy trees and reducing wounding and other stress factors. Careful thinning of dense stands is an effective silvicultural method. Reducing stand density relieves competition between the remaining trees for water light



Scattered western pine beetle induced mortality in ponderosa pine



Western pine beetle pitch tubes on Ponderosa pine

and nutrients; this increases tree vigor and reduces tree susceptibility to successful bark beetle attacks. Careful thinning practices and care during construction activities are simple, yet effective ways to prevent damage to trees.

A tree cannot be saved once it is infested, with attacks exceeding $\frac{3}{4}$ of the tree's circumference. To reduce attacking beetle populations, cut down currently infested trees as soon as possible, and remove them from the area, preferably to a site where there are no pine trees. Properly treat infested tree material by debarking, chipping or burning the infested tree. If you wish to use the infested wood as firewood, cut into ≤ 18 inch pieces, pile in a tent like shape in full sun. Completely cover the pile with **clear** 10ml plastic, making sure to seal plastic cover around the base (soil works well to seal), so as not to leave any possible escape points for emerging beetles. Be aware that damage to the plastic is possible; either by wind, snow, falling debris, and birds, which may puncture, or tear the plastic looking for food. Do not stack infested firewood near uninfested trees. After a full summer season of covered wood, it may then be uncovered and used for firewood.

Individual high value trees can be given a short-term protective spray treatment to prevent successful attack. Protective spray treatments using insecticides, with the active ingredient Carbaryl, are quite effective, and several brand names are registered for bark beetle protective treatments. Other insecticides are also registered for bark beetles. The insecticide must cover the circumference of the trunk up to 50 feet, or to where the diameter narrows to 6 inches. To effectively treat trees, apply heavily enough to where the solution is dripping off of the surface, making sure the solution also soaks into bark furrows. If any portion of the trunk is missed, then beetles can successfully attack the non-treated area. Preventative sprays should be applied in late fall or very early spring. Carbaryl based treatments, when applied properly as a 2% (active ingredient) solution, should provide protection from attacking beetles for approximately 16 to 18 months. For large trees these insecticides are most effective when sprayed with a high-pressure sprayer (at least 450 psi-through the pull) with nozzle containing a # 8 or #10 orifice. Treatments may be repeated until the insect outbreak passes. After the outbreak has passed, continued protective sprays may not be needed.

Carbaryl based treatments are damaging to natural controls, which generally keep bark beetle populations at low levels. Beetle populations vary from year to year. Therefore, an area with only a couple infested trees may not have populations that pose a significant threat. If there are currently beetles in the area, then your trees may be at higher risk, especially if they are under stress.

Always use EXTREME CAUTION when applying pesticides/insecticides. Always follow label instructions and safety recommendations.

For further information please contact:



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