



Forest Insect & Disease Leaflet

Western Balsam Bark Beetle



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In Utah, the western balsam bark beetle (*Dryocoetes confusus* Swaine) (WBBB), attacks mainly subalpine fir (*Abies lasiocarpa*), other true firs, and rarely during outbreaks, spruce and lodgepole pine.

Trees are usually more susceptible to bark beetle attack when under stress from drought, injury, root pathogens (*Armillaria* spp., *Heterobasidion* spp.), overcrowding (competition), or old age. Subalpine fir (SAF) mortality may be associated with western balsam bark beetle (WBBB), root disease, and several other insects and disease. This complex of insects and disease is often referred to as subalpine fir mortality complex or decline. Trees are usually attacked in groups and beetle populations are likely to increase during periods of drought. However, populations may subside when moisture conditions improve.



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Currently infested SAF trees with characteristic red needles.

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Male (left) and female (right) western balsam bark beetles. Female western balsam bark beetles are identified by the denser and thicker setal brush located on the forehead.

Thomas A. Shah- an, Oregon Department of Agriculture

Life Cycle: WBBB typically completes one generation every two years, but in some locations may complete one generation in a single year. An individual female may have up to three separate broods in the year following attack. Adult male beetles initially colonize the tree and mate with multiple females within a circular nuptial chamber in the phloem. The phloem layer occurs just beneath the bark and transfers nutrients throughout the tree. After the eggs hatch, the larvae feed creating more tunnels that further destroy the phloem tissue, girdling the tree. The larvae pupate and exit the tree as adult beetles, usually in June; and may continue to emerge and fly through September. New adult WBBB beetles will re-attack uninfested portions of the same tree or attack another susceptible host tree. WBBB is also associated with a pathogenic fungus that aids in killing host trees (*Ceratocystis dryocoetidis*).

Damage: Symptoms of western balsam bark beetle-attacked trees may include fading foliage (turns yellow and then red) during the year following attack, and is one of the first highly noticeable symptoms. Fading may occur on one or more branches, or over the entire tree.



WBBB star like gallery pattern.

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Beetle-killed firs may retain their red needles for 4-5 years. Other indications of infestation may be difficult to find, but may include streams of pitch on the trunk, entrance and exit holes on the bark (similar in size to a grain of rice), reddish-brown boring dust (a sawdust-like material) along the trunk and in bark crevices or cobwebs. Attack typically occurs higher along the tree bole, so observing these signs may be difficult. The definitive sign of western balsam bark beetle is seen when the bark is removed and the characteristic star-like galleries are revealed. WBBB crown damage may appear similar to damage caused by balsam woolly adelgid, fir engraver, twig beetles, root diseases or other agents.

Subalpine fir that has had red needles for more than 2 years or has lost most or all of their needles will likely no longer have WBBB in them. If the tree has some discolored green needles scattered in the top or lateral branches, then the tree may still harbor WBBB.

Management: Western balsam bark beetle populations may be partially controlled in several ways. Silvicultural activities aimed at increasing the vigor of individual trees and maintaining healthy stand conditions offer the best chance for minimizing losses from WBBB. Overly dense stands should be thinned to reduce competition between trees for water, light, and nutrients. Old, diseased, decadent, injured, or currently infested trees should be removed and disposed of properly. Infested trees can be felled (cut down) and cut into <18" lengths and the bark burned in place or peeled and left to dry. If the tree is to be kept as firewood, pile the cut wood in **full sun** and completely cover with 6-10 ml **clear** plastic with the base of the plastic covered with dirt to seal the tent. This is done to solarize and contain any beetles that may still remain in the wood.

Since the WBBB preferentially infests weakened trees, blowdown, and freshly cut green logs, windthrown trees and green logs should be removed or treated within the year before the beetles have time to complete their life cycle.

NOTE: Currently, there are no chemical controls available which will provide effective protection or control for western balsam bark beetle

For more information please contact:



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