



TREE NOTES

CALIFORNIA DEPARTMENT OF FORESTRY AND FIRE PROTECTION

Pete Wilson
Governor
State of California

Richard A. Wilson
Director

Douglas Wheeler
Secretary for Resources
The Resources Agency



NUMBER: 3

July 1996

Controlling Bark Beetles in Wood Residue and Firewood

Sherburn R. Sanborn

Forester, Resource Management, P.O. Box 670, Santa Rosa, CA 95402-0670
Revised 1996 by Donald R. Owen, Forest Pest Specialist, 6105 Airport Rd., Redding, CA 96002.

Each year, timber losses in California forests due to bark beetle attack exceed those caused by wildland fire. Drought conditions worsen this situation. It was estimated that 10 million trees were killed throughout the state in 1989 and 1990 alone, destroying enough timber to build one million three bedroom homes.

Many valuable urban landscape trees are also killed due to drought stress and bark beetle attack. In some urban areas of Southern California, pines are frequently killed by bark beetles transported in infested firewood obtained from dead and dying trees in the Southern Sierra Nevada (personal communication, Eric Oldar, CDF Service Forester). Firewood may harbor immature beetles (larvae) which complete their development, emerge, attack and kill nearby pines in the urban landscape. This problem may be occurring in other areas as well.

This article discusses several techniques that may be used by both forest landowners and urban dwellers to reduce tree mortality by reducing local bark beetle breeding sites. An important first step before applying any of the following techniques is to determine if a potential bark beetle problem exists. Next, identify the species of bark beetle infesting the wood as well as the species of tree (host) infested. Because host preference and life cycle are so variable among different species of bark beetles, reducing tree mortality may depend on the proper selection and timing of control techniques. Because these techniques are preventative in nature, their use may be justified even where bark beetle problems do not exist. This is particularly true where high value trees, such as those in parks or residential areas, are at risk.

Firewood Pests and Regulations

Wood from tree removals, salvage logging, and forest thinning is often used for firewood. The freshly cut wood of many trees can attract bark beetles which can breed in it, while the wood of trees killed by bark beetles may harbor developing brood. Trees of particular importance are pine, true fir, Douglas-fir, elm and eucalyptus. Whenever wood is moved, there is a risk that associated insect and/or disease pathogens are moved as well. This can result in the introduction of new pests or exacerbate existing pest problems. Some bark beetle species become so numerous during periods of drought that they will mass attack and kill healthy trees.

Pine pitch canker is an incurable tree disease that has killed thousands of Monterey pines and other pines in the state. Bark beetles and other insects help move the disease around. Pine logs, firewood, branches, needles, and cones may all be a source of the disease. This material should not be transported from one part of the state to another unless you are sure it is disease-free. Contact your local Agricultural Commissioner's office or California Department of Forestry and Fire Protection forester to determine if you are in a pitch canker-infested area.

Elm wood is of particular concern because the European elm bark beetle which breeds in it vectors the Dutch Elm Disease (DED) fungus. The spread of DED over long distances has invariably been due to the movement of elm firewood from infested areas.

The eucalyptus longhorned borer (ELHB), a native of Australia, was introduced into Southern California in 1984. Since then, it has spread to a number of locations in the state. Many mature eucalyptus trees have been killed in areas where this insect has become well established. The movement of eucalyptus wood has become an increasing problem because ELHB and other introduced insects can be carried great distances in firewood. The transport of ELHB infested wood is prohibited under section 4714.5 of the Public Resources Code.

Firewood Tarping

Tarping and sealing wood piles with clear plastic is a very effective way to prevent the emergence of beetles from the wood. This technique will also prevent them from colonizing freshly cut uninfested wood. To properly tarp a wood pile you will need the following materials: Six mil clear plastic sheeting of a size sufficient to cover your wood pile. This material is available in various sizes at most hardware supply stores. If available, six mil ultra-

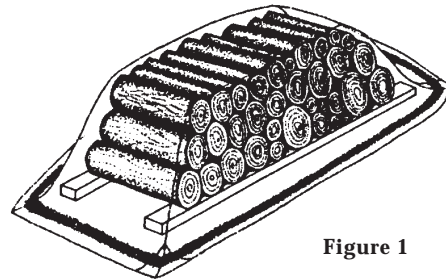


Figure 1

violet (UV) resistant plastic sheeting such as CIL Durafilm Polyethylene Greenhouse film is excellent. Do not use black plastic because beetles are attracted to areas that are lighter

in color and they chew through it.

- » Lumber such as 2X4's to use as runners to keep the wood off the ground.
- » An old tarpaulin, carpet, cardboard, automobile tires or similar material to protect the plastic from tearing.
- » Soil, gravel or other material to seal the plastic along the ground.

Figures 1 & 2 are examples of how to stack the wood. Use these examples and the following procedures to tarp it:

1. The wood stack can be any size provided it can be covered by a single sheet of plastic that will allow for 12 inches of overlap along the ground.
2. To aid in drying, keep the wood off the ground by stacking it on 2X4 runners. Placing the stack in partial sunlight will reduce

drying time, minimize the breakdown of non-UV resistant plastic and render the wood unsuitable for beetle breeding.

3. Prior to covering the stack, make sure there are no sharp projections which could pierce the plastic. Place a tarpaulin, cardboard, automobile tires (see diagrams) or similar material over the top of the stack to protect the plastic.

4. Cover the stack with plastic allowing 12 inches of material to overlap along the ground (see diagram).

5. Seal overlap against the ground with soil, gravel or similar material. Tarp must be sealed entirely around the stack.

6. After sealing, the plastic may become tightly stretched over the wood stack. If this occurs, gently pull up on the plastic allowing 2-3 inches of slack to relieve strain. This will reduce punctures and tears. If the plastic is held too firmly against the bark, tarpaulin, cardboard or other materials, beetles will get between that material and the plastic and escape by chewing their way out. This would necessitate retarping the wood.

7. Inspect tarping frequently for damage. Repair small holes and tears with duct tape. Larger tears may require retarping.

Wood should be tarped for one season after cutting, from April 1 until November 1. Firewood seasoned in this manner through one spring and summer will not support beetle colonization. Any beetle brood present in the wood when it is tarped will be killed. Wood that is tarped dries more rapidly, particularly during the winter.

Slash Treatment

Slash is woody material generally consisting of branches and tops of trees left behind after commercial logging or thinning operations. Those materials with bark still attached may become a breeding site for bark beetles and can lead to a bark beetle population buildup. There are several techniques which can be used to render this material unsuitable for beetle breeding.

Lop and scatter involves 1) severing branches from bolts 3 inches or larger in diameter, and 2) scattering the branches and bolts so that they receive maximum exposure to the sun. This technique is recommended where pine trees are being logged or thinned particularly when beetles of the genus *Ips* are already abundant. Heat from the sun increases the temperature under the bark and hastens drying. Both heat exposure and drying can greatly reduce the breeding success of bark beetles. To be effective, lop and scatter slash within one week of slash creation. As an alternative, avoid activities in pine stands that will place "green" slash on the ground from February through June.

To be effective, the remaining techniques must be completed within five weeks of slash creation or before beetle broods emerge:

Piling and burning is another effective technique which will render the slash unsuitable for beetle colonization or will kill beetles infesting the slash. This may be a very cost effective approach in rural areas where burn permits (LE-7) can be obtained through CDF.

Chipping is a very effective way of reducing bark beetle population buildup in logging slash and wood residue from pruning,

thinning or tree removal in urban areas. Chipping destroys most beetle brood present in the wood while leaving chips that are unsuitable for bark beetle breeding. Many tree services have chippers that can chip wood up to 12 inches in diameter. Whole-tree chippers are also available for biomass production.

Debarking logs, or bark removal, destroys the habitat where bark beetles breed and their larvae feed. Once removed, the bark and the wood are unsuitable for bark beetle breeding. The wood can then be left on site or used for firewood without concern. Wood that is still green or freshly cut is easier to debark than dry or seasoned wood. There are various devices available that can speed the process. They range from steel bars and chain saw attachments to commercial log debarking machines.

Chemical Control

Controlling bark beetle infestations through the application of pesticides have demonstrated varying levels of success. On commercial forest land, insecticides are costly and difficult to apply on a large scale. They can also disrupt the effect of natural enemies, and their effectiveness in controlling beetle outbreaks has been variable. In the urbanizing forest, it is possible to manage bark beetle-caused mortality with insecticide application as a temporary prevention measure or to reduce pocket killing. However, this should be considered a short term remedy used in conjunction with long term practices that improve the growing conditions for the tree.

Conclusion

Whichever technique(s) you choose, be sure to investigate the legal requirements pertinent to your activities. If you are involved in timber harvesting, insure that you are in compliance with the California Forest Practice Rules. The Registered Professional Forester (RPF) or Licensed Timber Operator (LTO) responsible for the timber harvest plan will be aware of current rules. If you plan to burn woody material, you will need a burn permit from the California Department of Forestry and Fire Protection (CDF) or other local agency. There are many communities that have ordinances restricting the removal of trees.

Further Reading

- Dutch elm disease in California. Calif Dept. of Forestry and Fire Protection. Revised, 1991.
- Krawczyk, Joseph H, Charles J. Kostichka, Gayle L. Worf, and Daniel L. Mahr. 1982. Polyethylene tarping of elm firewood to prevent elm beetle flight. *J. Arboric.* 8:292-295.
- Owen, Donald R. 1990. The red turpentine beetle. *Tree Note* #9.
- 1990 The fir engraver beetle. *Tree Note* #10.
- 1991 The western pine beetle. *Tree Note* #13.
- Sanborn, Sherburn R. 1989. The Eucalyptus longhorned borer in California. *Tree Note* #4.
- Scott, Stephen R. 1990. *Ips* beetles in California (Coleoptera: Scolytidae) *Tree Note* #8.
- Svihra, Pavel. 1987. Suitability of elm firewood to bark beetle attack stored under polyethylene sheeting. *J. Arboric.* 13(6):164-166.

Figure 2

