

Utilization Implications for Hardwoods Susceptible to Sudden Oak Death¹

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The number of woody species succumbing to Sudden Oak Death (SOD) infections and the number of counties where the pathogen has been reported continue to increase. One result is that the hazards related to falling trees and high levels of fuel hazard conditions are also increasing dramatically. The removal of infected, dead and dying trees creates numerous handling and disposal problems. One possible solution is to develop markets for wood products made from SOD infected material that would help defer some of the cost of removing the hazards and reduce the amount going into landfill. The results of a recent project that focused on tanoak (*Lithocarpus densiflorus*) utilization, one of the SOD susceptible species, provide valuable insight into the potential for utilizing SOD infected material.

Tanoak was found to have very good woodworking properties that make it a viable resource for furniture, flooring, and other value-added products. However, because of some unexpected inherent physical and chemical properties, about 80 percent of the lumber value was lost to defects that were introduced into the lumber when it was kiln dried. Cell collapse was responsible for about 1/3 of this loss and the remainder was due to enzymatic stain. Special manufacturing techniques and drying schedules are needed to minimize these defects. Results indicate that tanoak logs need to be processed into lumber soon after the trees are harvested and that fresh cut lumber must immediately begin drying in a moderate temperature/low humidity environment. Delay in drying will result in unacceptable stain. However, initial drying at temperatures above 100 degrees Fahrenheit dramatically increase the potential for other drying defects. A recommended drying schedule is reported. These difficulties encountered in processing tanoak emphasize the need to fully understand the properties of any SOD infected material being considered for value-added processing.

For utilization of SOD infected material to be a realistic option it is necessary to develop an understanding of the amount of material that could be available for utilization, the quality of the infected wood, and what types of products are feasible. A series of utilization studies were recently initiated at the UC Forest Products Laboratory focused on inventorying SOD infected wood in Marin County and determining the physical and chemical properties of representative samples of infected wood at various stages of SOD disease. The objectives of this study are to determine the relationship between pathogen initiation and the rate of wood

¹ This paper summarizes a poster that was presented at the Fifth Symposium on Oak Woodlands: Oaks in California's Changing Landscape, October 22-25, 2001, San Diego, California.

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deterioration; and to define protocols, guidelines, and recommended utilization practices for the inventory, removal, transport and manufacturing of value-added products from SOD infected material. The specific project objectives include:

- Analyze the rate of wood deterioration in SOD-infected material,
- Determine risk of using infected wood in existing disposal/utilization enterprises,
- Develop recommendations for handling, transporting and processing infected material,
- Analyze the technical feasibility of using SOD-infected material for wood products including particle and fiber composites, solidwood, and fuel and firewood (chips, firewood, and densified fuel), and pulp,
- Assess the risk of pathogen survival in processed products.

Preliminary results suggest that the primary pathogen, *Phytophthora* has little or no direct effect on wood quality but that the secondary pathogens (hypoxylon and ambrosia/bark beetles) have the potential to seriously and rapidly deteriorate wood quality. If trees with low natural resistance to insect and decay attack are not removed before the final stages of SOD disease it is unlikely they can be used for any value-added products except landscape materials (mulch/compost) or soil amendments. Although this observation suggests the early removal of infected trees, the advocacy of such a policy would compromise the species ability to develop natural resistance to the *Phytophthora* pathogen. This and other utilization questions need additional research. Trees with natural resistance would likely have more utilization potential and this will be explored in the final stages of the current project.