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Laminated Root Rot in Western North America

Walter G. Thies and Rona N. Sturrock



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Laminated Root Rot in Western North America

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Abstract

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Laminated root rot, caused by *Phellinus weirii* (Murr.) Gilb., is a serious root disease affecting Douglas-fir and other commercially important species of conifers in northwestern North America. This report gives an overview of the disease as it occurs in the Pacific Northwest in Canada and the United States. Information on recognizing crown symptoms and signs of the disease is presented. The disease cycle of laminated root rot, from initiation to intensification and distribution within infected stands, is described. Finally, disease management strategies during stand development and at stand regeneration are discussed. Features on the nomenclature of the fungus and on its management by silvicultural and mechanical approaches also are included. The report is intended as a general reference for a wide audience.

Keywords: *Inonotus sulphurascens*, laminated root rot, *Phellinus sulphurascens*, *Phellinus weirii*, *Poria weirii*, root diseases.

Preface

The information presented here has been compiled from many sources and represents both published research findings and observations of forest pathologists and resource managers in the Pacific Northwest in Canada and the United States. Some of the management recommendations are based on research still in progress. Although much of the information focuses on high volume coastal stands, it can be generally applied to both coastal and inland (east of the crest of the Cascade Range) stands. This report is intended as a general reference for a wide audience including laypersons, resource managers, students, and members of the research community. Although many primary references are listed, a complete literature review or listing of all publications on laminated root rot is beyond the scope of this presentation.

This report updates information in earlier publications intended to provide a guide to resource managers: Hadfield 1985, Hadfield and others 1986, Morrison and others 1992, Thies 1984, and Wallis 1976. These earlier publications are recommended as sources for additional color illustrations to augment those shown here.

Table I-Susceptibility of western North American tree species to laminated root rot

Level of susceptibility ^a and species	Scientific name
Highly susceptible:	
Douglas-fir	<i>Pseudotsuga menziesii</i> (Mirb.) Franco
Grand fir	<i>Abies grandis</i> (Dougl. ex D. Don) Lindl.
Mountain hemlock	<i>Tsuga mertensiana</i> (Bong.) Carr.
Pacific silver fir	<i>Abies amabilis</i> Dougl. ex Forbes
White fir	<i>Abies concolor</i> (Gord. & Glend.) Lindl. ex Hildebr.
Intermediately susceptible:	
California red fir	<i>Abies magnifica</i> A. Murr.
Engelmann spruce	<i>Picea engelmannii</i> Parry ex Engelm.
Giant sequoia	<i>Sequoiadendron giganteum</i> (Lindl.) Buchholz
Noble fir	<i>Abies procera</i> Rehd.
Pacific yew	<i>Taxus brevifolia</i> Nutt.
Sitka spruce	<i>Picea sitchensis</i> (Bong.) Carr.
Subalpine fir	<i>Abies lasiocarpa</i> (Hook.) Nutt.
Western hemlock	<i>Tsuga heterophylla</i> (Raf.) Sarg.
Western larch	<i>Larix occidentalis</i> Nutt.
Tolerant:	
Lodgepole pine	<i>Pinus contorta</i> Dougl. ex Loud.
Sugar pine	<i>Pinus lambertiana</i> Dougl.
Western white pine	<i>Pinus monticola</i> Dougl. ex D. Don
Resistant:	
Alaska-cedar	<i>Chamaecyparis nootkatensis</i> (D. Don) Spach
Incense-cedar	<i>Libocedrus decurrens</i> Torr.
Ponderosa pine	<i>Pinus ponderosa</i> Dougl. ex Laws.
Port-Orford-cedar	<i>Chamaecyparis lawsoniana</i> (A. Murr.) Parl.
Redwood	<i>Sequoia sempervirens</i> (D. Don) Endl.
Western redcedar	<i>Thuja plicata</i> Donn ex D. Don
Immune:	
Hardwoods ^b -	
Bigleaf maple	<i>Acer macrophyllum</i> Pursh.
Mallow ninebark	<i>Physocarpus malvaceus</i> (Greene) Kuntze
Ocean-spray	<i>Holodiscus discolor</i> (Pursh) Maxim.
Red alder	<i>Alnus rubra</i> Bong.
Rocky Mountain maple	<i>Acer glabrum</i> Torr.
Vine maple	<i>Acer circinatum</i> Pursh

^aLevels of susceptibility: high-readily infected and readily killed; intermediate-readily infected, usually not killed, often develops butt decay; tolerantinfrequently infected unless growing in association with the most susceptible species, rarely killed; and resistant-rarely infected, almost never killed.

^bAll hardwoods are immune.

Sources: Adapted from Filip and Schmitt 1979, Hadfield 1985, Nelson and Sturrock 1993, Wallis 1976.

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