Forest Disease Management Notes

United States Department of Agriculture

Forest Service
Pacific Northwest Region

Laminated Root Rot

Laminated root rot, caused by the fungus *Phellinus (Poria) weirii is* responsible for an annual estimated volume loss of 32 million cubic feet in the West Side Douglas-fir type. Surveys indicate approximately 5% of the area of highly susceptible host types in Oregon and Washington is out of production because of this disease. It causes growth loss, butt decay, uprooting, and tree mortality.

Hosts: Highly susceptible- Douglas-fir, mountain hemlock, Pacific silver, white, and grand fir; intermediately susceptible- spruces, larch, western hemlock, red, noble, and subalpine fir; tolerant-lodgepole, sugar, and western white pine; resistant-ponderosa pine, western red and incense cedar-, immune- hardwoods.

Recognition: Growth increment reduction, especially height, foliage yellowing, distress cone crop, slow crown decline, death; infected trees are often windthrown, exhibiting a "root ball" where roots have rotted off just below the root crown; early decay appears as a reddish stain, usually crescent shaped or semi-circular in cross-section; advanced decay is a laminated rot, the wood separating readily at the growth rings and containing numerous small, elliptical pits; butt rot is more common than tree killing in tolerant species.

White to grayish mycelium on bark surface of roots (ectotrophic mycelium); reddish, whiskery mycelium between layers of rotted wood; flat gray to brown fruit bodies formed in protected locations but infrequently observed.

Disease Spread: The fungus can survive for decades in large old stumps or roots; new hosts are infected when their roots contact old infected material; tree to tree spread occurs across root grafts and contacts; infection centers are generally small (less than 1 acre) and scattered on West Side, large on East Side; trees of all ages are affected; secondary attack by bark beetles is common.

Management: Remove infected trees from infection centers and susceptible hosts from a 50-75 foot buffer strip then (1) replant with resistant conifers or immune hardwoods or (2) remove stumps and roots and replant with susceptible species. Trees with signs or symptoms should be treated in recreational areas. Favoring less susceptible tree species is usually the most practical treatment.

May be Confused With: Annosus root and butt rot, brown cubical butt rot, black stain root disease, Armillaria root rot, or animal feeding on roots.

"Root Ball" characteristic of *Phellinus weirii* infection

Ectotrophic mycelium of *Phellinus weirii*

Typical laminated *Phellinus weirii* rot