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True Fir: Annosus root rot

Use Integrated Pest Management (IPM) for successful plant problem management.

Biology

Annosus root rot is caused by the fungus *Heterobasidion annosum*. This native soil pathogen is often in large old tree stumps. It can live several decades as a saprophyte on stumps and roots. Infection is mainly from airborne spores produced by conks on or in old stump hollows. Spores infect freshly cut stump surfaces or trunk wounds. Infection spreads from stumps to roots of healthy seedlings or trees that contact infected wood. Root infections may lead to root and lower bole decay, and trunk infections lead to stem decay. Infected roots may be covered by mycelium of the fungus, but usually no mycelium or conks are present. Decayed wood may be laminated or stringy with black flecks. In later stages of root infection, affected trees show crown yellowing and reduced branch growth. Trees often die as a result of windthrow. Bark beetles also often infest *Annosus*-infected trees. Newer trees growing between stumps of old trees are especially susceptible, and pockets of this disease increase in areas where the disease goes unnoticed and/or untreated.

Management Options

Non-Chemical Management

- ~ Avoid wounding tree roots and trunks
- ~ In mixed-species areas, favor resistant species (cedar, pine, Nordmann fir, hardwoods) when thinning or harvesting
- ~ Remove and destroy infected trees and roots systems if possible
- ~ Stumps may be excavated between rotations, preventing spread
- ~ *Trichoderma* spp. have been tried as a biological control with positive results on stumps of some tree species and are readily available.

Select non-chemical management options as your first choice!

Chemical Management

IMPORTANT: Visit Home and Garden Fact Sheets for more information on using pesticides

None recommended

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Images



~ *Caption: Annosus root rot decayed wood with black flecks*
~ *Photo by: B.M. Johnson*



~ *Caption: Annosus root rot stump symptoms*
~ *Photo by: B.M. Johnson*



~ *Caption: Annosus root rot fruiting bodies exuding from trunk*
~ *Photo by: G.A. Chastagner*



~ *Caption: Annosus root rot trunk symptoms*
~ *Photo by: G.A. Chastagner*



*~ Caption: Annosus root rot infected farm trees
~ Photo by: G.A. Chastagner*