



# Western Gall Rust

*Endocronartium harknessii*



## HOSTS:

Two- and three-needle pines, primarily Ponderosa and lodgepole in Montana

## DAMAGE:

Galls girdle branches, leading to branch dieback; severely infected trees may die over time due to loss of branches. Galls that form on the main stem may cause mortality in small-diameter seedlings/saplings as they girdle the tree. On larger trees, stem galls develop into hip cankers, causing deformity and weakness, leading to stem breakage.

## Ecology & Life Cycle

Western gall rust is a fungal pathogen native to North America. An obligate parasite, it only grows on live hosts. Unlike other rusts, it does not need an alternate host to complete its life cycle. Western gall rust produces round swellings (galls) on branches and on the stem, where the galls develop into hip cankers over time (provided the stem is large enough to avoid being girdled).

One to two years after infection, galls will produce bright orange spores in spring, which go on to infect new pine shoots and cone-flowers. Galls on branches usually only live a couple years, since once they begin producing spores, the galls disrupt host tissue function of their host branch, causing the branch to die. Infection does not spread internally from branch galls into the main stem.

High infection rates can predispose a pine to *Ips* pine engraver beetles. Rodents may chew on galls and cankers, while other insects such as sequoia pitch moth *Synanthedon sequoiae* attack on the edges of cankers.

## Identification

- Dead branches, visible from a distance as orange or brown needles
- Round or spindle-shaped swellings/galls on branches or main stem
- Bright orange spores on galls in spring
- Flared cankers on main stem, commonly referred to as "hip cankers"



Hip canker on lodgepole



Sporulating gall on main stem; will likely girdle and kill sapling.

# Western Gall Rust

## Management

- Thin stands to reduce competition and promote individual tree vigor.
  - In infected stands, remove trees with more than six branch galls as well as trees with stem galls that will develop into hip cankers.
- Promote non-host tree species.
- In ornamental pines, prune out infected branches to allow space for healthy branches to grow and reduce inoculum.
- Source seed from trees that appear resistant.
- The fungus cannot spread from dead trees nor dead branches, so disposing of slash is not necessary to control western gall rust.



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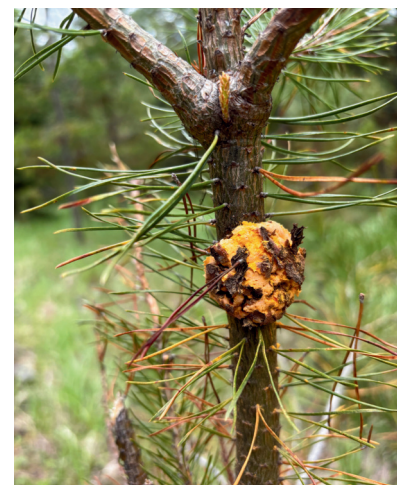
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Sporulating gall



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Old gall on dead branch



Spindle-shaped gall with signs of rodent chewing

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