

# BALSAM FIR NEEDLE RUST GUIDE

## Uredinopsis Needle Rust & Pucciniastrum Needle Rust

### Identification

Balsam fir needle rust affects current year needles on balsam fir trees. Sporadic yellow needles appear on the new growth of trees. Fruiting bodies protrude from the underside of needles. Fruiting bodies will either be white or yellow in color and can be indicative of the alternate host plant. Wet cool springs perpetuate the spread of this fungus. It is important to note that affected needles will shed before harvest and will therefore not impact marketability of trees.

### Life Cycle

Each rust fungi require alternate hosts to complete their life cycle. Most alternate host species are perennial in nature, and spores move between fir trees and alternate hosts. Balsam fir needle rust will infect and kill current year needles within a matter of weeks or months. Rusts are identified by tube-like structures that emerge on the underside of needles. These structures are called aecia and are fruiting bodies of the fungus that release spores. The aecia break through the epidermis of the needle in the spring and release spores that will cause infection of the alternate host species. Spore release and spread can be perpetuated by shearing infected trees. Depending on the species of the rust, the fungus may overwinter on the alternate host species or within fir needles as mycelium. If the rust fungus does not overwinter within fir needles, the alternate host plant produces spores that are carried by wind back to newly emerging fir needles in the spring.

## Uredinopsis Needle Rust: Fir-Fern Rust

Uredinopsis spp. & Milesina spp.

Alternate host – Bracken fern

### Signs & Symptoms

- Infected trees have ghostly appearance from afar
- Infected needles will have yellow blotches and banding
- White pustules (fruiting bodies) emerging on the underside of needles
- Similar symptoms as Current Season Needle Necrosis (CSNN) and Pucciniastrum Needle Rust

### Control

	J	F	M	A	M	J	J	A	S	O	N	D
Symptoms	Yellow											
Monitor				Yellow								
Manage					Red			Red				

**Symptoms:** Symptoms can potentially be visible year-round but are most prominent in early spring to late summer.

**Monitor:** Scout for this pest in late spring to late summer.

**Manage:** Treat alternate host during emergence in May and June. The second management period allows to check for symptoms and control alternate host plants.



## Pucciniastrum Needle Rust

*Pucciniastrum goeppertianum* & *Pucciniastrum epilobii*

Alternate hosts: *Vaccinium spp.* (i.e. Huckleberry, Wild Blueberry, Cranberry) and Fireweed

### Signs & Symptoms

- Infected trees have ghostly appearance from afar
- Infected needles will have yellow blotches and banding
- Cream/yellow pustules (fruiting bodies) emerging on the underside of needles
- Similar symptoms as Current Season Needle Necrosis (CSNN) and Uredinopsis Needle Rust

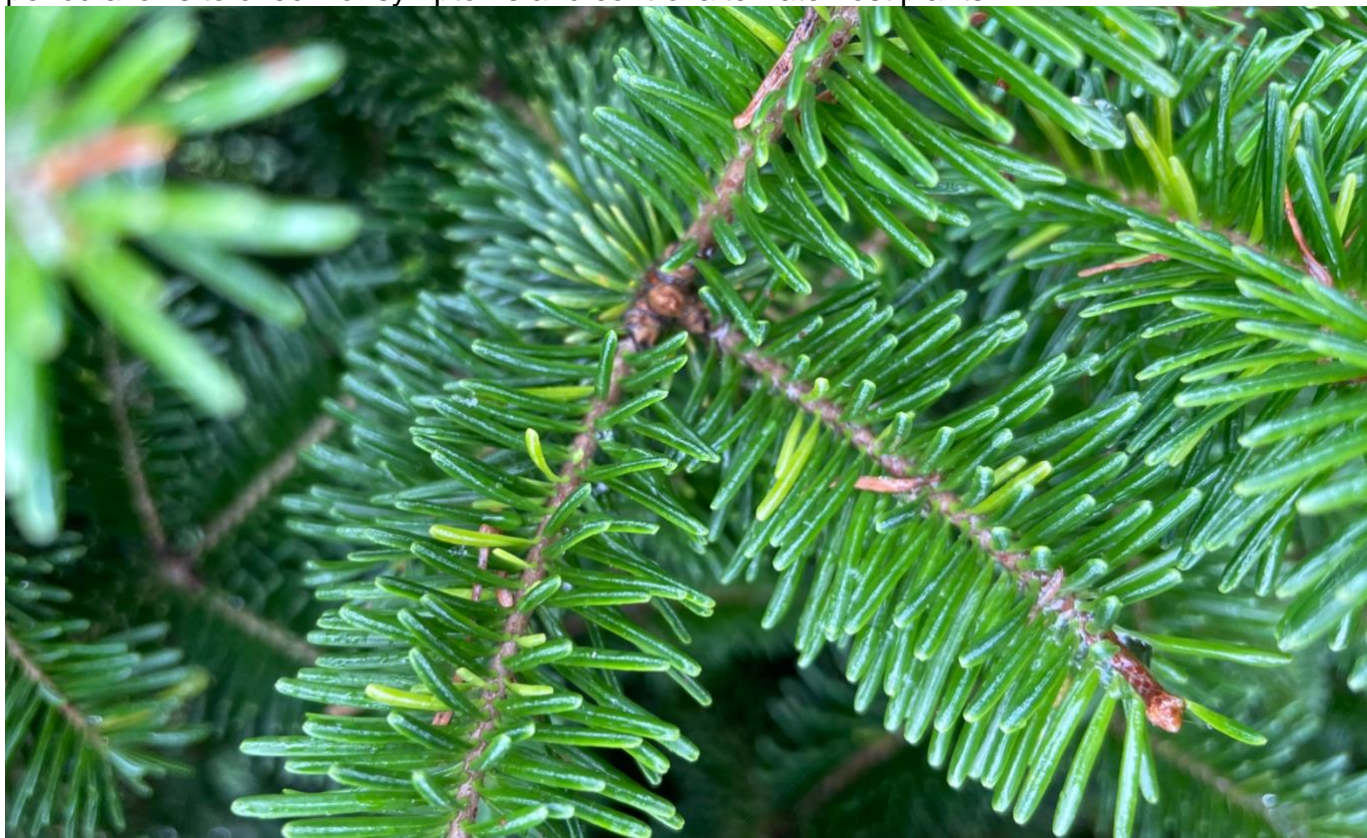
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A – Needles yellowing from rust fungal infection.





B & C – Aecia (fruiting bodies) protruding from the lower surface of fir needles.

### **Management**

The first line of defense for management is to control the alternate host of the needle rust affecting marketable trees. Remove alternate host plants in areas near trees by employing physical, mechanical, cultural, or chemical control measures. When using chemical control, always use registered products and abide by the pesticide labels. There are currently no registered products for control of Balsam Fir Needle Rust. By reducing the occurrence of alternate host plants, the amount of inoculum in an area will decrease. This should, in term reduce infection in future years. The infected needles will fall from the tree in the fall before harvest. If re-infection occurs, and defoliation is severe, trees may have to be held back another year before they are marketable.

### **Resources**

<http://www.plantpath.cornell.edu/Trees/Firfern.html>

<http://plantclinic.cornell.edu/factsheets/firfernrust.pdf>

<https://forestrynews.blogs.govdelivery.com/2021/07/06/balsam-fir-needle-rust/>

<https://catalog.extension.oregonstate.edu/sites/catalog/files/project/supplemental/pnw659/pnw659.pdf>

