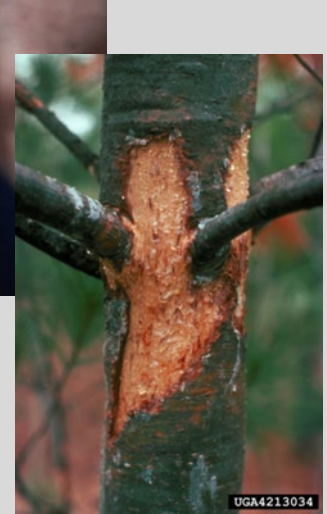


White Pine Blister Rust Discussion



James Jacobs

USDA-FS Forest Health Protection

“But for diseases and insect pests, there would likely be no food in these trees, and hence no chickadees to add cheer to my woods in winter.”



**Aldo Leopold
A Sand County Almanac**



“Disease” is a Rare Event

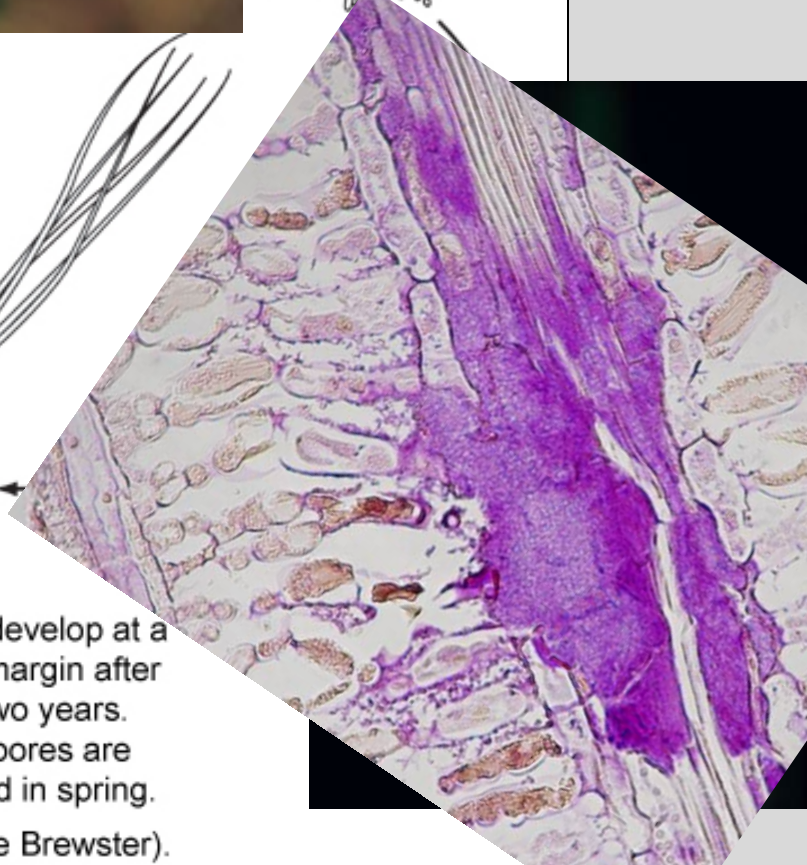
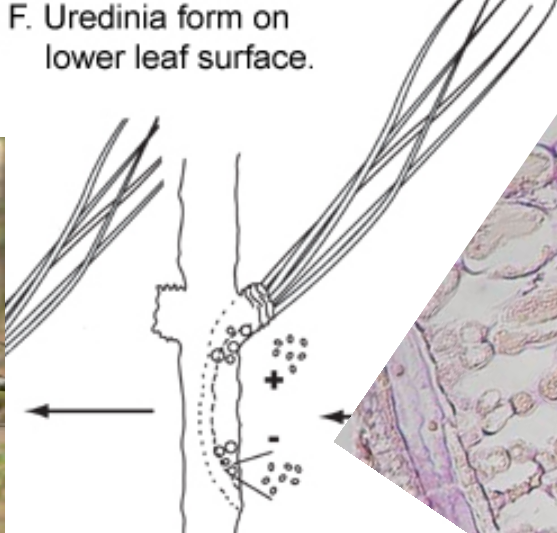
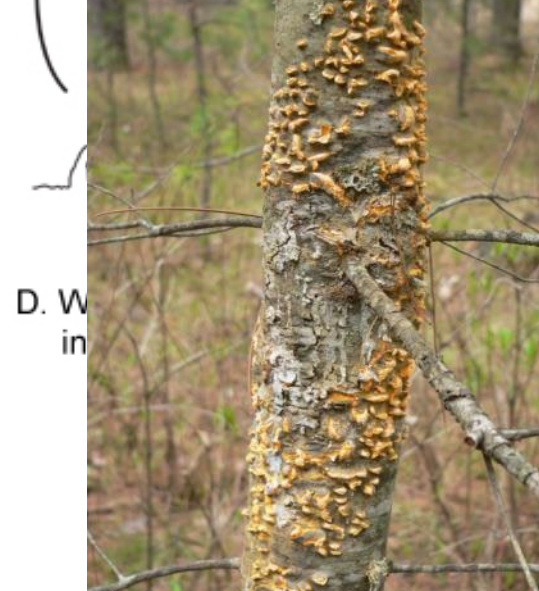
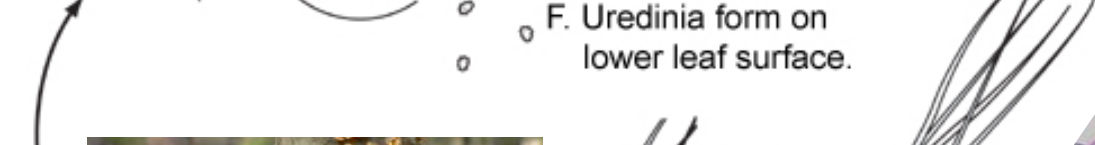
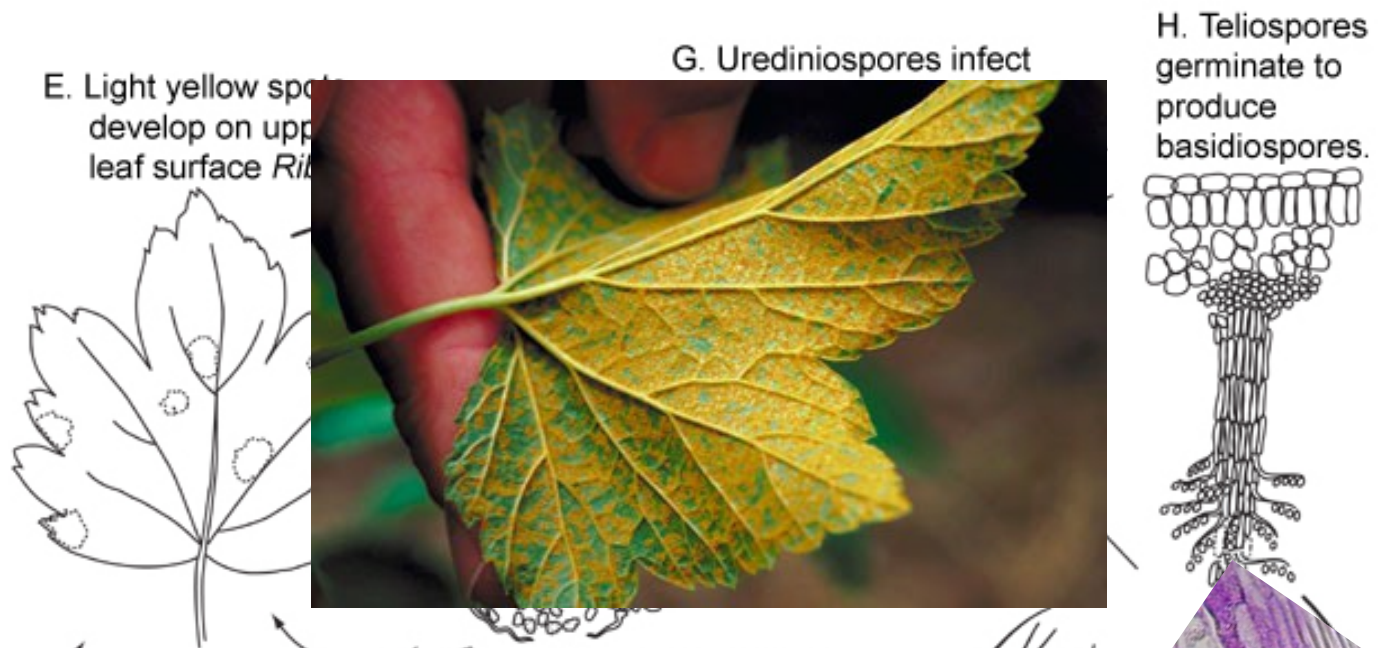
- Rare for a microbe to be a pathogen
- Plants are bombarded throughout their lives by pathogens and abiotic stressors
 - Especially true for trees



White Pine Blister Rust

- *Cronartium ribicola*
- Alternate hosts: Currants and Gooseberries (*Ribes* spp.) and a couple other hosts
- Lethal to 5-needle pines
- Introduced to the Eastern and Western US in the early 20th century.





White Pine Blister Rust Disease Cycle (Drawing by Vickie Brewster).



Spores that infect pine require persistent cool moist conditions in the fall to germinate

It does well where dew forms and persists on white pine needles



Infection requires needles

Currants and Gooseberries



- Ribes spp. like damp/moist sites with nutrient rich soils
- Abundant around lakeshores, wetlands, rich woods

How we got here

- 1600-1800
 - EWP introduced to Europe
 - Rust thought to be caused by *C. flaccidum*/*Peridermium pini* (resin top disease)
- Mid 1800s
 - Rust on *Ribes spp.* Named *C. ribicola*
- 1880s
 - Inoculations prove *C. ribicola* is causing disease in EWP







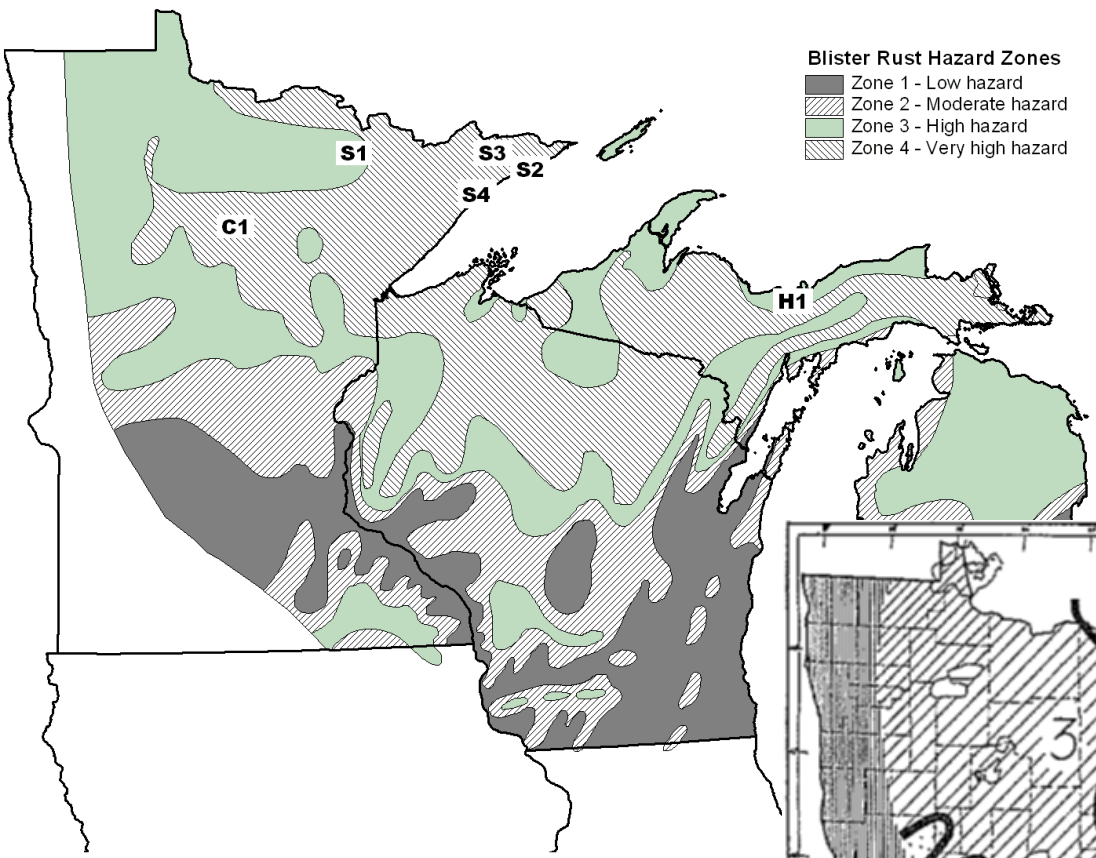
How we got here

- ~1906-1933
 - Rust introduced
 - Observations of damage in native pine and pine in Europe
- ~1950
 - Rust well established



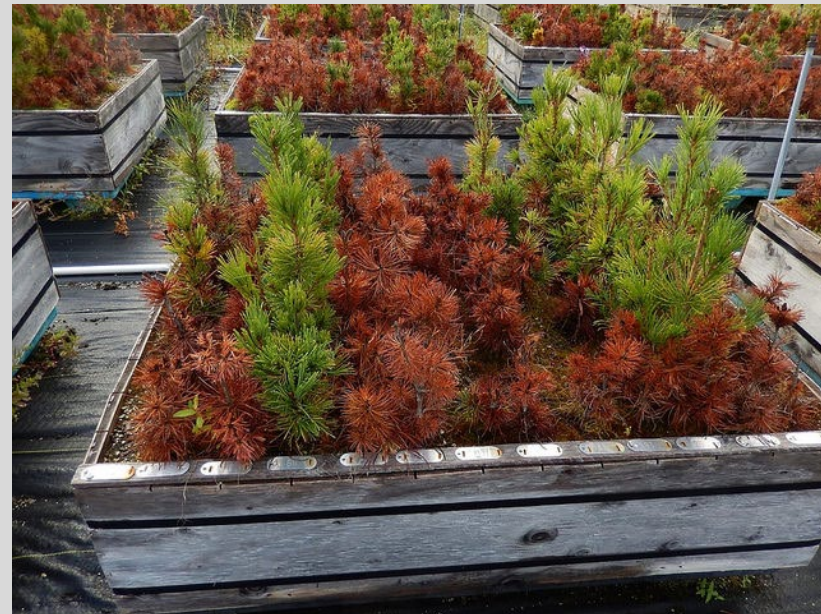
Blister Rust Hazard Zones

-  Zone 1 - Low hazard
-  Zone 2 - Moderate hazard
-  Zone 3 - High hazard
-  Zone 4 - Very high hazard



- Resistance

- Recognized in EWP in 1930s
- Western program started around 1950
- Lake States 1960s and 70s
- Varying levels of success
- Not all pine are created equal



Some fun facts

- Roughly \$150,000,000 spent on Ribes eradication
- 1919 value of standing white pine estimated at more than 1 billion dollars.
 - East or west or both?
- By 1952
 - losses of about 90 million board feet of saw timber
 - 75 million board feet of pole and smaller
- 1955 USFS Review stated \$3.8 million spent on direct disease control in 1952....\$3.6 million for WPBR

Caliciopsis Canker

- *Caliciopsis pinea*
 - “new”
 - Midwest observations increasing in last two decades





