

# Stem and Cone Rusts of Pine

## White Pine Blister Rust *Cronartium ribicola* J.C. Fisch.

**Hosts:** Southwestern white pine is the only species currently affected in the Southwest; limber pine and bristlecone pine are also susceptible. Currants and gooseberries (*Ribes* spp.) are alternate hosts.

**Symptoms/Signs:** Tapered branch swellings or stem swellings (on young trees) are an early symptom on pine. The characteristic white blisters (aecia) appear on mature cankers in late spring. After the blisters disintegrate, cankers have a dark, roughened



Figure 220. *Cronartium ribicola* spores are discharged from sacs or blisters in the spring.



Figure 221. White pine blister rust sporulating on the bole of an infected tree.

appearance. Flagging (i.e. recently killed branches with red needles) occurs several years after initial infection.

**Biology:** Spores produced on *Ribes* leaves are wind dispersed and infect pine needles. The fungus grows into the inner bark, forming a canker that eventually girdles the branch or stem. Blisters erupt through the bark of the canker, releasing the spores that infect *Ribes*.

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**Effects:** This nonnative disease is one of the most damaging tree diseases in North America. Trees of all sizes can be affected, although smaller trees are killed more rapidly than larger trees.

In the Southwest, white pine blister rust was first observed in 1990 near Cloudcroft, New Mexico. It was dispersed throughout the Sacramento and adjoining White Mountains, but was more common in moist, mixed conifer sites above 2,450 m. The disease was later found in the nearby Capitan Mountains and on Gallinas Peak (near Corona, NM). By 2005, it was discovered on the Gila National Forest in far western New Mexico. Although the forests of Arizona were scouted since the Cloudcroft discovery,



*Figure 222. White pine blister rust cankers eventually girdle infected stems and branches.*



*Figure 223. Cronartium ribicola on Ribes.*

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the first confirmed observation was in 2009, in the east-central White Mountains, including both White Mountain Apache tribal lands and the Apache-Sitgreaves National Forests.

Blister rust incidence does vary by habitat, with the higher incidence found on cooler, wetter sites. However, there is also a temporal effect. In newly infested areas, branch flagging and death of small trees is observed with little, if any, impact to mature trees.



*Figure 224. Top-kill and flagging on mature white pine.*

In older infestations, branch flagging and top kill of mature trees is common.

## **Similar**

**Diseases:** The slight swelling and roughened bark formed by *Atropellis* canker can be mistaken for blister rust, and so can branch flagging due to rodent feeding of dwarf mistletoe infected limbs. *Ribes* leaves are often infected by other rusts, such as *Coleosporium ribicola*, that can be mistaken for white pine blister rust.

## **References:**

27, 70, 93