

# Stem and Cone Rusts of Pine

## Fir Broom Rust

*Melampsorella caryophyllacearum* J. Schröt

**Hosts:** White and subalpine fir, with chickweeds as alternate hosts.

## Spruce Broom Rust

*Chrysomyxa arctostaphyli* Dietel

**Hosts:** Engelmann and blue spruce, with bearberry and kinnikinnick as alternate hosts.

### Symptoms/

**Signs:** Both of these diseases appear very similar on their respective hosts. The yellow to pale green brooms are dense and compact. Stem or branch swellings may also occur near the point of infection.

### Biology:

Windblown spores produced on an



Figure 231. Yellow to pale-green witches' brooms are conspicuous even at the forest level.



alternate host are needed to start new infections on trees. Once a tree is infected, the fungus stimulates bud formation, leading to broom development.

Figure 232. Expanding foliage is pale green.

# Stem and Cone Rusts of Pine

The brooms shed their needles in the winter and grow new ones in the spring.

## **Effects:**

Broom rusts can be found throughout much of the Southwest on their respective hosts. They typically occur at low levels, but are abundant in some locations. Infection typically results in deformity, which is most significant on young trees. Stem infections sometimes result in topkill and/or stem breakage.

## **Similar**

**Diseases:** Broom rusts are sometimes mistaken for dwarf mistletoe witches' brooms. However, the former are more



*Figure 233. Foliage yellows in late summer.*



*Figure 234. Needles die and drop, leaving the broom devoid of foliage during winter.*

# Stem and Cone Rusts of Pine

dense and compact, and lack mistletoe shoots. Dwarf mistletoes of true firs and spruces have very limited distributions in the Southwest.

## References:

93, 117



*Figure 235. Chickweeds are alternate hosts for fir broom rust.*



*Figure 236. Topkill caused by spruce broom rust.*

# Stem and Cone Rusts of Pine



*Figure 237. Infected needles release spores in mid to late summer.*



*Figure 238. Kinnikinnick is the alternate host to spruce broom rust.*