

## Weir's Cushion Rust of Spruce

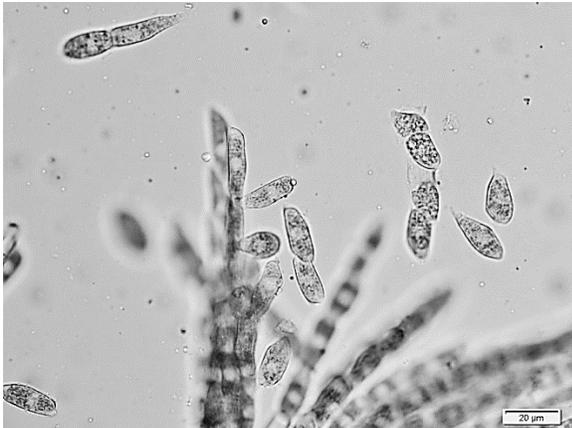
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Weir's cushion rust of spruce, also called Spruce needle rust, is caused by the fungus *Chrysomyxa weirii*. This fungus is native to the western United States, but is now found throughout North America from Canada south through the southern Appalachian Mountains. The disease rarely kills spruce, but can seriously defoliate and disfigure trees creating a problem for nurseries, landscapes, and Christmas tree growers. Colorado blue spruce (*Picea pungens*) is the most commonly and seriously affected, but all spruce species are susceptible.

### Symptoms and signs

Symptoms first appear in summer when small yellow spots or bands form on the current season's needles. The following spring at budswell, signs of orange cushion-like fungal fruiting structures called telia push through infected portions of what are now the previous season's needles (Figure 1).

**Figure 1: Teliospores produced in mature fruiting bodies (telia)**



### Disease Cycle

Weir's rust is unlike many rust fungi in that it is autoecious, meaning it completes its entire life cycle on one host species rather than requiring an alternate

**Figure 2: Development of fungal fruiting structures (telia) in infected needles of blue spruce growing in New York**



host. The fungus over-winters in the yellow portions of the current season's needles (Figure 2). In spring, wind and splashing rain move spores to newly developing needles where infection occurs. As with most fungi, mild and moist weather is conducive to disease development. Under these conditions, it is possible for infection to continue for 2-3 weeks after budbreak. As the season progresses, new spots and bands develop on the current season's growth. The previous season's infected needles that have already dispersed spores will turn rusty brown and fall from the tree.

## Management

Suppression of this disease requires well-timed fungicide applications. Apply a suitable fungicide starting between bud-swell and bud-break, and at least two additional treatments at 10-to-14 day intervals following the first one. Fungicides will not kill the fungus if it has already colonized the needle, so applications must be initiated preventatively prior to infection in the spring. Sanitation involving the removal or destruction of fallen needles is not necessary due to the fact that the fungus does not produce spores on dead tissue. Cultural practices such

as proper spacing of spruce trees at planting will promote foliage drying following rain and reduce the likelihood of infection. Spruce prefers full sun and shading can increase the severity of rust and other foliage diseases. Pruning over-story or adjacent plants to improve light and air penetration will help suppress disease. On spruce that are defoliated by Weir's cushion rust, cultural practices including fertilization based on soil analysis, proper mulching and irrigation during dry periods in the growing season will aid recovery. Monitor carefully for other pests that can compound the effects of this rust disease with emphasis on spider mites, adelgids, spruce bud scale and needlecast disease.



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