

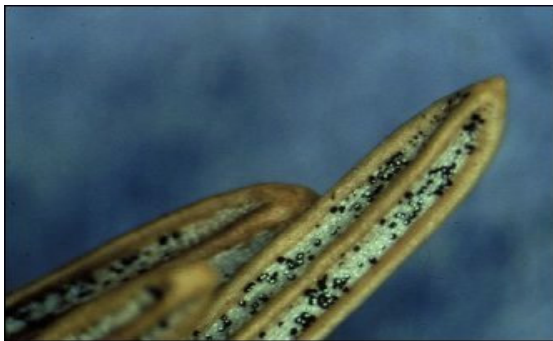
Rhizosphaera Needlecast on Spruce

Identification, Biology and Management

The fungus *Rhizosphaera kalkhoffii* causes premature needle drop on **spruce and pines**. **Colorado Blue spruce** is most susceptible, followed by **Englemann, white and Norway spruce**. Significant levels of defoliation will result in loss of tree vitality and early death.

SYMPTOMS

Symptoms are first apparent as browning of needles usually in late winter or early spring. One and two year old needles are the first affected, usually on lower branches. The infected needles usually drop in the summer and fall. The fungus can be identified using a hand lens as small black dots with white caps growing out of the stomates on the needles. Fungal spores are spread by spring rain to newly formed needles. Trees stressed by lack or excess water, lack of nutrients, root collar or root problems are most susceptible.



Fungal fruiting structures (pycnidia) emerging from stomates on spruce needles.

MANAGEMENT

To reduce inoculum, it is best to remove infected limbs and fallen needles before spring. If fallen needles cannot be removed, cover with mulch. Vigorous trees are less susceptible and better able to tolerate disease damage. Proper mulching, watering and fertilizing may improve tree vitality. Mulch should be applied from the trunk to the dripline at a depth of 2-4 inches. Avoid mulching directly against the trunk. Wood chips are one of the best mulch materials. Other materials, which can be used, include bark, pine needles and leaf compost.

Trees should be watered during dry periods in the spring and summer. Avoid sprinkler irrigation, which wets the leaves. Instead use a soaker hose, drip or microsprinkler system.

Complete fertilizers containing high levels of nitrogen, improve tree vitality and reduce disease.

Overstory trees may also need to be pruned to improve drying conditions on the spruce. Since disease is usually most severe in "crowded" conditions, avoid spacings less than 25'. More dense stands will require thinning.

Fungicides will reduce infection of new needles. Treatments are especially effective when only a small portion of the tree is infected. Applications should be made when needles are half expanded and repeated when needles are fully expanded. Two years of treatment may be required to allow full foliage development. In severe cases additional treatments may be required.