

**Problem:** Rhizosphaera needlecast of Spruce - *Rhizosphaera kalkhoffii*



**Host:** Spruce

**Description:** Needle cast, caused by the fungus *Rhizosphaera kalkhoffii*, can be a serious disease of blue spruce in nursery and Christmas tree production, and occasionally in landscape settings. The disease attacks needles in the lower portion of the tree crown first, then gradually moves upward, killing the needles on progressively higher branches. Symptoms first appear in late summer or fall when mature needles on the lower portion of the crown begin to turn yellow. The diseased needles remain attached to the tree throughout the winter. The following spring, needles begin to turn purple and drop from the branch. Most defoliation occurs late in the summer the second year after infection. Defoliation proceeds from the inner-most (oldest) needles on a branch to the youngest and from branches nearest the ground up. A close examination of the affected needles will reveal the presence of black sooty-like dots protruding through silver-white openings on the needle called stomata. Because stomata are linearly arranged, the black dots, or fruiting structures of the fungus, characteristically line up in neat rows on the needles. Affected branches are eventually defoliated and killed by the fungus.

**Recommendations:** Disease development is favored by poor air circulation and high relative humidity. Control of unwanted weeds and shrubs in the vicinity of trees is important in increasing air movement and decreasing environmental conditions necessary for infection. Fungicide applications may be required to suppress further

infection on diseased trees. Proper timing is critical for disease control. Applications should be made just as new shoot growth is 1/2 to 1 inch long.

A second application after 3 weeks is recommended. The fungicides Bordeaux mixture (8-8-100 rate), thiophanate methyl (Fungo, Cleary's 3336), and chlorothalonil (Daconil, Fertilome Broad Spectrum Landscape & Garden Fungicide, Bonide Fungonil Concentrate, Ortho Garden Disease Control, others) are effective in controlling the disease.

The diseased needles remain attached to the tree throughout the winter. The following spring, needles begin to turn purple and drop from the branch. Most defoliation occurs late in the summer the second year after infection. Defoliation proceeds from the inner-most (oldest) needles on a branch to the youngest and from branches nearest the ground up. A close examination of the affected needles will reveal the presence of black sooty-like dots protruding through silver-white openings on the needle called stomata. Because stomata are linearly arranged, the black dots, or fruiting structures of the fungus, characteristically line up in neat rows on the needles. Affected branches are eventually defoliated and killed by the fungus.

### **References:**

1. [Tree & Shrub Problems in Kansas](#). K-State Research and Extension, Publication MF3132

**Last Update:** 1/20/2022

---

Brand names appearing in this publication are for product identification purposes only. No endorsement is intended, nor is criticism implied of similar products not mentioned.

*“Knowledge for Life”*

Kansas State University Agricultural Experiment Station and Cooperative Extension Service