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RHIZOSPHAERA NEEDLECAST

This common needlecast disease causes premature death and casting of needles on several conifers in the Connecticut landscape and in Christmas tree plantations. Several species of spruce (*Picea*) are the most common hosts, although Colorado spruce sustains the most damage in the landscape. *Rhizosphaera* needlecast is an occasional problem on pine (e.g., Austrian, mugo, eastern white), Douglas-fir, and true fir (e.g., noble, silver).

SYMPTOMS AND DISEASE DEVELOPMENT

Rhizosphaera needlecast is caused by the fungus *Rhizosphaera kalkhoffii*. Current-year needles become infected in May and June, but symptoms do not appear until late fall or the following spring. Diagnostic symptoms may develop in early September but typically occur in spring: infected needles turn a distinctive lavender or purplish-brown. At that time, pinpoint black fruiting bodies of the fungus appear in the stomata of the infected needles. These can be seen with a hand lens and appear as fuzzy black spots instead of white stomates. During periods of rain and wet weather, spores of the fungus are released and are rain-splashed onto newly-developing needles where infection occurs. The infection period for this disease can be quite long since infections begin in spring and can continue until autumn. The fungus usually attacks needles on the lower branches first and gradually progresses up the tree. On severely diseased trees, the infected needles usually fall during their second summer, leaving only the current season's growth on the bottom half. Branches die when they are defoliated for 3-4 consecutive years. Trees of any size are susceptible to infection and the fungus overwinters in infected needles on the tree and in fallen needles. Under epidemic conditions, lower branches may be killed by the fungus. In extreme cases, *Rhizosphaera* needlecast can result in tree death.

Rhizosphaera needlecast is often first evident in sites that are naturally moist or have poor air drainage or are adjacent to taller trees that reduce wind-drying of the foliage. *Rhizosphaera* typically infects newly grown needles of the current season but can attack needles of any age that are dying or stressed by other plant pests or environmental factors. It is well documented that *Rhizosphaera* needlecast is more severe in drought-stressed trees.

MANAGEMENT STRATEGIES

Rhizosphaera needlecast is not considered a life-threatening disease; it can be managed through the combined use of culture, sanitation, resistance, and fungicide sprays. Cultural methods

include use of healthy stock and maintenance of tree vigor by following sound cultural practices. It is also helpful to select the appropriate planting site (slopes with good air drainage) and maintain good weed control to promote good air drainage and conditions that help to dry the lower branches. Sanitation includes pruning and removing any dead or dying branches. All prunings should be removed from the vicinity of the tree since the fungus can mature on branches that are cut. It is often necessary to remove severely symptomatic trees to reduce the amount of inoculum. Since spores can be spread from tree to tree by tools, it is helpful to disinfect tools between cuts with household bleach (1 part bleach: 9 parts water), 70% alcohol, or one of the commercially available compounds such as Greenshield[®]. To further reduce the spread of disease, pruning should not be done when the foliage is wet.

When possible, it is helpful to use resistant varieties. Colorado and Englemann spruce are most sensitive, white spruce is intermediate, and Norway spruce is relatively resistant.

The final strategy for disease management involves the proper selection, timing, and application of fungicide sprays. Thorough coverage of all parts of the tree is necessary. Among the compounds registered for use in Connecticut are chlorothalonil, chlorothalonil + fenarimol, and mancozeb. The labels contain information on dosage rates and safety precautions. Applications are made before or when new growth is approximately 1½" long and again 3 weeks later. Additional applications may be necessary in years with excessive rainfall.

April 2002