

Red Band and Brown Spot Needle Blights

Discolored lower crowns of pines

Pathogen—Red band needle blight (also called *Dothistroma* needle blight) is caused primarily by *Dothistroma septosporum* and, to a lesser extent, by *D. pini* (= *Scirrhia pini*). The sexual form of *D. septosporum* is *Mycosphaerella pini*, while *Dothistroma pini* has no known sexual stage.

Brown spot needle blight is caused by *Scirrhia acicola* (= *Systemma acicola*). The sexual form is *Mycosphaerella acicola*.

Hosts—Most pines are hosts, but the diseases are common on ponderosa, lodgepole, and Austrian pine in the Region. Brown spot needle blight is also common on Scots pine. Needle blights can occur throughout the range of the hosts but are most common in areas that trap high humidity, in dense stands, and in off-site plantings.

Signs and Symptoms—With both diseases, symptoms are usually most severe in the lower crowns (especially on the north side) and on small trees and saplings (fig. 1). Symptoms first appear on older needles as yellow or tan bands or spots (figs. 2-3). Red band needle blight develops distinctive red transverse bands (fig. 4). Brown spot needle blight produces brown spots (fig. 5) but can form bands. Both diseases produce clearly defined margins on the needles. Needles progressively turn light green, yellow, tan, and brown from the tips back. With both diseases, black dots (fruiting bodies of the fungi) can occasionally be seen in the bands or spots throughout the year. Unlike needle casts, previous-year needles (dead needles) are usually retained in needle blights. The needles can have a drooping appearance. Needle blights look similar to early needle cast diseases, winter desiccation, drought, chemical damage, air pollutions, and symptoms caused by root diseases.

Symptoms of these diseases are quite similar. They can only be distinguished by microscopic examination of the spores (asexual spores called conidia). Even the spores are similar in shape and size, and both have cross-walls. However, conidia of *Dothistroma* species are clear, and conidia of *Scirrhia acicola* are usually greenish brown.

Disease Cycle—These fungi can infect multiple times during the year (from April to November) when temperatures are favorable during moist periods. Most have both sexual and asexual spores, but only the asexual forms are common in this Region. Under moist conditions, the asexual spores are dispersed by rain splash and, to a much lesser degree, by wind. The pathogens enter needles through stomata and colonize the needles. These pathogens overwinter in the dead or infected foliage that often remains attached to the branches for a year or two. Fruiting bodies develop below the epidermis, split the epidermis, and erupt through the needle surface in the bands or spots.

Impact—Impacts include growth reduction and, in small trees with extensive infections, mortality. Occasional outbreaks appear dramatic, but damage is almost always minor and trees recover.



Figure 1. Needle blight on a ponderosa pine sapling. Photo: Robert L. James, USDA Forest Service, Bugwood.org.



Figure 2. Infected ponderosa pine branch. Photo: Susan K. Hagle, USDA Forest Service, Bugwood.org.

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Management—Management is often not needed. Growth losses are usually localized and only occur in moist years. In dense stands, thinning can increase airflow, which will promote foliage drying and reduce infections. Thinning can also be used to remove the most damaged trees and the most susceptible species. In high-value sites, applying an appropriately registered fungicide to pines can reduce symptoms. Given the occasional nature of outbreaks and the high costs involved, fungicide treatments are often inappropriate in forest situations.



Figure 3. Infected lodgepole pine branch. Photo: Jane E. Taylor, USDA Forest Service, Bugwood.org.



Figure 4. Distinctive red, transverse bands of red band needle blight on ponderosa pine. Photo: Robert L. James, USDA Forest Service, Bugwood.org.



Figure 5. Typical spots caused by brown spot needle blight on Scots pine. Photo: Darroll D. Skilling, USDA Forest Service, Bugwood.org.

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