



Needle Diseases on 2-Needled Conifers in Ohio

Most of the "disease" problems encountered on conifers in Ohio are actually non-infectious disorders resulting from the plant being out of balance with its environment. Dry weather will often cause browning of needle tips or browning and drop of second year needles. Trees growing in sites which are wet early in the year are less tolerant of summer drought. Such trees may rather quickly turn yellow and die in the late summer. Nevertheless, some fungal needle diseases of conifers can cause considerable damage in plantings throughout Ohio. In such cases, control measures may be needed.

Lophodermium Needlecast

This needlecast disease is caused by the fungus *Lophodermium seditiosum*. Fungal fruiting pustules develop on fallen needles over the summer. They show up as black, football-shaped protrusions on the needles (Figures 1 and 2). From August to October, during wet periods, windborne spores are released, which infect the current year's needles, resulting in a small brown spot, often with a yellow halo (Figure 3).



Figure 1. Fruiting pustules of Lophodermium on pine needle.



Figure 2. Close-up of Lophodermium pustules.

The Spanish and French green strains of Scots pines have been especially hard hit; other 2-needled pines such as red or Austrian may be infected. The small yellows to brown spots become apparent on the one-year-old needles in March and April. By May, many of these needles have turned brown and begun to fall off. The defoliation may be more severe on the lower portions of the tree (Figure 5). As the new needles come out, the damage to the tree is often masked.



Figure 3. Infection spots of Lophodermium on pine needles.



Figure 4. Yellowing of previous year's needles caused by Cyclaneusma.

Cyclaneusma Needlecast

This needlecast, caused by *Cyclaneusma minor*, is also found on Scots pine throughout Ohio. (This disease was formerly referred to as *Naemacyclus*, and this name may still be found in some literature.) In early summer, yellowing of the previous

year's needles may be noted (Figure 4). Transverse brown bands are often present on needles as well (Figure 6). The fruiting pustules of the fungus are small, tan, elongate and protrude slightly above the needle surface (Figure 7). They are seen on fallen or still attached brown needles during a rainy or damp period.

The most damaging period for infection by the *Cyclaneusma* needlecast fungus appears to be on year-old needles in early spring. Most infections occur before the current season's buds have broken. However, this fungus can infect needles throughout the year during damp weather when temperatures are above freezing. Infected needles will tend to drop throughout the year.

Dothistroma Needlecast

Dothistroma needlecast, caused by the fungus *Dothistroma pini* occasionally infects Austrian, red and Scots pine in Ohio. In late summer to early fall, brown to reddish-brown spots or bands form on needles. The tips of the needles gradually die and turn brown, while the base of the needle can remain green. Small black fruiting bodies can be seen at the base of the infected area. Spores are spread by splashing rain. Infection can occur on 2-year-old needles from spring to fall. Current year needles can be infected beginning in midsummer. They are not susceptible to infection until they have emerged from the needle sheath.



Figure 6. Brown bands transversing needles of *Cyclaneusma* infected pine.



Figure 7. Fruiting pustules on needles of *Cyclaneusma* infected pine.

purple lilac buds show 1/8-inch green beyond the brown bud scale may provide a timing tool in most areas in Ohio. A second treatment should be applied in early May, and a third in mid-June. This fungus can infect needles throughout the year; rainy summers require additional treatments in mid-August and mid-October.

For *Dothistroma* needlecast, treat as new needles begin to emerge from needle sheaths, and again three to four weeks later. Apply properly labeled products containing mancozeb or copper compounds. Copper compounds may cause phytotoxicity, so be sure to follow label directions carefully.



Figure 5. Defoliation of lower portion of pine caused by *Lophodermium*.

Control of Needle Diseases

Control of these diseases involves cultural modification as well as chemical protection. Scots pine should not be planted in areas that will be shaded from the sun in the morning hours or in fog or dew prone locations. In plantations where there are only a few diseased trees, remove them and burn them along with their fallen needles. Do not allow weeds or tall grass to grow up around the Scots pine. Thin plantings which are crowded. Prune trees appropriately to promote air circulation within and among trees. Since these diseases infect needles at different times of the year, it is important to determine which disease is present before employing a fungicide. Laboratory diagnosis may be needed. Colored spots or bands on needles can be caused by insects or other injuries, and are not sufficient evidence of the presence of infectious diseases.

Fungicides may be used to protect the needles from infection. Good coverage via wet down hydraulic sprays is necessary. In all cases, read and follow the directions found on the label of the product chosen. Treatment intervals will depend on the product chosen and the amount of wetness during a given season. For *Cyclaneusma* needlecast, fungicide sprays applied in early spring have prevented some damage in tests conducted in Pennsylvania. Spraying when

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