SWISS NEEDLE CAST OF DOUGLAS-FIR

Swiss needle cast is a major disease in Douglas-fir Christmas tree plantations in western Oregon and Washington. In 1981, growers lost an estimated $3.4 million at harvest due to the reduction of grade caused by this disease. Even though the disease, caused by the fungus *Phaeocryptopus gaumannii*, first received attention in 1925 in Switzerland, it is apparently a native of the Pacific Coast region of North America. Douglas-fir is the only known host of this fungus.

**Symptoms**

As the name implies, the chief damage is the loss of needles. Trees have thin foliage with a general yellowish to brownish appearance (Figure 1).

**Winter - spring symptoms:**

Numerous small black fruiting bodies of the fungus appear as soot-like streaks on the undersides of both green and yellow needles along each side of the midrib (Figures 2 and 3). These small spherical fruiting bodies push their way through the stomata during the winter and mature in the spring (use a hand lens to see them). At the time of Douglas-fir bud break, during wet weather, airborne spores from diseased needles infect new growth needles. Do not shear infected foliage during wet weather because spores released at this time may be carried from tree to tree on shearing tools. Sterilize tools after shearing infected plants by dipping in denatured alcohol for 3 minutes.
FIGURE 2. The Swiss needle cast fungus, *Phaeocryptopus gaumanni* produces many small black fruiting bodies on the undersurface of the needles along either side of the midrib.

FIGURE 3. A close up of the numerous small black fruiting bodies of the Swiss needle cast fungus. These small spherical fruiting bodies push their way through the pore-like openings (stomata) on the undersides of both green and yellow needles during the winter and mature in the spring. Use a hand lens to see them. Infected needles later turn brown and fall off in late August.

**Summer - fall symptoms:**

In the Pacific Northwest, the current year's needles seldom show signs of infection. Only needles one year old and older appear infected. Individual needles may vary from yellow-green or mottled yellow-green to mottled brown or completely brown. Brown 2- and 3-yearold needles, especially on lower branches, fall off in late August.
Control

Until recently, the major hope for control of Swiss needle cast in Douglas-fir was in breeding and selecting resistant seed sources. Now, in addition to this effort, several fungicides, effective in controlling this disease, are available.

Benlate (WA and OR only), Bravo 500 4F, Bravo 75 WP, Daconil 2787 75 WP and Manzate 200 (WA and OR only) are registered.

Tests in Washington and northwest Oregon indicate that one application of fungicide in the spring when the new growth is approximately 1/2 to 2 inches long will give optimum control. Proper coverage is essential for fungicide control.

The fungicides currently available are protective in nature and will not eradicate the fungus from an infected needle. Applications made this year will only protect the current year's needles; they will do nothing for the previously infected ones.

Unprotected needles infected in the spring will most likely remain attached through the fall harvest, but they will surely drop by next year's harvest. Fungicide sprays, therefore, will seldom help trees which will be harvested the following fall, but must be integrated annually into the management program. In severe situations when the disease is left unchecked, all but the current year's needles may eventually fall. Needle retention for the last three years is considered the minimum limit for a salable Christmas tree.

Christmas tree pest manual.


Color photographs and descriptions of 70 Christmas tree pests will help growers, nursery workers, extension personnel, foresters, and students identify the cause of tree injury. Describes ways to prevent or reduce damage from insects, diseases, birds, mammals, and environmental factors. Covers North Central and Northeastern U.S. and Southeastern Canada. This manual is well-written, beautifully designed, and well-indexed and cross-referenced for easy use. The color photographs are of high quality and clearly illustrate the diagnostic clues and symptoms.

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