4. Dothistroma Needle Blight

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Hosts

Dothistroma needle blight, caused by the fungus *Dothistroma septospora* (syn. *D. pini*), affects 20 pine species and hybrids in the United States. The most frequent hosts are Austrian, mugo, and ponderosa pines in the Central and Eastern States and lodgepole, Monterey, and ponderosa pines in the West.

Distribution

The fungus occurs in 21 States, including Alaska (fig. 4-1). *Mycosphaerella pini* (syn. *Scirrhia pini*), the sexual state of the fungus, has been found only in Alaska, Oregon, and California.

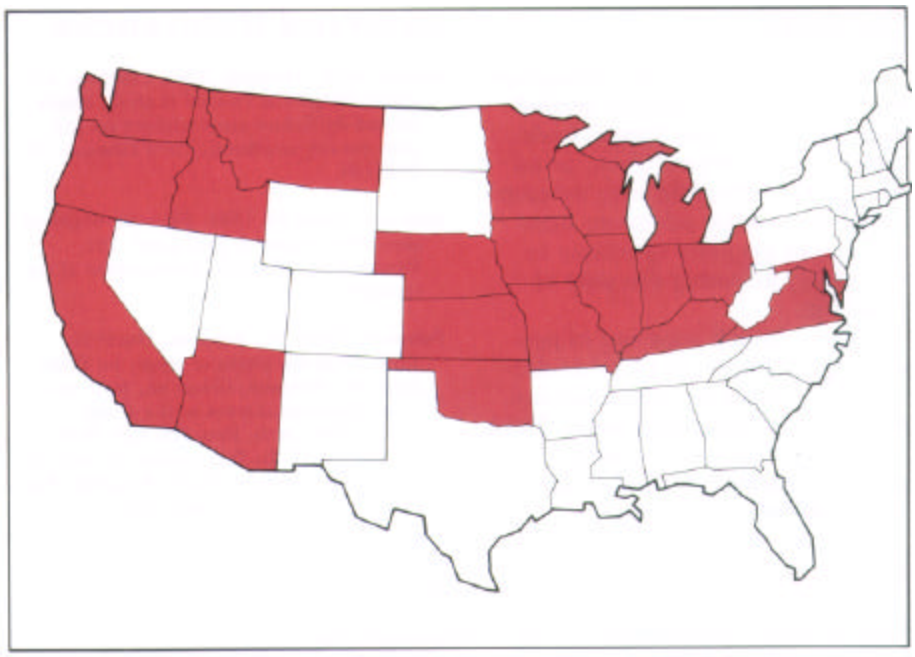

Figure 4-1—Distribution of Dothistroma blight.

Damage

Dothistroma needle blight does not seriously damage pine seedlings in nurseries. In plantations in the Central States, however, epidemics have developed within 5 years of outplanting with infected nursery stock. These epidemics have resulted in unmerchantable Christmas trees, reduced effectiveness of windbreaks, and increased maintenance costs in park and landscape plantings.

Diagnosis

On established pines, infection is most severe on the needles in the lower crowns (fig. 4-2). In the Central States, symptoms develop in the fall (October or later) of the year that the needles are infected. Look for yellow or tan spots and deep-green bands. The spots and bands on the needles turn brown to reddish brown (fig. 4-3). These reddish bands are most distinctive

Figure 4-2—Needles on lower branches of Austrian pine affected with Dothistroma blight.

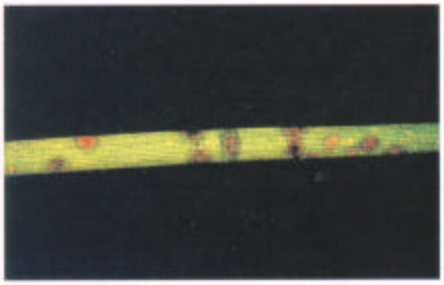

Figure 4-3—Symptoms of Dothistroma blight on needle.

Figure 4-4—Conidia of *D. septospora*.

on pines in the West, where this disease is often referred to as "red band" disease.

Although the bases of infected needles remain green, the ends of infected needles usually turn pale green, then yellow, and finally brown. Needles may develop extensive necrosis 2 to 3 weeks after the first symptoms appear. Infected needles drop prematurely. The second-year needles drop first, before the current-year needles.

Current-year needles of Austrian and ponderosa pine are initially resistant to infection, but they become susceptible in mid-July.

Symptoms on seedlings are similar to those produced on established pines.

Dark fruiting bodies are visible with a 10 x hand lens in the bands and spots on the needles. The epidermis characteristically is split longitudinally along two sides of the fruiting bodies, and a fragment of the epidermis adheres to the top.

Conidia (fig. 4-4) are exuded from the fruiting body in a white or pink sticky mass. The thin-walled conidia are hyaline, smooth, 1-5 septate, short clavate to long filiform, 10-32 x 1.8-3 microns and have a rounded apex and truncated base. Pseudothecia of the sexual state are produced on dead needles. Ascospores are hyaline, fusiform, and 11-14 x 2.5-3.5 microns.

Dothistroma blight can be mistaken for brown spot needle blight. The two diseases have similar symptoms, and the asexual fruiting bodies of the two fungi split the epidermis of the needle in a similar fashion. Both fungi have conidia that are septate and similar in shape and size; however, the conidia of *D. septospora* are translucent whereas the conidia of *M. dearnessii* are usually a greenish brown color.

Biology

In the Central States, fruiting bodies of the fungus are formed in the late fall, but they do not mature and produce conidia until the following spring. Conidia are dispersed and infection may occur from May to October.

In the West, fruiting bodies may form, mature, and release conidia during the same growing season. Infection occurs earlier in the season than in the Central States.

Control

Prevention—Remove infected pines on nursery grounds, or spray them with a fungicide. The infection of pine seedlings in nursery beds can be prevented by eliminating the sources of inoculum.

Chemical—Use Bordeaux mixture or fungicides containing copper salts of fatty and resin acids to control Dothistroma needle blight. In the Central and Eastern States, apply the fungicide twice, once in mid-May and again in mid-June. The first application protects the previous years' needles; the second application protects current-year needles. The first application should be made earlier in the West.

Selected References

Peterson, Glenn W. 1982. Dothistroma needle blight of pines. For. Insect & Dis. Leafl. 143. Washington, DC: U.S. Department of Agriculture, Forest Service. 6 p.

Peterson, Glenn W.; Wysong, David S. 1986. Dothistroma blight of pines. In: Riffle, Jerry W.; Peterson, Glenn W., tech. coords. Diseases of trees in the Great Plains. Gen. Tech. Rep. RM-129. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station: 120-121.