55. Naemacyclus (Cyclaneusma) Needle Cast of Pines

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Needle cast caused by *Naemacyclus minor* (*Cyclaneusma minus*) occasionally causes damage to Scots pines in young plantings in the Great Plains.

Hosts and Distribution

N. minor infects several pines including Scots, Austrian, and ponderosa pines. Distribution in the Great Plains is seemingly sporadic. Young plantations of Scots pines have been infected in North Dakota, South Dakota, Nebraska, and Kansas. The fungus has also been found on ponderosa pine in Nebraska and North Dakota.

Symptoms and Signs

The largest number of needles develop symptoms during September-November of their second growing season; however, some infected needles may not develop symptoms until spring, summer, or fall of the third growing season. The first symptoms appear as small, light green spots which gradually lighten and coalesce, turning the entire needle a dusty yellow (figs. 55–1, 55–2) with distinct transverse brown bars. Needles becoming symptomatic during the summer usually are cast during the summer or fall. Needles becoming symptomatic during the summer or fall may be cast during the fall or winter, or may remain attached to the tree through the following spring. Off-white, waxy fruiting bodies develop on the symptomatic needles, usually within 1 month after symptoms appear (fig. 55–3). Fruiting bodies are particularly distinctive when they swell during wet weather; they are often conspicuous on recently cast needles.

Symptoms of this disease may be confused with natural needle senescence or damage caused by aphids. The presence of apothecia are diagnostic of *Naemacyclus*.

Disease Cycle

According to research in Pennsylvania, Scots pine needles become susceptible in July of the first growing season, and remain susceptible until they are naturally cast. Four distinct infection periods have been defined in Pennsylvania. The first infection period is from mid-July to August, and usually accounts for 5 percent of total infection; the second is from September through November, and may account for 0–60 percent (usually

Figure 55–1. Scots pine infected with Naemacyclus needle cast fungus.

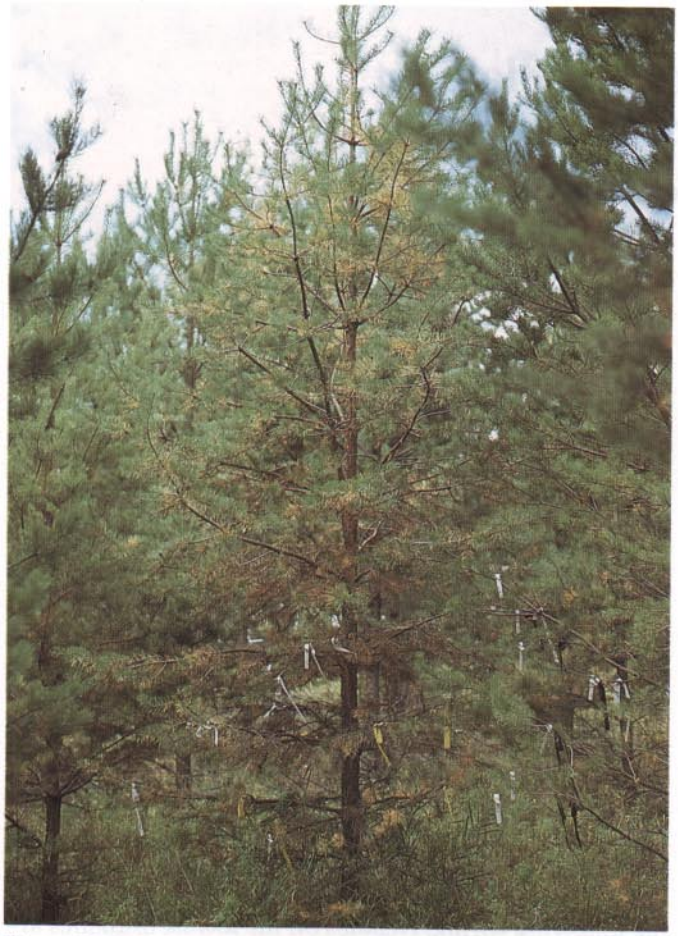

Figure 55-2. Scots pine infected with Naemacyclus needle cast fungus.

about 5 percent) of total infection; the third may occur in late November-early December, and usually is insignificant. These three infection periods during the first growing season usually account for 10–35 percent of the total infection, but some years account for 60 percent of the total infection. The fourth infection period usually begins in early April and extends through June of the second growing season; this period normally accounts for 50 percent of total infection.

Apothecia develop within 15 months of infection. The spores produced in apothecia are dispersed by wind after rainfall.

Damage

This fungus has caused extensive damage to Scots pines in Christmas tree plantings in some eastern and central States, but damage has been slight in the Great Plains. Severe infection results in yellow needles and reduced foliage, thereby reducing windbreaking ability, growth, and aesthetic value. The most extensive damage observed in the Great Plains was on Scots pine in neglected Christmas tree plantings in South Dakota, and in a crowded 11-year-old planting in North Dakota. The fungus has been found on cast needles in a 10-year-old planting of ponderosa pine in Nebraska; no damage was apparent.

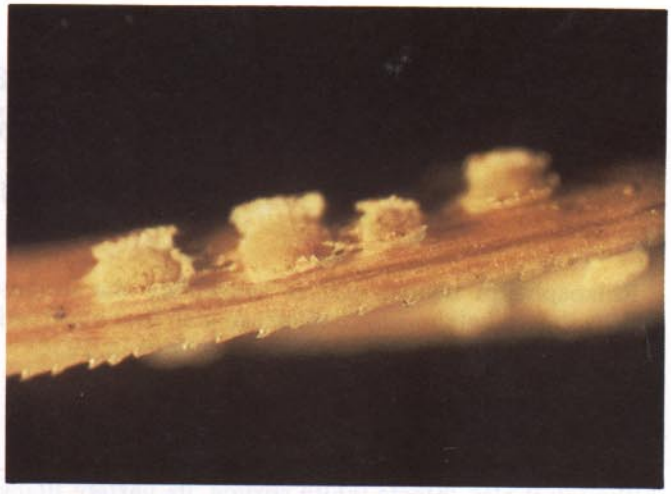

Figure 55-3. Fruiting bodies of *Naemacyclus minor*

Control

Control by fungicides is possible but several applications are needed. In Pennsylvania chlorothalonil (Bravo 500) applied four times between late March and early October has given good control.

Silvicultural practices that increase air movement through plantings, or increase distances between susceptible trees should reduce amount of infection.

There is considerable variation in susceptibility to this fungus among Scots pine provenances; scientists in Pennsylvania are seeking to identify resistant individuals for use in seed orchards.

Selected References

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