

11. Lophodermium Needle Cast

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Hosts

Lophodermium needle cast, caused by pathogenic species of *Lophodermium*, occurs on numerous conifers. Other species of *Lophodermium* are saprophytes and occur only on dead needles. Some of the more common species of *Lophodermium*, along with their hosts and pathogenic relationship, are shown in table 11-1. *Lophodermium seditiosum* is the species most commonly associated with severe damage in nurseries. Nursery damage by other *Lophodermium* spp. is less well understood.

Distribution

Lophodermium species are widely distributed; most can be found wherever their hosts are present.

Damage

Lophodermium needle cast seldom kills seedlings in the nursery but may cause extensive needle loss. If outplanted, however, infected seedlings may perform poorly and could serve as focal points for infection in the plantation. For these reasons, infected seedlings should be culled.

Diagnosis

In the winter and spring, look for yellow and reddish-brown spots on the needles, some of which may have yellow margins (fig. 11-1). Eventually, the entire needle will turn yellow, then reddish brown. Severely affected seedlings appear scorched (fig. 11-2).

Fruiting bodies occur on dead portions of infected needles or on fallen needles. Look for small, gray or black, football-shaped structures visible to the naked eye (figs. 11-3

and 11-4). When mature, these protrude slightly, and the epidermis ruptures to form a slit. Spores are hyaline, septate, and wormlike in shape; size varies according to species.

Saprophytic species fruiting on dead needles, such as *L. australe* (fig. 11-5), may closely resemble pathogenic species; a specialist in this group of fungi is needed to distinguish between them.

Biology

Spores are produced on infected trees in the vicinity of the nursery or on infected nursery stock. Infected transplant seedlings and pine needles used as mulch may also be sources of inoculum. Some species of *Lophodermium* fruit on cone scales and can be introduced into nurseries on cone fragments mixed with seeds.

The period in which spores are produced varies with species and climatic conditions but may occur throughout the year. Infection by *L. seditiosum* usually occurs on current-year needles in summer or fall, but no symptoms are seen until the following winter or spring. Life cycles of other *Lophodermium* spp. are less well known.

Many species of *Lophodermium* are only weakly pathogenic and produce symptoms only on older, senescent needles.

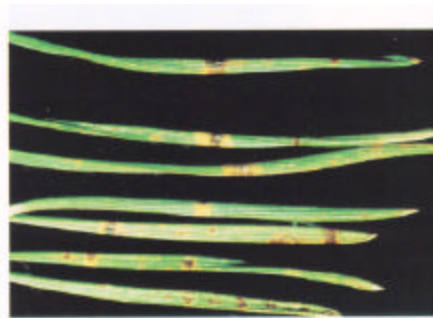


Figure 11-1—Typical symptoms of *Lophodermium seditiosum* on Scotch pine needles.



Figure 11-2—Beds of red pine severely affected by *L. seditiosum*. Bed in foreground was protected by fungicide.

Lophodermium Diseases of Pines



Figure 11-3—Fruiting body of *L. seditiosum*.



Figure 11-4—Fruiting body of *L. pinastri*.

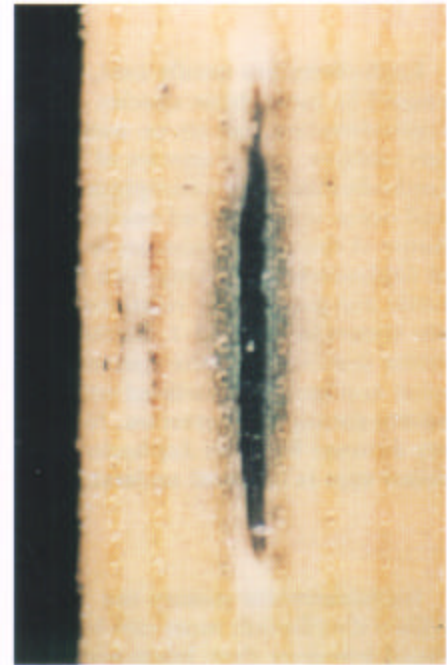


Figure 11-5—Fruiting body of *L. australe*.

Control

Prevention—Do not bring in infected transplants from other nurseries. Do not plant seedlings next to windbreaks of conifers susceptible to *Lophodermium* needle cast; windbreaks may be reservoirs of inoculum. Clean seedlots thoroughly to minimize the trash sown with the seed. Do not use pine needle mulch.

Cultural—Irrigate in the morning so that the seedlings will have time to dry in the afternoon; prolonged moisture is conducive to infection.

Chemical—Two fungicides—chlorothalonil and maneb—are registered for control of *Lophodermium* needle cast. A surfactant is needed for maneb. During rain, do not apply fungicide as it tends to wash

off. Spray applications are best during periods of low air movement—during the still, early morning hours, for example—because these periods allow more uniform coverage.

Timing of fungicide applications may vary with geographic location and species of *Lophodermium*. In the Lake States and the Northeast, apply four sprays (August 1, August 15, September 1, and September 15) just before and during the period when spores are released. Where infection is severe and prolonged rainy weather is expected, spraying again on October 1 may be necessary.

In the Pacific Northwest, where mild, moist conditions are expected most of the year, experience has shown that from 9 to 12 sprays are most effective. Apply year-round at approximately 1-month intervals except when beds are covered by snow.

Selected References

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- Nicholls, Thomas H.; Skilling, Darroll D. 1974. Control of *Lophodermium* needlecast in forest nurseries and Christmas tree plantations. Res. Pap. NC-110. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 11 p.

Table 11-1—Species of *Lophodermium*, their conifer hosts, and pathogenic relationship

<i>Lophodermium</i> spp.	Hosts	Relationship
<i>L. australe</i>	Southern and eastern hard pines	Saprophyte
<i>L. nitens</i>	White pines	Weak pathogen *
<i>L. durilabrum</i>		Weak pathogen
<i>L. staleyi</i>	White and Scotch pines	Moderate pathogen
<i>L. baculiferum</i>	Ponderosa and Jeffrey pines	Weak pathogen *
<i>L. seditiosum</i>	Red pine	Strong pathogen
Other species		Weak pathogens
Other species	Lodgepole pine	Weak pathogens
<i>L. seditiosum</i>	Scotch pine	Strong pathogen
<i>L. pinastri</i>		Weak pathogen
<i>L. conigenum</i>		Saprophyte
<i>L. abietis</i>	True fir	Weak pathogen
<i>L. decorum</i>		Weak pathogen
<i>L. piceae</i>	Spruces	Weak pathogen
<i>L. juniperi</i>	Juniper	Weak pathogen

* Status uncertain.