RESEARCH LABORATORY TECHNICAL REPORT

BARTLETT TREE EXPERTS
SCIENTIFIC TREE CARE SINCE 1907

Summary of Needlecast & Needle Blight Diseases

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Needlecast - *Cyclaneusma*

Primary hosts: Scots and mugo pine but also Virginia, Austrian, red, limber, Monterey and eastern white pines.

Infection period: Overlapping periods of infection with most occurring mid-April through August. A late infection period can occur in late autumn.

Symptoms: 2nd year needles become yellow in late summer and are cast in autumn; in Scots, prominent transverse brown bars appear on needles in fall. Later season infected needles overwinter on the tree. Elliptical fruiting bodies, similar in color to dead needle tissue, split open in the spring to release spores (photos taken in March).

Treatment: 3 treatments at 14-21 day intervals and then monthly until early October. Remove or cover cast needles with mulch. Thin plants to improve air movement.

Notes: This disease is most common on shaded, crowded plantings and on lower branches.

Needlecast - *Lophophacidium* (syn. *Canavirgella*)

Primary host: Eastern white pine

Infection period: New growth in late June and early July

Symptoms: In spring, needles fade to gray except for bases which remain green. Usually not all needles in a fascicle are infected. A dark stripe on the dorsal side of the needle becomes visible as the fungal fruiting body matures in the spring (photos).

Treatment: Apply 3 treatments at 14 day intervals beginning when needles emerge from fascicles.

Notes: Only about 10% of eastern white pine is susceptible. Diagnosis is difficult because fruiting bodies are present on needles for a short time in the spring.

Needlecast- *Lophodermium seditiosum*

Primary hosts: Scots, Austrian, red pines; also Aleppo and Virginia pines

Infection period: July to early fall with most infection occurring August to September, especially in wet summers.

Symptoms: Yellow spots on previous year's needles develop in early spring. Infected needles turn from reddish brown to straw colored before casting usually in June-July. The fungus forms dark brown football-shaped fruiting bodies on dead year old needles which release spores in late summer (photos).

Treatment: Spray once per month from July through October. Clean up cast needles from the ground and amongst branches before late summer. The disease is worse during wet summers.

Notes: Other *Lophodermium* species can infect stressed needles (ex. white pine), hastening their casting but are not considered a serious disease pathogen.

Needlecast- *Rhabdocline*

Primary host: Douglas-fir

Infection period: Cool, wet weather, spring through early summer (May-July)

Symptoms: Chlorotic spots on current season's growth in late summer; by the next spring, spots enlarge and darken to orange brown, then split open.

Treatment: Apply 3 sprays at 14 day intervals beginning at budbreak. Remove cast needles or cover with mulch. Thin plants to increase air circulation.

Notes: Orange raised fruiting bodies easy to see in spring (photos taken in May).

Needlecast- *Phaeocryptopus gaeumannii* (Swiss)

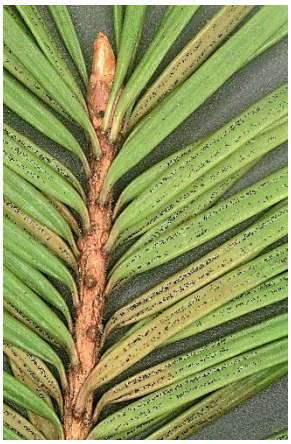
Primary host: Douglas fir

Infection period: Overlapping infection periods with peak infection occurring late spring to early summer during shoot elongation.

Symptoms: General appearance of two dark bands along the undersides of 1-3 year old needles. Black round fruiting bodies form on green needles. Infected needles may live for up to 3 years after infection. Needles become chlorotic and may appear mottled with brown or entirely brown before casting (photos).

Treatment: Treat 3 times beginning when shoots are 1" long and continue at 14 day intervals. Disease spread is rapid during rainy summer weather.

Note: Disease can build up undetected because infected needles may appear healthy green even while producing spores for up to three years before dying.



Needlecast- *Ploioderma lethale*

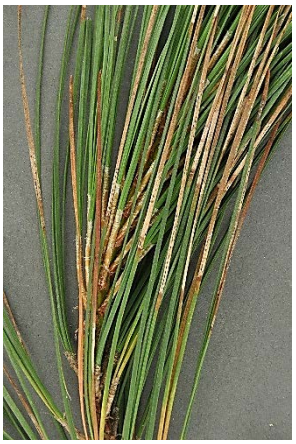
Primary hosts: Austrian, loblolly, pitch, red, Virginia, Japanese black and most other hard needle pines on the east coast.

Infection period: Infects newly formed needles in late spring and early summer.

Symptoms: Straw to brown colored bands appear in late spring to early summer on second year needles. Needle tips turn brown and needle bases remain green. Thin black longitudinal fruiting bodies appear in line on straw colored needle tissue (photos).

Treatment: Apply first spray treatment when needles begin to emerge from the fascicle and repeat at monthly intervals two more times.

Notes: Thin plants to improve air circulation.



Needlecast- *Rhizosphaera*

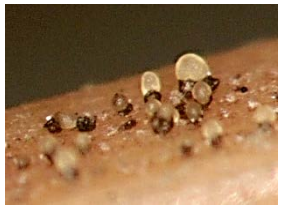
Primary hosts: Colorado blue and Engelmann spruce are very susceptible. White spruce is intermediate while Norway is fairly resistant. Other conifer hosts include fir, deodar cedar, California redwood, hemlock and pine.

Infection period: Infection predominantly occurs during shoot elongation. A second infection period is possible in late summer to early fall.

Symptoms: Infected needles turn brown, or in the case of blue spruce, purple, then brown. Symptoms appear on both current year's or last year's needles during spring or fall. Fruiting bodies pop through stomata on the dorsal needle surface and have a white waxy cap of stomatal material which is later replaced by masses of spores as they ooze out (photos). The structures occur on both green and brown infected needles.

Treatment: Treat newly forming needles when half elongated and again at full needle expansion. Additional monthly treatments for highly susceptible spruce or when disease pressure is high are recommended in August and September. Remove or cover fallen needles with mulch.

Notes: Can infect both new and mature senescent or stressed mature needles. Disease usually begins on lower limbs. If is starts higher, it usually spreads downward and outward.



Needlecast - *Stigmina lautii*

Stigmina lautii is considered similar to *Rhizosphaera* causing symptoms of needle browning and defoliation. It is associated with spruce trees that are under stress. The fungus produces black fungal fruiting structures on green and brown needles. Unlike *Rhizosphaera*, the structures have a fuzzy outline (photos). Treatment is the same as for *Rhizosphaera*.

Needle blight - *Mycosphaerella dearnessii*

(Brown spot)

Primary hosts: Longleaf and Scots pines but also Aleppo, Austrian, Japanese black, Monterey, pitch, red, mugo, shortleaf, Virginia and eastern white pine.

Infection period: Late spring when needles are emerging. Succulent needle tissue is more susceptible.

Symptoms: Lesions start as spots and may enlarge to encompass the needle leading to death of the distal parts. In warmer climates, spots typically appear May-October while in colder areas, they appear June-August. Lesions are variable with some appearing initially as straw yellow then turning brown with a dark border or as brown lesions with an amber-yellow halo around them (photos). Before dropping, needles turn reddish brown then fade to a muted hue.

Treatment: The first application should be applied when new growth begins to emerge and repeated 3-4 weeks later. Wet summers can extend the spray period.

Notes: Do not prune infected plants during warm, wet weather. Disease severity can vary among and within pine species.

Needle blight - *Mycosphaerella pini*

(*Dothistroma* or Red band)

Primary hosts: Austria and Monterey ones are very susceptible but also 30 other pine species are hosts.

Infection period: Second-year and older needles become infected spring until fall with wet summers favoring disease. New developing growth is immune to infection.

Symptoms: Majority of disease develops within 6-10 feet above ground. Yellow to reddish-brown spots or bands appear on infected needles with needle bases remaining green (photos). The red color in the lesions is due to accumulation of the toxin, dothistromin.

Treatment: First spray in mid-late May protects old growth; second spray in mid-June protects new growth after it matures. In wet summers, continue with monthly sprays.

Notes: Do not prune when foliage is wet. Remove recently fallen (2 months or less) needles.

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