



## Information

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### Needle cast diseases

#### Cyclaneusma needle cast and 'radiata yellows' (Cyclaneusma minus)



This disease was once mistaken for natural senescence with needle drop occurring in the centres of pine trees. It was then discovered that a fungus was responsible for this needle drop and that it could be managed with a fungicide. This particular needle cast is caused by a fungus that mainly attacks Scots pine, although Austrian and Eastern white pine as well as a few other pine species may also be infected. This disease can be found on all but the current season's needles.

Symptoms begin in early autumn when needles begin to develop yellow spots. This yellowing progresses until the entire needle is yellow. As the season progresses, infected needles develop more of a tan colour and brown transverse bands begin to become apparent on the needle surfaces.

The infected needles will overwinter in this manner with many of them remaining on the tree through the winter months. In the spring, small (2-3mm) cream coloured blisters develop on the infected needles. During wet weather, from March to October, these fruiting bodies split open and release spores into the air which land on needles and infect them. Needles are infected throughout the growing season as the fruiting bodies release more spores, but the initial symptoms may not develop until at least 10 months after infection occurs.

It is difficult to manage *Cyclaneusma* needle cast because infected needles may remain attached through the winter and spring, and spore production and infection can take place whenever temperatures are above freezing and needles are wet. Likewise, as symptoms may not develop for almost a year after infection occurs, newly infected needles will not develop symptoms until the following autumn, making the effectiveness of pesticides applied the first season difficult to evaluate.

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As infected needles that are on or even under the tree may release spores any time during the growing season, to protect needles, a fungicide must be used throughout the growing season. Five treatments are recommended to provide the best protection with the first beginning in March when spore production may be at its peak. Continue treatment about every 5-6 weeks through October to provide maximum protection of the foliage. In Christmas tree plantations, if the infection level is not yet severe, an individual tree's appearance may be improved just prior to harvest by using a leaf blower to forcibly remove infected needles from the trees' interior.

Lophodermium needle cast (*Lophodermium seditiosum*)



This fungus can attack all two- and three-needle pines as well as a few five-needle pines. Scots, Austrian and red pines are among the more susceptible species. Although there are many species of *Lophodermium* which act as secondary pathogens and saprophytes, *L. seditiosum* is the most serious of the group, and can be a problem in both nurseries and Christmas tree plantations.

In the spring, *L. seditiosum* causes yellowing and then browning of needles infected the previous year. Needle cast may occur any time after this symptom appears. Symptoms are usually most severe on the lower part of the crown because that is where favorable conditions of cool temperatures and free moisture on the needles are most likely to occur and persist. In mid-to-late summer, minute, black, football-shaped fruiting bodies form on the recently killed needles, and these fruiting bodies release spores after they are moistened. The spores are shot out of the fruiting bodies and up into the air where they are carried by the wind to new sites of infection on the current years' needles.

Prevent infections by keeping weeds under control and planting on south-facing slopes. Avoid planting or growing crops in valleys or other low lying areas. Good air flow keeps trees drier and helps to prevent infection. Remove heavily infected trees to limit inoculum and remove windbreak trees of the same species as your crop trees to minimise inoculum production.

Resistance to this disease varies among pines. Scots pine from different seed sources show differences in susceptibility, while red pine seems to be most susceptible in the seedling stage. Pesticides are available for controlling this disease once it becomes established in a plantation. It requires four separate treatments to control this disease, beginning in early July and continuing, monthly, through early October.

Product name	EAMU required?
Bravo 500	✓
Dithane 945	✓
Signum	✓
Switch	✗

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