

Needle Diseases

of Radiata Pine

The major foliage diseases of *Pinus radiata* are all expressed during the spring months of September, October and November. Dothistroma needle blight may be apparent throughout the growing season but the symptoms of *Cyclaneusma* needle cast and physiological needle blight tend to be more restricted to the spring period. Classical symptoms of each disease, especially in the early stages of an outbreak, are readily distinguishable but it may become more difficult to separate the symptoms later in the season when needle breakdown becomes more advanced and tissue is necrotic.

Although the environmental drivers that promote outbreaks differ for each disorder, symptom expression may occur at the same time. This can also make the disorders difficult to separate in some circumstances.

Magnesium deficiency and UMCY



The symptoms of magnesium deficiency may also be visible in spring particularly in drought years. There is some potential for confusion with the disorders described here, in particular with *Cyclaneusma* as the yellow colour of needles is very similar (Chapman 1999). For magnesium deficiency distribution of yellowing is however quite different. In trees younger than 10 years of age the tips of previous season needles will be yellow. Usually all needles in a branch whorl will be affected giving a halo effect. In very severe cases even immature needles can be yellow tipped.

In older trees symptoms are manifest in the upper crown (but not the topmost part of the tree). Yellowing of needles in a discrete section of the crown may be followed by premature needle loss and twig dieback. Historical symptoms can be seen as a hollow section of crown with no needles and in severe cases dead primary branches or whorls. This condition is known as upper mid-crown yellowing (UMCY).

References: S. Chapman 1999: Field guide to common pests, diseases and other disorders of radiata pine in New Zealand. Forest Research Bulletin No. 207

Dothistroma and Cyclaneusma

For further information - available on Ensis website

Bulman, L S; Gadgil, P D 2001: *Cyclaneusma* needle-cast in New Zealand. Forest Research Bulletin No. 222

Bulman et al. 2004: Assessment and control of *Dothistroma* needle-blight. Forest Research Bulletin No. 229

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Dothistroma?



Cyclaneusma?



Physiological Needle Blight?



Can you tell
the difference?



Pinus radiata - symptoms of needle disorders

| | Dothistroma | Cyclaneusma | Physiological Needle Blight (PNB) |
|------------------------|---|---|---|
| Time of year | <ul style="list-style-type: none"> - on current foliage symptoms generally appear in late summer and disease levels increase through autumn - peak disease level is visible in spring prior to emergence of the new flush | <ul style="list-style-type: none"> - main expression in spring - some expression in autumn | <ul style="list-style-type: none"> - late winter - spring |
| Part of crown | <ul style="list-style-type: none"> - begins in lower crown (tidemark) - often occurs on the outer part of the crown giving a 'halo' effect - all needle ages are susceptible | <ul style="list-style-type: none"> - in highly susceptible trees almost the entire crown may be affected - newly flushed needles are not affected - in contrast to <i>Dothistroma</i> needles at branch tips sometimes remain unaffected | <ul style="list-style-type: none"> - evenly distributed throughout crown - newly flushed needles are not affected |
| Susceptible age | <ul style="list-style-type: none"> - usually up to 15 years - occasionally up to 20 years (on disease-prone sites) | <ul style="list-style-type: none"> - 4 - 20 years - occasionally on older trees | <ul style="list-style-type: none"> - usually over 15 years - occasionally on trees from 10 - 15 years |
| Needle symptoms | <ul style="list-style-type: none"> - red bands and black fruiting bodies - needles remain attached to the tree | <ul style="list-style-type: none"> - yellow to mottled brown - extremely easily detached - can be shaken from the tree | <ul style="list-style-type: none"> - brown/khaki bands or entire needle changing colour - needles droop and remain attached - cannot be shaken from the tree |



Infection is not uniform in stands of mixed parentage. Infected and uninfected trees are distributed throughout the stand.



Infection levels are highest in locations where needle moisture is retained for longest, e.g. gullies and ridgetops subject to cloud.



Characterised by comparatively uniform infection throughout large patches within a stand. Maybe more severe in gullies and ridgetops.