



Defoliation of trees by DFP.

Image: Durán et al 2008.

Daño Foliar del Pino

Daño Foliar del Pino (DFP) is not present in New Zealand. DFP is a *Phytophthora* foliar disease of *Pinus radiata* in Chile. Help us keep DFP from establishing here by learning what to look for.



Infected *P. radiata* stands Chile.

Image: Durán et al 2008.

Daño Foliar del Pino (DFP) is a serious needle blight disease of *Pinus radiata* in Chile caused by *Phytophthora pinifolia*. In 2004, DFP was first detected causing tree mortality and needle blight in a six-year-old *Pinus radiata* stand of about 70 ha on the coast of Arauco Province in Chile. The damage increased dramatically in further years expanding to approximately 60 000 ha by the end of 2006. DFP is a severe biosecurity risk for all countries that grow *P. radiata*. This disease is not present in New Zealand and we need to be vigilant to ensure it does not arrive here.

Symptoms to look for

- DFP affects trees of all ages.
- On mature trees, symptoms begin with a reddening of needles, beginning on the undersides of the branches. Needles then turn grey and are initially retained giving the trees a scorched appearance. Needles are then cast, which may result in almost complete defoliation of the trees during winter. Current year's needles are not affected, giving a lion's tail appearance. Drops of resin are found at the base of the needles, which often leads to collapse of the needles that hang at right angles from the branches.
- On trees one to four-years-old, cankers encircling the stems lead to rapid death of the upper part of the tree ultimately to the death of the entire plant.
- One of the earliest symptoms, in all the age groups, is black resinous bands on the green needles.



Stem necrosis and dieback in young *P. radiata*.



Infected needles with black banding

Hosts

Pinus radiata is the only known host to be naturally infected. Artificial inoculation trials have shown *Pinus attenuata*, *Pinus muricata*, *Pinus ponderosa*, *Pinus rigida*, *Thuja occidentalis* and *Larix laricina* seedlings are also susceptible.

Disease development and spread

- Trees show symptoms of DFP from autumn to late spring, which is also the main rainfall season in Chile.
- Zoospores (mobile spores) are produced in high numbers during high rainfall on infected needles. Zoospores move through free water and are wind dispersed via water droplets.
- Zoospores infect needles causing black resinous bands to occur. Infection moves down the needle and into the branch or stem causing necrosis and cankers.

Identification and testing

Scion's Forest Health Reference Laboratory (FHRL) has the capability to detect *P. pinifolia*, by using morphological and molecular techniques. A qPCR assay for rapid detection within 48 hours, can be used directly from suspected infected needle tissue, Phytophthora ImmunoStrip® (Agdia, Inc., Elkhart, Indiana, USA, Cat. #92601) tests used to check infected tissues, and/or cultures.

As required by the Biosecurity Act (1993), if you suspect that you have typical DFP symptoms, call Biosecurity New Zealand Pest and Disease hotline - 0800 80 99 66. MPI will coordinate how best to proceed with sampling and identification.

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Duran, A., Gryzenhout, M., Slippers, B., Ahumada, R., Rotella, A., Flores, F., Wingfield, B. D., & Wingfield, M. J. (2008). *Phytophthora pinifolia* sp. nov. associated with a serious needle disease of *Pinus radiata* in Chile. *Plant Pathology*, 57(4), 715-727.

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