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PREDICTING THE SEVERITY OF *CYCLANEUSMA MINUS* ON *PINUS RADIATA* IN NEW ZEALAND

Cyclaneusma needle cast caused by the pathogen *Cyclaneusma minus* occurs widely in *Pinus radiata* plantations throughout New Zealand. The disease, which began causing real concern in the late 1950s, is characterised by yellow and brown mottling of needles which are prematurely cast.

In 2009, the losses caused by cyclaneusma needle cast were estimated to be around $38 million per annum. Given the high impact of cyclaneusma needle cast on plantation forests, Scion undertook a study to explore the relationship between disease severity and environmental conditions throughout the country. The first step in the study was to develop a model for predicting disease severity, using an extensive set of observations of cyclaneusma needle cast, collected over four decades across New Zealand.

The model showed that disease severity is most sensitive to elevation, followed by mean winter air temperature, mean relative humidity during July, then stand age. Severity increased to a maximum at mean winter air temperatures of between 7 and 9°C before declining. Values of severity were found to be highest in moderately warm, wet and humid high elevation environments located in the central North Island. In contrast, relatively low values of severity were predicted in drier eastern and southern regions of New Zealand.

Results from this study broadly agree with previous research that demonstrated the influence of environment on development of *Cyclaneusma* over a number of important stages in the life cycle. The model provides a valuable baseline for researchers to predict the likely impact of cyclaneusma needle cast under future climate scenarios.

This project was part of a larger research programme funded by the Ministry of Agriculture and Forestry (MAF) to predict the likely impacts of climate change on plantation forests. This information is seen by MAF as an important step towards risk management and adaptation. Studies involve modelling the direct effects of changes in environmental conditions on tree growth, and indirect impacts caused by changing wind, fire and disease risks.

Improved understanding of environmental drivers will ultimately help managers to make informed decisions on future siting of plantation species or management of existing species. The type of information arising from this study could be combined into a decision support system that allows comparison of future productivity for commonly occurring plantation species, or silvicultural regimes, across New Zealand.

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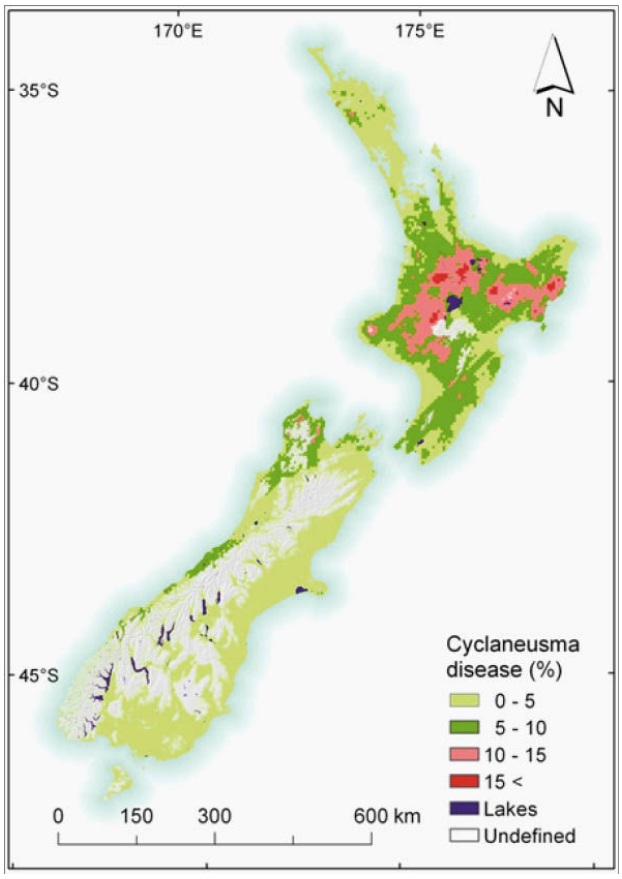

Map of New Zealand showing spatial variation in severity predicted by the final model.

*Newsletter of the **Scion Forest Protection team**, and the **Forest Health Reference Laboratory** (incorporating the Forest Research Mycological Herbarium (NZFRI-M), the Forest Research Culture Collection (NZFS), and the National Forest Insect Collection (FRNZ). Edited by John Bain, New Zealand Forest Research Institute Ltd, Private Bag 3020, Rotorua. <john.bain@scionresearch.com> Web site < http://www.scionresearch.com/biosecurity >*

LEPTOCYBE INVASA, A GALL FORMING WASP ON *EUCALYPTUS*, NOT IN NEW ZEALAND

Leptocybe invasa is a small chacidoid wasp that causes galls on the leaf midribs, petioles and stems of new growth of young *eucalyptus* trees, coppice and seedlings. Heavily attacked trees suffer leaf fall, loss of vigour, stunted growth and dieback. Severe infestation can cause tree death.

Leptocybe invasa was first recorded in the Middle East in 2000 but was not described as a new species (and genus) until 2004. It is restricted to *Eucalyptus* spp. and because of this is almost certainly of Australian origin although its distribution there is unknown. It has been recorded from the following areas: Middle East: Iran, Israel, Jordan, Syria; Europe: France, Italy, Portugal, Spain, Turkey; Africa: Algeria, Kenya, Morocco, South Africa, Tanzania, Uganda; Asia: China, India, Thailand, Viet Nam; North America: Florida; South America: Brazil.

It attacks quite a range of *Eucalyptus* species including *E. botryoides, E. bridgesiana, E. camaldulensis, E. deanei, E. globulus, E. gunii, E. grandis, E. nitens, E.robusta, E. saligna E. tereticornis* and *E. viminalis*.

An internet search will find at least two sites that say *Leptocybe invasa* is present in New Zealand. These are www.fao.org/docrep/012/al332e/al332e00.pdf and ftp://ftp.fao.org/docrep/fao/011/i0640e/i0640e10o.pdf. Both of these are United Nations Food and Agriculture Organization sites so, as one would expect, have a high profile. Over the past few years I have been asked by several people if *L. invasa* is present in New Zealand. It has not been found here and this can be said with a very high degree of confidence because for many years now eucalypts grown in New Zealand have been subject to very close examination in connection with work on the biological control of *Paropsis charybdis* (eucalyptus tortoise beetle) and *Uraba lugens* (gumleaf skeletoniser).

Above: *Leptocybe* gall on leaf showing exit holes.

It would seem very likely that the records from New Zealand referred to above arise from the fact that *L. invasa* is commonly called blue gum chalcid. In New Zealand there is another gall forming wasp on eucalypts with the common name bluegum chalcid. This is *Ophelimus eucalypti* (formerly known as *Rhicnopeltella eucalypti*), an Australian species first found here in the early 1920s. Ironically the Australian distribution of *O. eucalypti* is not known, just as is the case with *L. invasa*. We will have to ask the Australians to stop exporting insects that they do not know they have!

John Bain

At left: *Leptocybe* gall on twig.

NEW RECORDS

We are no longer publishing details of new records. For further information on results of MAF funded programmes see MAF's Biosecurity magazine (http://www.biosecurity.govt.nz/publications/biosecurity-magazine/index.htm) where information on new biosecurity identifications is regularly published.

John Bain

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