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AN IMPROVED ARTIFICIAL PATHOGENICITY ASSAY FOR DOTHISTROMA NEEDLE BLIGHT ON *PINUS RADIATA*

Dothistroma needle blight (DNB) is one of the most serious diseases of *Pinus radiata* in New Zealand. Based on the high level of occurrence and severity of DNB here, many people might think that doing artificial inoculations would be easy. It's not! Attempts to achieve infection under controlled laboratory or glasshouse conditions have met with mixed success. Whilst successful artificial DNB inoculation has been done by Peter Gadgil and others over the years, results can be very difficult to replicate.

As part of his research programme M. Shahjahan Kabir, a Ph.D. student from Massey University, has developed a DNB pathogenicity assay that is reproducible and results in high levels of DNB infection. Using critical pathogen and environmental factors identified by Peter Gadgil, Kabir has improved the DNB assays by testing specific factors. His work has shown that by growing the pathogen, *Dothistroma septosporum*, on a minimal medium infused with pine needles spore production was increased by over 50% compared with standard media. Spraying was the most effective inoculation technique but the use of an adhesive (such as Tween®) did not increase infection levels.

The most critical environmental factor for achieving high levels of DNB (>80% of needles with disease symptoms) was leaf wetness. Kabir found that by covering the seedlings with plastic bags for the first four days after inoculation, and then keeping the seedlings in covered chambers using water foggers for another nine weeks, he got reliable and high rates of DNB.

Using this assay, it has been possible to distinguish between trees from families with different levels of field resistance, using clones taken as cuttings from young trees (<1 yr). The method will facilitate screening for biological control agents, quantitative resistance traits and cross resistance to multiple diseases as well as enabling functional studies of pathogen effectors and virulence factors. The assay has been successfully trialled at Scion as part of the Bioprotection for Foliar Diseases and Disorders of Radiata Pine Programme, with the aim of up-scaling the amount of material that can be tested to allow high through put screening to be undertaken. It is expected that there will be international interest in this method.

Kabir's work is funded by the Bio-Protection Research Centre and a Massey Doctoral Scholarship. He is co-supervised by Dr Rosie Bradshaw, Massey University and Dr Beccy Ganley, Scion. His work has been accepted for publication in Australasian Plant Pathology.

Shahjahan Kabir, Beccy Ganley and Rosie Bradshaw

DNB infection in radiata pine clonal material with known resistance based on field studies. The cutting on the left is genetically susceptible and shows a high level of DNB infection versus the resistant cutting on the right.

*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>*

CLEOBORA MELLYI

In April 2012 Forest Health News (No. 224) reported that the Bio-Protection Research Centre at Lincoln started trials on the use of an Australian ladybird, *Cleobora mellyi,* to control the potato-tomato psyllid, *Bactericera cockerelli*, in New Zealand. *Cleobora mellyi* was introduced into New Zealand in 1977 for the control of the eucalyptus tortoise beetle, *Paropsis charybdis*. The adults and larvae of *C. mellyi* feed on the eggs of the tortoise beetle but also eat psyllids and aphids. Without psyllids as part of its diet the ladybird lays very few eggs.

The team at the Bio-Protection Research Centre (led by Steve Wratten) have demonstrated that *C. mellyi* is a very effective predator of *B. cockerelli* in the laboratory and earlier this month *C. mellyi* eggs, larvae and adults were released into an organic potato crop in Mid Canterbury. For further details see (or rather listen to) http://www.radionz.co.nz/national/programmes/ourchangingworld/audio/2549113/ladybird-release.asx.

It is hoped that the ladybirds find the potato patch to their liking and they stay there and breed. Its potential as a biological control agent appears to be very promising.

The potato-tomato-psyllid causes major damage in New Zealand's potato and tamarillo industries and also damages capsicums, tomatoes and eggplants.

John Bain

***Cleobora* eggs**

***Cleobora* larva**

***Cleobora* pupa**

NEW STAFF MEMBER

Dr Peter Scott is a new forest pathologist at Scion. Peter has a strong background in natural forest and woodland ecosystems, specializing in the epidemiology and management of *Phytophthora* pathogens. He works in the Forest Health Reference Laboratory, diagnosing tree pathogens including a wide range of samples from the High Risk Site Surveillance programme. He also conducts research into the epidemiology and management of forest pathogens including diseases associated with soil borne and aerial *Phytophthora* species and rust pathogens. His work benefits the New Zealand forest industry by improving forest health and disease management and contributes to the biosecurity of natural, plantation and urban forests.

Editor

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