forest health news

forest research

*No. 135, November 2003* **ISSN 1175-9755**

- **DNA BASED DETECTION OF THE PITCH CANKER PATHOGEN**

Investigations are underway at Forest Research to develop a molecular diagnostic technique for *Fusarium circinatum*, a potentially serious threat to *Pinus radiata* cultivation in New Zealand (*FHNews* **111**:1, **118**:1). Funding for the project is being provided both by the Foundation for Research, Science, and Technology (FRST) and by the Ministry of Agriculture and Forestry (MAF). The objective is to develop a method that is capable of detecting the pitch canker pathogen within infected host material, eliminating the time consuming step of first isolating the pathogen. DNA based diagnostics have the added advantages of differentiating species that are morphologically very similar, and detecting pathogens that are difficult to isolate using traditional methods.

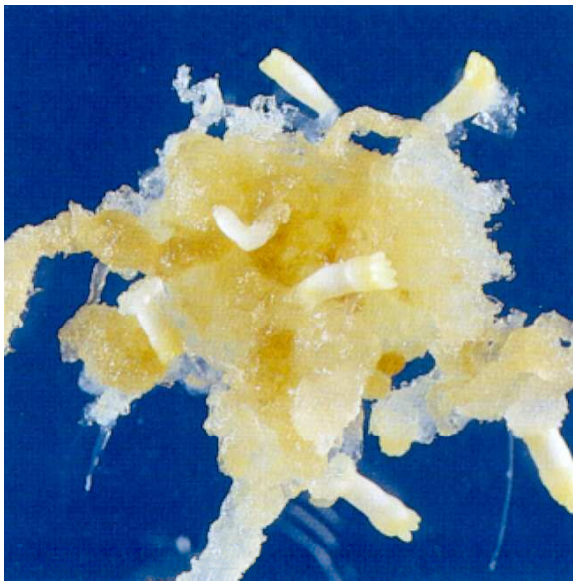
**Pitch canker in *Pinus radiata* in California (M. Dick)**

The pitch canker pathogen is present in the native range of *Pinus radiata*, as well as South Africa, Chile, Spain and Japan, and every effort is being made to prevent the entry of the pathogen into New Zealand. The usefulness of the diagnostic test was recently underscored when Forest Research made a putative positive identification of *F. circinatum* on quarantined Douglas fir scion material imported from the United States.

The protection of New Zealand's plantation forest resource is of utmost importance and DNA based detection methods are a tool that can be utilised as part of an overall biosecurity strategy to ensure continued productivity from the forestry sector.

(*Tod Ramsfield, Forest Research*)

- **TISSUE CULTURE AS A BIOSECURITY TOOL**



A recent media release relating to imported cell lines of *Pinus taeda* embryos has highlighted the biosecurity value of tissue culture as an aid in protecting New Zealand's forests from the accidental introduction of tree diseases. In the tissue culture procedure, groups of plant cells are induced to develop into new plantlets, each a clone of the original plant, by growing them in a sterile nutrient and plant hormone regime under controlled light conditions. The key to success is to isolate the tissues in axenic culture, meaning that they are not contaminated by any of the organisms generally present on and within the tissues of normally growing plants, including both harmless and virulent forms of fungi, bacteria, and nematodes. Even organisms that occur inside the plant cells, such as viruses and phytoplasmas, are easily eliminated by simple treatment. Fungi thrive under the conditions required for successful tissue culture and so are readily and quickly detected with the naked eye and destroyed. Through routine observation and good technique it is a simple matter to free plant material from contaminating pathogens. By using this technology, genetically important tree breeding material can be safely imported even from regions with unwanted endemic diseases such as pitch canker (previous item), as long as all biosecurity protocols are adhered to. (*Geoff Ridley, Forest Research*)

*Newsletter of the **Forest Health and Biosecurity Project**, 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 Ian Hood, New Zealand Forest Research Institute Ltd, Private Bag 3020, Rotorua. <ian.hood@forestresearch.co.nz> , Web site < http://www.foresthealth.co.nz>*

## • FEEDBACK - LUPIN BLIGHT

Last month's item on lupin blight disease caused by *Colletotrichum gloeosporioides*[1] generated some unexpected and energetic debate (*FHNews* **134**: 1-2). A summary of the various viewpoints is presented here, taken from contributions by Greg Jenks (*Environment Bay of Plenty*), Jim Dahm (*Eco Nomos Ltd*), and David Bergin, Ruth Gadgil, and Greg Steward (*Forest Research*).

The article outlined problems faced by managers of coastal pine forests following the decline of susceptible tree lupin (*Lupinus arboreus*), and attempts to find an alternative plant capable of restoring the lost nitrogen input and productivity. In their response, environmental managers agreed that lupins had been important for the early stabilisation of invading dunes. However, they noted that many dune areas around the North Island are now being effectively restored using native species.[2] They are not happy that these shade-intolerant plants may be threatened by an aggressive introduced nitrogen-fixing species. *Acacia sophorae*, referred to in last month's item, was cited as an example of an undesirable weed currently causing problems on Bay of Plenty shorelines. The Coastal Dune Vegetation Network coordinated through Forest Research, with participation from industry, government agencies and community groups, seeks to promote the natural character, biodiversity, and amenity values of the coastal margins.

In reply, Forest Research scientists, reiterated that they have always been concerned about the weed potential of any blight-resistant lupins or other exotic nitrogen fixing plants, and are sympathetic with the reluctance to plant exotic species in the coastal environment. Nevertheless, there are still large-scale dune erosion problems in some regions where managers have no alternative but to use exotics such as marram grass (*Ammophila arenaria*) and ice plant (*Carpobrotus edulis*) to control sand movement. Until a workable low cost method is developed, planting and maintaining the less vigorous native species on a large scale is just too expensive.

There is still no practical nitrogen-fixing indigenous alternative to a blight-resistant lupin species for use in pine plantations. However, on the more exposed non-forested dunes where there is considerable sand movement, Forest Research trials indicate that it may be possible to establish native species by interplanting with marram grass established for initial sand stabilisation. Such areas occur along parts of the west coast of the North Island and on the east coast of the South Island. By supplementing with a slow-release nitrogen fertilizer, fencing off from beach users in frequented areas, and rabbit control, this may be an effective way of restoring the original quality of many coastal dunes. (*Editor*)

[1]Previously attributed in error to *Gloeosporium gloeosporioides*.
[2]*Backyard buffers*, Coast Care Information Brochure No. 9, describes and illustrates a number of the indigenous plants being used on New Zealand coastal sand dunes (available from Coast Care Bay of Plenty Programme, Environment Bay of Plenty; email: info@envbop.govt.nz).

## • NEW RECORDS

**New host record for New Zealand – Fungus:** *Pseudocecospora acerosa*; **Bioregion:** Wanganui; **Host:** *Eucalyptus verrucata*; **Coll:** B Rogan, 02/11/2003; **Ident:** K Dobbie, 18/11/2003; **Comments:** This recently described (2002) fungus had previously been recorded from *E. baxteri* and *E. nitens.*

**New host record for New Zealand – Fungus:** *Fairmaniella leprosa*; **Bioregion:** Wanganui; **Host:** *Eucalyptus stellulata*; **Coll:** B Rogan, 02/11/2003; **Ident:** M Dick, 11/11/2003; **Comments:** A common fungus causing leaf spots on a wide range of *Eucalyptus* spp. throughout much of NZ. Generally of minor significance.

**Extension to known distribution – Fungus:** *Pseudocercospora acerosa*; **Bioregion:** Wanganui; **Host:** *Eucalyptus verrucata*; **Coll:** B Rogan, 02/11/2003; **Ident:** K Dobbie, 18/11/2003; **Comments:** This recently described (2002) fungus had previously been recorded only from the South Island.

**Extension to known distribution – Fungus:** *Mycosphaerella metrosideri*; **Bioregion:** Wellington; **Host:** *Metrosideros excelsa*; **Coll:** B Rogan, 06/11/2003; **Ident:** M Dick, 11/11/2003; **Comments:** This species was described from Hawai'i but records in NZ, all from *M. excelsa*, date back to 1956. Previously recorded only from Northland and Auckland.

**New host record for New Zealand – Insect:** *Ceroplastes sinensis* (Coccidae); **Bioregion:** Northland; **Host:** *Coprosma acerosa*; **Coll:** C Inglis, 15/10/2003; **Ident:** R Crabtree, 22/10/2003; **Comments:** This introduced species, first found in NZ in 1932, occurs in most regions of the northern half of the North Island. It has quite a wide host range that includes both native and exotic plants. It is an important pest of citrus. It has been recorded from other *Coprosma* spp.

**New host record for New Zealand – Insect:** *Hemiberlesia rapax* (Diaspididae); **Bioregion:** Northland; **Host:** *Virgilia* sp.; **Coll:** C Inglis, 17/10/2003; **Ident:** R Henderson, 28/10/2003; **Comments:** This cosmopolitan species has a very wide host range including other Fabaceae.

**New host record for New Zealand – Insect:** *Uraba lugens* (Nolidae); **Bioregion:** Auckland; **Host:** *Metrosideros excelsa*; **Coll:** C Inglis, 24/10/2003; **Ident:** R Crabtree, 29/10/2003; **Comments:** *Uraba lugens* is widespread in south Auckland and has previously recorded only from *Eucalyptus* spp. and *Lophostemon* spp. This is the first field record of it feeding on *Metrosideros* although it has been recorded on this genus in laboratory trials. It is the first field record from a NZ native plant and is therefore significant. However it should be noted that the *M. excelsa* was growing partly under a *Eucalyptus cinerea* which had high numbers of *U. lugens.*

**New host record for New Zealand – Insect:** *Xanthopimpla rhopalocerus* (Ichneumonidae); **Bioregion:** Auckland; **Host:** *Uraba lugens* (Nolidae); **Coll:** C Inglis & C Scott, 24/10/2003; **Ident:** J Bain, 31/10/2003; **Comments:** This parasitoid is native to Australia and was introduced to NZ in the late 1960s and early 1970s as a biological control agent for *Epiphyas postvittana* (light brown apple moth). It has been recorded from *U. lugens* in Australia.

**New host record for New Zealand – Insect:** *Cardiaspina fiscella* (Psyllidae); **Bioregion:** Auckland; **Host:** *Eucalyptus diversicolor*; **Coll:** C Scott, 04/11/2003; **Ident:** R Crabtree, 06/11/2003; **Comments:** This Australian species was first found in NZ in 1996. It is now found throughout most of the North Island and is common on *Eucalyptus botryoides* and *E. saligna*.

**New host record for New Zealand – Insect:** *Oemona hirta* (Cerambycidae); **Bioregion:** Wellington; **Host:** *Chrysanthemoides monilifera*; **Coll:** B Rogan, 07/11/2003; **Ident:** J Bain, 10/11/2003; **Comments:** An extremely polyphagous native cerambycid.

**New host record for New Zealand – Insect:** *Sassetia oleae* (Coccidae); **Bioregion:** Wellington; **Host:** *Erica curviflora*; **Coll:** B Rogan, 07/11/2003; **Ident:** R Crabtree, 11/11/2003; **Comments:** This cosmopolitan scale insect was first recorded in NZ in 1885 and is found throughout most of the country. It has a very wide host range.

**New host records for New Zealand – Insect:** *Acrocercops laciniella* (Gracillariidae); **Bioregion:** Northland; **Host:** *Eucalyptus guilfoylei* and *E. gummifera*; **Coll:** D Satchell, 07/11/2003; **Ident:** T Withers, 13/11/2003; **Comments:** This Australian species was first found in NZ in 1999 and has been recorded from many *Eucalyptus* spp.

**New host record for New Zealand – Insect:** *Paropsis charybdis* (Chrysomelidae); **Bioregion:** Northland; **Host:** *Eucalyptus guilfoylei*; **Coll:** D Satchell, 07/11/2003; **Ident:** T Withers, 13/11/2003; **Comments:** Another addition to an already very extensive host list in the genus *Eucalyptus.*

(*John Bain, Forest Research*)