

## THE NECTRIA RESEARCH PROGRAMME

A stem malformation problem has arisen following pruning in *Pinus radiata* plantations in Southland and Otago, associated with infection by a fungus named *Nectria fuckeliana*. Symptoms take the form of longitudinal depressions (fluting) or cankers extending above and below the pruned whorls. The Forest Health Group at Forest Research first became aware of this disorder when samples were received late in 1996, although stem malformation had been seen in southern forests since the mid-1980s. The canker symptoms are very similar to those of "Diplodia whorl canker", and the fungus *Sphaeropsis sapinea* was isolated from damaged stems on several occasions (*Forest Pathology in New Zealand* 1: 1-4). However, although *S. sapinea* is known to invade through pruning wounds, further investigation revealed that it was present at only a low incidence in southern forests, and the majority of stub infections were by *N. fuckeliana*. Due to a confused taxonomy, the formal identification of this fungus was not confirmed until March 2003.



Young pruned *Pinus radiata* tree with typical symptoms of longitudinal stem fluting associated with infection by *Nectria fuckeliana*

Forest Research has been conducting significant research on the *Nectria*-associated disorder since 2002. The research programme was initially funded by a *Nectria* Working Group (NWG) composed of a consortium of several forest companies (Blakely Pacific, City Forests, Ernslaw One, PF Olsen & Co., Rayonier, and Wenita), which continues to fund a significant portion of the research. Latterly, the New Zealand Forest Owners' Association has contributed additional funding through the Forest Biosecurity



Radiata pine whorl section demonstrating typical stain and decay

Research Council, and the Forest Health Research Collaborative has part-financed a regional incidence survey. In addition, supplementary funding for the *Nectria* Research Programme has been secured from the Foundation for Research Science and Technology.

The stem canker symptoms are often associated with sapwood staining and wood decay. As part of the initial research programme trees were felled, dissected, and whorl sections were closely examined in order to clarify this relationship and to determine the extent of the internal damage. It is also important to resolve the current distribution and potential spread of the disorder and to this end a series of surveys are now under way. Individual trees are being assessed in a variety of stands throughout the affected area in order to ascertain the incidence and severity of damage, and to determine whether symptoms are related to various environmental and physical factors such as altitude, climate, aspect, slope, seedlot, and silviculture. A more focused delimiting survey is planned for early 2005, in order to define the present distribution of *N. fuckeliana* in *P. radiata* stands in North Otago and South Canterbury. This will provide a baseline so that later surveys can monitor its spread. A wider national survey is being extended into the remaining part of Canterbury, the upper South Island, and Buller. Parts of the central North Island will also be assessed where seedlings from the southern region have been planted.

More needs to be learned about the fungus, and epidemiological and related studies will soon commence to examine the infection process, development, mode of spread, virulence, and relationships with environmental factors. Dr Patricia Crane from Alberta, Canada, has been appointed to a 2-year post-doctoral position to take up this work. An examination of the anatomical effects of infection and the formation of pathological heartwood will also be undertaken. To assist forest managers, a trial was initiated in late 2002 to investigate the effects of different pruning regimes and fungicide applications on pruned stubs. The future of this trial will be reviewed in November 2005, but early results are promising and the NWG is confident that research will lead to an operational management solution. Other work has been started to compare the relative susceptibilities of seedlings and cuttings, and the susceptibilities of other conifers will be examined early in 2005. All research is backed by an extensive review of the published literature. We are confident that the broad research

strategy now in place will provide a long-term management answer to minimise the impact of this disorder.

(Lindsay Bulman and Margaret Dick, Forest Research)

#### UPDATE ON GUM LEAF SKELETONISER RESEARCH

The Environmental Risk Management Authority of New Zealand (ERMA) recently approved an application to import four insect parasitoids from Australia for testing as biological control agents against the gum leaf skeletoniser (*Uraba lugens*; *FHNews* 136: 1). The adult parasitoid wasps lay their eggs in the *U. lugens* larvae, which are eventually eaten and killed by the parasitoid larvae. The Ministry of Agriculture and Forestry (MAF) is funding the testing of the parasitoids under strict quarantine to gauge their likely efficacy against *U. lugens*, and to identify any potentially adverse effects on New Zealand fauna, such as native moths. The first shipment of parasitoid pupae is expected to arrive at Forest Research in December 2005. In order to assess the likely distribution of *U. lugens* in New Zealand, a pheromone trap survey will be conducted in western Tasmania from February to April 2005. This will determine the coldest and wettest places that *U. lugens* can persist, and assist in the verification of a climate model (CLIMEX) being used to map those areas of New Zealand that are likely to be invaded by this pest (*FHNews* 143: 2).

(Darren Kriticos, Forest Research)

#### OREGON SWISS NEEDLE CAST WORKSHOP

A 1-day workshop was held in Eugene, Oregon, on 16 November entitled "Growing Douglas-fir in the Swiss needle cast zone". This disease, caused by the needle fungus *Phaeocryptopus gaeumannii*, has a significant impact on the growth of Douglas fir in New Zealand (*FHNews* 114: 1–2), and is also the cause of serious concern to managers of Douglas fir plantations along the coastal 30-km-wide strip of western Oregon. The workshop was organised by Doug Mainwaring (Oregon State University) and others from the Oregon Swiss Needle Cast Cooperative (a collective of university, company, and US Forest Service representatives), and was introduced and chaired by a former director of the Cooperative, Greg Filip (US Forest Service). In a series of presentations, various researchers described their latest findings on the cause, impact (on both growth and wood properties), distribution, biology, and epidemiology of the disease, and on various influencing constraints, including climatic and nutritional factors. There were also papers on studies to mitigate and manage the effects of the disease, including thinning, fungicide application, fertilisation, vegetation control, and tree breeding. The keynote paper was given by Ian Hood (Forest Research, Rotorua), who was invited and funded to attend by the SNC

Cooperative in order to outline the New Zealand experience with this disease.

Indeed it became clear during the course of the workshop that there is much in common between the two regions in both the disease itself, and the way it has been and is being researched and managed. In one paper Everett Hansen (Oregon State University) addressed the question as to why the indigenous *P. gaeumannii* should have become a problem to Douglas fir in its native range. The answer is not fully clear, but it appears to have much to do with the establishment of Douglas fir monocultures of indeterminate seed origin in a zone of high precipitation, where the host naturally occurs only in mixed stands with other native conifer species. However, Jeff Stone (Oregon State University) revealed that a proportion of *P. gaeumannii* in the affected zone comprises a genetic lineage not present in other parts of the natural host range, although he did note that there is no evidence of a "new strain" being responsible for the problem. The workshop concluded with a review presentation by Will Littke (Weyerhaeuser Co.) that summed up the day's proceedings. The workshop was followed by a 1-day field trip held within the affected Douglas fir zone near Tillamook, which provided opportunity for some intense and fruitful discussion on the problem. The meeting proved mutually beneficial, and suggested some new lines of research advantageous to New Zealand Douglas fir growers. For instance, there is clear need for a model to explain the incidence of the disease and its causative agent in this country along the lines developed in the US, to help growers assess the potential impact in their region. It is hoped that discussions held with the Oregon researchers during the course of the workshop may lead to some productive collaboration that will help fill this gap.

(Ian Hood, Forest Research)

#### CORRECTION

It has been kindly pointed out by Chris Ecroyd (Forest Research) that the flowers depicted in the previous issue (*Forest Health News* 146: 1) belong not to *Gastrodia cunninghamii* but to *G. sesamoides*. Both species of orchid form tubers beneath pine trees in the central North Island.

(Editor)

#### CHRISTMAS SHUTDOWN

Forest Research will be closed during the Christmas holidays from 4.30 pm Friday, 24 December, and will re-open on Wednesday 5 January. If you need to contact the Forest Research Forest Health Group on any matter of urgency during this period you should phone John Bain on (021) 927 249.

#### NEW RECORDS

**New distribution record for New Zealand – Fungus:** *Elsinoe* sp.; **Bioregion:** Mid Canterbury; **Host:** *Pittosporum tenuifolium*; **Coll:** B Doherty, 02/11/2004; **Ident:** T Ramsfield, 11/11/2004; **Comments:** This is the second record of this species on *P. tenuifolium*. It is a new species and is in the process of being described.

**New distribution record for New Zealand – Fungus:** *Elsinoe* sp.; **Bioregion:** Rangitikei; **Host:** *Pittosporum tenuifolium*; **Coll:** B Rogan, 11/11/2004; **Ident:** T Ramsfield, 15/11/2004; **Comments:** This is the third record of this species on *P. tenuifolium*. It is a new species and is in the process of being described.

**New host record for New Zealand – Fungus:** *Fairmaniella leprosa*; **Bioregion:** Mid Canterbury; **Host:** *Eucalyptus tenuiramis*; **Coll:** B Doherty, 04/11/2004; **Ident:** J Gardner, 15/11/2004; **Comments:** This is a common fungus causing leaf spots on a wide range of *Eucalyptus* spp.

**New host record for New Zealand – Fungus:** *Cryptosporiopsis edgertonii*; **Bioregion:** Rangitikei; **Host:** *Larix kaempferi*; **Coll:** B Rogan, 13/10/2004; **Ident:** K Dobbie, 16/11/2004; **Comments:** This fungus is associated with twig dieback on a range of hosts; it is generally not considered to be a primary cause of dieback.

**New host record for New Zealand – Insect:** *Eucolaspis brunnea* (Chrysomelidae); **Bioregion:** Northland; **Host:** *Beilschmiedia tawa*; **Coll:** C Inglis, 06/11/2004; **Ident:** D Jones, 08/11/2004; **Comments:** The adults of this native species feed on the foliage of a wide range of plants. The larvae feed on plant roots.

**New host record for New Zealand – Insect:** *Eriococcus coriaceus* (Eriococcidae); **Bioregion:** Mid Canterbury; **Host:** *Eucalyptus tenuiramis*; **Coll:** B Doherty 04/11/04; **Ident:** D Jones, 11/11/2004; **Comments:** This Australian species is commonly found on *Eucalyptus* spp. in New Zealand.

**New host record for New Zealand – Insect:** *Oemona hirta* (Cerambycidae); **Bioregion:** Hawke's Bay; **Host:** *Koelreuteria paniculata*; **Coll:** B Rogan, 16/11/2004; **Ident:** J Bain, 22/11/2004; **Comments:** This native branch and stem borer has an extremely wide host range.

**New host record for New Zealand – Insect:** *Oemona hirta* (Cerambycidae); **Bioregion:** Hawke's Bay; **Host:** *Platanus acerifolia*; **Coll:** B Rogan, 16/11/2004; **Ident:** J Bain, 22/11/2004; **Comments:** This native branch and stem borer has an extremely wide host range.

(John Bain, Forest Research)