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## DO WE NEED TO FUMIGATE EXPORT LOGS?: THE CASE FOR INTEGRATED PHYTOSANITARY PEST MANAGEMENT

All New Zealand log exports are currently fumigated to meet the requirements of the importing country. Fumigation occurs either here in New Zealand, in transit on ships, or, in the case of Korea and Japan, at their final destination. Currently two gases are used for fumigation, methyl bromide and phosphine. The former is an ozone depleting gas and because of this there is intense international pressure to eliminate its release into the atmosphere. Logs are fumigated without any consideration of the actual biosecurity risk these products pose to importing countries. Compare this with many food crops that now operate Integrated Pest Management strategies. Twenty years ago crops, such as apples, were sprayed with pesticides on a highly prescribed schedule. Today sprays are only applied if monitoring shows that pest populations have exceeded an acceptability threshold and threaten to damage the crop or present a biosecurity risk to trade. The concept of an acceptable threshold is simple; however implementation is the result of many years of complex research into the ecology and biology of relevant pest species.

Scion is embarking on an ambitious new four year, $7.2 million, project funded by the Ministry of Business, Innovation and Employment and industry via STIMBR (Stakeholders in Methyl Bromide Reduction). We hope to bring the principles of Integrated Pest Management to the export forest industry, something we term Integrated Phytosanitary Pest Management (IPPM) for forest exports as our focus is on regulated pests of biosecurity significance.

In essence, the research programme aims to predict periods during the year when regulated pests are not present within the supply chain. These periods are largely centred on the reduced biological activity that occurs during winter months. Scion's predictions will be based on knowledge about the developmental biology of the pest species (which is strongly linked to climate), the pest behaviour, e.g., flight capability, and the effect of landscape context on pest populations. Landscape context affects pest abundance at a given site as it is the location, timing and proximity of past management operations, e.g., harvesting or thinning, that determine the availability of breeding material for these pest species. All of the regulated export pests that we fumigate for feed on recently dead *Pinus radiata*, hence the volume of this in the surrounding landscape will be a strong regulator of pest pressure.

By quantifying how these factors influence pest abundance New Zealand exporters can provide strong assurances to trading partners that our export logs are not infested with unwanted pests at certain times of the year, and therefore do not require fumigation.

*Steve Pawson*

*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>*

## SCION'S SWEDISH CONNECTION

In 2011 Scion's Forest Protection group started a four year science exchange programme with the Swedish University of Agricultural Sciences (SLU) in Uppsala, Sweden. The programme is funded by the Swedish Foundation for International Corporation in Research and Higher Education (STINT) and aims to share experience and knowledge from both countries on forest health and invasive forest pathogens and their changed behaviour in different environments. For this, researchers and post-graduate students from both parties are travelling to each country to meet others and develop research programmes together.

To date, Scion has hosted several senior scientists and professors from SLU for shorter visits (Jan Stenlid, Roger Finlay, Rimvys Vasaitis) and two PhD students (Remigijus Bakys and Natalija Arhipova) for six months, which contributed to their PhD work. Both students worked with Ian Hood and learned from his expertise in silvicultural root rot control. Ian will visit Sweden next year and work with Jonas Olivia on the role of driftwood in the global dispersal of terrestrial fungi. Jonas assisted Forest Protection with work on climate based models for forest diseases and their potential distribution during a visit here earlier this year.

Anna Hopkins moved to SLU for a 6 month project on the ecology of invasive forest pathogens in relation to climatic changes. In this project the New Zealand expertise on dothistroma needle blight was beneficial to the research as this disease is relatively new to Sweden. Matt Power also moved to Sweden to complete his Master's research project on the molecular taxonomy of *Neonectria fuckeliana,* the causal agent of nectria flute canker. This fungus originates from Scandinavia and northern Europe where it is found on spruce and fir but causes little damage.

Part of this programme is to develop collaborations and projects on ectomycorrhizal communities in forests. SLU has a strong mycorrhizal research group and is at the forefront of working with advanced molecular methods for species community analysis. As part of this, Katrin Walbert spent time in Sweden in September 2012 to work with Audrius Menkis on a small project on the diversity of soil fungi and ectomycorrhizae of *Pinus radiata*. The aim of this project is to learn new molecular techniques that we do not use in our lab yet. The method used is called 454 sequencing which allows getting a snap shot of a whole fungal community at a site whilst only collecting a relatively small amount of material. This method is much more efficient than molecular techniques used prior and covers the whole genome very inexpensively. It produces a great amount of information, hence the main focus with this method is analyzing the data. With this project we are investigating if pine seedlings that are of same age and planted the same way but with different soil conditions are associated with a significantly different range of soil and ectomycorrhizal fungi. This knowledge will complement the ectomycorrhizal work that we are currently undertaking, which is focused around finding ways to use mycorrhizae and soil fungi as sustainable nursery and forest management tools.

In June 2012 we collected soil and lateral roots from two-year old radiata pine seedlings spot mounded at five sites with varying soil conditions in the Kaingaroa estate. DNA was extracted in the lab at Scion and sent to Sweden for further processing during Katrin's visit in September. Data have recently returned from the 454 sequence analysis provider and will be analysed in the coming months. We will report findings in a future edition of the Forest Health News.

For further information on SLU can be found on the following sites:

*http://www.slu.se/en/faculties/nl/about-the-faculty/cluster/uppsala-biocenter/about-uppsala-biocenter/departments/forest-mycology-and-pathology/*

*http://www.slu.se/en/faculties/nl/about-the-faculty/departments/department-of-forest-mycology-and-pathology/research/microbial_ecology/mycorrhiza2/*

*Katrin Walbert*

**From fruit body and root tip to DNA**

## CHRISTMAS SHUTDOWN

We will be closed during the Christmas holidays from the end of business Friday 21 December 2012 and will re-open on Monday 7 January 2013. If you need to contact us on any urgent matters during this period phone John Bain on 07 348 1263 or 021 927 249. *Editor*

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