Unit 7.02.00 - Pathology Newsletter

Coordinator: Jolanda Roux Deputy: Tod Ramsfield www.iufro.org May 2014

Message from the Coordinator

Jolanda Roux

Hallo Colleagues and Friends,

The year is already flying past fast, with lots of exciting activities for IUFRO in 2014, including the World Congress in Salt Lake City in October (5-11)! We look forward to hopefully meeting many of you at the XXIV IUFRO World Congress. There will be many talks on tree/ forest health, field trips focussing on tree health and meetings relating to the activities of our Research Group on Forest Pathology. This is also the meeting where Mike Wingfield, a forest pathologist most of us know well, will take over leadership of IUFRO for the next five years.

Fungal pathogens are certainly continuing to make impacts globally. At a recent IUFRO meeting in Hue, Vietnam, or the Silviculture and Genetics of Australian *Acacia* species, more than 90% of the plenary talks, and at least 50% of the other talks mentioned pathogens as being a major constraint to the industry. In fact, people were calling the new disease of Australian *Acacia* species in South East Asia, caused by a species of *Ceratocystis*, "the biggest game changer in the industry" and said it was "like hitting a brick wall".

The Acacia industry in SE Asia is a classical example of the cumulative increase in the number of pest and disease problems, as a new industry develops and ages. This industry, which is not little more than twenty years old, in its oldest regions, was initially disease free, but within a very short span of time, compared to other industries, has hit some major obstacles. These include root and heart rot, rust and now Ceratocystis wilt, necessitating some companies to completely change the genus of tree they plant. It was clearly emphasized at the meeting in Hue, that hoping for quick fixes for these and other tree health problems will "result in lost opportunities".

It is only through collaboration between scientists, between scientists and foresters, and across disciplines, that sustainable management options will be found for the problems currently experienced by the Acacia industry in SE Asia. This is equally true for all other commercial forestry operations, as well as for the protection of our dwindling native forests. I, therefore, encourage all of you to get involved in IUFRO activities, also beyond our own Research Groups and Working Parties. There are increasing numbers of multi-discipline WP and RG IUFRO meetings, providing ample opportunity to do this. Let us challenge

ourselves to attend at least one meeting a year, or every two years, that you would not normally consider attending, with the aim of building collaborations with people in other fields.

As usual, I encourage you to send us news of what is happening in forest/tree pathology in your part of the world. Let us also celebrate the achievements of our friends and colleagues. Please contact Tod Ramsfield (Tod.Ramsfield@NRCan-RNCan.gc.ca) or myself, and also post this to your working party co-ordinators for distribution on the working party and IUFRO website (remember you can also post items at the FORPATH list server).

Let's keep the news flowing in and keep in touch!

You can contact me by e-mail: jolanda.roux@fabi.up.ac.za
Yours in tree health,

Jolanda

XXIV IUFRO World Congress 2014

The next IUFRO world congress, to be held in Salt Lake City, Utah, USA, is rapidly approaching. Earlybird registration and abstract submission have closed and the program is currently being finalised. The congress website (http://iufro2014.com) is full of information, including biographies of the plenary speakers, accepted abstracts, and information pertaining to travel and side events. The theme of the congress is "Sustaining Forests, Sustaining People: The Role of Research" and the programme contains 150 technical sessions and over 2000 poster and oral presentations that reflect this theme. Online registration will remain open until September 21 and then onsite registration will begin on October 5. Forest health is well represented within the world congress programme through the theme "Forest Health in a Changing World", and there will also be tremendous opportunity for networking with other forest scientists as the world congress is the meeting point for all of IUFRO. It promises to be a memorable world congress with tremendous opportunity to renew friendships and develop new international collaborations. Hopefully we will see you there!

Proceedings Published

A summary of the 6th meeting of WP 7.02.09 "Phytophthoras in forests and natural ecosystems" was included in the January 2013 IUFRO Pathology Newsletter. This highly active working party produces a proceedings volume after every meeting and the proceedings from this meeting are now available on line at the Forest Phytophthoras website. In addition to the proceedings of the 6th meeting, links to the proceedings of every meeting of this working party can be accessed on the same web page.

Jung, T., Brasier, C.M., Sánchez, M.E., Pérez-Sierra, A. (Editors) 2014. Proceedings of the sixth meeting of the International Union of Forest Research Organizations (IUFRO) Working Party S07.02.09: Phytophthoras in forests and natural ecosystems. 202 pp.

http://www.forestphytophthoras.org/proceedings

The next meeting of this working party is scheduled for November 2014 in Patagonia; the link to the website is in the upcoming meetings section of this newsletter.

Effective Forest Protection is a Multifaceted Endeavour

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In November of 2003, the pitch canker pathogen (*Fusarium circinatum*) was detected in Douglas-fir scion material that had been imported from the USA into quarantine in New Zealand. After the pathogen was detected the material in quarantine was destroyed, preventing the release of any infected material into the New Zealand environment. The full story is outlined in Biosecurity magazine, issues 49 and 51 and by Vogler et al. (2004), and rather than repeat it here, this article is focussed on the various contributing factors that resulted in the identification and mitigation of this potentially devastating pathogen. With changing trade patterns as a result of globalisation we believe that this example serves as a model that can be put in place to prevent future introduction of exotic organisms. As members of the team that were involved with the detection (now over ten years ago) and with the benefit of hindsight and contemplation, we outline below what we feel were the important contributing factors that lead to the successful outcome.

1. Planning: Release of *Fusarium circinatum* into New Zealand was avoided because of good planning and preparation, not good luck. When *F. circinatum* was detected in California in 1986, within the native range of *Pinus radiata*, forest pathologists and entomologists from the Forest Research Institute (FRI; now trading as Scion) in New Zealand became concerned. They travelled to California and established contact with Prof. Tom Gordon, University of California Davis, and others who were studying the pathogen in California. In this way, they obtained knowledge and contacts that would later prove key to the successful outcome for New Zealand.

2. Education: After multiple trips to California, Scion scientists fully understood the lifecycle and pathogenesis process of *F. circinatum* and the threat that it posed to *P. radiata* in New Zealand. Rather than keep this knowledge within Scion, they endeavoured to share the knowledge broadly with regulators in the Ministry of Agriculture and Forestry (MAF; now the Ministry for Primary Industries (MPI)), the forest industry through workshops, and as guest lecturers to forestry students. Additionally, Prof. Tom Gordon and Prof. Mike Wingfield were invited to New Zealand to present the latest information on *F. circinatum* to government and industry at a MPI / Forest Owners Association (FOA) workshop in 2003.

3. Forest industry response: Upon learning of the risk posed by an incursion of *F. circinatum* in New Zealand, the FOA responded by continued investment in research at Scion, and they voiced their concerns to MPI. This was a positive response that demonstrated that they were willing to engage in the actions against *F. circinatum*, rather than ignore the risks.

4. Proactive actions: New Zealand and Australia both recognised the risk that *F. circinatum* posed to their exotic *P. radiata* plantations. Together both countries pooled their resources and through a joint task force developed the “Management Plan Response to an Incursion of Pine Pitch Canker in Australia or New Zealand” that was published

in 2003. This document contains step by step management actions to eradicate *F. circinatum*. In addition to the management plan, MPI funded the development of a DNA-based diagnostic test that could be used to detect *F. circinatum*.

5. International agreements: New Zealand has strong inter-governmental networks and collaborations, such as the QUADS between New Zealand, Australia, Canada and the USA, related to plant biosecurity. These relationships that have developed between regulatory agencies can facilitate a rapid response if required.

6. International collaboration: Close collaboration with Prof. Tom Gordon in California and Prof. Mike Wingfield in South Africa facilitated knowledge exchange and the development of the DNA-based diagnostic system. These collaborators provided DNA and hosted Scion scientists in their laboratories, and without this collaboration, development of the DNA-based diagnostic would have been impossible.

7. Cooperation: Within New Zealand, there exists excellent cooperation between scientists at Scion and the New Zealand government such that regulators and scientists have developed personal relationships and trust. This is much more effective than impersonal exchanges between a large bureaucracy and the science community.

8. Prevention: Prior to importation of this material, a biosecurity risk assessment was conducted and it was concluded that the material could be imported because it was sourced from what was thought to be a pitch canker free area. The New Zealand government was aware of the disease and required that the Douglas-fir material be imported into a quarantine facility with regular sampling and observation because of the potential risk. Knowing that the DNA-based diagnostic test had been recently developed at Scion, MPI sent Douglas-fir samples to Scion to “test the system”. The regular inspections and foresight by MPI staff lead to the discovery of *F. circinatum* in the material.

9. People: With the benefit of hindsight and objective assessment, one of the most important, yet difficult to quantify, reasons for the successful outcome was the working relationships that existed within the team of people who were gathered to work on this problem. The team included entomologists, pathologists, molecular biologists and regulators who worked together seamlessly. It sounds like a cliché, but we believe we were all genuinely united in our efforts and understood the importance of our work. Within this group of people, we must also include our international collaborators who contributed to this project.

10. Facilities: There was significant investment by Scion to build a quarantine facility that allowed this work to be conducted in a safe environment. The quarantine glasshouse facility that received the imported material also represented a significant investment. Studies of exotic insects or pathogens outside of New Zealand, such as the IMPACT project in California that included inoculation of New Zealand *P. radiata* seed stock with *F. circinatum*, represent the lowest risk; however, working outside of the country is not always practical. Quarantine laboratories, and proper management of them, facilitate research on high-risk organisms.

11. Importer response: In the article in Biosecurity 51, MPI praised the cooperation and quick response by the importing company and the quarantine glasshouse operator. Clearly, the relationship that existed between MPI and the importing company was effective.

12. Action: New Zealand is a relatively small country and inherent with that is the flexibility and agility of the New Zealand system to respond to a threat to primary production. This represents the culmination of all of the points above. Teams and communications between the government and researchers, and external collaborations, resulted in the discovery and rapid destruction of material that posed a significant threat to its forest industry if the infected material had been released.

It is our belief that all of these points can be considered as keys to successfully preventing the release of *F. circinatum* into the New Zealand environment. Rather than rest after this incident, MPI, the FOA and scientists used this event as a learning exercise and continued to work to prevent the establishment of *F. circinatum* in New Zealand. For example, the FOA sponsored the placement of a post-doctoral position within Scion that was focussed exclusively on learning as much as possible about the risk *F. circinatum* posed through extensive travels around the world. The candidate, Dr. Rebecca Ganley, is now a research leader within Scion. Another learning exercise run by MPI was a 3-day simulation exercise at a forest nursery in 2005 (see Biosecurity 64). This simulation exercise tested the management plan, the incursion response teams and the forest industry in order to identify gaps in the response actions so that management could be improved in the event of a real incursion. No expense was spared to run the scenario and everything was conducted as if the pathogen was actually present. Ten years later the importance and risk is still recognised and incursion simulations occur periodically, with an emphasis on reviewing and ensuring the processes and connections are streamlined. It is also recognised that the systems and networks developed for an *F.circinatum* incursion are relevant and applicable to an incursion response against most other unwanted forestry pathogens. New Zealanders take the protection of their primary industries and natural environment very seriously and this example highlights all of the components that contribute to the prevention of the establishment of an exotic organism.

Further reading:

"Pine pitch canker intercepted in quarantine", Biosecurity, Issue 49, February 2004, p 5. http://www.biosecurity.govt.nz/files/publications/biosecurity-magazine/issue-49/biosecurity-49.pdf

"Pitch canker in quarantine – a biosecurity success story", Biosecurity, Issue 51, May 2004, p 10. http://www.biosecurity.govt.nz/files/publications/biosecurity-magazine/issue-51/biosecurity-51.pdf

"Pitch canker simulation an outstanding success", Biosecurity, Issue 64, December 2005, p 17. http://www.biosecurity.govt.nz/files/publications/biosecurity-magazine/issue-64/biosecurity-64.pdf

Vogler, D.R., Gordon, T.R., Aegerter, B.J., Kirkpatrick, S.C., Lunak, G.A., Stover, P., and Violett, P. 2004. First report of the pitch canker fungus (*Fusarium circinatum*) in the Sierra Nevada of California. Plant Disease 88: 772.

Upcoming Meetings

Joint meeting of 2.02.15 Breeding and Genetic Resources of Five-Needle Pines, 7.02.05 Rusts of Forest Trees, and Strobusphere. Challenges and Opportunities in (1) Genetics of Five-Needle Pines and (2) Rusts of Forest Trees Research: Conservation, Evolution and Sustainable Management in a Changing Climate. Fort Collins, Colorado, USA, 2014-06-15 to 2014-06-20. The meeting promises to be exciting and well attended, with over 100 registrants representing 16 countries, including 17 US states and 4 Canadian provinces. The official website is here: http://www.westernforestry.org/Events/conference/five-needle-pines-and-rusts-2014/

2014 Joint meeting of the American and Canadian Phytopathological Societies. Minneapolis, Minnesota, USA, 2014-08-09 to 2014-08-13.
https://www.apsnet.org/meetings/annual/Pages/default.aspx

62nd Western International Forest Disease Work Conference (WIFDWC), Cedar City, Utah, USA, 2014-09-08 to 2014-09-12.
http://www.fs.fed.us/foresthealth/technology/wif/

24th IUFRO World Congress, Salt Lake City, Utah, USA, 2014-10-5 to 2014-10-11.
http://www.iufro2014.com

Society of American Foresters National Convention with CIF/IFC AGM & Conference, Salt Lake City, Utah, USA, 2014-10-8 to 2014-10-11.
http://www.xcdsystem.com/saf/site14/

7th Meeting of IUFRO Working Party 7.02.09, Phytophthora in Forests and Natural Ecosystems. Esquel, Chabut. Patagonia, Argentina, 2014-11-10 to 2014-11-14.
http://www.iufrophytophthora2014.org/

FORPATH list server

The FORPATH list server was initiated by Dale Berghdal in the early 1990s and is now hosted by IUFRO. FORPATH links the international forest pathology community by announcing meetings, jobs, graduate student positions and discussing forest pathology issues. To subscribe follow this link:http://www.iufro.org/science/iufro-mailing-lists/list-management/rg-702-forpath

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Newsletter contributions

Newsletter contributions are welcome and encouraged. If you would like to contribute graduate student postings, employment opportunities, meeting announcements or anything else forest pathology related to the newsletter, please contact Tod Ramsfield or Jolanda Roux at:
Tod.Ramsfield@NRCan-RNCan.gc.ca or Jolanda.Roux@fabi.up.ac.za

IUFRO Forest Pathology Working Parties

Working Party	Coordinator	Deputies
7.02.01 - Root and butt rots	Matteo Garbelotto	Gregory Filip
7.02.02 - Foliage, shoot and stem diseases	Antti Uotila	Julio Javier Diez Castro Hatice Tugba Dogmus Lehtijarvi Glen R. Stanoz
7.02.03 - Vascular wilt diseases	Krystyna Przybyl	C. Mohanan
7.02.04 - Phytoplasma and virus diseases of forest trees	Carmen Büttner	Risto Jalkanen
7.02.05 - Rusts of forest trees	Richard Hamelin	Pascal Frey Salvatore Moricca
7.02.06 - Disease/environment interactions in forest decline	Thomas Cech	Dusan Jurc
7.02.07 - Diseases and insects of tropical forest trees	Sri Rahayu	Didier Begoude Paul Bosu
7.02.09 - Phytophthora diseases on forest trees	Everett M. Hansen	Giles Hardy Thomas Jung Andrea Vannini
7.020.10 - Pine wilt disease	Katsunori Nakamura-Matori	Luis Filipe Bonifacio Yeong Jin Chung Thomas Schröder
7.02.11 - Parasitic flowering plants in forests	David Shaw	Simon Francis Shamoun Marcelo Luis Wagner