



Tree Protection News



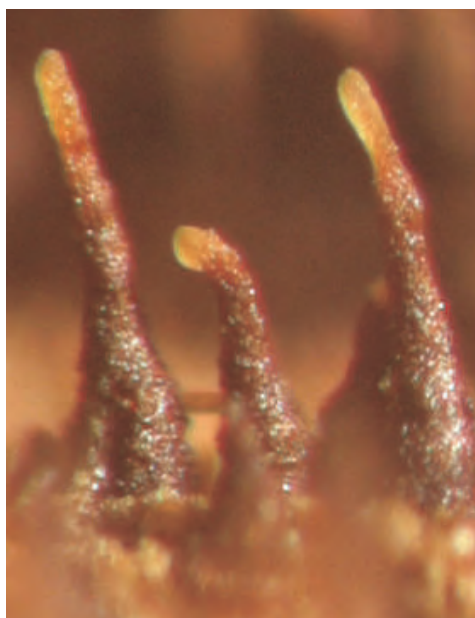
Newsletter of the Tree Protection Co-operative Programme and
the DST/NRF Centre of Excellence in Tree Health Biotechnology.

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FROM THE DIRECTOR'S DESK

One name one fungus – why does it matter? I am writing this note as I fly back to South Africa after attending the Board Meeting of the Centraalbureau voor Schimmelcultures and where a meeting regarding the naming of fungi was also held. Crystal clear in my mind are numerous discussions with forestry colleagues (members of the TPCP) as to why this really matters. The old argument – a name is a name is a name. The truth is that classification is crucially important to effective forest pathology and entomology. And this is nothing different to the situation in the medical world. The fact that two human viruses might look the same (remember the H1N1 debacle) does not mean that they have similar biological characteristics. And thus the matter of responsible diagnosis is so very crucial to dealing with tree pests and pathogens.



Chrysosporthe austroafricana, once thought to be *Cryphonectria cubensis*, but later shown to be a native African fungus and named in a new genus.

One might ask why members of the research team of the TPCP engage in some taxonomic work. Surely there are others who could deal with these problems and we could simply focus on the biological side of pests and pathogens.



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Darryl Herron, Mike Wingfield, Bernard Slippers,
Brett Hurley.



The truth is that this is just not possible because there are few taxonomists available and even fewer concerned with the problems with which we have to contend. As I write on this topic, I am reminded of a recent paper showing that the insect that we have known as *Gonipterus scutellatus* (the Eucalyptus snout beetle) is not one species but at least four. Two of these – all looking very similar – are in South Africa. And the implication is that the biological control programme for the pest needs to be tailored to two target pests and not only one. There are many other examples of such problems and they are emerging through the more readily available DNA-based techniques. They are also highlighting why many disease and pest management programmes of the past have not been fully effective.

And then back to the matter of ONE FUNGUS ONE NAME. What is this all about? Well fungi (in our area of interest fungal pathogens) are complex organisms that occur in various states including sexual and asexual morphs. Weird perhaps but this has been a huge challenge for fungal taxonomy for more than 100 years. It has necessitated a dual system of naming and many fungi have had two or more names, depending on the morphs in which they occur. But DNA techniques have changed the situation dramatically and they have made it possible to move to a system where one name can be assigned to a single fungus. FANTASTIC for practitioners (www.imafungus.org-Issue-4-03.pdf) and much less confusing for those having to deal with tree diseases. The key issue for us is RESPONSIBLE (and meaningful) diagnoses of diseases. I believe we have now made a huge step in the right direction.



One of the great challenges for the TPCP in recent months has been dealing with the growing invasion of the Eucalyptus gall wasp *Leptocybe invasa*. This pest has now moved inland, no longer only plaguing foresters on the Zululand Coast but now seriously damaging plantations on the Highveld. There really is only one clear solution to dealing with this pest and that is biological control. The TPCP team has worked furiously to develop biological control for *L. invasa* and we are now in position of what appears to be a superb biological control agent. Also one that has been tested for specificity to *L. invasa*, and has a negligible chance of being a pest itself. What is now required is Government permission to release the parasitoid. And herein lies the blockage! The TPCP team has submitted an application to DAFF for release and this was done in August of 2011. Yet, there appears not to have been any progress towards reviewing the application. We have thus undertaken an internal review of the application, having some of the world's best-known forestry biological control experts consider the documents. They too believe that the parasitoid is safe to release. We sincerely hope for a resolution to this problem soon.

Annual TPCP & CTHB Meetings 6-8 May 2013

The annual TPCP and CTHB meeting will take place in May 2013 at the University of Pretoria.

If you are a member of the TPCP member companies, please contact your respective board member to secure a place at the meeting, since space is limited.

For general enquiries please contact Prof. Mike Wingfield.

CTHB meeting: **6 May 2013**
24th TPCP & CTHB annual meeting: **7-8 May 2013**
Venue: **University of Pretoria, Pretoria**

Clearly biological control of forest pests will be increasingly important to South African forestry in the future. We are actively deploying biological control agents for the Sirex wood wasp and additional agents will be needed for this pest in the future. We are working actively to develop a biological control option for *Thaumastocoris peregrinus* and options to improve the biological control of *G. scutellatus* (sensu lato) are being considered. In all these cases – and others that will surely emerge – the TPCP and the South African Forestry Industry will need to have Government support to deal with releases. The economy of South Africa and the future of South African Forestry and Agriculture will depend on effective biological control.





While we believe strongly in responsible actions and are fully aware of the risks involved, we must hope for an effective and reasonable system for biological control of insect pests in South Africa in the future. In this regard, there are many countries with fine programmes that we could follow.

The TPCP plea is that a clear and efficient system of evaluation of potential biological control agents is instituted such that reasonable levels of safety are maintained but also that huge losses are not sustained. The most dangerous possible situation is one where “Nero fiddles while Rome burns”.

As I write this introduction to the first issue of “Tree Protection News” for 2012, we are in the final stages of preparing for the annual meeting of the TPCP. It is amazing to think that this will be the 23rd annual meeting of a programme that has come to be the strongest single initiative in the world that deals with pests and pathogens of forest trees. The success of the TPCP is firmly based in the strong relationship that researchers, South African Forestry companies, the University of Pretoria and other stakeholders have built over a very long period of time. The TPCP is unique in many ways but perhaps mostly in the amazing success that it has been able to have in leveraging support from a wide variety of stakeholders to promote the single vision of “KEEPING TREES HEALTHY”.

Mike Wingfield



FABI DIRECTOR TO RECEIVE HONORARY DOCTORATES

Mike Wingfield is to receive not one, but two honorary doctorates. In 2011 we received news that Mike is to receive an honorary doctorate from the University of British Columbia (UBC) in Vancouver, Canada. This degree will officially be awarded to him during UBC's graduation ceremony in November 2012. Then, in early May, we received news that the North Carolina State University (NCSU) will also be awarding Mike an honorary doctorate degree.

These awards are being made in recognition of Mike's outstanding academic and scientific career over the past 30 years. They also recognize his significant contributions to plantation tree health internationally. Together with industry leaders, Mike established the Tree Protection Co-operative Programme (TPCP) in 1990. This programme is today the largest tree health programme in the world and Mike consults on tree health matters on all continents where plantation forestry is practised. The success of the TPCP programme led to the establishment of the Forestry and Agricultural Biotechnology Institute (FABI) in 1998 and most recently, the DST/NRF Centre of Excellence in Tree Health Biotechnology (CTHB). These two programmes respectively include research into the health of agricultural trees and crops, as well as native tree species.



Mike has supervised more than 50 PhD students and has authored and co-authored more than 600 papers in international journals. He is one of only a very small number of A-rated scientists in South Africa and has received numerous academic rewards for his research.

Mike's scientific and industry contributions have led to him being elected into numerous leadership positions internationally. In forestry, he is, for example, a deputy director in the International Union of Forestry Research Organizations (IUFRO). He has truly been a great ambassador for forestry in South Africa and I am sure all in the industry rejoice with him and join us in congratulating him on these two honorary doctorates.



A SWEDISH INVASION

SWEDEN – RSA COLLABORATION FOR IMPROVED TREE HEALTH MANAGEMENT

A group of ten PhD students, post-doctoral research fellows and staff members of the Swedish Agricultural University (SLU) in Uppsala, Sweden – fondly termed the “Swedish invasion” – visited South Africa for two weeks in May 2012. The visit coincided with the annual stakeholder meeting of the TPCP and CTHB, which took place on the 8th and 9th of May. The visit, organized by Prof. Jan Stenlid of the Department of Forest Mycology and Plant Pathology at SLU, aimed to strengthen ties with the Forestry and Agricultural Biotechnology Institute's (FABI) programmes in tree health, bringing together researchers from arguably the two largest tree health research teams in the world. The group from Sweden included Dr. Elna Stenström, a nursery disease expert, Prof. Christer Björkman an entomologist in the Department of Ecology and SLU, and their post-docs and PhD students.



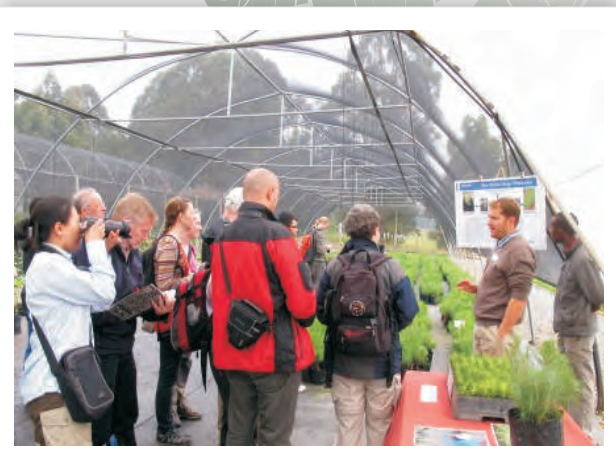
The SLU and FABI group during the two-day workshop to discuss the challenges and opportunities in research and management of invasive forest pests and pathogens.

Arriving on Sunday the 6th, the “Swedes”, who included students from Spain, Germany, China and the USA, spent their first full day in Pretoria touring the FABI facilities and the campus of the University of Pretoria. During the next two days, the group attended the annual TPCP & CTHB stakeholder meetings, with Prof. Stenlid presenting a talk at the meeting.

In his talk, he shared with foresters and CTHB stakeholders the opportunities available for the development of improved tree health management strategies through the use of genomics and other “new” technologies.



The meetings in Pretoria were followed by a field tour, together with three other international visitors to the annual meetings and four TPCP/CTHB staff members. The first part of the tour was to Howick, where they visit Sappi's Shaw Research Centre at Tweedie. Here, Craig Ford and Dr. Andrew Morris introduced them to Sappi research efforts and some of the tree health issues that they are experiencing, particularly their efforts to manage *Fusarium circinatum*. The group toured Sappi's research nursery and visited a pitch canker compartment, consisting of a *Pinus greggii* trial plot. This made it possible to exchange valuable experiences in working with *F. circinatum* and other tree pathogens between visiting scientists, Sappi and FABI researchers. The next leg of the tour took our visitors up the coast to Zululand, where they were treated to a day in the Hluhluwe-Imfolozi Game Park, before spending time with Mondi looking at clonal Eucalypt forestry at KwaMbonambi. Here, they visited the Mondi clonal nursery, looked at *Leptocybe* infestation on Eucalypts, *Teratosphaeria* stem canker (*Coniothyrium*), *Chrysosporthe austroafricana* on *Tibouchina* and *Syzygium cordatum*, and an as yet uncharacterized disease of a eucalypt clone.



Craig Ford of Sappi explaining some of their selection and breeding strategies to reduce the impact of *F. circinatum*.





Apart from looking at diseased trees, visitors were also shown some healthy *E. grandis* trees, planted in the 1930s.

The last part of the field tour included visits to sites in the Lothair area where stops were made to look at Phytophthora root rot, Mycosphaerella Leaf Blotch and cossid moth on *E. nitens* trees. The tour ended with a look at some *Sirex noctilio* infested trees and a *Sirex* "feast". Some of us in FABI know that entomologists are not quite as normal as mycologists and this again proved to be true on the last day of the tour when Dr. Brett Hurley lead the way in "biological control" of *Sirex* by consuming a few raw larvae! Unfortunately for the author, a few mycologists also participated in this exercise, thus placing a dent in the theory that mycologists are more normal than entomologists. All for a good cause though!



Visiting *E. grandis* trees planted in the 1930's with Mondi staff at KwaMbonambi.

The final two days of the SLU tree health scientists were spent in a workshop with TPCP and CTHB students and staff near Pretoria. The aim of the workshop was to exchange information on tree health issues in Sweden and South Africa, particularly the new challenges and opportunities facing tree health scientists. The theme of the

workshop revolved especially around invasive forest pests and pathogens and the increasing numbers of tree health problems caused by new introductions.



During the workshop each attendee presented a short talk on his/her research, after which the group entered into an extended period of debate and discussion, which culminated in the first stage of writing an opinion paper on current tree health issues.



Additional to the main scientific paper planned from the meeting, it was also decided that two additional outcomes should be a letter to the editor of an appropriate forestry journal, highlighting some of the issues raised during the meeting, and a "popular" article aimed at non-tree health specialists. After an evening of drumming and fire-side dancing, the workshop ended by a morning of working in smaller groups on these three papers.



Fire-side singing and dancing to celebrate new friendships and stronger future research ties.

The TPCP and CTHB team thanks all the forestry companies who made the visit of our Swedish and other international visitors such a memorable and valuable experience. All of the visitors, repeatedly noted how impressed they were with the vision, hospitality and energy of South African foresters! A special word of thanks to Craig Ford, Andrew Morris, Ben Pienaar, Mark Holmes, Marius du Plessis, Leonard Magagula, Dean da Costa, Ian Harrison, Theuns Strydom and Mbusiseni Masango.



Calvin and Hobbes

HOBBS... do you KNOW
WHAT KILLED THIS TREE,
CAUSE IM STUMPED?



darryl herron

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ANNUAL TPCP/CTHB STAKEHOLDER MEETING - 2012

Networking to improve tree health

On the 7th, 8th and 9th of May the Forestry and Agricultural Biotechnology Institute (FABI), was a hive of activity with more than 100 visitors from across South Africa and the world. The occasion was the 23rd annual meeting of the Tree Protection Co-operative Programme (TPCP) and DST/NRF Centre of Excellence in Tree Health Biotechnology (CTHB).



Prof. Karen Essler, Anathi Magadlela and Benedict Odhiambo of Stellenbosch University looking at *Deladenus* nematodes being raised for *Sirex noctilio* control.

The meetings started on Monday the 7th with a CTHB day during which core members of the CTHB gathered to listen to presentations by post-graduate students of the various research groups. Research groups in the CTHB include those from FABI, as well as the Universities of WITS, Rhodes, Stellenbosch and the Free State. The inclusion of research groups specialising in different aspects of tree health, including environmental factors such as frost, nutrition, anthropogenic impacts and others, allows for a more holistic assessment of tree health in South Africa. As a result, the CTHB can now more readily draw on experts in, for example, climate change and modelling, or plant nutrition, to increase our understanding of the impact of microbial and insect impacts on tree health. The day ended with a tour of the Insectarium and Quarantine facilities on the experimental farm of the University of Pretoria, where visiting CTHB members, together with international visitors to FABI, were exposed to some of the more applied research of the TPCP and CTHB research groups.

Tuesday the 8th of May marked the start of the combined annual TPCP and CTHB stakeholder feedback meeting. This year was the 23rd such meeting since the inception of the TPCP programme. The formalities kicked-off with a presentation by Mr. Claus Lippert, CEO of Hans Merensky, who provided some background to the current situation in plantation forestry and the issues facing forestry companies. This was followed by a full day and a half's programme, including presentations on tree health topics by four international visiting scientists. These included Prof. Steve Woodward from Aberdeen in Scotland, Dr. Julio Diez from Spain, Prof. Randy Ploetz from the USA and Prof. Jan Stenlid from Sweden.



Mr. Claus Lippert of Hans Merensky

Topics covered by the international visitors included the increasing number of tree health problems internationally as a result of new introductions of pests and pathogens, referred to as "black swans" (black swans is used to refer to something unexpected) by Prof. Ploetz, problems with *Fusarium circinatum* in Spain and how new technologies, such as genomics, are already allowing us to better understand pest and disease problems. Presentations by TPCP and CTHB students and staff included feed-back on *Sirex*, *Leptocybe* and *Cossid* moth research, as well as the opportunities for the development of biological control agents at FABI. On the pathology side, several talks on *F. circinatum* were included in the programme, including one by Dr. Andrew Morris who leads the industry funded *Fusarium* Control Programme.





Talks, however, also included feedback on projects considering pathogens of native South African trees, such as *Adansonia digitata* (Baobabs), as well as some of the “old” enemies of forestry, *Armillaria* species and *Diplodia pinea*. Delegates were also alerted to the threat of *Puccinia psidii*, the Eucalyptus rust pathogen, that reached Australia in 2010. This rust fungus presents a serious threat to both native *Myrtales* as well as the plantation forestry industry in South Africa.



Marcele Verleur (Sappi) and Phillip Croft (Sirex Control Programme, ICFR) attentively listening to one of the presentations

Activities on the 8th was ended by a social function at the Tuscan Barbeque Restaurant where visitors, students, foresters and all others attending the annual meeting could get to know each



Prof. Mike Wingfield (FABI Director), Prof. Jan Stenlid of the Swedish Agricultural University in Sweden and Dr. Julio J. Diez Casero of the University of Valladolid in Spain.

other better through some relaxed social interaction. The evening also included the annual “hands-free-beer-slug” competition, during which attendees competed against each other in various categories. In the international category, Miguel Nemesio Gorriz from SLU took honours, while Guillaume Jooste took honours in the CTHB competition. The forestry industry competition was this year won by Sappi, with Nigel Barker from Ngodwana walking away with the award and ensuring that Sappi’s name once again appears on the trophy.



Prof. Mike Wingfield handing over the “hands-free-beer-slug” trophy to Nigel Barker of Sappi.

The annual meeting concluded on Wednesday the 9th at lunch time, after which the board of the TPCP programme held their annual meeting. On behalf of the TPCP and CTHB research team at

FABI, we thank all attendees to this year’s meetings for their company and engagement in an important annual forestry event. All our international visitors were highly impressed by the interactions between industry and science, and between researchers from the different Universities in South Africa. They were in agreement that this open and trusting interaction is the key to the success of the TPCP and CTHB programmes. Further, that this is what makes these programmes the internationally recognised successes that they are.



GRADUATIONS

During the recent autumn graduation ceremonies of the University of Pretoria a number of students associated with the TPCP and CTHB programmes received their post-graduate degrees. These included:

Ph.D Degrees



Ali Al'Adawi: Studies on *Ceratocystis* species associated with mango die-back in Oman

Albe van der Merwe: Phylogeography and population biology of *Chrysosporthe austroafricana* and allied species.



M.Sc. Degrees



Melissa Simpson: Microsatellite analysis of *Ceratocystis fimbriata*

Chrizelle Beukes: Characterization of bacteria associated with the root nodules of *Hypocalyptus* and related genera



Johan van der Linde: Factors associated with the decline of *Euphorbia ingens* in the Limpopo Province of South Africa

Marcele Vermeulen: Diversity and host range of the *Cryphonectriaceae* in Southern Africa



B.Sc Honours Degrees

Jon Ambler • Arista Fourie • Marike du Plessis • Teboho Letsoale • Rofhiwa Nesamari • Kgosi Mongwaketsi

The TPCP and BiCEP – building a network to support biological control for *Eucalyptus* pests

We are all painfully aware of the damage that recent invasive pests like *Leptocybe invasa* (Eucalyptus Gall Wasp) and *Thaumastocoris peregrinus* (Bronze Bug) are causing to South African *Eucalyptus* plantations. Similarly, plantations around the world are suffering losses from these and other pests. Of great concern is that global trends of forest invasive pests predict that we can expect many other pests to arrive in our plantations in the near future, as the rate of pest introductions continually increases. History has shown that these pests can be managed. However, the road to thorough control can sometimes be costly and long, and the rate of increase in the number of new pests is already putting strain on the research support system that drives the development of control methods. It should be remembered that many of these pests might not be well known and completely new control methods need to be developed. And even when the pests are known, existing control methods might need to be adapted to local populations or conditions (take *Sirex noctilio* as an example). This requires specialized knowledge and a well established research base. One of the main control methods, that is expected to play an even more significant role in future, is biological control. For this reason the TPCP has been investing deeply over the last years in research capacity and facilities to support the growing demand for biological control (see for example the article on the new Biocontrol Research and Quarantine Centre in WoodSA, XXDATE). The TPCP has also actively been building links with colleagues around the world to help collect biological control agents. The importance of this part of the process is often not appreciated. A pest that might be abundant in our plantations, maybe extremely scarce in its country of origin, and thus difficult to locate and collect the biological control agents. Furthermore, the development of a biological control agent requires long periods of very intensive research, which often necessitate multiple imports and large numbers of the biological control agent. Without a good network of collaborators, this would be impossible to achieve.

Between 5-9 March, Dr Simon Lawson (Australia) and Prof Carlos Wilcken (Brazil) visited the TPCP at the Forestry and Agricultural Biotechnology to discuss a formalized structure for the network of researchers and organizations to support the identification and sharing of biological control agents for *Eucalyptus* pests. While such a network has existed informally for some time, it has always been built on individual connections between researchers. This is obviously less stable in the long term, and is also difficult to fund. The idea for a more formalized programme was first discussed by Dr Lawson at the IUFRO meeting in Uruguay in October 2011. The visit in March to South Africa was to build on those discussions and further developed the concept. The project, known as Biological Control of Eucalyptus Pests (BiCEP) has now been formally launched (see www.bicep.net.au). This project will help coordinate future biological control collections, exchanges and research with partners across the Southern Hemisphere. During the visit, Dr Lawson and Prof Wilcken also accompanied Prof Slippers and Dr Hurley on visits to *L. invasa* sites. They were shocked at the incredible damage they observed at some sites, where planting of susceptible *E. grandis* seedlings is no longer viable. It clearly brought home the message for the urgency and importance of an international community that support rapid development and sharing of organisms and best practices for the biological control for *Eucalyptus* pests.



Dr Brett Hurley, Dr Simon Lawson and Prof Carlos Wilcken discuss the heavy investment of *E. grandis* seedlings with XXFORESTER? at a site in Mpumalanga



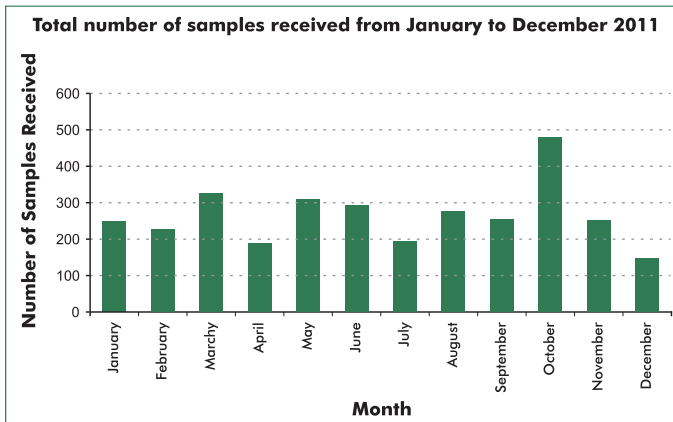
TPCP and CTHB The Diagnostic Clinic

The TPCP/CTHB Diagnostic Clinic assists in the identification and management of pest and pathogen problems on trees in and outside of the commercial forestry industry. To do this the Diagnostic Clinic receives samples from forestry companies, private farmers and concerned individuals each year for diagnosis. Another part of the Diagnostic Clinic's responsibility is to help conduct surveillances i.e. monitor the occurrence and spread of known pests and pathogens and to keep a keen eye on emerging pests and pathogens. This service is free to all member companies of the TPCP/CTHB programmes.



Students in the Diagnostic Clinic examine the roots of a diseased *Eucalyptus* tree

From January to December 2011, the Diagnostic Clinic received a total of 3185 samples. Pine samples comprised 72% of the total number of samples, the majority of which were for *Fusarium* screening. Only 7.3 % of the samples were *Eucalyptus* and *Acacia mearnsii* (Black Wattle) made up 0.4%. Soil samples received comprised 0.8 % of samples in 2011, while seed lot and petri dish samples received for *Fusarium* screening comprised of 4.3% and 14%, respectively. Samples from non-forestry and indigenous trees as well as water samples, categorized as "other", comprised of 1 % of received samples.



Team 2012

The Diagnostic Clinic team is made up of MSc and PhD students conducting their research at FABI, either in the TPCP or CTHB programmes. The students usually rotate from year to year with one or two students staying on for another year. These students dedicate set amounts of time each week to assist with the processing of samples received. By working in the clinic, students gain experience in the various diagnostic and lab techniques, as well as learn about the pests and pathogens occurring in South Africa.

The team for 2012 is: Fahimeh Jami, a PhD student from Iran, DongHyeon Lee, a PhD student from South Korea, Katie Termer, a MSc student from the United States and Mkhululi Maphosa, a MSc student from Zimbabwe. Darryl Herron will be carrying on this year as the Diagnostic Clinic manager with the help of Bernice Porter who will be continuing with the *F. circinatum* molecular screening.



Members of the Diagnostic Clinic and Craig Ford from Sappi

In February the diagnostic clinic team went on a training field trip to introduce them to the South African forestry industry and provide them with in-field training in disease

and pest recognition. The trip started in Lothair where they had a look at Phytophthora and leaf spot (MLB) on *Eucalyptus nitens*. The then went to the Kwambonambi area to look at *Eucalyptus* "patch death" and saw *Chrysosporthe* stem canker, *Coniothyrium* stem canker, *Leptocybe* and *Thaumastocoris*. The trip ended in the KZN Midlands where they visited the Shaw Research Centre of Sappi and had a look at pitch canker (*Fusarium circinatum*).



Diagnostic Clinic Team for 2012, Front left to right: Katie Termer, Fahimeh Jami and Back left to right: Mkhululi Maphosa, Dong Hyeon Lee

We encourage TPCP and CTHB members who experience disease problems on trees to contact the Diagnostic Clinic, or one of the TPCP/CTHB extension scientists to discuss these problems and obtain information on how to send samples for analyses.

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PHYTOSANITARY STANDARDS IN FORESTRY

Statement by the Forest Invasive Species Network For Africa (Fisna), stemming from the executive council meeting held in Kampala, Uganda, February 2012



The Forest Invasive Species Network for Africa (FISNA) aims to facilitate the sharing of information regarding forest invasive species, including insects, invasive plant species and microbial pathogens, on the African continent. Recognizing that knowledge and implementation of phytosanitary standards in forestry is essential to facilitate safe trade within and outside Africa, the executive committee of FISNA recently met in Kampala, Uganda, to discuss these and other issues related to forest and plantation health on the continent.

Introduced (non-native) invasive plants, insects and pathogens pose a significant threat to plant health globally. Examples of the devastating impact of non-native organisms abound in scientific literature and have been the topic of a number of books. With the dramatic increase in trade and travel between continents over the past two centuries, reports of disease and pest problems caused by non-native organisms have more than doubled.

The threat posed by introduced invasive plants, insects and pathogens to natural forests and the plantation forestry industry is perhaps even higher than that to agriculture. Where with potato or maize resistant lines can be developed in a couple of years, the same is not true for trees. This is particularly true for native forest trees. Efforts by the United States of America to develop tolerant lines of native *Castanea dentata* (chestnut) trees, after the introduction of the chestnut blight fungus *Cryphonectria parasitica*, has been ongoing for more than 60 years, with limited success.

Efforts to reduce the spread of invasive plants, insects and pathogens around the globe need to be intensified, particularly in forestry, if we are to continue productive commercial forestry. This needs to be even higher a priority to protect our rapidly dwindling native forests where alternative management options are limited.

In the past ten years, considerable emphasis has been placed on the movement of insects and pathogens on wooden packaging material and logs. More recently, the trade in "plants for planting" has also been receiving a great deal of attention, most recently through the Montesclaros declaration

(www.iufro.org/science/divisions/division.../montesclaros-declaration/). These pathways have been responsible for the introduction of pests and pathogens into new countries, with devastating impacts. The Eurasian wood wasp, *Sirex noctilio*, was for example spread globally on infected wood, while the sudden oak death pathogen, *Phytophthora ramorum* was most likely spread in contaminated nursery material.

To limit the spread of insects and pathogens globally, the International Plant Protection Convention (IPPC) has, in consultation with various stakeholders and scientists, developed legislation to reduce the spread of non-native organisms globally. The IPPC is an international agreement between countries to manage pests and prevent their spread. More than 175 countries are signatories of this convention that has developed a number of International Standards for Phytosanitary Measures (ISPMs) to limit insect and pathogen spread, while still facilitating international trade.

A number of the 34 ISPMs are relevant to forestry. These include, for example ISPM No. 15 which deals with the regulation of wood packaging material in international trade. Other ISPMs include ones on the use of biological control agents (ISPM No. 03) and living modified organisms (ISPM No. 11), to name a few. There are also specific ISPMs dealing with the reporting of new pests, which is usually driven through a particular country's NPPO (National Plant Protection Officer).





Cement bags damaged by *Sirex noctilio* after emerging from infected wooden packaging material



High risk logs, with bark, awaiting export at a harbour



IPPC stamp of approval showing country of export, treatment company code and treatment type

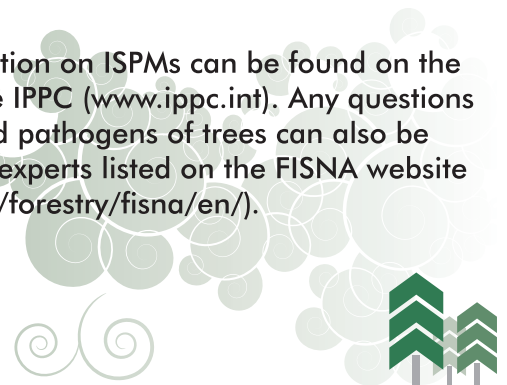
ISPM No. 15 aims to regulate the movement of insects and pathogens in wood packaging material such as pallets, wooden spools, dunnage and other packaging material. This is especially important since packaging material is mostly constructed of low quality, often diseased material. If left untreated, this material can result in the spread of pests, as has been seen in South Africa with *Sirex noctilio* infested pallets. ISPM 15 requires that all wooden packaging material should be made from debarked timber and be treated either with high temperatures or fumigation with chemicals according to recommended standards. Compliant material should be clearly marked, with an approved stamp, by an accredited organization.

Non-compliance to the IPPC standards can, therefore, apart from place forests and forestry on the African continent at risk, also significantly affect trade and the economies of countries. A number of key concerns affecting the forestry sector were identified during the FISNA meeting in Kampala. Key among them were :

- Lack of trained and experienced personnel in entomology and pathology to deal with tree health threats ,
- Lack of trained and experienced personnel in entomology and pathology to deal with the development and implementation of management strategies against invasive pests,
- Limited access and sharing of vital tree health information available in the developed countries due to lack of the necessary infrastructure eg .reliable internet connectivity,
- Lack of interaction between institutions working in the forestry sector eg. forestry research organisations, community based organisations (CBOs) and NPPOs ,
- NPPOs give more focus to the implementation of ISPMs that are related to the Agricultural sector leaving forestry vulnerable.

The FISNA executive gratefully acknowledges the FAO Forestry Department and partners for assistance in organizing the meeting in Kampala and particularly Dr. Gillian Allard, Shiroma Sathyapala and Beverly Moore for the training provided. It is recognized that the e-learning on good practices for forest health protection (<http://www.fao.org/forestry/en/>) and other training materials produced by the FAO will have immense impact on the forest sector and its partners. The US Forest Service is acknowledged for financial support of the workshop and FAO and MAF New Zealand for their valuable technical support.

More information on ISPMs can be found on the website of the IPPC (www.ippc.int). Any questions on insects and pathogens of trees can also be addressed to experts listed on the FISNA website (www.fao.org/forestry/fisna/en/).



WELCOME TO THE TPCP AND CTHB PROGRAMMES

We would like to welcome the following people to the TPCP and CTHB research programmes on tree health



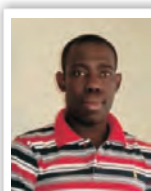
Alisa Postma started her PhD with the TPCP on a part-time basis. The topic of her research will be the genomics of communication in a tripartite symbiosis across three Kingdoms. Alisa has been working as a technical assistant in FABI.



Felix Fru will be working on *Fusarium circinatum* on *Pinus* species in South Africa, with a focus on the epidemiology of the disease. Felix completed a Masters at Pretoria University, in Plant Quarantine, before joining the TPCP programme in 2012.



Malegola Mohlala is studying towards obtaining a B.Sc honours degree. Her research project is on the diseases of cycad species in South Africa. Malegola worked at the police's forensics department in the Eastern Cape before deciding to continue her studies. She holds a B.Sc degree from WITS and grew up in eMalaheni.



Kwabena Kaffoe joined the TPCP to work towards a PhD. His project is on *Leptocybe invasa* and he will be looking at host plant resistance and biological control. Kwabena is from Ghana, but obtained an M.Sc in Sweden with the Swedish University of Agricultural Sciences.



Vimbai Siziba is a B.Sc honours student in genetics and will be working on the Taxonomy and population genetic analyses of *Dothistroma* blight pathogens in the northern USA.



Carlos Batista is from Brazil and joined FABI for six months on a research visit as part of his PhD studies. He works on the population genetics of *Ceratocystis* sp on *Acacia mangium* trees in Indonesia



Mkhululi Maphosa is from Zimbabwe and will be working on *Fusarium circinatum*, the pitch canker fungus, for his M.Sc research.



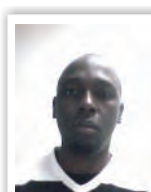
Nicole Andrée is a M.Sc. student at the Technical University of Braunschweig in Germany who joined FABI for a six month internship. She will be working on the population genetics analyses of the pathogenic fungus *Mycosphaerella laricina*, on native and non-native European larch.



Donghyeon Lee is from South Korea and joined FABI for his PhD. His project aims to better understand the fitness of the Acacia wilt pathogen, *Ceratocystis albifundus*, in South Africa.



Andrés de Errasti is a PhD student from Argentina who will be spending three months in FABI as part of a collaborative research programme between researchers in the TPCP/CTHB programmes and CIEFAP in Esquel, Argentina. Andrés works on the Ophiostomatoid fungi on *Pinus* species and *Nothofagus* trees in Patagonia.



Zakheleni Palane Dube joined the TPCP programme to work towards obtaining a Ph.D. His project is on the infection biology of *Fusarium circinatum* in the nursery environment. He is from Zimbabwe where he obtained a M.Sc. in Crop Protection.

Rouxlè Botha will be doing a BSc honours project in Genetics, with Professor Emma Steenkamp, working on *Fusarium* species.

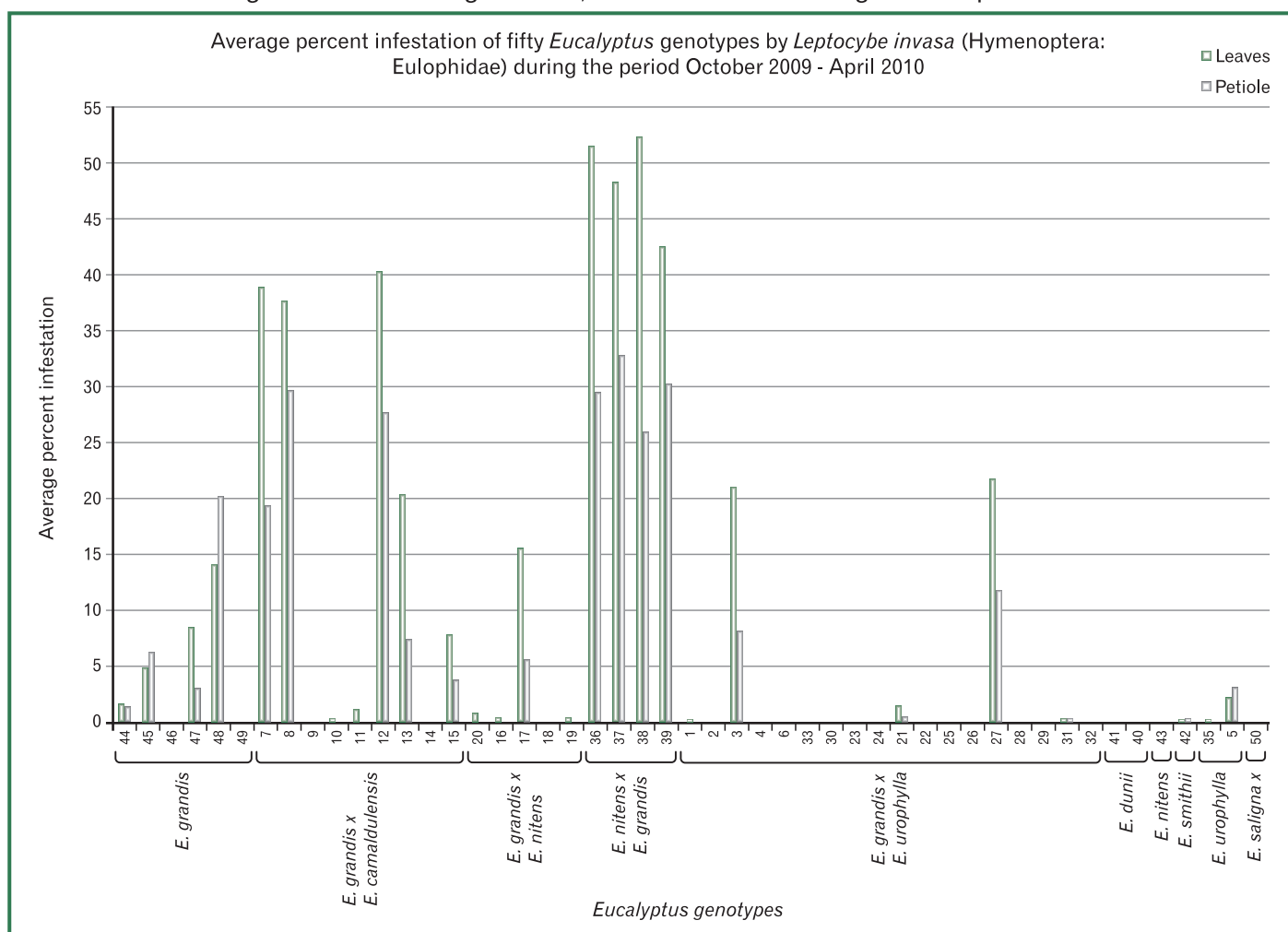
Khumbuzile Bophela joined the CTHB programme for her B.Sc Honours project. She will be working with Prof Teresa Coutinho on the identification and characterization of species of leaf-nodule forming bacterial endophytes within *Pavetta lanceolata* in different environments".

Sarai Olivier-Espejel is from Mexico and joined the programme for her PhD. She is an entomologist and will be working on the insects of native and introduced (*Acacia mearnsii*) Acacia species in South Africa. Sarai obtained her M.Sc from the University of Arizona and is also an excellent photographer.

LEPTOCYBE INVASA IN SOUTH AFRICA AND ITS POSSIBLE CONTROL OPTIONS

Subsequent to the first discovery of the *Eucalyptus* gall wasp *Leptocybe invasa* in Pretoria 2007, the pest has spread to all *Eucalyptus* growing provinces in South Africa. Infestations by *L. invasa* have been particularly severe in parts of KwaZulu-Natal and Mpumalanga, where heavy infestation in some stands has resulted in sites having to be replanted. Currently, two control options exist, namely planting resistant clones and biological control. Comparison of the susceptibility of various *Eucalyptus* species and clones to damage by *L. invasa* has shown that there is significant variation in susceptibility to the wasp between *Eucalyptus* genotypes. In trials conducted by the Tree Protection Co-operative Programme (TPCP), *Eucalyptus nitens* x *E. grandis* and *E. grandis* x *E. camaldulensis* clones were the most susceptible amongst South African material available for testing.

Collection of galls similar in morphology to those produced by *L. invasa*, from the natural habitat of the gall-former, yielded an abundance of an undescribed Hymenopteran parasitoid. Detailed observations, experimentation and documentation of the biology of this wasp lead to its description as the new species *Selitrichodes neseri*. Subsequent work with *S. neseri* has shown that it has the potential to play an important role in biological control of *L. invasa* in the future. Detailed research has shown no evidence that there is any risk to release this biological control agent and an application for its release has, therefore, been submitted to the South African government in August 2011, but we are still waiting for a response.



CAPE BEECH (BOEKENHOUT) UNDER THREAT!

A serious new canker disease of cape beech (*Rapanea melanophloeos*) trees has been found in the Harold Porter National Botanical Gardens in South Africa. The disease, identified by scientists from the University of Pretoria's DST/NRF Centre of Excellence in Tree Health Biotechnology (CTHB; www.fabinet.up.ac.za/cthb) has been shown to be caused by a fungus belonging to a previously unknown genus.



Dead branch on an *R. melanophloeos* tree. This branch has been killed as a result of infection by the newly discovered canker pathogen, *I. knoxdavesiana*.

The disease on *R. melanophloeos*, characterised by branch and stem cankers is resulting in the death of entire branches and even trees. The first sign of disease is often the death of a single branch, or growth tip of young trees, characterized by the yellow/red discolouration of the foliage of the infected branch. Closer investigation will reveal cracking and death of the bark on affected branches. Cankers often develop around points of attachment of branches from which they expand to eventually girdle the entire stem, thus resulting in the death of tree tops. A large number of trees in Harold Porter are affected and in some sections of the garden, many of the young coppice stems and seedlings are being killed by the pathogen.

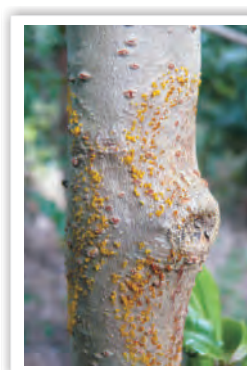
During moist conditions the fungal pathogen responsible for the cankers on *R. melanophloeos*, sporulates on the affected parts of the trees. Here it produces masses of yellow to orange spores, which often also confer an orange colour to infected stems and branches. The fungal pathogen responsible for the cankers and death of *R. melanophloeos* has been found to represent an undescribed fungal genus and species belonging to a notorious family of tree pathogens, the *Cryphonectriaceae*.



Stem canker on *R. melanophloeos*

The name that has been proposed for this aggressive pathogen is *Immersiporthe knoxdavesiana*, referring to the immersed nature of the fruiting bodies in the bark and also acknowledging the work of a leading South African plant pathologist, Prof. Peter Knox-Davies, who loved the gardens and whose ashes have been placed in the area.

An important question is whether the disease of *R. melanophloeos* occurs in areas other than the Harold Porter Botanical Garden. This would provide clues to whether it might be caused by an invasive alien pathogen. The CTHB team have undertaken surveys of various areas in the Western Cape where *R. melanophloeos* grows naturally but have failed to find other outbreaks of the disease. This has led the team to believe that the pathogen has been introduced into the Harold Porter Botanical Garden from an unknown source. This is reminiscent of chestnut blight in the USA, caused by the fungus *Cryphonectria parasitica*, residing in the same family of fungi as the *R. melanophloeos* pathogen. *Cryphonectria parasitica* was first detected in the New York Botanical Gardens in 1900, affecting *Castanea dentata* trees. From this limited introduction the pathogen, now known to be native in Asia, spread rapidly throughout the eastern USA, causing one of the most dramatic examples of tree death known to date.



Yellow fruiting bodies of *I. knoxdavesiana* on infected *R. melanophloeos* stem

Chestnut blight has been described by some researchers as the "Disaster of the century". It reduced a once dominant canopy tree to small coppice stems and has changed an entire ecosystem. This type of damage is typical of non-native pathogens and the impact that they can have on hosts lacking co-evolved natural resistance to them. The outbreak of a serious canker disease on *R. melanophloeos* in the Harold Porter Botanical Garden has raised concern that this tree could be seriously threatened in South Africa. If it is shown that the fungal pathogen has been introduced, every effort will need to be made to prevent its spread from the relatively limited area in which it currently occurs. All tree enthusiasts and the general public are encouraged to report occurrences of the disease to the CTHB in Pretoria, or the SANBI staff. It is also important not to move *R. melanophloeos* plants from the affected area.

