Tree Protection News

tpcp

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

VOL: 14 December 2007

FROM THE DIRECTOR'S DESK

Tree Protection News represents just one of a number of vehicles used by the Tree Protection Co-operative Programme (TPCP) and the DST/ NRF Centre of Excellence in Tree Health Biotechnology (CTHB) to share news with its members. Thus, the contents of this second issue for 2007, serve mainly to connect items published in member Company newsletters, the ICFR News, articles in Wood SA and SA Forestry as well as the regular postings on our 'list server" TREEHEALTH NET. This newsletter also marks the end of another very active year for the TPCP research team, one that has been packed with research, extension, educational and community service accomplishments. All of which are important components of the TPCP and CTHB.

Education and Communication are two of the key pillars of successful plant health management: CTHB and TPCP Management committee members enjoying time together with a group of young students (MRYE) who, sponsored by CTHB, assist school going children in their subject choices in order for them to embark on scientific careers.

CONTENTS

The newsletter was edited and compiled by
Jolanda Roux & Jenny Hale
Layout, Design & Printing by: Dyason Design & Print
Newsletter edited by: Jolanda Roux,
Bernard Slippers & Mike Wingfield
Contributions to this issue:
Mike Wingfield, Jolanda Roux, Bernard Slippers,
Ryan Nadel, Izette Greyling, Brett Hurley,
Teresa Coutinho, Brenda Wingfield

Tree health issues appear to be increasing in importance in South Africa and some developments are of great concern. During the last few months for example, the very much feared Eucalyptus Gall Wasp, *Leptocybe invasa* was recorded in the country for the first time (http://www.fabinet.up.ac.za/tpcp/Leptocybe_alert). This insect has already caused serious damage to Eucalyptus plantations in countries north of South Africa. Earlier this year, in a meeting to discuss the threats of pests and diseases to South African Forestry, if I remember correctly Errol Duncan of Mondi noted that *L. invasa* was found in plantations closer to our northern border than the distance from that point to Cape Town. A really serious pest existing literally on our doorstep and that would inevitably reach us. The only good part of this situation is that the TPCP team has been working on the problem at a distance for some years. Close contacts in other parts of Africa and elsewhere in the world have been forged and we have already learned from the experiences of others. We are now in a position to establish cultures of the pest and to move ahead actively towards biological control. I should not make this sound as if it will be a rapid process, the biological control agent has yet to be formally named! But we are further ahead of the problem than we might have been if it had not been for the extensive TPCP international network of tree health specialists.

The rising number of insect pest problems facing forestry in South Africa has wide concern and appreciation. It was thus good news to learn recently that Forestry South Africa will support the appointment of a Forest Entomology Extension Agent to support TPCP efforts in this domain. This person will have exclusively extension responsibilities and it is intended that the incumbent would spend the majority of his/her time in the field. This responsibility would link closely to those of Jolanda Roux who has provided outstanding field support to foresters for many years. The intension is also to have the new Forest Entomology Extension Agent, linking very closely with the tree health diagnostic service and the entomology programmes in FABI. In this way, we hope to gain maximum benefit from this new initiative and also to provide the best possible service to Industry.

It is not only insect pest problems that have increased in importance in recent years. It is not much more than a year ago that we recorded the first field outbreak of pitch canker in South Africa. This is a very worrying situation and just a few weeks prior to my writing this note, the disease caused by the fungus *Fusarium circinatum* was recorded in various parts of the eastern Cape of South Africa. These outbreaks also extend the host range of the pathogen beyond *P. radiata*. It will now be more important than ever to ensure that we have pitch-canker tolerant planting stock available for areas where the disease occurs. The TPCP team is working actively with industry partners to achieve this goal. Here it is appropriate to recognise Sappi in having arranged a superb symposium on pitch canker a few months ago. This meeting provided an excellent summary of past research on pitch canker in South Africa and it also helped to focus a future trajectory for dealing with this disease.

Since the last issue of TPCP News, what has to be the largest Forest Entomology meeting ever held in South Africa was held in the country. Many readers will know that this was the International Sirex Symposium and Workshop – a week-long meeting organised jointly by the ICFR and the TPCP. This was a hugely successful event that brought to South Africa, a very large percentage of the world's researchers having an interest in Sirex. We thus had the privilege of "benchmarking" our own Sirex programme against those active in other parts of the world. It was furthermore possible to reinforce collaboration with colleagues elsewhere and to refine future research and management strategies for this damaging pest.

During 2007, what is certainly the largest ever initiative to control a forest pest was undertaken. This commercial scale inoculation of *Sirex noctilio*-infested trees with the parasitic nematode *Beddingia siricidicola* was clearly a huge undertaking. As I write this introductory note, the TPCP team is awaiting emergence of the first wasps from inoculated trees. This will provide essential data on how effective the inoculation was. It will also set us on a trajectory for inoculations in 2008. These inoculations will be made with nematodes produced at FABI and as part of a programme in which a production facility will likely be established, linked to but operating independently of the Institute.

TREEHEALTHNET is continually gaining new members and this facility is clearly becoming a major conduit of news regarding tree health issues in South Africa. We are beginning to see reports posted by people outside the TPCP/ CTHB

team, which is an excellent development. If you have not listed yourself on this news distribution network, please do so soon. Further, if you have a management responsibility, please consider listing your staff members, especially if they are involved in tree growing. What makes TREEHEALTNET so effective is that members receive any news posted by members and whatever commentary is written, is received by all. Some people have expressed a fear that this might mean an overloaded e-mail inbox. This is very unlikely to happen and further "click delete" is a quick and easy for those (mails that are not of particular interest. Certainly, by joining TREEHEALTHNET, you will be the first to hear of new pest and disease outbreaks or to have information that might facilitate management of these problems. To join the NETWORK, all you need to do is to drop a note to Wilhelm deBeer (Wilhelm.DeBeer@fabi.up.ac.za) and he will do the rest.

The year is drawing to a close ever more rapidly. This year marks the end of 10years in which the TPCP has operated out of what was a brand new institute in 1998. It is hard to believe that time has passed so rapidly and it is also remarkable to look back on 10 remarkable years. Next year is the 100th anniversary of the University of Pretoria and we will in some way, celebrate ten years of FABI in the Centenary year of the parent institution. Furthermore, we look back on 18 years in which the TPCP has provided tree health research and extension services to South African Forestry. In this time, the Programme has grown to become the strongest single programme dealing with the health of trees in forest plantations anywhere in the world. Achieving this stature is thanks to many people that have dedicated their time to driving the TPCP, and it is also thanks to TPCP member organisations and their staff, that have contributed hugely to attaining this remarkable situation.

As we come to the end of another year, the end of 18 years of the TPCP and four years of the CTHB, the research team wishes to thank colleagues and friends linked to our member organisations for their support. We sincerely appreciate the great friendships and support that we enjoy in these remarkable and closely linked programmes. We wish all our colleagues a wonderful festive season and we look forward to working closely with you in 2008.

Mike Wingfield
Director TPCP and CTHB

GRADUATIONS

The following people obtained their MSc degrees during the latter part of 2007. Congratulations on your achievement!

Elsie de Meyer: Fungi from utility poles in South Africa: Taxonomy, phylogeny and effect on wood *(Cum Laude).*

Gilbert Kamgan Nkuekam: *Ceratocystis* and *Ophiostoma* species infecting wounds on hardwood trees, with particular reference to South Africa *(Cum Laude).*

Izette Greyling: *Pantoea spp*. associated with leaf and stem diseases of *Eucalyptus*.

TPCP/CTHB Diagnostic Clinic 2007

As part of our service to industry and other stake holders, the TPCP and CTHB runs a diagnostic clinic to assist foresters, farmers and others in the identification and management of pest and disease problems. The diagnostic clinic accepts both insect and plant material for analyses. Member companies of the TPCP and CTHB may use the services of the clinic at no cost, while private individuals must pay for the services.

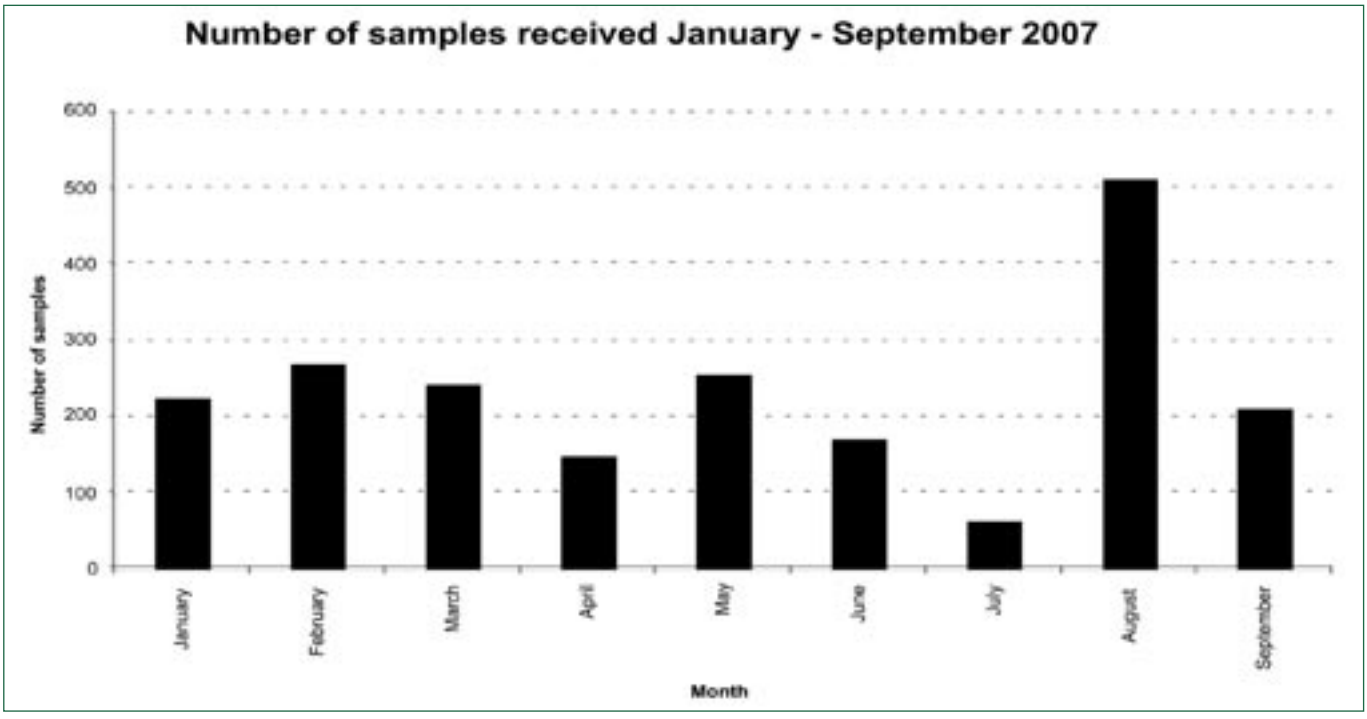
Sample report

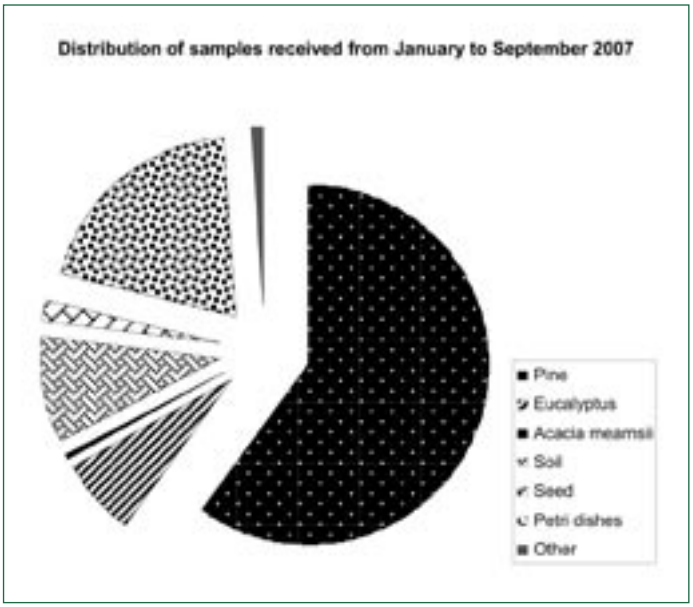
This year has been a very busy year for the clinic, receiving a total of 2092 samples between January and October. As in previous years, the majority of samples received were from *Pinus* species. However, considerably higher amounts of soil, seed and Petri dish samples were received compared to previous years.

Pine samples comprised 60% of the samples received, with the majority of these samples being for *Fusarium* screening. *Eucalyptus* samples made up 7% of the total number of samples and *Acacia mearnsii* only comprised about 0.4%. The amount of soil samples received during 2007 comprised 10% of all samples received. Seed samples, received for *Fusarium* screening comprised 1.7% of samples received. Petri dish samples, for the confirmation of *Fusarium circinatum,* made up 20% of the total samples. Samples from non-forestry and indigenous trees as well as water samples are categorized under "other" and these comprised 1.3% of the samples received.

The number of asymptomatic Pine samples, received from nurseries, testing positive for *Fusarium circinatum* has decreased from last year. This is a good indication that nurseries are successfully implementing measures to control this pathogen where possible. A number of samples from mature trees in the Eastern and Western Cape Provinces which tested positive for *F. circinatum* were, however, received, clearly showing that this pathogen has now also become a field problem of great concern.

With the exceptional weather conditions experienced over the last year, we have noticed an increase in stress related disease incidences. This holds true for Pine, Eucalypts and wattle, with stress related pathogens like *Diplodia pinea, Botryosphaeria* spp. and *Cytospora* spp. causing problems throughout South African forestry regions.





General clinic news

During the year the Diagnostic Clinic team was joined by **Marthin Tarigan** to assist us in coping with the high number of samples received. Marthin is a MSc. student from Indonesia and is working on diseases affecting *Acacia* spp. in that country.

In September, the clinic team went on a fieldtrip to KZN forestry regions. The main aim of this trip was to expose the members to diseases and pests in field, as well as show them some forestry aspects in South Africa. We would once again like to thank Philip Croft, Mark Holmes, Rob Perry, Konrad Buchler and Bryn Pollard for their assistance in showing us the various nursery operations and sites of interest.

Contacting the clinic

If you have any questions regarding possible diseases or would like to send samples to the Clinic, please contact either Izette Greyling (izette.greyling@fabi.up.ac.za) or Jolanda Roux (jolanda.roux@fabi.up.ac.za) for advice on the type and number of samples to send. It also allows us to prepare properly, especially if a particularly large sample is expected.

It is particularly important to contact us if you want to send water samples. The quality of water samples decrease very rapidly, even if stored in a fridge, to such an extent that no reliable results can be obtained. For this reason, water testing is done on site.

Remember to join our online tree health forum, Treehealthnet, for regular updates on pests and diseases, fieldtrip advertisements and other issues related to tree health. More information on pests and diseases as well as sample submission is also available on our website at http: //www.fabinet.up.ac.za/tpcp/.

WELCOME to the TPCP and CTHB

SHUAIFEI CHEN is from China and joined the TPCP in June 2007 for his PhD. ShuaiFei obtained his previous training in China, where he studied Eucalyptus breeding for his MSc. He also worked at the Eucalyptus Breeding at the China Eucalypt Research Centre (CERC) for two years before coming to South Africa. For his PhD, ShuaiFei will be learning more about Eucalyptus pests and diseases, specifically focussing on the fungal diseases of these trees in China.

DONALD CHUNGU is a Zambian who joined the TPCP programme in July 2007 for his MSc. Donald has a diploma and a degree in Forestry which he obtained from the Copperbelt University in Zambia. For his MSc. Donald will be looking at the fungal diseases of plantation forestry trees in the Copperbelt region of Zambia.

Contact numbers & web address:
Tel: 012 420 3938/9 • Fax: 012 420 3960 • http://www.fabinet.up.ac.za

In order for us to coordinate services to you please help us by using the following contact address:
FABI
Lunnon Road, University of Pretoria, Hillcrest, Pretoria, Gauteng

Postal address:
Tree Protection Co-operative Programme (TPCP)
Attention: Professor Mike Wingfield,
FABI
University of Pretoria, Pretoria, 0002

MATSEPO MOTSELISI TAOLE joined the Joined TPCP in June 2007 and will be working on the Eucalyptus leaf pathogen, *Kirramyces epicoccoides*.

ALVARO DURÁN SANDOVAL is from Chile and joined the TPCP in April 2007 for his Ph.D. which will focus on disease of *Pinus radiata* in Chile. Alvaro works for Bioforest S.A. in that country, but has been joined in RSA by his wife and two children for the duration of his Ph.D.

WUBETU BIHON, an Ethiopian, joined the TPCP for his PhD which focuses on the genetic diversity of *Diplodia pinea* and its infection processes on pine using molecular techniques.

Monitoring the Bronze Bug, *Thaumastocoris peregrinus* in South Africa

A long term country wide monitoring trial has been setup to obtain quantitative data about the population dynamics of *Thaumastocoris peregrinus*. This trial aims to focus on the effects that a range of environmental variables have on *T. peregrinus* populations over time.

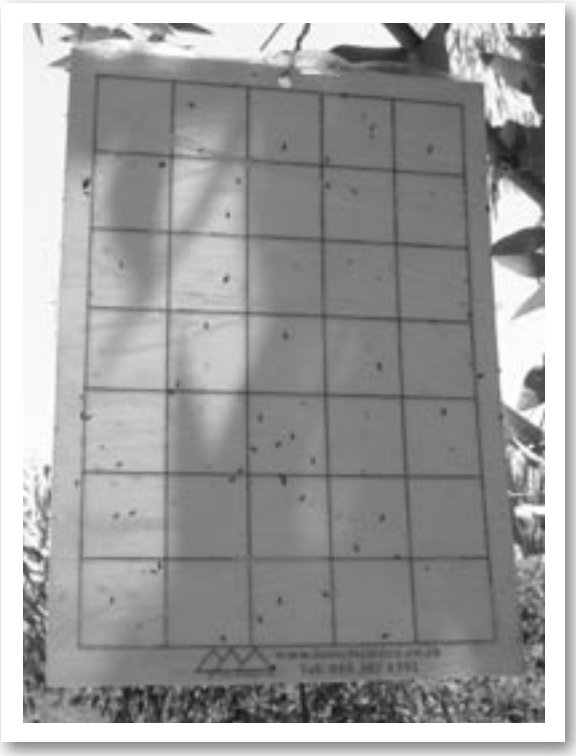
In collaboration with several TPCP industry members we have set up six plantation plots spanning the major *Eucalyptus* growing areas of South Africa. These include:

1. Limpopo (Tzaneen)
2. Northern KwaZulu-Natal (Piet Retief)
3. KwaZulu-Natal Midlands (Pietermaritzburg)
4. KwaZulu-Natal Zululand (Kwambonambi)
5. Mpumalanga (Sabie)
6. Gauteng (Pretoria)

This trial involves the monitoring of the population over two years to correlate fluctuations in population size with environmental and other factors. Monitoring involves the use of yellow sticky board traps (Fig 1) that have been shown to be effective in capturing *T. peregrinus*, by providing an attractive visual stimulus. For this trial only one life stage (namely that of adults) is monitored as an estimation of population size. Every site has twenty traps which are replaced on a weekly basis and exchanged between FABI and the foresters involved. Each site also has its own data logger taking temperature and humidity data every two hours.

This research trial will shed light on the factors affecting the build up and decline of *T. peregrinus* populations across different sites (weather, host and altitude) and associated with different levels of damage over time. The information from this trial will form the foundation upon which risk models can be based and future control strategies directed (i.e. to inform where, how and when to apply chemical and biological control measures). The tool developed in the process will also be critical to test the effects of various control measures. Without this information, control efforts will have no basis for direction, decision-making and testing efficiency.

We would like to thank the following people for their assistance with this trial: Botha Maree, Sonia du Buisson, Maurits Perold (Hans Merensky), Tony Winter (Mondi), Gary Button (NCT), Denis Oscroft (ICFR), Glen Mitchell, Kholisa Langa and Kgosi Mongwaketsi (KLF).



Yellow sticky board traps used to capture Thaumastocoris peregrinus *adults.*

News from the Forest Invasive Species Network For Africa

The Forest Invasive Species Network for Africa (FISNA) aims to facilitate the exchange of information, and provide a link for communication, about forest invasive species between countries on the African continent. One of the main modes of communication of FISNA is through their website, which is currently hosted by the FAO at the following website: http://www.fao.org/forestry/site/26951/en/. This website includes new alerts for recently discovered invasive species, lists of experts on the African continent that can be contacted for specialist advice and publications relating to invasive species on the continent.

An interim executive committee, charged with establishing the network and providing it with the momentum to continue into the future consists of representatives of the countries involved in the previous network, established in 1994 in Kenya and those present at a meeting in Malawi to revitalize the network. Dr. Clement Chilima of the Forestry Research Institute of Malawi (FRIM) was selected as the interim secretariat. Other countries currently represented on the interim committee are Kenya, Uganda, Ghana, Tanzania, Zambia, Zimbabwe and South Africa. For South Africa, Professor Jolanda Roux of the Tree Protection co-operative Programme (TPCP) was appointed as interim representative of the country.

The network is open to all involved in forestry on the African continent. Contributions and information from all are welcome and may be submitted to Jolanda Roux (for South Africa) or directly to Dr. Clement Chilima. You may also wish to add your name as an expert and offer your assistance to colleagues and foresters on the African continent. Also, if you have important points for discussions at future FISNA meetings please contact the secretariat who will raise them on your behalf. Your involvement is important.

FISNA Executive Committee Meeting – Pietermaritzburg RSA, May 2007

On the 16th and 17th of May 2007, FISNA held its first executive committee meeting in the boardroom of the Institute for Commercial Forestry Research (ICFR) in Pietermaritzburg. The meeting was arranged specifically so that it could be held back to back with the international *Sirex noctilio* symposium which took place from the 9-16th of May. This provided six of the FISNA members the opportunity to participate full time in the Sirex meeting. Other FISNA members arrived in RSA on time to participate in the Sirex field day and wrap-up meeting of the Sirex symposium on the 15th and 16th.

Attending the Sirex meeting falls well within the mandate of FISNA, namely to share information pertaining to forest pests and diseases between countries and continents. During the Sirex meeting, two presentations by FISNA committee members were made. Dr. Clement Chilima and Mr Member Mushongahande each gave presentations on the potential threat of Sirex to Zimbabwe, as one of South Africa's nearest neighbors, and also of the threat to the rest of the continent. This symposium and the threat of *Sirex noctilio* to the rest of the African continent formed an important part of the discussions during the FISNA meeting. Many African countries are greatly concerned about *S. noctilio* as plantations in many places are under great stress due to lack of effective management.

During the FISNA meeting each country presented a report on the status of invasive pests and diseases in their country. A number of new threats to African plantation forestry were highlighted during these discussions. Of serious concern to Eucalypt forestry is the threat of the blue gum chalcid, *Leptocybe invasa*, which was spreading south and had reached Tanzania at the time of the meeting. This insect has

since also been reported from South Africa (http://www.fabinet.up.ac.za/tpcp/Leptocybe_alert). Another insect pest of concern to Africa is the bronze bug, *Thaumastocoris peregrinus*, which was first reported from South Africa and has recently also been found in Zimbabwe (see FISNA website under "new outbreaks"). On the pathogen side, the spread of *Fusarium circinatum*, the pine pitch canker fungus, poses a threat to other African countries. Currently this pathogen is only known from South Africa, but is easily spread in contaminated seed.

FISNA would like to thank the ICFR for their hospitality during the meeting and for making their boardroom available for the meeting.

FISNA executive committee listening to a demonstration on a trap system to monitor Sirex noctilio.

Dr. Clement Chilima presenting his talk during the International Sirex Symposium hosted by FABI.

'First appeared in the September issue of Wood and Timber Times Southern Africa'

The damaging Eucalyptus Gall Wasp, Leptocybe Invasa, is now in South Africa

The research team of the Tree Protection Co-operative Programme (TPCP) based at FABI, University of Pretoria has been following the world-wide spread of the Eucalyptus gall wasp for many years. Members of the team have worked with colleagues in other countries, fighting the ravages of this pest during much of this time. In his address at the Annual General Meeting of Forestry South Africa, earlier this year, Mike Wingfield made the point that the wasp was closer to our northern border than the distance from that point to Cape Town. It was clearly just a matter of time, and likely not much time, before it would be detected in South Africa. The inevitable has now become a reality!

What is the Eucalyptus gall wasp and where did it come from?

The tiny wasp known as the Eucalyptus gall wasp or blue gum chalcid, *Leptocybe invasa*, was completely unknown anywhere in the world until 2000. At that time the severe damage it causes to *Eucalyptus* foliage and twigs was noticed in the Middle East and Mediterranean. In these regions, and other countries where the wasp has since appeared, it has become apparent that it is amongst the most devastating invasive pests to affect *Eucalyptus* in non-native plantations and urban environments.

The Eucalyptus gall wasp originates from Australia, but was identified from that country well after its discovery in the Middle East and

Prof. Jolanda Roux looking at Eucalyptus *coppice which has been badly stunted following heavy attack by the Eucalyptus gall wasp, while unaffected trees of the same age were already 3m in height.*

Young Eucalyptus trees bending over with thousands of galls covering virtually all the leaves and twigs, following heavy attack by the Eucalyptus *gall wasp,* Leptocybe invasa*.*

the Mediterranean. The wasp clearly has an incredible natural dispersal ability throughout areas where it has been introduced. Since its discovery in 2000, it now occurs virtually throughout the Middle East and Mediterranean. It is also spreading at an alarming rate throughout *Eucalyptus* plantations in South-East Asia in countries such as Thailand and Vietnam. It has taken only a few years to spread from North Africa to central Africa, and eventually to South Africa where it was noticed for the first time in June 2007 by Dr. Stefan Neser.

The areas of the world currently infested with *L. invasa* range from temperate to tropical, from dry to relatively wet, some with extremely hot periods and others extremely cold periods. It is thus clear that the pest has the potential to infest most, if not all, of the Eucalyptus growing areas of South Africa.

What does it do?

Leptocybe invasa is a very small wasp, only slightly more than a millimetre long. The adult wasp lays its eggs in the midrib of young *Eucalyptus* leaves, as well as petioles and twigs. After infestation small galls (< 3mm) form on the plant tissue in which larvae of the wasp develop. In periods of high population build-ups of the wasp, up to 50 galls can form per leaf, and virtually all young foliage and twigs infested. The galls coalesce to form large galls, which cause severe deformation of the leaves and twigs. This deformation can be severe enough as to completely impair the development of the tree and reduce it to a gnarled shrub, sometimes killing the young trees.

Many *Eucalyptus* species grown in South Africa are known to be highly susceptible to *L. invasa.* While *E. camaldulensis* appears to be the most susceptible species, *E. botryoides, E. bridgesiana, E. globulus, E. gunii, E. grandis, E. robusta, E. saligna, E. tereticornis, and E. viminalis* are also susceptible. Some hybrids including those of *E. grandis x camaldulensis* also appear to be susceptible to *L. invasa* in Israel and parts of Africa. Some of the *Eucalyptus* species grown in South Africa (e.g. *E. nitens* and *E. dunii*) have not yet been tested for susceptibility.

Why has an unknown wasp suddenly become such a devastating pest?

One of the main reasons appears to lie in the absence of natural enemies of L*. invasa* in invaded areas. This insect is not considered a pest at all in Australia where it is native. This is in part ascribed to the presence of the natural enemies there, as well as natural resistance or tolerance of the trees.

A second reason for the pest status of *L. invasa* is the presence of large amounts of suitable and genetically uniform breeding material for the wasp in plantation situations. Large scale

Contorted leaves and twigs due to extensive galling after attack by the Eucalyptus gall wasp, Leptocybe invasa.

Galls on leave midribs and petioles showing exit holes after Leptocybe gall wasps emerged.

plantings of susceptible seedlings or clones, and particularly the practice of coppicing, provides large amounts of young leaf and shoot material that is ideal for *L. invasa* attack. This favours large population build-up and consequent higher levels of damage.

What can be done to control the Eucalyptus gall wasp?

While *Leptocybe invasa* has a wide host range, field tests have revealed resistance of some genotypes within otherwise susceptible species. Most encouraging has been trials of South African produced clones in Tanzania, Kenya and Uganda, some of which showed resistance amongst otherwise heavily infested material. Some clones and seedlings originating from South African seed sources were, however, also very susceptible. There is thus an important opportunity to select for resistance amongst South African *Eucalyptus* breeding material.

No effective control measures have been found for *L. invasa* on susceptible plant material. Researchers and foresters in countries where the wasp has been established for some time have realised that biological control will be the only feasible way to control the wasp on such material over large areas.

For this reason a program was launched by Dr. Zvi Mendel from the Agriculture Research Organization in Israel and Australian collaborators to collect and study parasites of *L. invasa.* This program is making good progress. Dr. Mendel and his Australian colleagues have agreed to work with the Tree Protection Co-operative Programme (TPCP) to share expertise and material to speed up this process in South Africa.

An integrated control programme, based on silviculture to ensure healthy plantations, planting resistant or tolerant material, and biological control is likely to reduce the impact of this devastating pest to minimal levels. Immediate action is, however, needed to ensure that these measures are implemented before the wasp can spread through the country and build up high population levels on susceptible material.

To support this effort it is important that everybody keeps a lookout for the kind of damage illustrated by the pictures in this article.

If you see something similar, please contact Bernard Slippers or Brett Hurley of the TPCP at FABI (012-4203938; bernard.slippers@fabi.up.ac.za). Further information can also be found on the FABI web site at www.fabinet.up.ac.za/tpcp/index.

Landmark international meeting sets new course towards finding a solution for *Sirex* in South Africa

'A version of this article first appeared in Forestry SA. It was written together with Prof. Colin Dyer, Philip Croft and Sally Upfold of the ICFR'.

Forty international researchers and foresters from 17 different countries, and as many delegates from South Africa, convened between 9-16 May in Pretoria and Pietermaritzburg, to engage with the subject of the *Sirex* woodwasp and its control (www.fabinet.up.ac.za/Sirex/index). The meeting was jointly organised by Sirex researchers at the Forestry and Agricultural Biotechnology Institute (FABI), University of Pretoria, the South African Sirex Control Programme and the Institute for Commercial Forestry Research (ICFR). This remarkable event emerged from the realisation that there is an international need to combine efforts to combat the growing threat of *Sirex* globally.

The international *Sirex* symposium held from 9-10 May at the University of Pretoria succeeded in bringing together a rich mosaic of both practical and academic experience from virtually all groups working in this domain around the world. From presentations and discussions at the symposium in Pretoria it was clear that Sirex continues to represent a serious threat to conifer forests and forestry world-wide, and needs to be treated as seriously as ever. There are several reasons for this. Firstly, when control measures are relaxed due to complacency, serious outbreaks can follow despite the presence of established biological control organisms; e.g. in the Green Triangle outbreak in Australia. Furthermore, the wasp is continuing to spread into areas with environmental conditions not previously encountered in Sirex control programmes, such as the USA and Canada, and KwaZulu-Natal in South Africa. These areas can present unique challenges and may require novel approaches to control Sirex. Furthermore, despite the knowledge that has been accumulated relating to this damaging insect during the last 100 years, many aspects of its biology and control are still poorly understood. Fortunately, research is being done around the world to address these gaps in our knowledge and to improve Sirex control. The meeting significantly advanced these efforts by combining ideas and linking research communities from various countries.

Where *Sirex* has been controlled successfully, governments, researchers and forestry companies have combined efforts to adapting control programmes to suit local conditions. Such an integrated, national control effort might well be the only way to control Sirex successfully on a long term basis. In many cases this control effort was run entirely, or with substantial support, by the respective national government, given the extent of the undertaking. Intensive quarantine, monitoring and awareness campaigns were key features of all large control programmes. Silviculture aimed at minimising stress in plantations was raised as perhaps one of the most crucial aspects of Sirex control. It was also clear that an integrated biological control effort, based on nematodes and the different wasp parasitoids, is the most secure way to ensure long-term control of Sirex under differing conditions. The Symposium therefore succeeded in presenting an international summary of both research and management efforts around the control of Sirex.

After the symposium, international delegates had the opportunity to experience first hand the efforts of the South African *Sirex* Control Programme. They spent a day in-field in the KwaZulu-Natal midlands, looking at forest compartments where inoculations with nematodes were being carried out and where wasp parasitoids have been released. They also visited the site of a chemical spray trial and the emergence cages being used to monitor Sirex.

The next leg of the event was a one-day workshop held in Pietermaritzburg. Here the aim was

to meet with key stakeholders from the South African Forestry Industry, and to focus combined international and local expertise and experience towards finding a solution to effectively manage the threat of *Sirex* in southern Africa. The workshop began with an update on the current initiatives and efforts of the Control Programme. Linked to this was a presentation providing an overview from the Symposium highlighting the current state of knowledge on Sirex and its management globally.

The main component of the workshop was a facilitated discussion around key questions that have arisen from the implementation of a control programme in South Africa, with the aim of identifying key issues that need to be addressed for the successful control of *Sirex* in southern Africa in the future. One aspect that became clear from the discussion is that we have developed a uniquely South African problem that requires a uniquely South African solution. It is critical to put in place a single control strategy for Sirex with all activities aligned to a common goal that benefits all stakeholders (government and the private sector), and one that considers all the aspects of a uniquely South African situation, such as climate. The idea of an integrated approach which considers biological controls, including both wasp parasitoids and the nematode *Beddingia siricidicola*, as well as silviculture for forest health is clearly the correct approach, and significant work in these areas is already underway.

An aspect which received considerable attention at the workshop and the symposium was around monitoring; both of the spread and occurrence of *Sirex*, and the spread of the biological control agents used. The use of trap trees and artificial traps to detect and manage new outbreaks is an aspect that needs urgent attention. We need to fully understand both the extent of the problem and the risk associated with further spread. It is critical that we look at putting in place quarantine measures to reduce this risk, e.g. controlling of the movement of untreated timber and wood products around southern Africa.

Other issues raised at the workshop included the need for the support and participation of Government, in order to have an effective control programme. In addition, discussions indicated that the economic impact of the *Sirex* threat is not clearly understood at an industry level, an issue which is being addressed.

The workshop did not produce a "silver bullet" solution to the *Sirex* woodwasp problem in Southern Africa. But it did provide a forum for clarifying and prioritising the issues that need to be considered in building a consolidated short- and long-term approach towards successfully controlling and managing the pest and its associated fungal symbiont. One of the most important outcomes of the International Symposium and Workshop was that it facilitated the birth of invaluable collaboration and partnerships with experts from around the globe. Amongst other benefits, it was decided to establish a central database of literature and information (www.fabinet.up.ac.za/Sirex/index) pertaining to the Sirex woodwasp and the Siricidae in general. There can be no doubt that this remarkable event will continue to support efforts to manage the Sirex woodwasp, well into the future.

Attendees of the first international Sirex *symposium*

Observing the damage done by Sirex *on* Pinus patula *during the field visit.*

The annual TPCP review meeting provides a focus on tree health

The 17th annual meeting of the Tree Protection Cooperative Programme (TPCP) and the DST/ NRF Centre of Excellence in Tree Health Biotechnology (CTHB) was held at the Forestry and Agricultural Biotechnology Institute (FABI), University of Pretoria on the 8th and 9th of May this year. During this annual meeting the TPCP and CTHB team members share their research progress with various stakeholders and attendees, including forest managers, field foresters and forestry researchers. As in the past, this year's meeting provided a unique opportunity for interaction and discussion of forestry pest and disease problems between forestry colleagues and TPCP / CTHB students and staff.

The meeting was opened with a keynote lecture by Linda Mossop-Rossouw (SAFCOL). She reflected on the many challenges and changes that the SA forestry industry has experienced through the pre-apartheid, apartheid and post-apartheid eras, moving from strong government involvement and ownership in commercial forestry, to minimal ownership but with more regulation by government today. She highlighted many current challenges facing the industry, including transformation, growth, pests and diseases, natural disasters, imports, tertiary training, land reform policy, job creation, information sharing and use, public perception of commercial forestry, financial and labour challenges, raising forestry on the national agenda, and environmental services.

Scientists from abroad with whom TPCP / CTHB researchers collaborate were invited to provide stakeholders with a global perspective of forestry pest and disease problems. There was a significant focus on international trends in forest entomology, reflecting the current pressure on the industry from various insect pests. Dr. Simon Lawson (Specialist forest entomologist from the Queensland Department of Primary Industries) provided an overview of various pests that affect *Eucalyptus* in their native range. He made the point that it would be wise for South Africa to be aware and prepared for the time when these might appear. Dr. Lori Eckhardt (Auburn University, USA) shared the complexities of addressing an extensive tree decline, associated with root feeding insects, their associated fungi and environmental factors. Dr. Paal Krokene (Skogforsk, Norway) shared his experiences and those of his colleagues, in their use of early detection tools, particularly remote sensing, to avert large scale damage due to forest pests such as sawflies.

The international movement of serious fungal pathogens and pests is one of the most serious threats to forestry industries around the world. Two Australian visiting scientists who focus on these issues in their work are Dr. Treena Burgess (Murdoch University, Australia) and Dr. Aaron Maxwell (Australian Quarantine Service, AQIS). They shared their experiences regarding potential and current threats to *Eucalyptus* in Australia, which is most relevant to South African *Eucalyptus* forestry.

The past year has once again seen a tremendous amount of information relating to forest pests and diseases and their management, generated by the TPCP / CTHB programme. It was clearly impossible to share all this knowledge in the very short two day duration of the meeting. An important point is that in recent years, the TPCP has tackled a growing number of serious pest problems facing the industry. From this focus, progress in dealing with *Sirex*, *Gonipterus*, the Goat moth, fungus gnats and *Thaumastocoris* were discussed. The forest pathology projects reported on included work on pathogens of Pinus (genomic work with the Pitch canker fungus and a talk on the identification and international spread of this pathogen, *Dothistroma* needle blight and *Diplodia pinea*), *Eucalyptus* (*Ceratocystis* diseases, the growing phytobacteriology focus and *Chryphonectria* canker) and diseases and fungi of native trees such as Maroela, Waterberry and *Protea*.

Presentations emphasized the continued productivity and success of the TPCP, an internationally recognized programme of which the forestry industry and the University of Pretoria can be very proud. To learn more about the work of the TPCP, or about the international *Sirex* Symposium that followed the TPCP meeting, visit the website at: www.fabinet.up.ac.za/tpcp

Prof. Mike Wingfield congratulating Andrea Louw (ICFR) on winning the annual beer balancing competition. This is a light hearted event where TPCP members 'compete' in this outragous event for a floating trophy.

The meeting affords staff and members of the TPCP the chance to discuss tree health issues in depth. Here Prof. Teresa Coutinho and Dr. Arnulf Kanzler are in deep discussion.

Tony Trahar receives an honorary doctorate

It will be of interest to many foresters and forest managers, particularly those working for Mondi Business Paper, that Tony Trahar, former Executive Chairman of Mondi Paper Company and later Chairman of Anglo American PLC, recently received an honorary doctorate from the University of Pretoria. This degree was conferred at a graduation ceremony of the Faculty of Business and Management Sciences on Monday 6th September. The honorary doctorate was particularly intended to recognise Tony Trahar's exceptional contributions to South African and world-wide business. The University of Pretoria also wished to acknowledge Tony's contribution to education and research through his support of the Anglo American Chairman's fund.

In his acceptance speech, Tony focused deeply on the importance of education. In his words "Education is the great equaliser- it gives everyone reason to believe in themselves and their individual ability to change the world. Education gives people the capacity to do previously unimaginable things; it opens new vistas and creates new possibilities. Knowledge is power, we are told, and it is true both for society and for individuals. And it is for this reason that education has taken the lion's share of Anglo American's investment in the wider community".

Tony Trahar made tremendous contributions to forestry in South Africa. Under his leadership, Mondi was the pioneer of clonal forestry in South Africa, which has had a major impact on the nature of the forestry industry in South Africa. He was also pivotal in supporting the many scientific and technological elements that are crucial to contemporary plantation forestry and many scientists have by association been trained or have gained substantial experience based on his vision. His vision also contributed significantly to the establishment of the Forestry and Agricultural Biotechnology Institute (FABI), elevating the accomplishments of Tree Protection Co-operative Programme (TPCP), which has become the largest and most broadly based programme dealing with plantation pests and diseases in the world. In this regard, he was also responsible for establishing the Mondi Professorship in Tree Protection that has substantially promoted education and research dealing with plantation pest and disease problems in South Africa.

In concluding his acceptance address, Tony urged graduates to consider the importance of contributing to the common good. His closing statements contain a great deal of wisdom for us all…. "As mainly business graduates, you may perhaps wonder why I have dwelt so extensively on the importance of forestry research and education, two topics which have been close to my heart at Anglo American, and not talked about the world economy, the stock market and other foundations of capitalist thought. The reason is this – many young businessmen today are going to be brought up in a world that is fiercely capitalist, driven by short term-ism and a hunger for self enrichment. This is often coupled with a disregard for helping others and in a lack of acceptance of a longer term view, where investing in research and development and investing in your community and country is vitally important for the long term good. Perhaps as you leave this university and make your successful careers in the years ahead, you too will contribute to the common good, to balancing short term goals with long term strategy and play a broader role in the communities that surround you"

Screening of pine breeding material against the pitch canker fungus

TPCP students busy inoculating young pine plants with F. circinatum.

Fusarium circinatum, the cause of pitch canker disease of pine trees in the United States of America, was first reported from South Africa in the early 1990s. In the USA this pathogen results in the death of mature pine trees and is considered as a major constraint to pine plantations and native pine trees in that country. For many years typical pitch canker disease was not observed in South Africa. In contrast to the USA, the disease in South Africa was restricted to the nursery where the pathogen resulted in large scale losses to especially *Pinus patula* trees. The pathogen spread from its first point of introduction and can now be found in all pine growing nurseries in the country. It also rapidly established itself as a major problem for the establishment of pine plantations, often killing young plants at transplanting.

Pine plants of varying origin and susceptibility after inoculation with F. circinatum.

Pitch canker is considered by most pine growing countries as being the most important threat to the successful growing of pine trees. With this in mind many countries have already developed programmes to select trees that may be tolerant to infection. In the USA regular screening of breeding material is done through the artificial infection of breeding lines with *F. circinatum*. Some South African companies started investigating this possibility towards the end of the 1990's, with the assistance of the TPCP.

In 2005, a collaborative project was launched by Sappi, Mondi and Komatiland in conjunction with the TPCP to screen their breeding stock against *F. circinatum*. With funding from these companies facilities were established in which to house and inoculate thousands of young pine trees annually. Twice a year, between 15000 and 20000 trees are inoculated with *F. circinatum*. In 2007 a total number of 17 808 Pine seedlings from different families and hybrids were screened.

Management of *F. circinatum* requires an integrated management system. This should include strict quarantine to prevent the introduction of new genotypes into the country and to prevent the movement of these genotypes between different areas in South Africa. This will prevent an increase in diversity and possibly vigor in the pathogen and ensure longer durability for breeding programmes. Furthermore, care should be taken in nurseries to use only pathogen free water and growth media.

Insect populations should be kept to a minimum to prevent wounding and trays should be thoroughly cleaned. Long term management of pitch canker disease, however, is impossible without sound breeding strategies. With the recent outbreaks of pitch canker on mature trees in the Eastern and Western Cape Provinces it is clear that this is not a point for debate.

TPCP and CTHB women win awards

Prof. Brenda Wingfield (standing), Dr. Marieka Gryzenhout (sitting left) and Professor Jolanda Roux (sitting right) with their trophees.

Not one, nor two, but three winners for the TPCP/CTHB!!

Globally the lack of gender equity in science is well recognised. Furthermore, it is also becoming increasingly obvious that there are significant benefits in having a gender balance in science as women have different strengths to their male colleagues. Celebrating particularly the success of women in science is regarded as one of the ways South Africa can inspire girls to consider careers in science.

August is "women's month" in South Africa and as part of celebrating women's part in society there are a number of awards for women in Science. This year three of the women scientists in the TPCP/CTHB walked off with prizes.

Dr. Marieka Gryzenhout, who is well known for her passion for fungi, received the L'Oreal Fellowship. This is an award given jointly by the Department of Science and Technology (DST) and L'Oreal with the support of the National Commission for UNESCO to prominent young scientists.

Profs. Brenda Wingfield and Jolanda Roux received the top two awards for research in Forestry. These awards are given by the Department of Forestry to recognise excellence in research in Forestry. Both Prof Wingfield and Roux are internationally recognised for the research that they have published on tree pathogenic fungi. Prof Wingfield was also nominated for the DST Distinguished Women Scientist award and was the 2nd runner up for 2007.

TPCP AND CTHB ANNUAL RESEARCH MEETING 2008

10 YEARS of FABI!!
100 YEARS of TUKKIES!!

The annual research meeting of the Tree Protection Co-operative Programme (TPCP) and DST/NRF Centre of Excellence in Tree Health Biotechnology (CTHB) will take place on the **6th and 7th of May 2008** at the University of Pretoria. During these meetings students and staff of the TPCP and CTHB will provide feed back to the industry and other stake holders on their research. This meeting will also include the celebration of the 10th year of existence of the Forestry and Agricultural Biotechnology Institute (FABI) and the 100th year of existence of the University of Pretoria. If you wish to attend these meetings please contact the research director or other appropriate person of your company. Alternatively, please contact Prof. Mike Wingfield at FABI (012 420 3938/9).

FABI
Exceptional Contributions Awards

Many people contribute to the success and team spirit of the Forestry and Agricultural Biotechnology Institute (FABI). During the annual "year-end-function" of FABI in November, the Institute honoured a number of the people who have contributed to the success of the group. Awards were made in nine categories, based on nominations made by staff and students of the Institute.

AWARD RECOGNISING CONTRIBUTIONS BY A PERSON EXTERNAL TO THE INSTITUTE

Mr. Mike Edwards of Forestry South Africa was the first recipient of the award acknowledging the contribution of a person, external to FABI, to the success of the group. Mike is known by most people in the forestry industry and has been one of the major people influencing the TPCP and recently the THB programmes. Without his support and motivation and that of the forestry industry, the TPCP would not have been as successful as it is today.

Mike Edwards (FSA) receiving his award from Mike Wingfield

AWARD RECOGNISING CONTRIBUTIONS BY A MEMBER OF STAFF OF THE UNIVERSITY OF PRETORIA

Mrs. Marie Theron, of the University of Pretoria's library services received the award for her assistance in obtaining literature and other information and thus keeping everyone updated.

FABI AWARD "GETTING THE MESSAGE TO THE PUBLIC"

This award was made to **Dr. Marieka Gryzenhout**, a post-doctoral fellow at FABI. Marieka is the editor of a mycological newsletter, Mycorrhizae, which is distributed to any one interested in mushrooms. She is also the editor of the newsletter of the African Mycological Society. Furthermore, she conducts regular guided walks with the public to look at fungi, presents mushroom identification courses and writes a feature article for "The Gardener", a popular magazine.

BEST FABI STUDENT PERSONAL WEB SITE

This award went jointly to **Gilbert Kamgan Nkuekam** and **Chrizelle Beukes**.

FABI AWARD FOR MENTORSHIP

The training of young people is an integral part of FABI's mission. As far as possible the Institute tries to encourage senior students to assist younger ones. Three FABIANS were recognized for their outstanding contributions in this field. They were nominated by fellow students (some of whom were previously mentored by them). This award went jointly to **Irene Barnes**, **Martin Ranik** and **Wilhelm de Beer**.

BEST FABI MSc

FABI had several M.Sc. students who obtained their degrees with distinction during 2007, indicating the high quality of research taking place in the group. **Michele Victor**, a student of Prof. Zander Myburg, obtained her M.Sc. *cum laude* with an average mark

of 88% and was the recipient of the award for the best Master's thesis.

BEST FABI STUDENT PUBLICATION

This award was made to **Lieschen de Vos** for her publication in Fungal Genetics and Biology: De Vos L, Myburg AA, Wingfield MJ, Desjardins AE, Gordon TR, Wingfield BD. 2007. Complete genetic linkage maps from an interspecific cross between *Fusarium circinatum* and *Fusarium subglutinans*. The impact factor is: 3.121

BEST FABI STUDENT FEATURE ARTICLE ON THE FABI WEB SITE

As part of our communication with the general public, FABIans summarize some of their publications in feature articles which appear on the FABI website. These are written in such a manner as to make them more understandable to the general public. **Marelize van Wyk** was the recipient of this award for 2007.

FABIAN OF THE YEAR

Draginja Pavlic, recipient of the Fabian of the year award.

The FABIAN of the year award seeks to acknowledge the contributions by a FABI student during his/her career in FABI. This award is based on overall contributions and performance, including scientific excellence (publications etc.), mentorship of fellow students, contributions to FABI structures such as the social club, chaperoning of visitors and general attitude. Nominations were made by fellow students, whereafter the FABI Mancom evaluated the candidates, based on a set list of criteria. The very worthy winner of the FABIAN of the year award for 2007 was **Draginja Pavlic**.

Draginja completed her BSc (Agric) in Plant and Food Protection at the University of Belgrade in Yugoslavia. She joined the TPCP for her MSc degree, which she obtained with a distinction, before continuing with her Ph.D. degree which she is currently writing up. Her research for both these degrees focussed on an important group of forestry pathogens, the Botryosphaeriaceous fungi. The species of the *Botryosphaeriaceae* are pathogens of *Eucalyptus* worldwide, but also occur on native trees within the *Eucalyptus* family *Myrtaceae*. During her MSc project she investigated the *Botryosphaeriaceae* that occur on native *Syzygium cordatum* in South Africa and their potential threat to *Eucalyptus*. For her PhD project she focused on the origin, population genetics and biology of species of the *Botryosphaeriaceae* and their movement between native and non-native hosts. From her research Draginja has already published two articles in international journals, had several that have been submitted for publication, and has presented posters and talks at a number of national and international conferences. She has also mentored a number of younger students, worked in the TPCP Diagnostic Clinic, served on the FABI social club for a number of years and is a regular face on TPCP field trips, interacting with foresters.

Draginja and fellow student Didier Begoude busy with Fusarium circinatum inoculations for industry.

Draginja interacting with two Mondi foresters.

Further outbreaks of pitch canker

Earlier this year the first report of pitch canker on mature *Pinus radiata* in Tokai plantation in the Western Cape was published in Australian Plant Pathology. The affected trees were between five and nine years of age and symptoms included resinous cankers on the main stems and branches, flagging of branches and shoot tip die-back. On recent field trips to the Eastern Cape, twelve to 15-year-old *P. radiata* trees in the George area were noticed showing similar symptoms to those observed in Tokai. Similarly, *P. greggii* (Southern provenance) in the Ugie area also showed typical symptoms of pitch canker. Isolations from these trees, examination of cultures for morphological features and DNA sequence comparisons confirmed the presence of the pitch canker fungus, *Fusarium circinatum*, on mature trees in these areas.

The origin of the *F. circinatum* inoculum for the new outbreaks is not known, but insect transmission is suspected because the deodar weevil, *Pissodes nemorensis* was found at all sites. Research is currently underway to trace the source of these field infections. The majority of the affected compartments were those that had not undergone the prescribed thinning, indicating that the trees were affected by stress. However, detailed surveys and mapping of outbreaks are required to make useful conclusions regarding these worrying field outbreaks of pitch canker. Foresters are urged to monitor trees for symptoms of pitch canker and to report observations to the TPCP immediately.

The occurrence of *F. circinatum* on mature pine trees is of great concern. Not only does it threaten the productivity of plantations, but it also has implications for seed production in seed orchards. It is well known that the pitch canker pathogen is seed-borne and up until now, South African pine seed that has been screened has been free of *F. circinatum*. This is presumably because stem and cone infections are needed to result in seed being contaminated. With the first outbreaks of full-blown pitch canker in South Africa it has become more crucial for all forestry companies to prioritize the screening and selection of trees that are tolerant/resistant to infection by this pathogen. This will be the only sure means to avoid dramatic losses in the longer term.

Pitch soaked Pinus *stem showing typical resin accumulation within the wood and under the bark of an affected tree. Note how infection points originate from branch stubs.*

Resin running down the stem of a Pinus *tree infected by* F. circinatum.