

FROM THE DIRECTOR'S DESK

As I write this note to accompany the last issue of Tree Protection News for 2008, I am sitting in a plane returning from three days in the Cape, where I was a guest speaker at the Elton Symposium. This meeting was arranged by one of South Africa's other Centres of Excellence, the CoE for Invasion Biology, also known as the C.I.B. Many of those reading this newsletter will be wondering exactly what I mean by the "Elton" symposium. Let me tell you more as this has a great deal to do with matters pertaining to Tree Health.



Keeping trees healthy – a team effort!
Foresters and TPCP students/staff in a plantation
learning from each other.
Thank you foresters, farmers and all people who have
assisted us in our research and efforts
to keeping trees healthy in 2008!

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Charles Elton (1900- 1991) was a British ecologist and some would argue that he is by far the most famous ecologist that has ever lived. He was a remarkable man who published a seminal Ecology text when he was 26 years old. But he is best known to many of us as the “Father of Invasion Biology” and the meeting that I have just participated in was held to mark the 50th anniversary of the publication of his famous book “The Ecology of Invasions by Animals and Plants” in 1958. Even today, this book is the most highly cited text in the field of invasion biology and it is widely accepted as representing the foundation of a hugely important discipline.

When I first read “The Ecology of Invasions by Animals and Plants” many years back, I was delighted that Elton has included in his work, a major tree pathogen invasion. This was, not surprisingly, the devastation caused to European and American chestnuts by the canker pathogen *Cryphonectria parasitica* and the disease known as Chestnut Blight. In fact, much of what Elton had to say about the disease remains relevant today and his writings have presented a fine foundation for TPCP work on Eucalyptus canker caused by *Chrysosporthe (Cryphonectria) austroafricana* and *Chrysosporthe cubensis*.

One of the key “thought bubbles” reinforced in my mind during the Elton symposium concerned the collapse of populations of introduced plants. In recent years, as we have witnessed the serious losses to plantation forestry species due to the ravages of the Sirex wood wasp and pitch canker in South Africa, and dramatically by the new *Phytophthora pinifolia* on *Pinus radiata* in Chile, one can only feel concerned for the future. Most likely, populations of some of the worst alien invasive weeds will collapse in time due to a breakdown of the barriers emerging from “enemy escape”. From a forestry perspective, we will need to work increasingly hard to ensure that our tree resource sustains what are likely to be increasing incursions of pests and diseases.

This last year has marked the initiation of various important new initiatives in the TPCP.

Very importantly, we have employed a field entomology extension agent to support our members in dealing mainly with insect pest incursions. New projects on the biological control of *Leptocybe invasa* (the Eucalyptus gall wasp) and *Thaumastocoris perigrinus* (the bronze bug) have been initiated. These are already placing the industry on a firm footing to deal with the increasing damage due to the pests. Furthermore, the year gone by has included the first large-scale production of biological control nematodes as part of our War Against Sirex Populations, which in FABI we refer to as WASP.

As the year draws to an end and we begin to plan activities for the coming year, it is also time to thank our many friends and colleagues in the TPCP member companies for the tremendous support that we enjoy, as we carry out our field work. While the core activities of the TPCP reside at the laboratory side of dealing with plantation pests and disease, a substantial bulk of work must occur in plantations.

Here we depend on support from member companies and we appreciate this greatly. The coming year will certainly be another busy one and one that will require an ongoing focus on reducing the impact of insect pests and diseases in South African plantations. Yet, we hope that there will also be some time for a “breather” for readers of this newsletter over the festive period.

Thank you all for your support and we wish you a very happy Christmas and all best wishes for a healthy (including tree healthy) 2009.

Mike Wingfield.



Chrysosporthe austroafricana causing disease on *Eucalyptus grandis* (right) and on Australian *Syzygium* sp. planted as ornamental in a South African garden (left).

TPCP/CTHB Diagnostic Clinic 2008

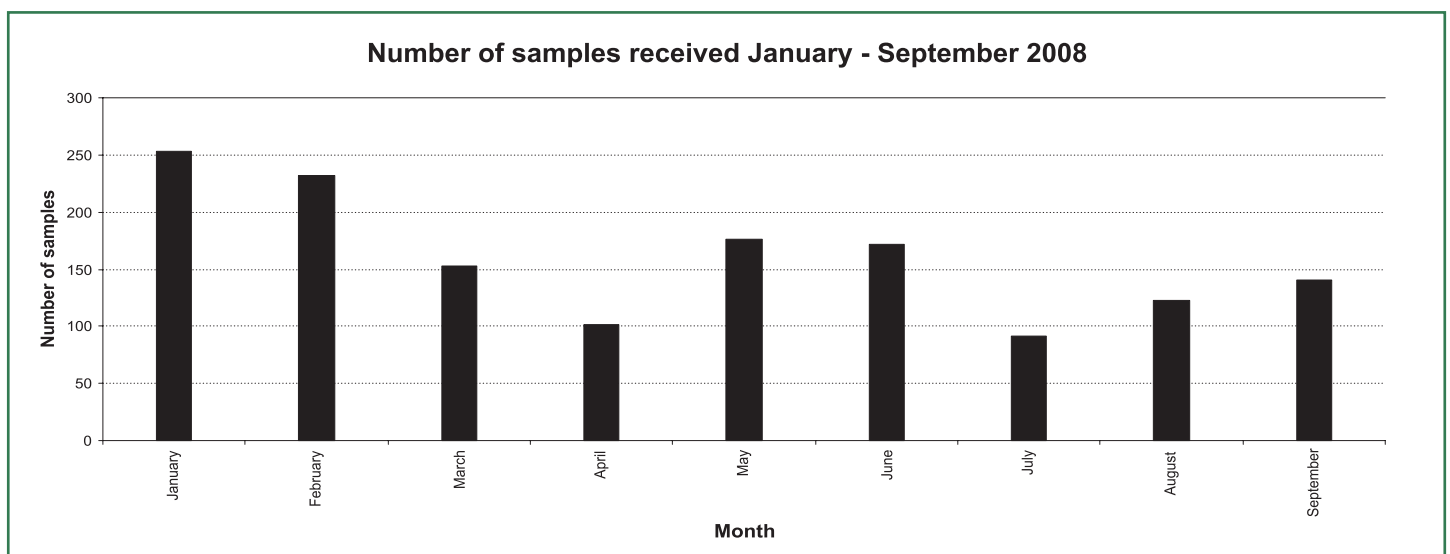
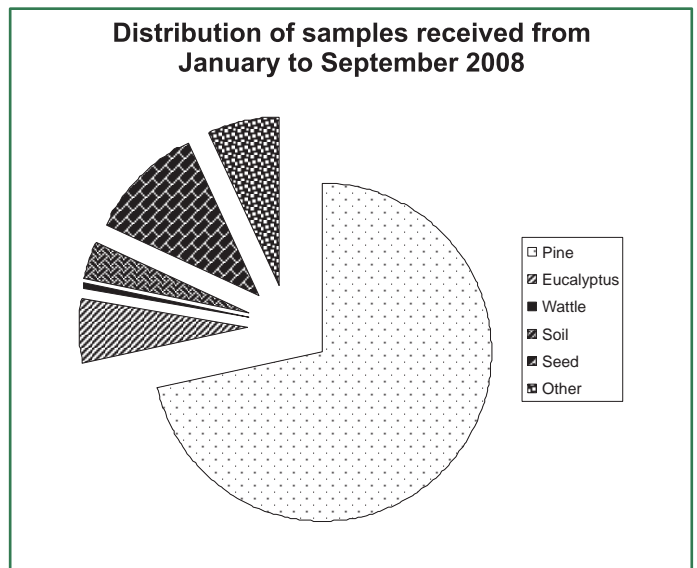
The clinic received a total number of 1442 samples from January until the end of September 2008. As in previous years, the majority of samples received were from *Pinus* species with very few wattle samples received. Fewer samples were received in autumn and winter months with the expectation that the volume will increase as summer begins.

Pine samples comprised 72 % of the total number of samples received, with the majority of these samples received for *Fusarium* screening. Eucalyptus samples made up 6 % of total number of samples. Wattle samples only comprised about 0.3 % of the total amount of samples. Soil samples comprised 3.7 % of all samples received. Seed samples, received for *Fusarium* screening comprised 11 % of samples received, an increase of approximately 10% from last year. Samples from non-forestry and indigenous trees as well as water and Petri dish samples are categorized under "other" and these comprised 7 % of received samples.

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 in the event that a large batch of samples are received.

Please also remember that the Diagnostic Clinic forms part of our monitoring strategy and we need as much information as possible regarding samples received. We would, therefore, like to encourage our members to fill out the submission forms as completely as possible as this would not only help with the diagnosis of the problem but would contribute greatly to our knowledge base and research efforts.

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 www.fabinet.up.ac.za/tpcp/.



What is that mushroom in your plantation?

Fungi are very diverse organisms based on morphology and function. The diseases caused by fungi in plantations are well known to the South African Forestry Industry, but other fungi have beneficial effects in plantations. There are those that degrade old woody and leaf material, or humus in soils. Some form special structures with trees that enable both fungus and tree to grow better. It is often not recognized that the power of many fungi has also been harnessed by humans to produce wine, bread, enzymes and many other products.

Mushrooms and other fungal fruiting bodies such as brackets are the “flowers” of fungi. The actual “body” of the fungus consists of thin threads, called hyphae, that permeate through the soil or the plant material that the fungus occupies.

These fruiting bodies come in a wide diversity of shapes and sizes, of which some are so beautiful that they become captivating, and searching for them addictive. Because plantations are ideal places for fungi to grow and they are often close to indigenous forest patches, those of us not scrambling after bugs usually eagerly look for mushrooms when we visit forestry stations to investigate disease and pest problems.

The majority of mushrooms and other macrofungi (those with

fruiting bodies one can easily see) in plantations, are not pathogens. They are usually saprophytes, thus living on dead material and contributing to the important degradation process. They can either live inside stumps, leaves or only in the soil.

A few of these fungi, such as species of *Armillaria* on pines and the root rotting *Ganoderma spp.* are, however, pathogens, which can become aggressive on living trees.



Ganoderma applanatum
(artist's conk)



Amanita species
common in pine plantations but best avoided

Mycorrhizae are hugely important to forestry as tree growth would not occur in their absence. This rather strange word, meaning “fungus root”, refers to a symbiosis between fungi and the roots of plants. Here it is important to recognize that they are neither fungus nor plant – but incredibly intricate symbiotic structures that arise from the combination of both organisms.

The fungal components of this group often form beautiful mushrooms that are common in plantations. Many of these mushrooms include some of the best edible mushrooms, such as *Boletus edulis* or the King Bolete that are commercially exploited in South African plantations. Others, however, are also very poisonous and must be avoided.

Continue



The fungi degrading wood either consume lignin, cellulose or both of these components of wood. This degradation is quite visible in forests where rotten pieces of wood either have a white colour (brown cellulose degraded, white lignin remains) or a brown colour (brown cellulose remain, white lignin degraded). Such fungi can be used in applications where these components need to be degraded, such as in the pulping process.

I am sure there are many foresters and contractors who see mushrooms, and often wondered what they are and what they do. There probably are also people with a greater interest in these fungi. If you would like to learn more or to obtain identifications of the fungi occurring in your plantations, please contact Dr. Marieka Gryzenhout (Marieka.gryzenhout@fabi.up.ac.za), who runs an informal list server for people who are interested in macrofungi.

GRADUATIONS

The following TPCP and CTHB student obtained degrees during the spring graduation of the University of Pretoria. Congratulations on your achievements!

Marthin Tarigan – M.Sc degree with thesis entitled “*Ceratocystis* spp. and Botryosphaeriaceae on plantation Acacia species in Central Sumatra, Indonesia”. Marthin received his degree *Cum Laude*.



FOREST ENTOMOLOGY EXTENSION AGENT APPOINTED

In April this year a Forest entomology extension agent was appointed at the TPCP through funding provided by Forestry South Africa. This appointment aims to increase the presence of the TPCP in South Africa's plantations and allow for quicker response time to new problems and queries by foresters. After advertising the position via list servers and forestry magazines, Izette Greyling was appointed as the extension agent. Izette is known to many foresters from working with the diagnostic clinic and from being a regular attendee on field visits in South Africa.

Izette will be working under the guidance of Prof. Jolanda Roux and the entomology team of Brett Hurley and Dr. Bernard Slippers. The appointment of Izette as extension agent also allows a much closer connection between the Diagnostic clinic, which she continues to manage, and our field services and we trust that we will be able to improve our services to industry even more with Izette's help.



MEETING A SCIENCE LEGEND

TPCP and CTHB students meet Nobel Prize winner, Prof. Sydney Brenner

Adapted from article prepared by Kirshney Naidoo and Natalie van Zuydam

In March 2008 Prof. Sydney Brenner, a Nobel Laureate for Physiology in Medicine (2002), visited the University of Pretoria to deliver the keynote address at the South African Genetics Society's (SAGS) 20th Biennial congress and as part of the Centennial Celebrations of the University of Pretoria. Delivering his address to an audience that ranged from geneticists to biochemists and curious students all hoping to be inspired by the great man, the allocated time slot seemed to be inadequate. Professor Brenner's talk entitled "Genetics in the next 100 years" addressed the challenge of the genomic era. His message was very simple - in our quest to characterize genomes in their entirety we must not lose track of the comparative sizes of these genomes. "Junk versus Garbage" was a perfect analogy used by Professor Brenner to convey this message. In his words, "we need to discontinue casting the genoscope" and focus our attention on rate of change in comparison to the fixation of genes. Brenner captivated the audience not only by his eccentric personality but also by his sheer charisma for encouraging the science-mind in every person to strive for excellence and always to challenge scientific thought to discover the novelty in all research undertaken.

Having a national, or international conference at the University of Pretoria allowed many students from the TPCP and CTHB programmes to interact with leading geneticists and to present some of the work these two programmes are doing. This in turn provides positive exposure to the forestry industry in South Africa and ensures that we continue producing work of international standard. Talks and posters presented by our students included work on *Chrysosporthe spp.* (canker pathogens of eucalypts), *Ceratocystis spp.* (causal agent of wattle wilt), *Thaumastocoris peregrinus* (the bronze bug on eucalypts), *Fusarium circinatum* (cause of pine pitch canker) and others.

During the conference and other proceedings to celebrate the University's 100th year, several opportunities existed for students and staff of the University to meet Prof. Brenner. A number of TPCP and CTHB students and staff members were among these lucky people, all commenting on what a special privilege it was, to speak to such a renowned scientist.



Pictured with the inspirational Professor Sidney Brenner at the welcome cocktail evening are from left to right, Dr. Colleen Aldous-Mycock, Lieschen De Vos, Kirshney Naidoo, Natalie van Zuydam and Professor Brenda Wingfield of the TPCP and CTHB. (Professor Mike Wingfield in the background)

University of Pretoria presents Chancellor's Medal Award

Prepared by Phindi Nkosi, Marketing Officer, Faculty of Natural and Agricultural Sciences

The University of Pretoria has presented its prestigious Chancellor's Medal Award to two prominent South Africans who have promoted research at the Forestry and Agricultural Biotechnology Institute (FABI) at the University. They are **Rodney Hearne** – a banana production and industry guru, and **Mike Edwards** – a leader in the forestry industry.

The event took place on 14 May 2008 at the Hatfield Campus of the University. It coincided with the 10-year anniversary of the University's Forestry and Agricultural Biotechnology Institute (FABI) as well as the 100-year anniversary of the University of Pretoria. At this meeting, more than 200 local and international scientists were present. The Dean of the Faculty of Natural and Agricultural Sciences, Prof Anton Ströh presented the candidates to the Vice-Principal, Prof Robin Crewe, who officially awarded the Chancellor's Awards to the recipients.

During the past decade, Mr Hearne has contributed immensely to research outputs in the Faculty of Natural and Agricultural Sciences, and particularly through his involvement with FABI. When Hearne first became a banana farmer in 1979, he realized that there was a great need to introduce research into the banana industry as means to improve crop yield and productivity. This resulted in him promoting innovative methodologies, which at that time were new to banana farming.

His vision and insight led to his becoming a member of the board of directors of the Banana Growers Association of South Africa (BGASA) in 1993. In 1998, then as co-chairman of BGASA, he played an integral role in negotiations to

establish banana research at the University of Pretoria. This led to the establishment of the Banana Research Programme and the signing of a five-year research contract between FABI, the University of Pretoria and BGASA. This contract was renewed five years later and the work continues today.

Mr Edwards has made substantial contributions to the South African forestry industry. He has just retired as the Executive Director of Forestry South Africa (FSA), an organisation that binds all the role players involved in commercial forestry in the country. In this capacity, he has guided and defended one of the country's most vital industries.

In 2002 he was actively involved in the creation of Forestry South Africa, an organization that replaced the Forest Owner's Association of which he was the Executive Director from 1991. Amongst others, he is also a member of the board of the Institute for Commercial Forestry Research, a member of the National Forests Advisory Council and a member of the board of the DST/ NRF Centre of Excellence in Tree Health Biotechnology (CTHB).

In 1997, Edwards was involved in negotiations to establish FABI, which houses the Tree Protection Cooperative Programme (TPCP) and the CTHB and has become one of the University's most prominent research hubs. Throughout FABI's ten years of existence, Mike Edwards has guided and supported the Institute. His influence and contributions with regards to the research programmes at the University of Pretoria can be argued to be one of the reasons that FABI was recognized to house one of South Africa's first government recognized Centres of Excellence.

Prof Anton Ströh
(Dean of the Faculty of Natural and Agricultural Sciences),
Prof Mike Wingfield
(Director: Forestry and Agricultural Biotechnology
Research Institute),
**Mr Mike Edwards, Mr Rodney Hearne and
Prof Robin Crewe** (Vice-Principal, University of Pretoria).



CELEBRATING ACHIEVEMENTS in 2008

TPCP and CTHB scientists rewarded for outstanding science

Professor Brenda Wingfield was awarded the national Distinguished Woman Scientist Award in the area of Life Science during an awards dinner in Johannesburg on the 8th of August 2008. This award, made by the South African Department of Science and Technology (DST) celebrates "Women in Science" as a direct response to the vision encapsulated in the National Research and Development Strategy of ultimate improvement in the quality of life of South Africans. The adjudication criteria were a proven research publication record, evidence of international eminence, experience in supervising other researchers, national and/or international acclaim for their research, contribution of research outputs to building the knowledge base and exploitability of outputs.



Prof. Brenda Wingfield

Professor Mike Wingfield was the recipient of two prestigious awards in 2008. On the 29th of July Mike was one of only 12 recipients of a prestigious APS Fellow award handed out by the American Phytopathological Society. The Society grants this honour to a current APS member in recognition of distinguished contributions to plant pathology and/or to The American Phytopathological Society. Fellow recognition is based on significant contributions in one or more of the following areas: original research, teaching, administration, professional and public service, and/or extension and outreach. The ceremony took place at the APS Centennial conference in Minneapolis, USA. To quote the President of the APS, Prof Ray Martyn: "It gives me great pleasure to inform you that you have been elected an APS Fellow this year. As you know,

this is the highest honour our society bestows upon a member and it recognizes your outstanding career and service to APS".

The second award Mike received this year was the Academy of Science of South Africa's (ASSAf) Science-For-Society 2008 Gold Medal. The committee of the ASSAf were particularly impressed by Prof Wingfield's self-initiated research, his record of training postgraduate students and the potential contribution of his research to South African society.



Prof. Mike Wingfield receiving his award from the APS.

Dr. Bernard Slippers was awarded one of the University of Pretoria's seven Exceptional young researcher awards. One of the University of Pretoria's most important goals is its delivery of quality research outputs. To give recognition to the people who are responsible for the establishment and development of the University's reputation as a research institution of note, the University annually holds an Awards Ceremony to honour its outstanding achievers in the academic field.

There are three categories for these awards: the Chancellor's Awards, the Outstanding Achievers: Academic, and the Exceptional Young Researchers Awards.



Dr. Bernard Slippers.

FORESTRY SHINES AT THE ANNUAL FABI 2008 AWARDS

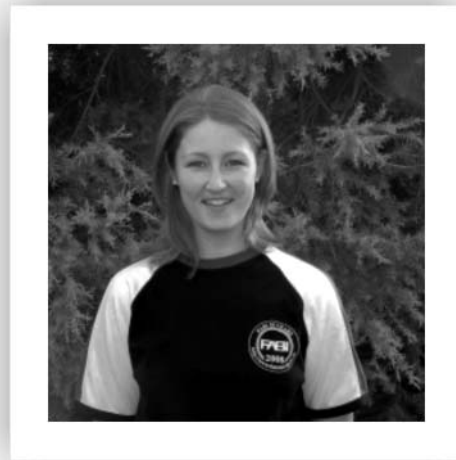
Annually the Forestry and Agricultural Biotechnology Institute (FABI) recognises the contributions of students, staff and persons external to the institute to the development, success and smooth running of the institute. Several students of the TPCP and CTHB, as well as two forestry scientists received awards at this year's FABI year-end function held at the Transvaal Museum in Pretoria on the 8th of November.

Prof. Colin Dyer and **Dr. Bernard Janse** received this year's awards for contributions to the success of FABI by persons external to the University of Pretoria. Their contributions to the development of the forestry research programmes within FABI, as well as general support of science in South Africa were recognised. Colin has played a key role in the development of the TPCP as it currently stands and has made numerous contributions to FABI. He is especially known to students and foresters for his role in the Sirex management programmes and in the Fusarium Working Group. Bernard has in recent years played an especially big role in the development of the Forest Molecular Genetics Programme, but has also been involved with the TPCP for many years. Thank you Colin and Bernard, without people such as you our respective research programmes would not be as successful as they are.

Mrs. Cathy Barnard of the Faculty of Natural and Agricultural Science's administration department received the award for contributions to FABI by a University Staff member, not part of FABI. Cathy provides invaluable support to students and staff of FABI and the rest of the faculty, especially when it comes to registration of new students, submission of theses, graduation and other general administration formalities.

Irene Barnes, a final year PhD student in the TPCP, working on the causal agent of *Dothistroma* needle blight of pines, received

this year's award for the FABIAN of the YEAR. Irene is recognised for her scientific excellence, with 15 publications in international ISI rated journals and numerous talks and posters at local and international conferences. Irene has also served on the FABI social committee, has managed the CTHB's mentorship programme, actively participated in seminars and research meetings through asking questions and making suggestions, to name but a few of her contributions.



Irene Barnes

Joha Grobbelaar, a final year MSc student in the TPCP received the award for "Getting the message to the public". Joha has been involved in training teachers in science as part of a Department of Sciences initiative, has been involved in exposing school children to science, was a great ambassador to science and FABI on research visits to Zambia, a mentor to students and chaperone to guests to FABI, always enthusiastically talking science to all.

Magriet van der Nest, a PhD student working on the *Amylostereum arealoatum* symbiont of *Sirex noctilio*, received one of the mentorship awards in recognition of her contribution to the mentoring and training of fellow students in FABI.

Bernice Porter, a final year M.Sc. student working on *Fusarium circinatum*, the pine pitch canker fungus received the award for the best student website.

FABI, AN INSTITUTE OF MANY TONGUES

The Forestry and Agricultural Biotechnology Institute (FABI), on the main campus of the University of Pretoria, has celebrated its 10th year of existence during 2008. The Institute has tripled from about 50 staff and student members in 1998, to about 150 people at present. As a result of its wide international recognition and collaborations, FABI also draws a substantial number of international guest researchers in the form of academics on sabbatical visits, postdoctoral fellows, as well as PhD and MSc students. Many of these students are full-time students registered at the University of Pretoria, but several others come for periods varying from a few weeks to one year as part of their degree programmes.

The numbers of people and countries represented within FABI is as dynamic as the Institute itself, and change almost on a weekly basis as some people leave and others arrive. During October 2008, a survey was conducted among 112 Fabians to determine their countries of origin and which languages they speak. The results surprised even the Fabians themselves!

The 112 Fabians questioned came from 26 different countries, representing all inhabited continents. The majority obviously came from South Africa, but 13 came from the rest of Africa, 12 from Asia, 9 from Europe, 5 from South America, and one each from Australia and the USA.

English is the operational language within FABI and spoken by all Fabians. However, English is mother tongue to only 26 Fabians, and second or third language to all the other Fabians. Nine of the eleven official languages of South Africa (indicated by * in Table) are spoken as mother tongue in FABI. The remaining two official languages, SeSotho and SiSwati, are respectively spoken by 6 and 2 Fabians as an additional language. This means that all 11 official languages can be spoken by Fabians. In total, 29 mother tongues are spoken in FABI with another 25 languages spoken as additional languages, bringing the total number of languages to 54!

Languages spoken by Fabians

Language	Mother tongue ¹	Additional language ¹
*Afrikaans	38	26
*English	26	86
German	5	4
Spanish	4	4
*Xhosa (isiXhosa)	4	
Amharic (Ethiopia)	2	
Chinese	2	
French	2	13
*Ndebele (isiNdebele)	2	1
Serbian	2	
Shona (Zimbabwe)	2	
*Venda (Tshivenda)	2	2
Arabic (Oman, Iran, etc.)	1	1
Hindi (India)	1	3
Bemba (Zambia)	1	

Language	Mother tongue ¹	Additional language ¹
Finnish	1	
Flemish (Belgium)	1	
Fotouni (Cameroon)	1	
Indonesian	1	
Korean	1	
*Northern Sotho (Sepedi)	1	12
Persian (Iran)	1	
Swiss German (Switzerland)	1	
Tamil (India)	1	1
Thai	1	
*Tsonga (Xitsonga)	1	3
*Tswana (Setswana)	1	6
Vietnamese	1	
*Zulu (isiZulu)	1	11

* Official languages of South Africa

1 E.g. Afrikaans is mother tongue to 38 Fabians, and spoken as an additional (2nd, 3rd, 4th, or 5th) language by 26 more Fabians.

FABI CELEBRATES TEN YEARS OF EXCELLENCE

The Forestry and Agricultural Biotechnology Institute (FABI) located at the University of Pretoria's main campus celebrated its 10th year of existence in 2008. FABI is a post graduate research institute in which research and education is focussed broadly on the improvement of crops related to Forestry and Agriculture. The Institute resides within the structures of the Faculty of Natural and Agricultural Sciences and links departments such as those of Genetics, Biochemistry, Plant Sciences, Plant Production, Microbiology and Plant Pathology as well as Zoology and Entomology.

"This is a year where we not only celebrate the 10th anniversary of FABI but the 100th Anniversary of the University of Pretoria. The establishment of FABI can only be described as a resounding success. The Institute has grown and excelled far beyond the expectations of its stakeholders, the University of Pretoria and the many funding agencies, government, state and private companies that support its research. Individual FABIANS have won countless awards for research excellence and the Institute as a whole has been the recipient of numerous awards and accolades. And all of these accomplishments have come to us in only ten years," said Prof Wingfield, Director of FABI. He continued to describe the exceptional grounds that FABI has covered since its official inception in 1998.

Various internationally acclaimed researchers have risen from FABI and/or have been affiliated with it. A further accolade with which the Institute is particularly proud is its association with numerous exceptional female scientists. The fact that Professors Brenda Wingfield, Jolanda Roux and Dr Marieka Gryzenhout were amongst those awarded for their excellent research contributions in 2007 was particularly pleasing. In this regard, Professors Wingfield and Roux received Women in Water, Sanitation and Forestry Awards from the Department of Water Affairs and Forestry and Dr Gryzenhout was one of the recipients of the Department of Science and Technology's L'oreal "Women in Science Awards 2007". Furthermore, Prof. Brenda Wingfield was runner-up in the Department of Science and Technology award for exceptional research contributions by a woman scientist in 2007.

One of FABI's key aims has been to expand research opportunities and education in the rapidly growing areas of molecular biology, particularly nucleic acid based research and recombinant DNA technology. Furthermore, it has played a critical role in the establishment of a dynamic, post-graduate research environment, which has included a strong focus on building collaborative research across disciplines.

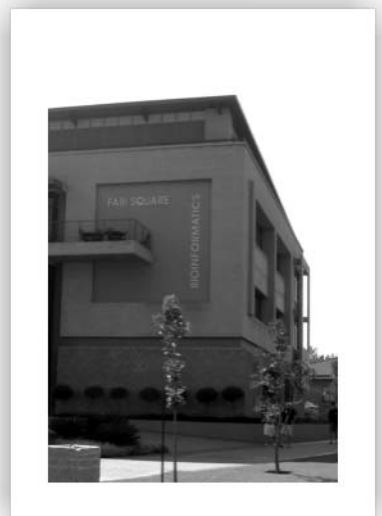
According to Prof Wingfield, FABI was a mere construct of a group of people with a vision in early 1997. "The first pioneers from Bloemfontein arrived on the Campus of the University of Pretoria in

December of 1997. These 'trailblazing researchers' occupied the new sixth floor FABI laboratories and they helped to pave the way for the 50 students and scientists that followed in two waves during the following year. That paving was an important part of what must have been one of the largest relocations of any research group in the history of South Africa. The relocation of equipment needed to be negotiated, new salary packages and appointments resolved and many of those making the move had very special needs. One of the teams needed to relocate not only her family but a herd of breeding cattle," elaborates Prof Wingfield when asked about the transition of the concept to the actual realization of FABI as it is celebrated today.

Thus FABI was born in 1998. It rose from modest beginnings with a group of core academics, technical staff and post graduate students numbering about 50. It is worth mentioning that the group has grown to about 180 within the decade. This multinational group is so diverse in its composition – Prof Wingfield argues that at least 30 different languages are spoken at any one time. The escalating growth in student numbers eventually led to the expansion of physical facilities. Thus the FABI Square/Bioinformatics was conceived and completed in 2003. The Institute is rapidly moving towards a point where additional facilities are required to allow for further expansion.



**Prof Wingfield,
Mondi Professor of
Forest Pathology and
Director of FABI**



FABI's 10th anniversary celebrations included a Colloquium to celebrate 10 years of FABI and the activities of the Department of Science and Technology/NRF Centres of Excellence (CoE). This is particularly justified by the fact that FABI houses the DST/NRF Centre of Excellence in Tree Health Biotechnology (CTHB), which was one of the first six Centres of Excellence recognised by the DST and NRF. The CoE's are physical or virtual centres of research which channel current capacity and resources to enable researchers to join forces across disciplines and institutions, on long-term projects that are locally relevant and globally competitive in order to improve the quest of research excellence and capacity development

The 9th International Congress of Plant Pathology-ICPP 2008

The 9th International Congress of Plant Pathology (ICPP) was held in the scenic city of Torino, in Northern Italy during August 2008. Five staff members and four students supported through the CTHB and TPCP had the privilege of attending this meeting. ICPP, held every 5 years, is the single largest meeting of plant pathologists who gather and share new developments in plant pathology. This year more than 1500 delegates from more than 90 countries attended the meeting. FABIans not only attended, but also made a substantial contribution to the larger meeting with 2 invited lectures and short presentations and 18 poster presentations.

The title of this year's meeting was "Healthy and safe food for everybody". A wide variety of topics was covered, including global food security, climate change, recent developments in disease control and prevention, breeding for resistance, and diagnostics and taxonomy. Although the majority of research results presented dealt with food crops and fruit trees, forest pathology was well represented. Several of the most prominent forest pathologists in the world attended the meeting, and apart from the symposia with formal presentations, the forest pathologists also organized a meeting to strategize on improving the visibility of forest pathology at such international congresses in future. Prof Jolanda Roux from FABI was elected chairperson of the working group responsible for coordinating these efforts.



Fabians attending the ICPP in Torino, Italy, tasting some good Italian ice cream.

Many of the TPCP/CTHB group ended their Italian experience with the forest pathology field tour to the Aosta valley on the border of Italy and Switzerland. The forests in the Aosta Valley cover about 100 000 ha and are mostly composed of coniferous trees such as Larch, Norway spruce and Scots pine in pure and mixed natural stands. Diseases of conifers were the main topics of the excursion and were illustrated by two presentations, one on the decline of *Pinus sylvestris* in the Alps and the other on *Heterobasidion anossom* root rot of coniferous species, and one of the most serious forest diseases in

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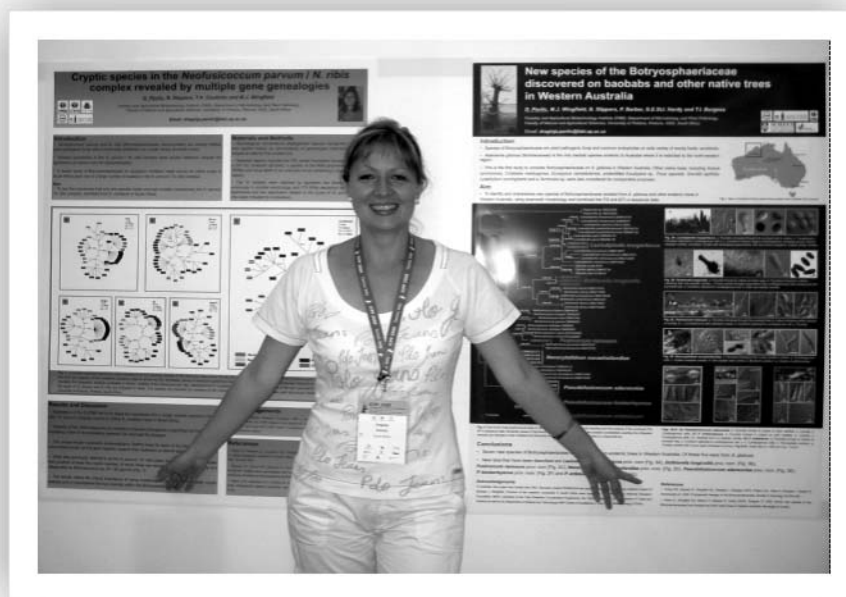
this region. In Italy it also represents an important example of what the result of the introduction of new genotypes of a pathogen can be.

The value to those attending these meetings is hard to quantify, but there are several levels of advantages. The first is that it serves as an international platform to present our results to peers in the field. Secondly, you get exposed to new ideas and modern techniques, which force you to compare the quality of your research with what is happening in the rest of the world. Thirdly, the opportunity is there to meet and interact with world leaders in your field, and most often research collaborations with scientists from other countries is initiated through these interactions.

Our thanks to the CTHB and TPCP programmes for sponsoring attendance at ICPP.



The group of international forest pathologists attending ICPP.



Draginja Pavlic, PhD candidate in the TPCP group with her two posters exhibited at the ICPP 2008.

Understanding the friends and foes of Sirex

We have often written in TPCP newsletters about the more practical aspects of the TPCP Sirex program. Field surveys, broad overviews of in field control programmes, nematode biological control and its commercial production and more. But this does not reveal the broad research base that supports these activities. This article aims to give such a broad overview.

The oldest part of the TPCP Sirex research programme is that focussing on the symbiotic fungus, *Amylostereum areolatum*. This work dates back to the first discovery of Sirex in the Cape province in the mid 1990's. The first focus was to establish protocols to handle and study the fungus, as well as to confirm its identity. A next step involved understanding its population diversity and comparing it with the rest of the world. Amazingly, this work indicated a clonal population in South Africa and South America, and a distinctly different strain of the fungus associated with the biocontrol nematode, *Deladenus siricidicola*. This work continues to form a strong foundation of many aspects of the Sirex control program.

In recent years population work on the *Amylostereum* fungal symbiont of Sirex, locally and throughout its native and introduced range, revealed the pattern of how this wasp-fungus symbionts have been spread by humans. It also has much relevance to biological control programs. We have also produced a detailed genomic linkage maps, with which various genetic aspects of this fungus can be mapped. Using such this map and other tools ground breaking insights have been gained into the molecular mechanisms controlling mating and self-recognition in the fungus.

It is off course most important to understand the Sirex wasp itself. Much effort has been spent to document the phenology or life cycle, and how this is influenced by the tree and the environment. We are also considering population growth models and understanding

sex ratios to help guide future control efforts. Furthermore, molecular work has helped to determine the wasp diversity, which is compared patterns of diversity and spread of fungus and used to track populations in South Africa. Important recent work has centred on the attraction of the wasp to different volatiles lures and traps, in order to support the all important monitoring network.

The bulk of the current work focuses on the biological control agents, both using the nematode *Deladenus siricidicola* and the parasitic wasp *Ibalia leucospoides*. All aspects of the nematode are dealt with; from the practical handling of the nematode, to studying individual nematodes in the laboratory, long term storage at -180C, packaging, transport, inoculation in logs in the field and monitoring of its success afterwards. We also study intricate aspects of how much diversity we have within nematode populations in South Africa and abroad, and how this influences the adaptive ability of the nematode to our conditions, fungi and wasps. Not the least, is the commercial production of the nematodes for inoculation programs in the field – 3 billion in total last year, and one of the largest undertakings of its kind ever.

An aspect of the Sirex control that is often overlooked is that it involves sensitive and obligate relationships between the wasp, a specific fungus, the tree and the biological control agents, all of which are differently affected by variable environments. The work of the TPCP Sirex research program provides the tools and detailed insight which allows us to unravel these complex interactions, in order to ensure a successful and sustainable control program.



International Union of Forest Research Organizations (IUFRO) Entomology Meeting Report – Recent Advances in Forest Entomology

From the 1 - 6 July 2008 forest entomologists gathered in Pretoria, South Africa to participate in the IUFRO working Group 7.3.00 Recent Advances in Forest Entomology congress. Sixty three delegates, from twenty one countries (Argentina, Australia, Brazil, Canada, Chile, China, Czech Republic, France, Finland, Hungary, Indonesia, New Zealand, Northern Ireland, South Africa, Sweden, Switzerland, Russia, Spain, Uruguay, USA and Zambia), participated in this congress. As the International Congress of Entomology (ICE) was held in Durban from the 6 – 11 July, it was ideal to have a more focused forest entomology congress beforehand.

The IUFRO congress was held at the ABSA Conference Centre in Montana, Pretoria with all delegates being accommodated at the centre. This allowed maximum interaction among delegates on a social and work-related basis. The congress commenced on the evening of the 1 July with three talks. The themes covered in

talks on the second day included symbioses between beetles and trees, moth pests of forests, pheromones as a means to control insect pests and much more. The evening commenced with a tour of the FABI buildings and facilities followed by an African drumming experience which was thoroughly enjoyed by all. Talks on the third day included a number focussing on South African forest pests such as *Sirex*, *Thaumastocoris*, *Leptocybe* and various native pests. In all, the three keynote presentations, thirty-four oral, and ten poster presentations touched on virtually every topic of current interest in forest entomology, and lead to vigorous exchanges of ideas.

Early on Friday morning all delegates departed from the conference centre on a bus trip to Hluhluwe. In Lothair, Mpumalanga, a field stop was made to observe damage to *Eucalyptus nitens* by Cossid moths and to discuss general aspects relating to forest pests in *Eucalyptus* plantations in South Africa. Most of Saturday

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Attendees of the IUFRO meeting in the *Eucalyptus* plantation at Lothair



was spent in Hluhluwe-Umfolozi Game Reserve on a game drive with the evening being free for socialising and interacting. The group departed from Hluhluwe on Sunday and headed for Durban to the ICE. En route to Durban, at Kwambonambi, *Thaumastocoris* damage was observed, a topic that raised much interest and discussion throughout the meeting. We also took the time to show the delegates some fungal diseases, particularly *Coniothyrium* stem canker, which also served as a good way in which to discuss the history of the TPCP and forest protection in South Africa. The IUFRO entomology meeting ended on Sunday afternoon with delegates being taken to their respective hotels in Durban – some staying on to participate in ICE; others returning home.

We would like to take this opportunity to thank all our forestry partners who assisted with various aspects of the meeting, including getting up on a Sunday to talk to a bunch of scientists! Thanks Fanie du Toit (Sappi, Lothair) and Richard Lindley (Mondi, Kwambonambi) for help with the field stops.

Towards

Understanding & Controlling

Thaumastocoris peregrinus

Thaumastocoris peregrinus is a serious pest and of major concern to Eucalyptus growers across Southern Africa and eastern parts of South America. In order to assess risk and design future control strategies, it is important to understand the pest's population dynamics. For this reason, a TPCP *Thaumastocoris* monitoring network was established across South Africa in

February 2007. This entails weekly monitoring of 20 traps at each of 7 sites by 6 people, a large undertaking.

The monitoring network has substantially improved our understanding of *T. peregrinus* populations across South Africa over the past year and a half. The populations of *T. peregrinus* fluctuated greatly over the sampling period, revealing unique patterns of build-up and decline at the various sampling sites. For example, the greatest mean numbers of *T. peregrinus* adults were found within the Pretoria site and the lowest within the Piet Retief and Zululand sites (Fig 1). In 2007 and 2008 the two Tzaneen sampling sites in addition to the Sabie site showed an increase in the number of *T. peregrinus* adults from mid July. The Pretoria site showed an increase in numbers from mid January, peaking in early March before declining to very low numbers during the winter months (Fig 1).

Biological control is currently deemed to be the only viable possibility to control *T. peregrinus* populations. A greater understanding of *T. peregrinus* population dynamics in Australia and the discovery of an egg parasitoid, *Cleruchoides noackae* (Fig 2) (Mymaridae) in this country in 2007, meant that the TPCP could proceed with biological control research. After obtaining collecting, export and import permits from the relevant authorities, we undertook surveys and collections in Australia in May 2008. For this purpose, funding was provided by Forestry South Africa to send Ryan Nadel and biological control expert and extra ordinary professor at FABI, Prof. Stefan Naser, to Australia. During a period of two weeks they sampled around Brisbane, Sydney and Perth with various Australian collaborators.

The collections in Australia were very successful and specimens of the wasp *Cleruchoides noackae* (Fig 2) were imported into quarantine in South Africa for the study.



As virtually nothing is known about this parasitoid, a considerable amount of work concerning the biology and host preference is still to be undertaken. Furthermore, its potential as a biological control agent also needs to be

assessed before eventual release permits can be applied for. Although the development of such a biological control programme is a long and tedious process, it is of high priority given the damage and threat of *T. peregrinus* and the absence of other realistic options.

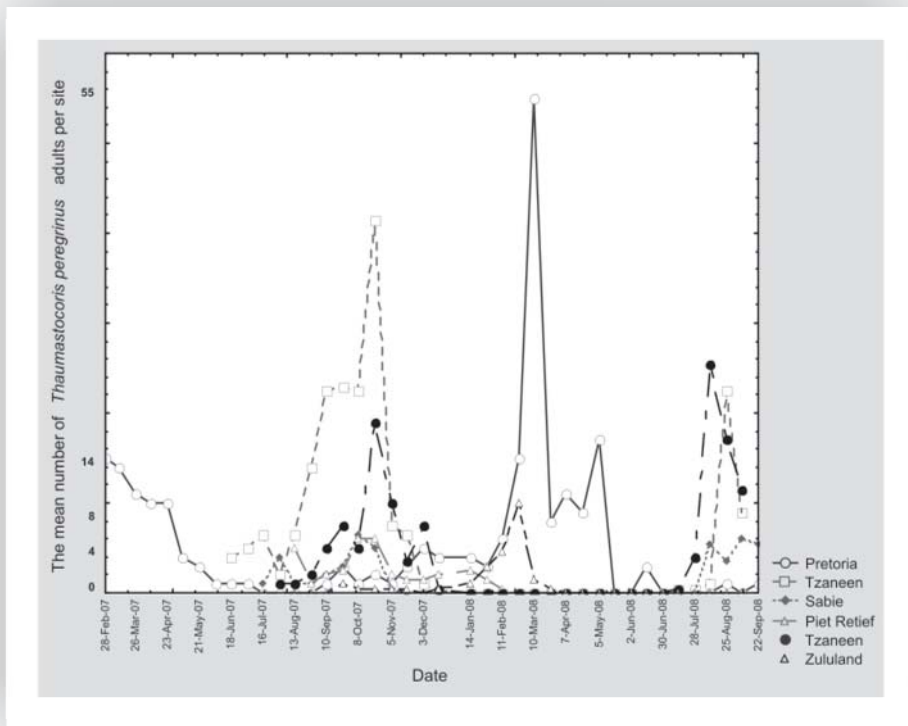


Figure 1:
An overview of the mean number of *Thaumastocoris peregrinus* adults caught at each sampling sites calculated on a fortnightly basis

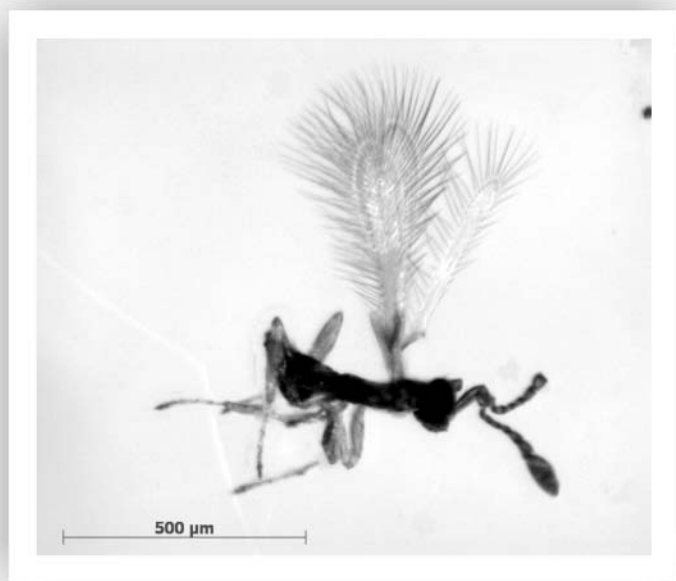


Figure 2:
The egg parasitoid
Cleruchooides noackae

Acknowledgements

- We thank Prof Stefan Naser, Dr. Simon Lawson and Ms Annie Noack for their assistance in Australia.
- We acknowledge Forestry South Africa for their financial assistance that allowed us to undertake the biological control survey trip in Australia.
- We would like to thank the following for their assistance with this TPCP monitoring trial: Botha Maree, Sonia du Buisson, Maurits Perold (Hans Merensky), Rhudolf Müller (Mondi), Denis Oscroft and Tammy Swain (ICFR), Glen Mitchell and Kholisa Langa (KLF).
- The National Zoological Gardens are thanked for allowing us to use the Tom Jenkins Eucalyptus plantation as one of our sampling sites. The South African Weather Service is acknowledged for providing rainfall data for this study.

News from the Fusarium Pine Screening Programme

The fight against *Fusarium circinatum*, the cause of huge losses to especially *P. patula* and *P. radiata* in South African nurseries continues at the TPCP. This pathogen has in recent years also been identified as causing full blown pitch canker on older pine trees in the plantations of the Western, Southern and Eastern Cape Province, placing even more pressure on tree breeders, foresters and scientists to manage its impact. The TPCP has been actively involved in studying this important pathogen since its first report in South Africa in the early 1990s.

We have thus been active in developing nursery hygiene practices and rapid identification techniques for *F. circinatum*, as well as actively contributing to the Pine *Fusarium* Working Group (managed by Paul Viero at the ICFR). Another contribution by the TPCP has been the optimization of effective techniques for screening pines for their susceptibility to *F. circinatum*. One of the outcomes of these trials has been the establishment of a *Fusarium* pine screening programme which evaluates pine breeding material for member companies of the screening programme.



Mature pine tree showing resin exudation as a result of infection by *F. circinatum*

As Izette Greyling completed her Masters degree (Congratulations!), and taken on the position of Entomology field extension manager, Bernice Porter has taken over the interim management of the pine screening facility, and *Fusarium circinatum* diagnostic PCR's for the disease clinic. Bernice has been working on *F. circinatum* for a number of years as part of her MSc. and has been actively involved in optimizing the inoculation techniques used in the screening facility and is thus a

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Bernice Porter in the *Fusarium* screening facility.



very appropriate manager for the programme.

The screening activities rely heavily on student volunteers from FABI, who under Bernice's guidance does all the inoculations and evaluation of results. Thank you to this wonderful group of people for helping with this process.

Two screening sessions have taken place in 2008.



Student volunteers busy evaluating one of the trials.

In total, approximately 23000 pine seedlings and cuttings were evaluated in the March 2008 inoculation. Inoculations lasted 1 day, with 3 whole days being used for the reading of the trial. The second screening was inoculated in November, comprising approximately 15000 pine seedlings and cuttings and the results will be collected in the 3rd week of January 2009.

The selection of disease tolerant genotypes is of crucial importance to the long term survival of *P. patula* and other pine genotypes in South Africa and we encourage all pine growing companies to invest in strong breeding programmes for their businesses.

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LEPTOCYBE INVASA SPREADING – PLEASE HELP US MONITOR

Leptocybe invasa (blue gum chalcid), the latest Eucalypt pest to arrive in South Africa, is spreading.

This insect, first detected in Israel in 2003, and from there steadily spreading south, was first reported from South Africa in 2007 by Prof. Stefan Naser (Extraordinary Professor at FABI and formerly of the ARC). Last year it was known only from the Pretoria and Britz areas, as well as a report by Stefan from Upington. During 2008 it has been detected causing considerable damage to jungle stands of eucalypts in the Limpopo Province around the towns of Bela Bela (Warmbad) and Modimolle (Nylstroom).

We urge all foresters, farmers and the public to keep their eyes open for this pest and to alert us to its occurrence in your area. To date, although infesting many different eucalypt species, it seems to first appear on *E. camaldulensis* (and hybrids).

Please do not move around infected plants or plant material if you suspect its presence.

