CTHB

Tree Protection News

tpcp

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

VOL: 24 **December 2012**

FROM THE DIRECTOR'S DESK

A substantial component of the research conducted by staff and students of the Tree Protection Co-operative Programme (TPCP) and the DST/NRF Centre of Excellence in Tree Health Biotechnology falls withing the field of INVASION BIOLOGY. For us, this encompasses the study of invasive alien pests and pathogens that infect trees in plantations (TPCP) and in natural ecosystems (CTHB). A point I heard made at a recent meeting of the Royal Society of South Africa was that news relating to invasion biology is always bad news…indeed that the news of dreadful new invasions appears to be growing increasingly worse. While I am as worried as most others who care about forestry and the environment, I do think we fail to consider the many examples of good news that are also found in this area of study. For example, there have been some great successes in the biological control of invasive alien organisms, also relevant to forestry in South Africa. We also tend to forget that many invasive aliens are based on very limited genetic diversity and that the genetic bottlenecks make them heavily vulnerable.

***Glycaspis* red gum lerp psyllid detected in South Africa**
Paragraph 1

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It is difficult to tell how vulnerable an invasive pest or pathogen will be to natural demise in an invaded area. But there are numerous examples of populations of invasives suddenly collapsing, presumably due to diseases that have appeared naturally. The collapse of the budgerigar invasion in California is a classic example. SO the question arises as to how long it might take for an invasion such as for example *Thuaumastocoris peregrinus* to decline naturally.

Here, I believe that the problem is that we tend to see these problems within very short time spans….. our perspective of time is typically our own life-span, for example 100 years. But biological processes are much more complex than this and change is most likely to occur much more slowly in many cases. Perhaps a 1000 years would be a reasonable length of time to see populations of invasive pests or pathogens declining naturally. Clearly this is much too long to be comfortable for commercial forestry or agriculture and thus we must rely strongly on augmenting the process through the introduction of biological control agents.

Of late, there has been some very good news relating to TPCP activities in the area of biological control. During the last few months, and with the invaluable help of various members of the TPCP Board, we were able to gain permission to release a most promising biological control agent for the gall wasp *Leptocybe invasa*. This parasitoid wasp, the recently discovered and named *Selitrichoides neseri*, was released for the first time on the Zululand coast on Wednesday 25th July. We now wait with great interest to see whether it has become established and how it will spread. Furthermore, new releases are planned once populations of the parasitoid have been built up. While it is impossible to know how effective this biological control agent will be, all indications from laboratory and green-house studies lead us to feel very optimistic. Clearly, this is no "silver bullet" – we will need to augment the biological control with various other components of our Integrated Pest Management armoury, but it is an important step in the right direction. We are also very grateful to the many people- researchers, administrators and foresters, who have made it possible to reach this point.

On the somewhat negative side, the past few months has brought the definitive confirmation that the red gum lerp psyllid *Glycaspis brimblecombei* has reached South Africa. This pest has been expected for some time because it has been moving globally outside its Australian native range for many years. It has also been known to be present in Mauritius, not far from our shores. With such invasions, it is impossible to really know when the first individual of a pest arrived. They can be present for many years without being obvious and prior to a significant population build-up. Yet in the case of commercial forestry, where there is an abundance of genetically uniform and susceptible host material, population explosions, at least where they have the capacity to appear, can occur rapidly. We now wait to see how *G. brimblecombei* spreads, while at the same time embarking on a serious initiative to develop biological control options for the pest.

Subsequent to the last issue of Tree Health News, the CTHB received the good news that the Honorable Minister of the Department of Science and Technology Naledi Pandoor is sufficiently impressed with the Centres of Excellence that she will ensure their continued funding. This has been a matter of great concern to the CoE/'s no less the CTHB that links very closely with the TPCP. The current term of the CoE's is set to end in 2014 and if they were to be closed, the last students with support from the Centers would need to already be in the system. The new funding cycle will run from 2015-2019 and will enable the CoE's to continue to contribute substantially to South Africa's Science base and to education of scientists in this country.

We are rapidly moving towards the end of another year. A year that has been packed with tree health research and I am happy to say many substantial accomplishments. One of these milestones that comes to mind immediately is the completion of Ph.D. degrees by three TPCP team members that were part of the move to Pretoria from Bloemfontein in 1997/1998.

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The completion of doctorates by Lieschen de Vos, Wilhelm de Beer and Albe van der Merwe marks the end of an Era. While we have now been operating in FABI for 15 years, our roots in Bloemfotein remain clearly embedded in many components of FABI. At least half of the 22 academics that lead FABI came to Pretoria with the group and while we have rapidly grown and become established in Pretoria, many of the original "trail blazers" make up the current leadership team. Clearly this is different for students who typically leave after degrees have been completed and I don't think that there is a single student in the 180 person –strong FABI community that came with us from Bloemfontein. Lieschen, Wilhelm and Albe have closed the loop.

As we move seemingly at lightning speed towards the Summer holiday season, I take this opportunity to thank all of those that support the TPCP and CTHB for amazing contributions in so many different manifestations. The TPCP and CTHB draw deeply on each other for support and they in turn benefit from many levels of leverage. This leverage is by no means only financial. It is deeply set in terms of research collaboration, education at many different levels as well as in terms of extension and community engagement. We thank every one of the huge community that contribute to the growth and accomplishments of a truly remarkable programme. Further also to wish you very best wishes for the Christmas/Holiday season and for a happy and healthy 2013.

Mike Wingfield
Director TPCP and CTHB

FIELD EXTENSION NEWS

Prof. Mike Wingfield and visiting scientists looking at a *Eucalyptus* disease problem in the Zululand area.

It has been another busy year for the TPCP and CTHB research programmes. The team went on well over 50 fieldtrips to various parts of the country. These fieldtrips have various aims, including diagnostics for member companies, extension, presentations at field days, research field experiments, student training, monitoring and surveillance.

One of the more concerning problems currently being investigated by the TPCP is the die-back of a Eucalypt clone in Zululand. Decline and death of patches of *Eucalyptus* hybrids was first noted in 2010 with mortality spreading rapidly with up to 90% of some compartments affected. Subsequent DNA fingerprinting indicated that the affected trees belong to a single clone. Symptoms observed include leaf yellowing and wilting, usually in the top to mid canopy. Staining and discoloration of the internal vascular tissue was noted in the roots, root collar and/or stems of the affected trees, and no external bark or stem cankers were visible. Root symptoms were very mild in most cases and xylem symptoms were most pronounced in the stems above ground. Insect activity was present in some trees in the form of frass exudation and small insect tunnels. Investigations are currently underway to determine the cause of the problem as well as to determine the possible involvement of microbial pathogens in the death of these trees.

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These investigations form part of a PhD project undertaken by Izette Greyling. Early results suggest that pathogens or pest may not be the primary cause of the problem but considerable work still needs to be done to tease apart this complex problem.

An insect pest which is less known by most, but has been known to affect *Pinus* species before, and which has increased in abundance the last two years is the Pine brown tail moth, *Euproctis terminales*. Reports have been received that outbreaks of the pest have increased in frequency and severity the past 2 years over the South Eastern parts of Mpumalanga.

Larvae of Pine brown tail moth

Euproctis terminales is a native insect that has adapted to feeding on our non-native plantation species, in this case Pine. The relatively small (wingspan of about 25 mm) deep brown-orange to yellow moths, which all bear a distinctive brown tuft at the base of the abdomen, emerge from cocoons under the leaf litter in spring. Females are capable of laying up to 300 eggs, which usually hatch in autumn. The larvae or caterpillars are about 2-3 cm long when fully grown and are characteristically hairy with long white hairs on their body which cause skin irritation when touched. They feed and grow during winter with larvae feeding mostly on the base of needles. The needles then drop from the tree and in this way the whole tree can be defoliated. When ready, the larvae drop to the ground and pupate in spun cocoons about 10-25 cm under the leaf litter. There are several natural enemies of the pest, although chemical control measures have also been applied to control the pest during outbreaks.

We encourage all foresters, farmers, conservationists to contact the TPCP and CTHB programmes if they observe disease problems on trees.

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Hilcrest, Pretoria, 0002, Gauteng

FLOATING BALLS & MAGIC MONDRIANS: NATIONAL SCIENCE WEEK 2012

This year the Centre of Excellence in Tree Health Biotechnology (CTHB) again funded participation in the National Science week (NSW) in Piet Retief. During the week of 30 July to 3 Augustus, the CTHB team had the opportunity of sharing their excitement and passion for science through the demonstration of colourful and fun experiments. The theme for this year was "Science at Home", and all experiments were designed to allow learners to repeat what they learned during the demonstrations at home and school.

Two of the teachers enjoying the effects of the Magic Mandrain

The CTHB team, including Amy Wooding, Katie Termer, Osmond Mlonyeni, Barend Jansen van Vuuren and Markus Wilken (all students from FABI), left for the Mondi Science Centre in Piet Retief on Sunday 29 July. With aid of light from the headlights of the FABI vehicle, the team started to set up their exhibition that evening. This ensured that everything was ready by the time the first group of learners arrived early on Monday morning.

A number of fun and interactive experiments made sure that never there was a dull moment! Using only a hairdryer and a ping-pong ball, Bernoulli's principle was illustrated in a very fun way.

The airspeed and pressure changes allow the ball to float in the stream of air, much to everyone's surprise! And when this was linked back to how airplanes fly, it became a science lesson that the learners will never forget.

Using lenses from an old set of 3D glasses, light from a fluorescent light bulb gets polarized into different colours. Wearing their own sets of polarized lenses, the light suddenly becomes a mixture of different colours, much to the delight of the learners. This experiment not only draws on the principles of light propagation, but also resembled the painting style of artist Piet Mondrian. For this reason, the experiment was aptly named Magic Mondrians.

CTHB team members, Katie Termer (left) **& Amy Wooding** (right), **posing with learners.**

A cornerstone of most biological experiments is the ability to extract DNA from cells. To the untrained ear, this sounds like an exercise that should stay in the lab. Using "biological material" (an onion in our case), dishwashing liquid, salt and rubbing alcohol, anyone can extract DNA at home. During this process, a group of grade 10 learners were able to pick out strands of onion DNA out from a solution using only a toothpick! Seeing is believing, and being able to see the molecule of life is truly special.

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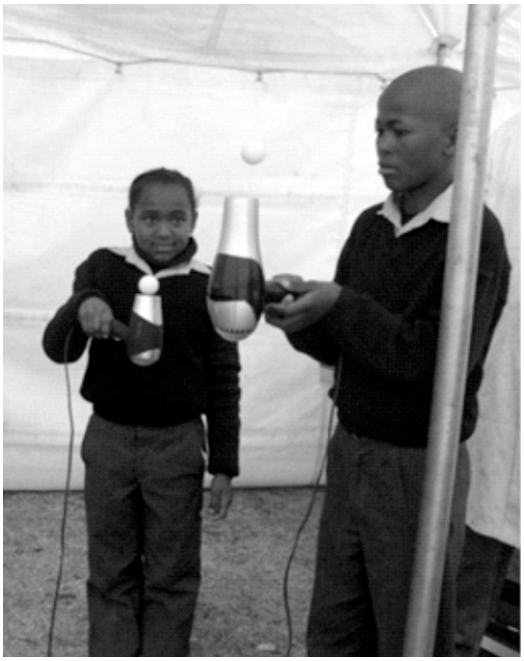


Two learners playing with the floating ball illusion. Brenoulli's principal at work!

The key to a successful science week presentation is simple. Enthusiasm, a love for science and interactive experiments will ensure that the crowd thoroughly enjoys what is presented. We were very fortunate to have team members that thoroughly enjoyed sharing this love with the learners.

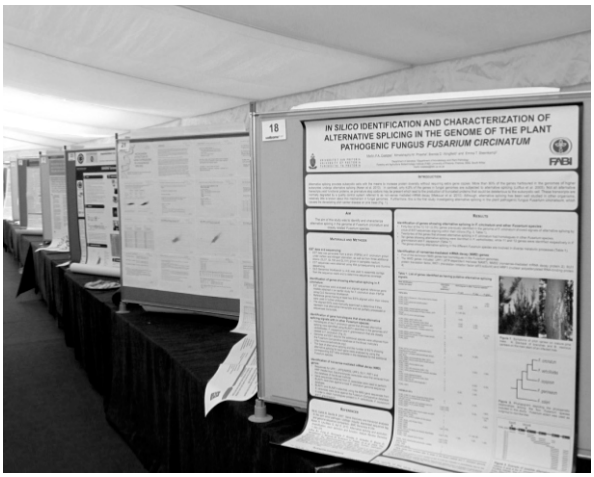
To spread the word about science and technology is an important part of a scientist's job. This ensures that the message of science will be spread to the public, helping them understand what we do. It ensures that the youth have an understanding and interest in science as a possible career.

It is our hope that these small contributions will inspire learners to become the next generation of scientists.

GENOMICS, BIOINFORMATICS & BIOLOGY

THE GENOME INFORMATICS CONFERENCE (CAMBRIDGE, 2012)

Genomics is a discipline in Biological Sciences concerned with the study of the genomes of organisms. Information gleaned from this research enable scientists to develop models explaining the evolution of genomes, characterise genes and pathways that are of particular interest to their research, or to gain knowledge regarding the genetic diversity of organisms. Genome research has experienced an explosive growth since the first genome of a eukaryotic organism, that of the budding yeast *Saccharomyces cerevisiae* (bakers yeast), was published in 1996.



Poster presented by Dr. Coetzee during the Genome Informatics Conference

Currently at least 7500 fungal genome projects are either complete or in progress. Within the TPCP / CTHB, at least 16 projects focus on the genomics of pests and pathogens of native and commercially important trees.

Conducting research on genomes is impossible without the contribution from Bioinformatics, which is the study of methods and the development of tools used by biologists for storing, retrieving and analysing biological data such as nucleic acid (DNA/RNA) sequences and protein structure, function and pathways.

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The conference venue - Robinson College
(Cambridge University).

When bioinformatics is specifically applied to genome research, this is referred to as genome informatics. Genome informatics therefore forms the bridge connecting the two disciplines in biological sciences.

This year the twelfth Wellcome Trust Scientific Conferences/Cold Spring Harbor Laboratory conference on Genome Informatics was held in Cambridge. The conference was attended by Dr. Martin Coetzee whose research within the TPCP / CTHB has a strong genomics component. The Genome Informatics conference focused on the management and analysis of large-scale genome data, such as whole genome comparisons within and among species and strains, the analysis of results from high-throughput experiments to uncover cellular pathways and molecular interactions, and the design of effective algorithms to conduct the analyses.

WHO'S WHO IN THE TPCP/CTHB

Samantha Bush: Technical Staff

Nationality: South African

Research / Expertise:
I am part of a team of students and researchers looking into potential biological control agents on two eucalyptus pests, namely *Leptocybe invasa* and *Thaumastocoris peregrinus*. The majority of the work I do is in the new quarantine facility on the Experimental Farm. This facility was built so that we can assess the impact of our potential biological control agents on both the pest insect species and our indigenous insect species. Part of my position is to ensure that there are enough potential biological control agents available for experimental work and undertaking some of the experiments, this involves rearing not only the potential biological control agents but also keeping a supply of our pest species.

Hobbies / Interests:
I enjoy geocaching, reading and watching movies.

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Osmond Mlonyeni: PhD Student

Nationality: South African

Research / Expertise:
The insect parasitic nematode, *Deladenus siricidicola,* forms the cornerstone of the biological control programme against the most damaging invasive pest to *Pinus* sp. in southern hemisphere plantations, *Sirex noctilio* and its obligate mutualist fungal symbiont *Amylostereum areolatum*. However, the efficacy of the highly inbred population of *D. siricidicola* has varied significantly in different regions of the southern hemisphere. To unlock the secrets underlying biological processes involved in *D. siricidicola* parasitism, we are sequencing its genome. The aim of my research is to understand the function and evolution of virulence in *D. siricidicola* in order to better improve the biological control system of the *Sirex noctilio* woodwasp.

Hobbies/Interest:
My interests are reading and sports, in particular playing and watching cricket and soccer.

SAASVELD FORESTRY STUDENTS AT TPCP

As in previous years, the TPCP played host to two forestry students from the Nelson Mandela Metropolitan University's Saasveld campus.

Sandisiwe Jali and Celani Nkosi

Sandisiwe Jali and Celani Nkosi, both second year forestry students, started their experiential training with the TPCP in April, with Sandisiwe's focus being pathology and Celani's entomology. Since then they have been exposed to the major forestry pests and pathogens in South Africa.

Sandisiwe collecting logs for beetle emergence

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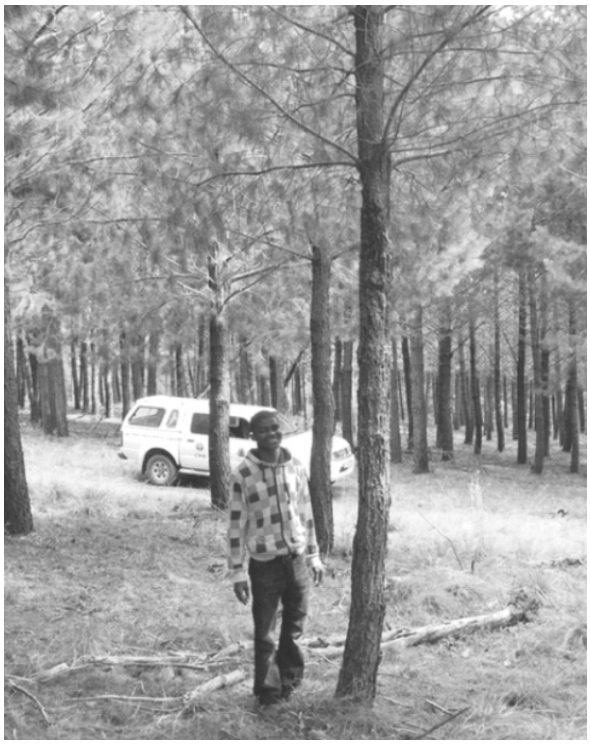
Sandisiwe's training consisted of various field trips as well as a research project around the pine pathogen, *Fusarium circinatum*. She is busy identifying *Fusarium* isolates obtained from pine trees and looked at some aspects of the pathogen in water by testing detection limits of current test methods and looking at the effect of storage on the ability to detect the pathogen in water. Through the research project, she has gained valuable experience working in a lab and dealing with both pathology and molecular based techniques. She is proof of the adage that dynamite comes in small packages.

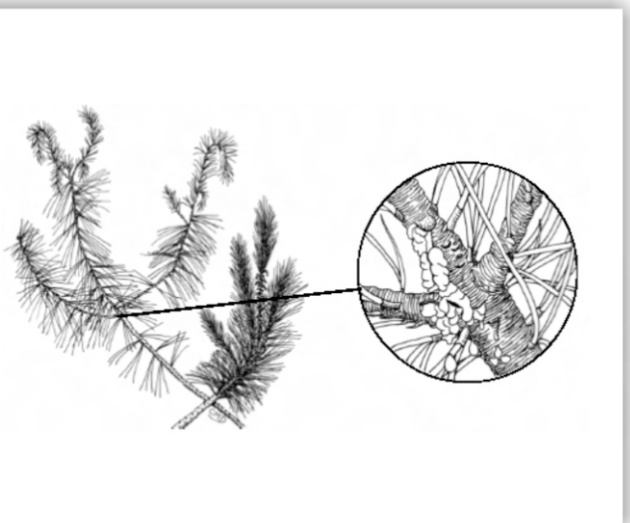


Celani next to a Pitch Canker diseased tree

Celani spent most of his time at the new Biocontrol facility on the UP Experimental farm, where his main focus was on the rearing of *Thaumastocoris peregrinus* and it's potential biological control agent, *Cleruchoides noackae*. He also helped with other important functions at the facility like morphological type classifications and insect dissections. One thing is for certain, if you need a reliable chainsaw maintenance manager, Celani is your guy.

Celani and Sandisiwe taking samples from Eucalyptus

Besides their activities in the various labs in FABI, they have also spent many hours in the field with various TPCP researchers and students looking at not only pests and pathogens, but other general forestry aspects as well. This included time at various nurseries and with foresters to gain insight into fire management, forestry planning and silviculture. They have enthusiastically participated in all FABI activities and have become valuable members of the team. We would like to thank Celani and Sandisiwe for their enthusiastic participation in TPCP activities in 2012 and wish them all the best with their future endevours in Forestry. We are sure they will help to "KEEP TREES HEALTHY" wherever they go!



Tips of gridled branches wilt, needles begin to discolour & fall.
Insert: Branch canker with oozing pitch.

FABIVolley Ball

The University of Pretoria's Spring day is a university holiday celebrating the arrival of Spring. As part of the annual Spring day celebrations, the university organises a fun day at the LC de Villiers sports grounds (Sports campus). The idea is to get staff and students to participate, communicate, have fun and socialize outside of the working environment. The festivities include a potjiekos competition, live Djs, live bands, a 5 km fun run, a volleyball tournament and, for the first time this year, a tennis tournament.

The team from left to right: Darryl Herron, Johan van der Linde, Ariska van der Nest, Marc Bouwer, and in front: Josef Janousek and Tuan Duong

FABI entered the Volleyball tournament again this year after coming 8th overall in 2010. This year's tournament consisted of ten teams from various departments including Anatomy, Physiology, Tax, Finance, Law, Law clinic and Academic administration. The tournament was divided into two groups, FABI was in group B with Tax 1, Finance 2, Physiology and Law Clinic. Team FABI won all four of their group matches and advanced to the semi-finals where they squared up against Anatomy.

FABI won that match 25 – 14 and advanced to the finals where they met Finance 1. FABI went down to the group A table topers 25 – 17, in what can only be described as a quality final. The team look forward to entering again next year in hopes of being crowned the 2013 Spring day volleyball champions.

UNIVERSATY OF PRETORIA CELEBRATES MANDELA DAY AT MONONONG PRIMARY SCHOOL

On Saturday 28 July 2012, in answer to a call from the Principal of Mononong Primary School in Mamelodi, Pretoria, more than 20 staff members and about 100 students from the University of Pretoria celebrated Mandela Day by taking part in the Mononong school renewal project. In the 34 years of its existence, the school had not been repainted and was in desperate need of a new coat. This, however, changed when the UP team led by the Rector, Prof Cheryl de la Rey, converged on the school to paint 12 classrooms and storerooms.

Prof. Cheryl de la Rey interacting with the pupils of Mononong Primary School

Most members of the UP team arrived at the school by bus from the University whilst others arrived by car. The School's wonderful team of young drum majorettes and their drummer led the buses up the road and into the entrance of the school – what a warm welcome we all had. Before the hard work began, this same team of drum majorettes performed a few dances and sang for us. This was followed by a few words of encouragement to the school and its learners from Prof de la Rey and Prof Denver Hendriks (Head of Community engagement of UP Marketing Services). Words of welcome and thanks were expressed by the Acting Principal of the school, Mrs Shirley Nkoana, the local inspector of schools and the Chairperson of the School Board. The Contractor whose firm was responsible for supplying all the paint and other material free of charge was also thanked and he instructed the "painting team" as to the format of the morning's activities. We were all divided into groups and allocated to classrooms for the start of the morning's work. Although most of us were inexperienced, the contractors showed us what to do and with great enthusiasm all walls of the classrooms were sanded down and painted by the end of the morning. UP catering had packed a delicious picnic lunch for all, and Mrs Nkoana invited UP staff members to join the staff of the school in the staffroom where a wonderful tea and lunch had been prepared for us.

Two former pupils of the school were part of the UP team that day. Charity Somo is now reading for a Master's degree in Educational Psychology and Violet Mojapelo is an IT specialist.

The three FABIANs who attended Mandela day
From left to right: Malegola Mohlala, Jenny Hale and Nelly Khumalo

Malegola Mohlala and Nelly Khumalo are two of the FABI students who also responded to the call as did two other FABians, Prof Dave Berger and Jenny Hale. The hope was expressed that further needs of the school would be taken up by the University and that this painting project would not be the last assistance the University staff and students would render to the school. Prof de la Rey assured Mrs Nkoana that the Mononong project would continue to be one of the community outreach projects supported by the University.

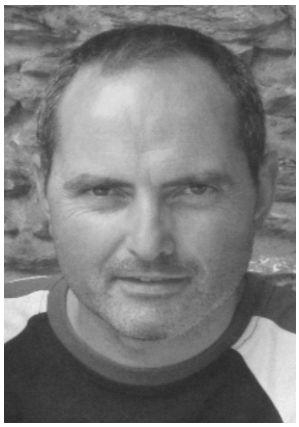
Malegola Mohlahla from FABI busy painting.

A tired, paint-covered but very happy and satisfied group of UP students and staff made their way home feeling very blessed for the comforts of their own educational and home environments. They felt satisfied at having had the opportunity of meeting and making a small difference to the staff and learners of Mononong Primary School while doing more than their 67 minutes for Mandela Day.

CONGRATULATIONS

The following people obtained degrees during the September graduation of the University of Pretoria. We would like to take this opportunity to once again congratulate them on their achievement.

Doctoral Degrees (PhD)



Wilhelm de Beer – Taxonomy and phylogeny of *Ophiostoma* spp. with *Sporothrix* anamorphs, and their genetic relationships in the Ophiostomatales.

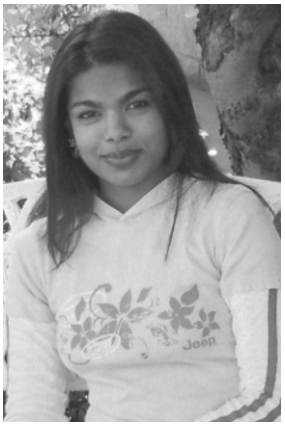
Lieschen de Vos – Genetic linkage map and QTL analysis of a cross between *Fusarium subglutinans* and *Fusarium circinatum*.

Glen Mitchell – Reducing the risk of the pitch canker fungus (*Fusarium circinatum*) to *Pinus patula* in South Africa.

Masters Degrees (MSc)

Angelica Marsberg – Diversity and distribution of fungal endophytes associated with native *Syzygium cordatum* in South Africa.

Kerry-Anne Pillay – Diversity and spatial distribution of fungal endophytes in a *Eucalyptus grandis* tree.



Gabrielle Carstensen – Bacterial endophytes in the leaves of *Pavetta* spp. with a specific focus on those causing leaf nodules.

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Wai Yin Chan – Genome assembly and metabolic pathway reconstruction of *Pantoea ananatis* LMG20103

Dina Gomez – Ophiostomatoid fungi associated with bark beetles in China

Mmatshepho Phasha – Intron architecture in *Fusarium*

Lunghile Mthombeni – Characterization of *Burkholderia* species associated with the root nodules of legumes indigenous to South Africa

Annie Botha – Bacterial endophytes associated with *Eucalyptus nitens* clones

TPCP & CTHB DIAGNOSTIC CLINIC 2012

The year is drawing to a close and the TPCP/CTHB Diagnostic Clinic looks back on another successful year of Diagnostic service. The clinic received less than 2000 samples in 2012, compared to the more than 3000 samples received in 2011.

This does not mean that it has been a quiet year for field work, however.

Besides the Diagnostic clinic field trip earlier in 2012, the clinic has been in and out of the field looking at tree health problems in and around Gauteng.

The Diagnostic clinic was called in to look at stressed Cypress trees in Centurion and Hartbeespoort; rat damage on Karob trees in Rietondale, Pretoria; an over

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watered Baobab tree in Bela-Bela, Limpopo; and *Ganoderma* infected Karee trees in and around Kareebosrand near Hartbeespoort. We also received many non-forestry related samples this year including Mopane, Avocado, Macadamia, Moringa, Oak and Cedar.

Diagnostic clinic members Fahimeh Jami, Katie Termer and DongHyeonLee looking for *Ganoderma* fruiting bodies at the base of a Karee tree in Hartbeespoort.

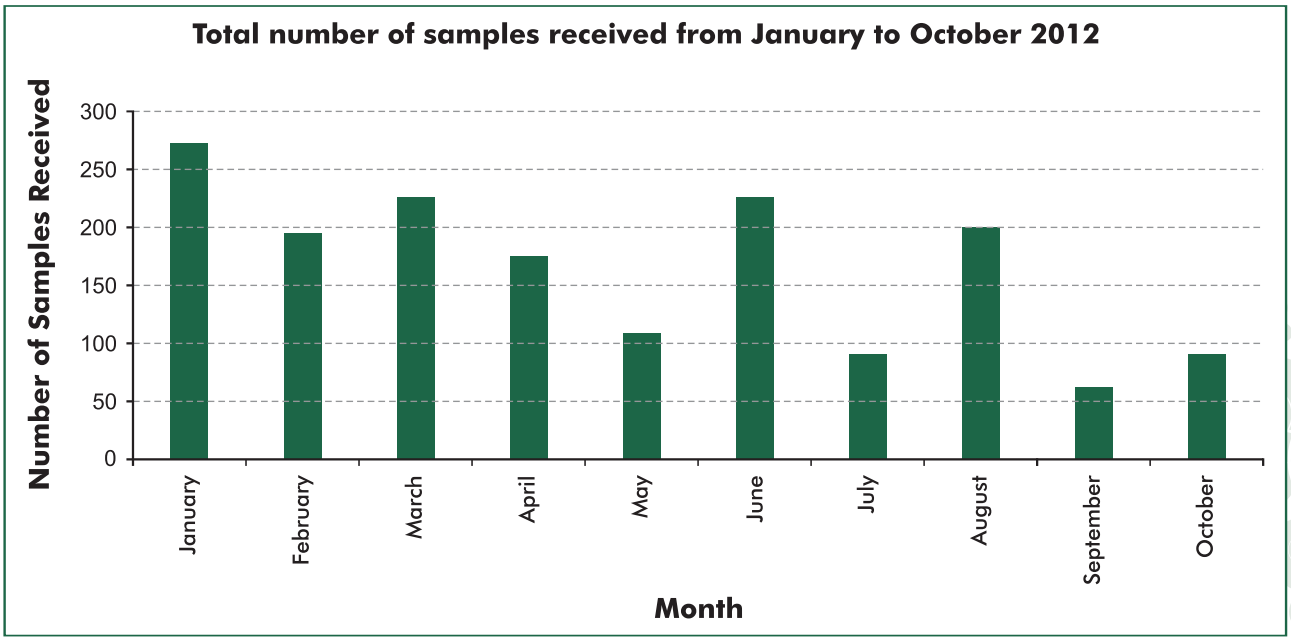
Although most of the problems with these samples could be linked to abiotic factors, there were some interesting findings from some of these samples including *Armillaria* on Avocado and *Phytophthora* on Oak.

We saw a different sample trend this year compared to last year. We received more soil samples and non-forestry related samples; we also received more insert and tray samples than previous years.

The rest has remained mostly the same. From January to October 2012, the Diagnostic Clinic received a total of 1647 samples. Pine samples comprised 76% of the total number of samples, the majority of which were for *Fusarium* screening. Only 5.9 % of the samples were *Eucalyptus,* and *Acacia mearnsii* (Black Wattle) made up 0.2%. Soil samples comprised 2.8 % of samples received for 2012, while seed lot and petri dish samples for *Fusarium* screening comprised of 5.7% and 1.1%, respectively.

Diagnostic clinic member Mkhululi Maphosa checking Karee roots for fungal mycelium.

Samples from non-forestry and indigenous trees as well as water samples, categorized as "other", comprised 8.3 % of received samples. This is six times as many samples compared to last year, but can be attributed to the increase in the number of inserts and tray samples for *Fusarium circinatum* analyses.



TPCP STUDENT RECEIVES L'Oréal-UNESCO AWARD

The University of Pretoria is proud to have two award winners among the recipients of the 2012 L'Oréal-UNESCO Award for Women in Science from sub-Saharan Africa. Of these, one is a Phd student in the Tree Protection Co-operative Programme (TPCP), Gerda Fourie. She is among ten inspiring women scientists from sub-Saharan Africa who have been honoured for their work in the scientific fields by being awarded fellowships towards their studies.

Gerda Fourie

The L'Oréal-UNESCO Regional Fellowships for Women in Science in sub-Saharan Africa is open to all women scientists up to age 40 across sub-Saharan Africa who are working towards their PhD in all fields of science. The fellowship programme aims to increase representation of women in global scientific circles, thereby creating role models for future female generations.

Gerda attained both her BSc in Microbiology and Plant Pathology, and her honours in Microbiology at the University of Pretoria. Following the completion of her honours, Gerda accepted a post as a Food Microbiologist at Food Consulting Services in Midrand, Gauteng Province.

The following year she worked as a research assistant at the Forestry and Agricultural Biotechnology Institute (FABI) at the University of Pretoria. In 2004 she enrolled for an MSc Degree in Microbiology (part time) at the University of Pretoria, obtaining her degree *cum laude* in 2008.

She went on to publish two research papers based on her thesis, and in 2009 she received the FABI award for best student publication. That same year she enrolled for a PhD degree in Microbiology at the University, and was awarded an NRF Scarce Skills Bursary to help her complete her studies.

"I have always been passionate about science and biology, and I enjoy the challenges and constantly changing environment of research. My research interests include the biology and evolution of Fusarium oxysporum and related fungi species in the *Gibberella fujikuroi* species complex, with specific focus on F. circinatum, the causal agent of pitch canker in pines," says Gerda.

Her current research is entitled 'The evolution of mitochondrial genomes within the *Gibberella fujikuroi* species complex'. The *Gibberella fujikuroi* species complex (GFC) includes many economically important pathogens. Species in this complex are the focusof various ongoing genome sequencing projects that seek to better understand the genetics and biology of these fungi.

Gerda has presented her research at four international and three national conferences, and has authored or co-authored six ISI-rated publications (and has an h-index of 3). Apart from working towards obtaining her PhD, Gerda is involved in mentoring undergraduate students linked to the CTHB / Faculty of Natural and Agricultural Sciences, as well as BScHons and MSc students.

MIKE WINGFIELD RECEIVES ANOTHER PRESTIGIOUS AWARD

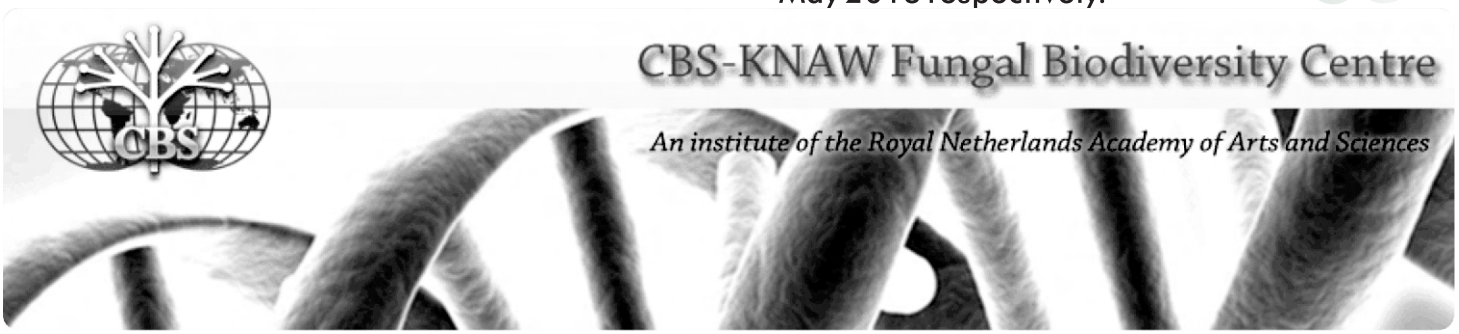
Prof Mike Wingfield receiving the Johanna van Westerdijk award from the Director of the CBS, Prof. Dr. Crous at Trippenhuis, the official home of the Royal Netherlands Academy of Arts and Sciences in Amsterdam

Mike Wingfield, Director of the Forestry and Agricultural Biotechnology Institute (FABI) at the University of Pretoria, and long-time stalwart of the Southern African Society for Plant Pathology has been awarded the prestigious Johanna Westerdijk Award by the Centraalbureau voor Schimmelcultures (CBS) Fungal Biodiversity Centre.

This Award is made on special occasions to an individual who has made an outstanding contribution to the culture collection of the CBS Fungal Biodiversity Centre, marking a distinguished career in mycology.

The CBS Fungal Biodiversity Centre is an institute of the Royal Netherlands Academy of Arts and Sciences (KNAW), situated in Utrecht and it maintains a world-renowned collection of living filamentous fungi, yeasts and bacteria. The Institute's research programs principally focus on the taxonomy and evolution of fungi as well as on functional aspects of fungal biology and ecology, increasingly making use of molecular and genomics approaches.

Mike is an internationally renowned researcher and was also recently selected to receive honorary doctorates from the University of British Columbia (Canada) and North Carolina State University (USA). These degrees will officially be awarded at graduation ceremonies of the two Universities in November 2012 and May 2013 respectively.



UPwithScience 2012: MICROBIAL MYTHBUSTERS

This year the UPwithScience initiative (University of Pretoria) of the Centre of Excellence in Tree Health Biotechnology (CTHB) aimed to raise an appreciation of the prolific abundance of fungi and bacteria in our general environment amongst a group of eager Grade 11 learners. The project, led by four FABI students (Tracy Hall, Barend Jansen van Vuuren, Melissa Simpson and Markus Wilken), aimed to make the learners aware of what fungi and bacteria look like and where they are found in our daily lives. Using a few suggestions from post-graduate students, the group set out to rot a variety of food products and observe the fungi and bacteria that drive this process. Swab samples from objects found in a household and on the UP campus were taken to the lab and grown on nutritious media. This allowed for a comparison of what is seen in a clean private house and a dirty public place.

Shannon and Emily-Rose collecting a swab sample from the headphones of an engineering student

The project was off to a flying start when Barend, an MSc student at FABI, presented the idea for the project to an auditorium of Grade 11 learners. They were in hysterics after an entertaining presentation on some aspects of microbes and their involvement in our day-to-day lives, and this ensured many volunteers for the project. In March, six bright and eager learners joined the rest at FABI. The learners spent most of the morning at a supermarket, shopping for food items. The aim of this exercise was to observe which types of food rot with microbial growth and which types of food are well preserved, such as canned compared to fresh fruit. An interested learner also decided to investigate the bacterial content of a probiotic capsule and yoghurt.

After a morning of shopping, the group proceeded to invade the home of one of the group leaders. Sample swabs were taken of anything

Tebogo preparing to take a swab sample from the ATM buttons on the University campus

they could find, from a dog's paw to the kitchen tap! These were carefully stored and transported back to the lab. Once back at campus, ATM buttons, door handles and iPod earphones also received the swab treatment. All these samples were cultured and analyzed over the six month duration of the project. The learners involved in the project gained valuable experience in the application of the scientific method and the good design of experiments, while also learning something new about their environment. All the hard work paid off in the form of some thrilling results.

Continue

An example would be the rotting of gouda and processed cheese. While the gouda showed lovely fungal growth in just 1 week, the highly preserved processed cheese never rotted, even after several weeks.

Duncan depositing a sample of his tongue onto the agar plate

The group also found that the bacterial content of a probiotic capsule and yoghurt were very similar, and suggested yoghurt as a cheaper alternative to expensive probiotics. The most shocking was probably the conclusion drawn from the swabs collected: the house and university campus are equally dirty when you count microbes!

The complete collection of samples

The learners thoroughly enjoyed the "gross" factor of the project, and this showed when they needed to present their findings to their peers. Videos showing the progression of the rotting (or lack thereof for some foods) were made with great enthusiasm. Once again we enjoyed a successful project with these Grade 11 students which they are going to take to the Science Expo in September 2012.

MASIFUNDE: INCEPTION OF THE FABI LANGUAGE PROJECT

In the Oxford dictionary language is defined as *"the method of human communication, either spoken or written, consisting of the use of words in a structured and conventional way."* However, beyond language being a medium of communication, it serves as an identity of a people. This is aptly described by the world renowned statesman President Nelson Mandela when he stated, *"If you talk to a man in a language he understands, that goes to his head. If you talk to him in his language, that goes to his heart"*. In the South African context, we are blessed with diverse languages, in particular 11 official languages which stream the heart beat of our nation.

Embedded in each language are its rich history, culture, ethos, hopes and aspirations of a people. Uniquely, such diversity is our South African identity and it is from this vantage point that the FABI language project was borne - the quest to speak to our hearts! On the unassuming morning of the 30th January 2012, the FABI Monday Morning Meeting (MMM), as per tradition at 08h30, was chaired by our director Professor Mike Wingfield. For the duration of this meeting all was as expected in terms of structure and delivery save for one factor, Mike was set on course to conclude the meeting with some healthy time to spare (a rare occurrence – if it were to happen!).

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However, it was not to be and for good reason as a-l-w-a-y-s. Our Director took this "spare" time to reflect on language and in particular how we as South Africans are found wanting with respect to our ability to greet or converse at a very basic level using one of our indigenous languages. A serene sense of silence captured the meeting room and then he announced that FABI Management Committee (Mancom) took a resolution to be proactive about this matter.

The first FABI language project presentation was given on the 30th by Osmond Mlonyeni. This presentation entailed a brief background on the language profile of South Africa, the "language share" in the country, predominant languages per province, a language diagram and then concluded with a SOWUBONA, MOLO, GOEIEDAG, DUMELA, HELLO, XEWANI, NDAA/Aa and LOTJHA! Subsequently, the FABI language project presentation became a permanent feature of the MMM for 2012. The scope of these presentations was to learn basic words and phrases with an emphasis on interactive learning between fellow FABIans. Two languages in particular were largely focused on, Sesotho sa Leboa (Sepedi) and isiZulu, due to our geographic location and numerically most spoken language respectively. As we travelled from SAWHUBHHONNA to SAWUBONA, NKHA BOSHISHAA to NKA BOTSHISHA and ultimately reaching KE A LÊBOGA and NGIYABONGA on the first attempt, the journey has been most fruitful, joyous and exciting.

This project serves as a clarion call to us all, in response to our shared history and acknowledgement of our aspirations, to free ourselves from the default state of inertia and to embrace a proactive state as described by the FABI text insert to the Hello South Africa phrasebook of "*fostering greater understanding and communication in the face of South Africa's great diversity, a true gift and a source of national pride*." Indeed we shall all proclaim: !Ke e: /xarra //ke (diverse people unite).

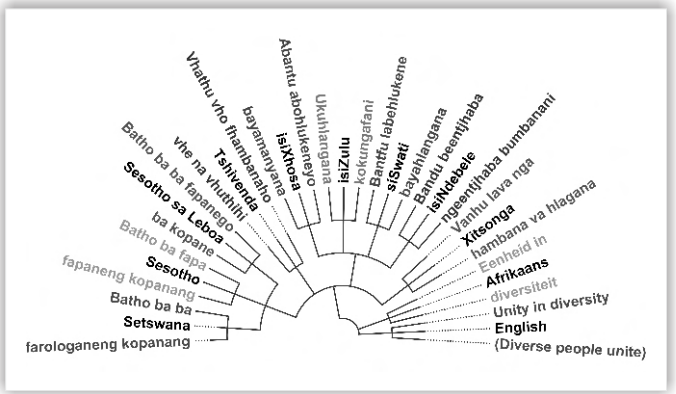

Diagram showing the approximate relationship among the 11 official South African languages. In the coloured text alongside each language is the South African motto "Unity in Diversity" in each respective language. This motto written from the Khoisan language of the /Xam people where "!Ke e: /xarra //ke" literally means "Diverse people unite" (Diagram by Dr. Jeff Garnas).

BIOCONTROL AGENT FOR EUCALYPTUS GALL WASP RELEASED

Since the last edition of the Tree Protection News in 2012, permission for the release of the biological control agent of the eucalyptus gall wasp, *Leptocybe invasa*, has been obtained and releases have been made in all the major areas of infestation.

Selitrichodes neseri, a parasitic wasp of *L. invasa* was discovered for the first time by Prof. Stefan Neser (retired weed biocontrol scientist and Extraordinary Professor at FABI, University of Pretoria) in April 2010, and subsequently named after him. This small Eulophid wasp (0.65 – 1.08mm) was imported into the FABI Biocontrol Centre where a rearing colony was established in order to study its biology and host specificity. These studies, conducted over a nearly two year period, showed that *S. neseri* was a suitable biological control agent due to its short developmental time, long adult life span, ability to utilize a range of gall ages, and a high level of host specificity.

The application to release *S. neseri* in South Africa was submitted to the Department of Agriculture, Forestry and Fisheries (DAFF) in August 2011 and subjected to a review process consisting of both national and international scientists. It was with great excitement when in June 2012 permission to release *S. neseri* as a biocontrol agent in South Africa was granted.

The first releases of *S. neseri* were made in July 2012 in Zululand, but subsequent releases have been made in all the major areas infested by *L. invasa* and releases continue to date. These are the first releases of *S. neseri* outside of Australia. Consequently, the expected rate of establishment and spread of this biocontrol agent is not known and will require investigation. This will form part of Mr Kwabena Baffoe's PhD project, a new student from FABI with experience in biological control.
The release of *S. neseri* comes at a much-needed time, when many farmers and

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foresters have already suffered substantial losses from *L. invasa*. Based on the performance of *S. neseri* in quarantine conditions, expectations are that *S. neseri* will be an effective biocontrol agent for the management of the eucalyptus gall wasp, *L. invasa*.

If so, this wasp together with other management strategies including host resistance and potentially silvicultural practices, will result in the significant reduction of what has been one of the most devastating pests of *Eucalyptus* to enter South Africa.

The story thus far ...

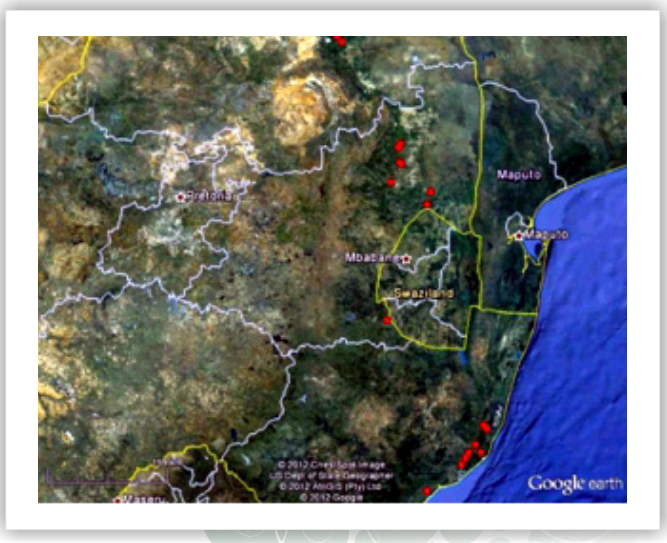
***Selitrichodes neseri*, a parasitic wasp of *L. invasa* discovered by Prof. Stefan Neser** (photo by S. Neser)

Mrs Gudrun Dittrich-Schröder (PhD student) **studying the biology of *S. neseri* in the FABI Biocontrol Centre**

Bi-weekly meetings to discuss progress with the studies on *S. neseri* to determine its suitability as a biological control agent (clockwise: Prof S. Neser, Mrs M. Harney, Ms S. Bush, Mr E. Mutitu, Mr K. Baffoe, Mrs E. Breytenbach, Dr B. Hurley)

The minute wasp, *S. neseri*, ready for release in the field

Prof. B Slippers and Mr D. Oscroft (ICFR) **releasing the first *S. neseri* in South Africa, 25 July 2012**



Current distribution of *S. neseri* releases as at 1 November 2012
(releases are ongoing)