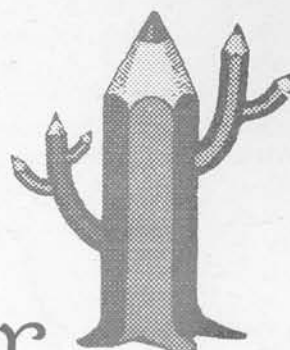


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comments from the director



In the lives of children, reaching the age of "double digits" is a major event. This is an event that, at least from the psychological standpoint, marks the progression of development from childhood to adolescence. In this sense, the TPCP has reached a major step in its growth and development. From small beginnings way back in 1990, the programme has grown significantly, and in this millennium year, we celebrate our tenth anniversary.

Reaching the ten year milestone for the TPCP is a tremendous accomplishment, both on the part of the Members of the Programme, as well as the research Team that has promoted it. Given the great progress that has been

made in dealing with diseases of plantation diseases during the course of the last ten years, the early objectives of the TPCP, might now be considered as having been rather conservative. The fact that the TPCP has come to represent the strongest group of plantation forest pathologists in the world, is an impressive accomplishment for the South African Forestry Industry. This accomplishment is also due to significant inputs by a very large number of people including scientists, forestry executives managers, students and academics. We recognise and thank them all.

Extension and field services have always been a major focus for the TPCP. As in the past, the group made huge contributions in this component of our activities during 1999. Thus, the group spent some 550 person days in plantations, where surveys were made, extension lectures were presented, experiments were executed and disease monitoring was undertaken. In all, the number of days spent in the field exceeded those of the previous year.

During the course of the past year, the disease clinic of the TPCP continued to provide an important service to Forestry. Although its services are focussed solely on the South African environment, it remains one of the best disease diagnostic services available for tree diseases, anywhere in the world. The disease clinic also forms a crucial component of the TPCP activities focussed on disease monitoring, which is one of the cornerstone activities of the Programme.



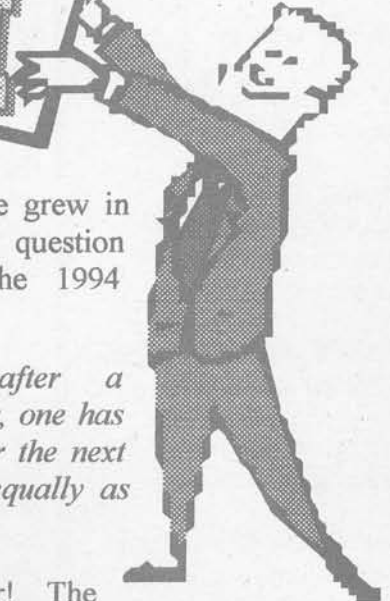
Even if I were certain that the world would end tomorrow, I would plant a tree this very day.
(Martin Luther King Jr.)

Funding to the TPCP for 1999 remained more or less the same as that for the past year. The University of Pretoria remains the largest single contributor to the Programme. This is justified based on the fact that the TPCP has a strong education component and training of post graduate students remains a crucial activity. Human resource development has also allowed the TPCP to access funding from programmes such as the Competitive Industry Programme of the NRF and the THRIP programme of the Department of Trade and Industry. These additional sources of support are important to the long term sustainability of the TPCP and every effort must be made to sustain them. The current view that THRIP funding should not be available for projects in Forestry and Agriculture is thus of considerable concern.

Readers of this newsletter will be aware that during 1999, the TPCP began to extend its services to include Forest Entomology. This has resulted from a gradual fragmentation of entomology support to the industry, and the fact that much synergy can be attained through merging services in the related fields of pathology and entomology. A large number of discussions and presentations have been held in an attempt to devise a suitable funding structure for a forest entomology component of the TPCP. While these discussions continue, a strong skeleton service in forest entomology is being maintained alongside the TPCP. New students are

already being drawn into the field and it is believed that a future forest entomology team should be equal to the current Programme linked to plantation disease problems. We hope to complete the process of formalising a well-founded forest entomology programme by the end of 2000, and will share elements of progress with you in future newsletters.

The success of the TPCP is due to many factors and especially to committed and excited participants. From my side, I owe great thanks to my fantastic team – the various programme managers (Dr Teresa Coutinho – Diagnostic Services, Dr Jolanda Roux – Field services, Prof. Brenda Wingfield – Molecular Biology Services and Mr Prem Govender – Entomological Services) and a great support staff. Our team also owes a special vote of gratitude to executives, managers and operational foresters attached to all TPCP members, for their tremendous support and encouragement. The TPCP is an excellent example of a outstanding cooperative effort. By its nature, it thus owes its success wholly to contributions of a large number of participants, in many different sectors of the South African Forestry Industry. We thank you all most sincerely



The 2000 Annual Meeting of the TPCP marked the 10th anniversary of the existence of the Programme. An occasion such as this urges one to look back over the past 10 years in a historic way.

In 1990 the TPCP was formally constituted. The first annual meeting was held in 1991, but at that time only with the board of directors.

In 1992 an experiment was tried with a few research talks given by team members to the board of directors. The May 1992 newsletter says of this:

"The format of this meeting was considerably different to that of previous years and turned out to be a most exciting and worthwhile experiment."

The format changed yet again in 1993 with not only board members invited to the meeting, but also selected staff from each of the member companies. In total 20 colleagues attended. "A mini congress to say the least!", was the excited comment in the newsletter.

The excitement and the attendance grew in 1994. Already the question was asked in the 1994 newsletter:

"Every year, after a successful meeting, one has to wonder whether the next will be at least equally as good."

1995 was better! The meeting was combined with the inauguration of the Sappi laboratories and phytotrons. For the first time international speakers also addressed the meeting, which included 51 staff of TPCP members. The 'mini congress' was becoming a real congress.

The meeting kept growing during 1996, 1997 and 1998 (the last meeting at the UOFS in Bloemfontein). The number of members attending increased to around 100. More presentations were squeezed in and two to three presentations by international members became a regular part of the



courtyard of the FABI "heart"

FABI TEAM -group photo taken in the

program. Staff members from the member companies also started presenting results from collaborative work.

As in 1995, the meeting in 1999 was a big and a special meeting as it was combined with the inauguration of new facilities - this time with the new FABI facilities at the University of Pretoria. With an attendance of around 170, numerous international, national, student and industry members' presentations, this must have been one of the largest meetings/congresses ever held by one program.

With the phenomenal growth and quality of previous years in mind, is it possible to keep up? But there is nothing to fear. In years not including inaugurations, the meeting seems to have stabilised with around 90-100 people attending (excluding the current \pm 60 UP team members), 2-3 international talks and 15-20 talks by students and members. What has, however, not stabilised is the

quality and enthusiasm of the meeting. Here is what two members had to say afterwards:

"Out of the many that I have attended, I found it to be the best yet which means that, like good red wine, the TPCP is improving with age." E-mail from Dr. Charlie Clark (Sappi).

"The saddest thing about hearing such exciting science, and about interacting with such wonderful people, is that the meeting happens only once per year." E-mail from Dr. Flic Blakeway (Mondi).

It is clear that the meeting has come a long way and can confidently be called mature and well established - as is the case with the TPCP program as a whole. The TPCP and its annual meeting has, however, also succeeded in establishing a culture of continual growth and improvement. We would like to add to Charlie Clark's comment that this wine has not yet reached its final complexity and there is much more to come. We can't wait - see you next year!



Acid rain has damaged 600,000 acres of forests in Poland and almost 1 million acres in the Czech Republic. Acid rain is carried by winds across natural boundaries.

FUNGAL LEAF BLIGHT OF *EUCALYPTUS* IN ZULULAND

The causal agent of this serious leaf and shoot blight disease was identified as *Sporothrix eucalypti* and represented a new and unusual report on *Eucalyptus*. Symptoms of the disease first appear as a white powdery fungal growth on the surface of the leaves and on the stem of hedge plants. On highly susceptible plants the fungal growth is so profuse that the entire plant is white, as if covered by snow. Infection leads to leaf drop as well as branch and tip die-back. It especially affects young, actively growing material and coppice from these ramets cannot be used for the production of cuttings.

It is advised that all infected material be removed and burned immediately when infection is noticed in a clonal hedge or nursery. This should be followed by the spraying of the ramets with a suitable fungicide.

Thirteen years ago, in 1987, a mysterious fungal infection of the leaves and young shoots of *Eucalyptus* clones resulted in the termination of the production of the infected clone. The fungus disappeared mysteriously with the removal of the susceptible clone, never to be seen again. That is until eleven years later, in the summer of 1998, when this disease reappeared in a different nursery in the same area.

Please contact the TPCP immediately when this disease is found in your nursery and we will recommend the appropriate fungicides.

Recent research on this pathogen by the TPCP has shown that contrary to previous identification, this pathogen is not an ascomycete fungus, but a basidiomycete, thus requiring a different type of fungicide for effective control.

SAASVELD, FABI AND THE FORESTRY INDUSTRY Perspective of two Saasveld students



Perspectives of a B.Tech student:

After working with the FABI family and being part of the TPCP programme for a period of nine months, I have had quite an experience combining my forestry knowledge with my new found encyclopaedia of fungi and diseases. It did not take me long to realise that there was a large shortcoming in my education concerning diseases in forestry.

My education at Saasveld has provided me with all the information for the cultivation, establishment and growth of

"healthy" trees that could supply the present and future demand in timber products. Saasveld instilled in me a holistic approach to the local as well as the international forestry industry. It covered a great deal of the forestry aspects from the dirty work (the first practical semester), to management aspects such as Human Resources Management, Work-Study, Cost and Management Accounting and Forest Management. As Joh Scriba (dean of forestry at that time) stated on my first day at Saasveld, "Foresters are Jack of all trades, and master of none". I feel that Saasveld did not only teach me about forestry, but it also educated me on a broader level.

Shortly after I joined the FABI family it dawned on me that the idea I had of a healthy tree was not as healthy as I had been taught. It became clear that although my training at Saasveld taught me about common diseases and insects and their basic symptoms, it did not supply me with sufficient information on diagnostics and how these pathogens and pests impact on forestry in South Africa. I feel that "the foresters of the future" should have a more detailed background on forest pathology. This will not only improve the efficiency of the TPCP group as a whole, especially with regards to disease monitoring, but it will also improve the international competitiveness of the South African forestry industry.

Perspectives of a 3rd year Saasveld student

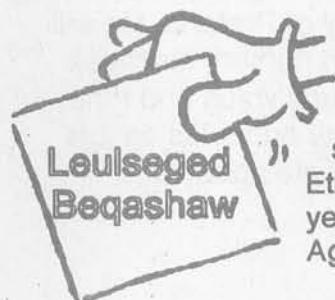
Saasveld has a proud history of students serving the forestry industry. Currently, about 80% of Saasveld students obtain employment in forest estate management while the remainder are involved in planning, harvesting and transport research, technology and education. Increasing numbers are working for private forestry contractors and consultants, or start their own companies. Now, for the first time a Saasveld student has the opportunity to further her knowledge by becoming integrated into the FABI family and to add another dimension to her training.

Two months have passed since I joined this incredible team for my third year practical training semester. It has been the first time that I have been exposed to laboratory and field research work and it has been an incredibly exciting learning experience. It is interesting to see the practical aspects of research being applied to the forestry industry in solving real economic problems. It is my opinion that in the future more forestry and agriculture students should have the opportunity to join FABI and similar institutes for their practical training, especially if they have an interest in tree breeding. Not only have I been learning about tree diseases and their impact on forestry, but I have broadened my horizons with respect to integrated disease management and the tools that will be used in the future for the study and prevention of tree diseases. FABI has provided me with a great experience, from digging up 22-year-old Pine trees near Baberton, to preparing food for the pathogens to grow on, extracting their DNA and testing their genetic diversity. The big picture has been made a lot bigger for me and has increased my love for forestry even more.



Ronald Heath and Sheilagh-Rose Pienaar from Saasveld.

Once again, as a new year begins, new postgraduate students join the TPCP. This year we would like to welcome and introduce the following students to the TPCP. Some are local, others from abroad.



obtained his BSc in plant sciences at University in Ethiopia. After spending a few years working in the Ethiopian Agricultural Research

**NEW
STUDENTS**

Organisation (EARO), he has come to South Africa to obtain his MSc degree in plant pathology at the University of Pretoria, FABI. He will be working on disease resistance using tissue culture techniques.





Mesfin Bogale from Ethiopia received his BSc and MSc from Addis Ababa University. His past experiences include pharmacological evaluation of Ethiopian medicinal plants, nematological studies on 'enset' (*Ensete ventricosum*) as well as biological control of certain plant pathogens. He has joined FABI for a PhD degree in Plant Biotechnology. His project entails the biological control and molecular differentiation of *Fusarium* (Ethiopian strains) in pulses and cereals.



Charity Ramasodi from Hammanskraal, has completed her BSc degree in Microbiology and Plant Pathology at UP and now continues with her honours. She will be expanding her knowledge and skills in molecular taxonomy, working on the Guava wilt pathogen, *Penicillium vermoeseni*.



Brenda Buthelezi originally from the University of Zululand, obtained her honours degree in Biochemistry studying the Physiochemical properties of pumpkin seeds. She has decided to broaden her horizons and is now doing her masters with FABI. She is currently working on the genetic diversity and pathogenicity of *Cylindrocladium scoparium*, the cause of leaf blight on *Eucalyptus*.



Alemu Gezahgne is an experienced forester who has a degree in Forest Management, a M. Phil in Forest Protection, and worked at the District Forestry Development Authority as well as in Forestry research in Ethiopia.

He joined FABI to obtain his PhD and will be working on tree diseases in plantation forestry in Ethiopia, focusing on species of *Armillaria*.



Brett Hurley is a new honours student in the Department of Zoology and Entomology. He will be working with Prem Govender in FABI.

His current project will be to investigate the status of the biological control of *Gonipterus scutellatus* (Coleoptera curculionidae) on *Eucalyptus*.



Hein van Geuns acquired a BSc degree in Microbiology and Plant Pathology at UP and is now studying towards his honours in Microbiology with FABI. His research project focuses on mating techniques in *Botryosphaeria dothidia*.



Lorenzo Lombard is doing his honours part-time whilst completing his BSc degree in Plant Pathology at the University of Pretoria. He will be working exclusively on nursery diseases with his main focus on *Eucalyptus* and Pine cuttings. He welcomes any enquiries on this topic from any interested parties.

We wish these new students all the success for their respective degrees and hope their stay with FABI and the TPCP is one of growth and enrichment.

10th Annual TPCP meeting: Pretoria

Beer, acrobatics and beef

CHEERS!



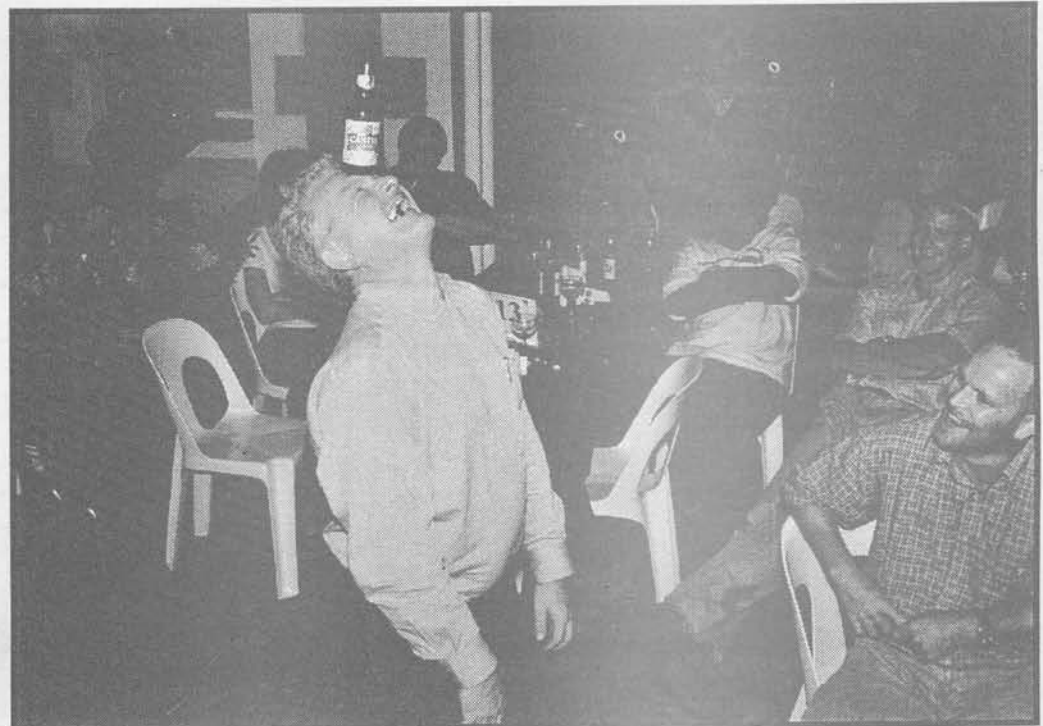
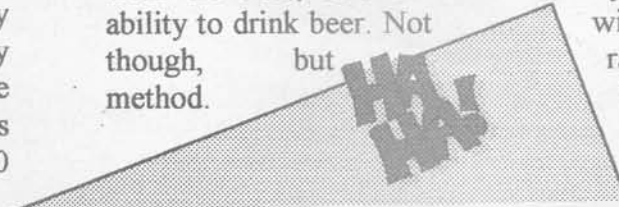
The year 2000, apart from being considered the start of the new millennium by some, is also the year in which the 10th annual meeting of the Tree Pathology Co-operative Programme (TPCP) was held. This meeting was considered by many of the approximately 100 attendees to be the best of the

10. As has become a tradition, the one and a half-day annual meeting was characterised by forest pathology research of the highest quality. Prof. Robin Crewe, the Dean of the Faculty, presented the keynote address which was followed by an overview of the past 10 years, and highlights of 1999 by Prof. Mike Wingfield (Director of the TPCP). Other presentations contained updates on the most important diseases of forestry trees in South Africa, a look into the future of forest pathology and plant biotechnology, as well as a presentation on the applications of GIS to disease management.

Apart from updating and reporting back on the research conducted by the TPCP, the other aim of the annual meeting is to strengthen the ties between students, researchers and our forestry colleagues. An evening

dinner sponsored by the members of the TPCP has thus become a custom at the annual TPCP meeting. The tradition was started at the famous Beef Baron. (Incidentally, the Beef Baron still holds on to its reputation of preparing the best steak in South Africa.) At the 1999 meeting, our first in Pretoria, the dinner was not held at a restaurant, but was a buffet on the campus due to various practical reasons. This year marked the start of what would probably be an ongoing experiment to find a replacement for the Beef Baron, with the honours for 2000 going to Giovanni's. Once again the evening turned out to be a resounding success. Good food and wine and a thorough mix between everyone present (regardless of affiliation or rank) at the tables, stimulated lively discussion, exchange of ideas and the building of often lasting friendships. A warm word of gratitude to the members who pull together each year to pay for this valuable and enjoyable evening.

The new millennium also brought a new tradition and challenge to the TPCP meeting. Under some pressure from the boss, Jolanda stunned everybody with her ability to drink beer. Not though, but with the quantity rather the method. The technique heralds from Professor



Dr Andrew Morris showing us what fun step 1 can be!!

John Mildenhall who, according to legend, perfected it as a student in order to con other students into buying him more beer. It is not known why Jolanda is so good at it though. It goes something like this:

HA! HA!
HA! HA!

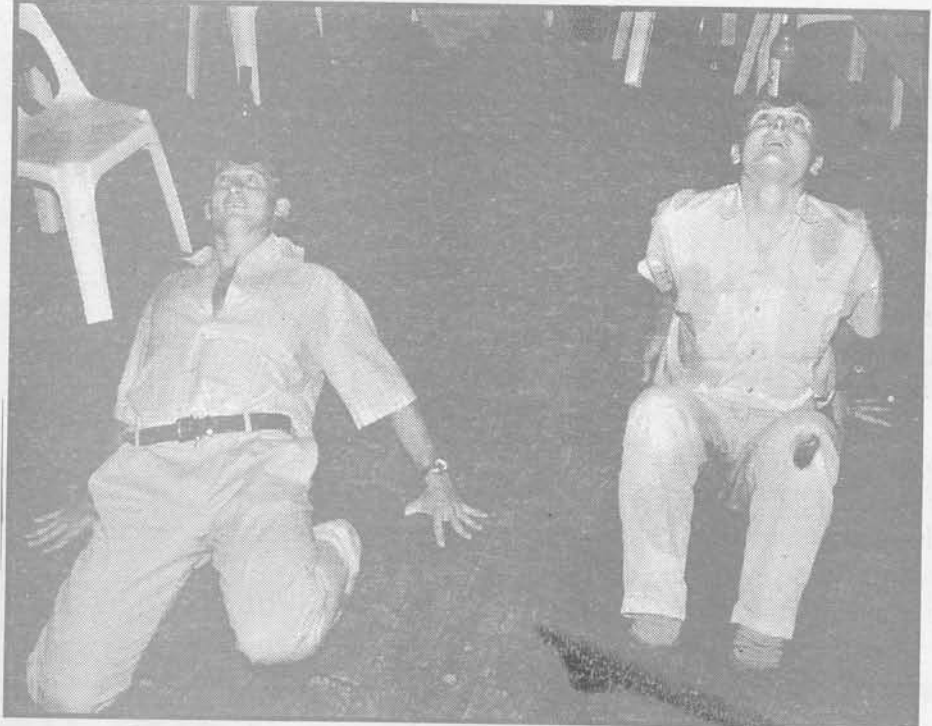


The aim is to drink a bottle of beer that is balanced on your forehead without touching it with your hands. You start by getting someone to buy you the beer in exchange for the show. Now, while balancing the bottle on your forehead, you bend your knees and go backwards until you can touch the ground with your hands. You now have to proceed downwards until you lie flat on your back – still balancing the bottle. By raising your legs over your head you will be able clasp the bottle between your knees, roll over and place the bottle on the ground. You can now get up clasp the bottle between your teeth and enjoy the beer that you did not pay for.

Step2: Getting down, Stuart (DWAF) takes this seriously, but some Craig (NTC), prefer the easy way of drinking beer.

Step 3: Richard (Mondi) and Greg (ICFR) getting down under it.

HA! HA!
HA! HA!



The exhibition soon turned into a competition. Members from all the forestry companies gave it their all, but only Felix Hacker from Mondi was able to successfully complete the task. Jolanda (from the UP team) is still the undisputed champion, with Gavin Hunter (also from the UP team) short on her hills. Staff from member companies who plan to attend the

2001 TPCP meeting are strongly encouraged to practice hard beforehand to avoid further embarrassment. If caught while practising, you could mention that this is what the doctor (Wingfield) ordered.

Mycology has many great pioneers that opened the door for research in many areas of this fascinating field. In January FABI and the TPCP had the great pleasure of hosting Professor John Taylor in South Africa. John Taylor is one of the pioneers in the taxonomy of fungi. This very humble, humoristic and witty professor from the Department of Plant Biology at the University of Berkeley has opened the door for mycologists to the world of phylogeny and population genetics.

John Taylor's primary interests (besides bird watching) are to discover the relationships of fungi based on the historical events that took place at the gene level to more recent events based on population genetics. His research in this area contributed much to defining the taxonomic limits of organisms in the kingdom "Fungi". This information has helped mycologists to design rapid and accurate identification methods to identify fungi. Additionally he and his research team were able to couple fungal molecular change to geologic time, and that gave the mycological community much insight as to where certain fungal groups fit in the bigger biological picture.

Professor John Taylor addressed delegates at the recent BIOY2K congress held in Grahamstown this year. The title of his talk was "Nucleic acids,

phylogenetics and the revolution in fungal evolution". His talk focused on the application of phylogenetic analysis of different genes to define species based on the phylogenetic species concept (PSC). This talk also included the use of molecular based techniques that showed that many of the populations originally thought to be clonal, because of

Phylogenetics, recombination and a man named JOHN TAYLOR

their asexual nature, are genetically recombining and, therefore, not strictly clonal.

PSC is a taxonomic concept not unfamiliar to zoologists but is still new to fungal taxonomy. This concept, however, is a novel approach to classify fungi and is now increasingly being used to identify and classify fungi at or below the species level. PSC is based on DNA sequence similarities or variation between different fungal groups. This means that all fungi having the same multi gene sequences are placed in the same PSC, those with different sequences are



John Taylor visiting one of Mondi's *Cryphonectria* inoculation trials

placed in PSC groups different to the identified one. The advantage to this concept is that it is replacing the classical identification and classification methods of fungi based on the morphology of their sexual or asexual structures. For the first time, fungi lacking

these structures can be classified based on their shared gene sequence characteristics. Also, PSC can be applied to all fungi regardless of their ability to grow or mate in culture. The application of this species concept resulted in the emergence of fungal classes previously not known to mycologists or in other cases the merging of classes previously thought to be distinct.

After the annual plant pathology congress in Grahamstown Prof. Taylor was taken on a short visit to the Kwambonambi area to share with him some of the work conducted by the TPCP and to introduce him to South African forestry. He presented a talk to a group of Mondi Foresters on sexual recombination in fungi and its impact on life, whereafter the rest of the day was spent visiting the Mondi nursery and several trial sites. The emphasis of the day was on *Cryphonectria* and *Coniothyrium* canker and on how recombination influences diseases.

The TPCP would like to express a word of special thanks to Mondi for their hospitality during Prof. Taylor's visit and for providing us with stunning accommodation. Prof. Taylor thoroughly enjoyed his visit to South Africa and was especially impressed by the clonal forestry in Zululand. We especially enjoyed the interaction with our forestry colleagues, since these visits often lead to many new ideas for the battle against pathogens.



Visiting Mondi's Kwambonambi Nursery



degree from the University of the Free State. Four honours degrees, two masters and two PhD degrees were conferred on students. Irene Vincent and Gavin Hunter shared the prize for the best honours students in the Department of Microbiology and Plant Pathology. Both Juanita de Wet and Albe van der Merwe obtained their M.Sc. cum laude.

Honours:

- Irene Vincent (UP)
- Gavin Hunter (UP)
- Daria Rutkoska (UP)
- Raksha Bhoora (UP)

M.Sc.

- Albe van der Merwe (UP)
(Molecular phylogeny and population biology studies on the *Eucalyptus* canker pathogen *Cryphonectria cubensis*)

Juanita de Wet (UP)

- (Studies in the diversity and biology of the pine pathogen *Sphaeropsis sapinea*)

Ph.D.

Len van Zyl (UOFS)

- (Factors associated with *Coniothyrium* canker of *Eucalyptus* in South Africa)

Karin Jacobs (UP)

- (The genus *Leptographium*: a critical taxonomic analysis)

TPCP/FMBC GRADUANDI 1999/2000

Several members of the TPCP/FMBC programme have successfully completed degrees. The majority of the degrees were obtained from the University of Pretoria with only one

FABI'S NURSERY:

from frustration to fabulation

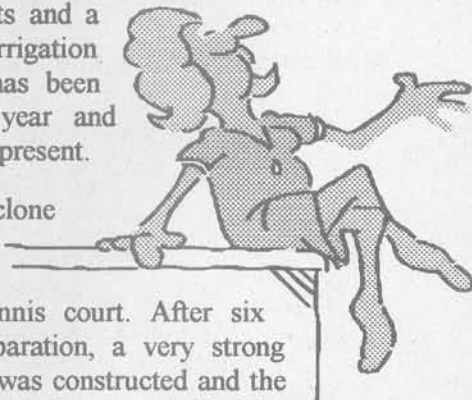


The past year saw the birth and expansion of a wonderful new nursery facility for FABI on the experimental farm of the University of Pretoria. For the first 18 months after the move from Bloemfontein, FABI had to be satisfied with a borrowed area of 100 m², covered with 60 % shade net, as nursery space. This proved to be much too small for the number of trees we use.

About a year ago, FABI inherited an old nursery facility on the farm. The facility had not been used for more than a year and was literally falling apart. With support from the experimental farm management, the University, and the TPCP, the process of restoration and expansion started. Funding for the project came from both the University and the TPCP.

The new nursery facilities consist of five functional units. The first unit is a 720 m² shade-net structure with a cement floor, where trees are grown in bags for experimental purposes. This structure had been blown over by a storm before we inherited it and had to be restored. It was covered with new shade-nets and a computerized overhead irrigation system was installed. It has been operational for almost a year and houses about 10 000 trees at present.

This year, an area for a clone bank was prepared next to the existing structures, on the premises of an old tennis court. After six thorough steps of soil preparation, a very strong galvanized steel framework was constructed and the 900m² area was covered by shade-net, provided by Knittex, for protection against hail and frost. This clone



bank will house eucalypt, pine and wattle hybrid clones and seedlings for conservation and research purposes. All the beds are equipped with computerized drip-irrigation and are covered with blackout.

The third unit is a glass fibre tunnel, of which the wet wall had to be replaced and new steel tables built on which plants can be stored. Currently, a computerized irrigation system is also being installed. Selected experiments will be conducted in this tunnel, and some trees will be kept here over winter to keep them actively growing. These trees will reach the right size for experiments up to six months earlier than when kept outdoors and results will, therefore, be produced significantly faster.

The fourth phase of development will consist of the upgrading of an existing tunnel with mist-beds and rooting facilities. Experiments on the rooting of cuttings and the hardening off of plants produced from tissue culture, will be conducted here.

Together with the outdoor facilities, the offices and storeroom on the premises were also restored and upgraded (with amongst others, internet connections) and now house staff and students of both FABI and the Department of Botany.



THE RESEARCH TEAM OF THE TREE PATHOLOGY CO-OPERATIVE PROGRAMME

The research team of the Tree Pathology Cooperative Programme is varied. It includes full time staff of the University of Pretoria: Prof. Mike Wingfield, Prof. Brenda Wingfield, Dr. Teresa Coutinho, Dr. Jolanda Roux and Prem Govender. They are supported by Rosemary Visser, Marveline Molema, Helen Doman, Shazia Shaik, Sonja de Beer and a number of technical assistants. The bulk of research conducted by the TPCP is by post-graduate students at the University, while colleagues from various departments, other Universities and the ICFR provide valuable advice and support. Saasveld students are also involved in research and in providing technical assistance.



Left to right: Mesfin Bogale, Alemu Gezahgne and Leulseged Begashaw.

DEVELOPING FRIENDSHIPS WITH ETHIOPIA

This year the TPCP and FABI have the pleasure of welcoming three researchers from Ethiopia to the University of Pretoria. Two of them, Alemu Gezahgne and Mesfin Bogale, will be working towards obtaining their Ph. D. degrees, while

Leulseged Begashaw will be doing a Masters Degree through FABI and the TPCP.

All three have extensive experience in plant sciences, including tissue culture, forest protection, agriculture and phytochemistry. Alemu has a diploma in Forestry and degrees in Forest Management and Protection and worked at the District Forestry and Wildlife Conservation and Development Authority in Ethiopia for 8 years. He later joined the Forestry Research Centre as a researcher and co-ordinator in silviculture, forest management, farm forestry and forest protection. Some of our TPCP colleagues would already have met Alemu in the plantations of South Africa, since his Ph. D. will be in forest pathology. Mesfin worked at the Ethiopian Science and Technology Commission (ESTC), evaluating the pharmacological activities of medicinal plants. Before coming to South Africa he was employed at the Ethiopian Agricultural Research Organisation (EARO) in the Plant Protection Research Centre (PPRC). In the PPRC he was involved in research activities in nematology and biological control of plant pathogens. Leulseged worked at EARO in the field of crop improvement and will now do a masters degree in disease resistance at FABI.

FABI and the TPCP welcome our colleagues from Ethiopia to our research group. We look forward to many years of collaboration and exchange of ideas.



Its substance reaches everywhere;
It touches the past and prepares the future;
it moves under the poles and wanders thinly
in the heights of the air
If there is magic on the planet,
it is contained in water
(Loren Eiseley, naturalist)

Bacterial wilt of Eucalyptus in Zululand

Another disease on the move

In recent months, bacterial wilt of *Eucalyptus* spp., caused by the bacterium *Ralstonia solanacearum*, has made a reappearance. This disease, which causes the wilt and death of young trees (mostly 2 years and younger), was first reported in South Africa at the beginning of 1997. It is a soil borne organism that infects trees through wounds in their root systems, rotting the roots and also causing a vascular wilt of trees.

Bacterial wilt of *Eucalyptus* spp., caused by *R. solanacearum*, is known from several countries, including the Republic of Congo and Uganda in Africa. On other continents it has been reported from China, Australia and Brazil, affecting young trees only. Some variation in susceptibility to this bacterium has been reported. In Africa, it has been found on pure *E. grandis* and several of its hybrids, including those with *E. camaldulensis* and *E. terreticornis*. In recent months it has also been recorded on a hybrid with *E. urophylla* from the Richards Bay area.

It is not clear where the bacterial wilt pathogen has its origin or how it entered the *Eucalyptus* plantations. Disease caused by *Ralstonia* is most severe in the hot summer months. During the cooler winter months it becomes less active and the spread of the disease decreases. With the onset of warmer, wetter conditions bacterial wilt starts developing again.

Because it is a soil borne pathogen infection often starts at one point from where it spreads in a radial fashion. As with fungal diseases of plantation trees, there is no rapid control measure for this disease. It is important to monitor the occurrence of bacterial wilt and to send all information on species and clones affected to your tree breeder and the TPCP. Please include complete detail on the affected clone as well as GPS coordinates of the compartment.

Typical symptoms of bacterial wilt include the wilt and death of young trees. Often the disease is first noticeable by the death of a single branch on the tree. As the disease proliferates more branches will die. When chopping into the wood at soil level one will find the entire xylem discoloured (brown), often with darker blue to black streaks in the xylem. The roots will be rotten and if one waits 5-10 minutes a creamy bacterial ooze will appear on the surface of any section made through the roots or root collar.

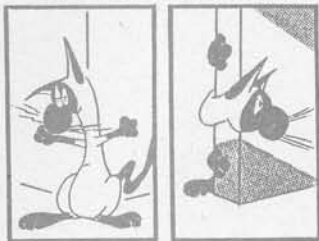
For more
information and
symptoms consult
our latest
pamphlet on
Bacterial wilt.

S A D I E

STEALTH IS THE CAT,
A SHADOW UNSEEN.



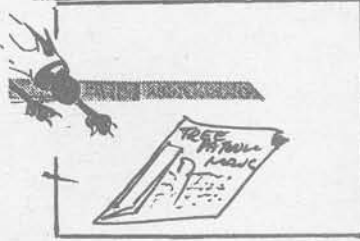
GUILE IS HERS,
SO CLEVER AND KEEN.



ATTACK IS THE CAT,
THE PREY IN ITS SIGHTS.



SUCCESS IS HERS....
TREE PATHOLOGY NEWS!



CRYPTHONECTRIA

AND

ENDOTHIA

two genera with a rich history

The genus *Cryphonectria* contains two of the most serious pathogens in the world. The one, *C. parasitica*, resulted in an ecological disaster when it caused the near demise of the American chestnut in its native habitat in North America. The other pathogen, *C. cubensis*, is a serious canker pathogen in commercial *Eucalyptus* plantations in South Africa and other tropical forestry countries. Of the other species in *Cryphonectria*, only *C. havanensis* and *C. gyrosa* occur on *Eucalyptus*, and may cause mild cankers in some cases. The remaining species are all saprophytes.

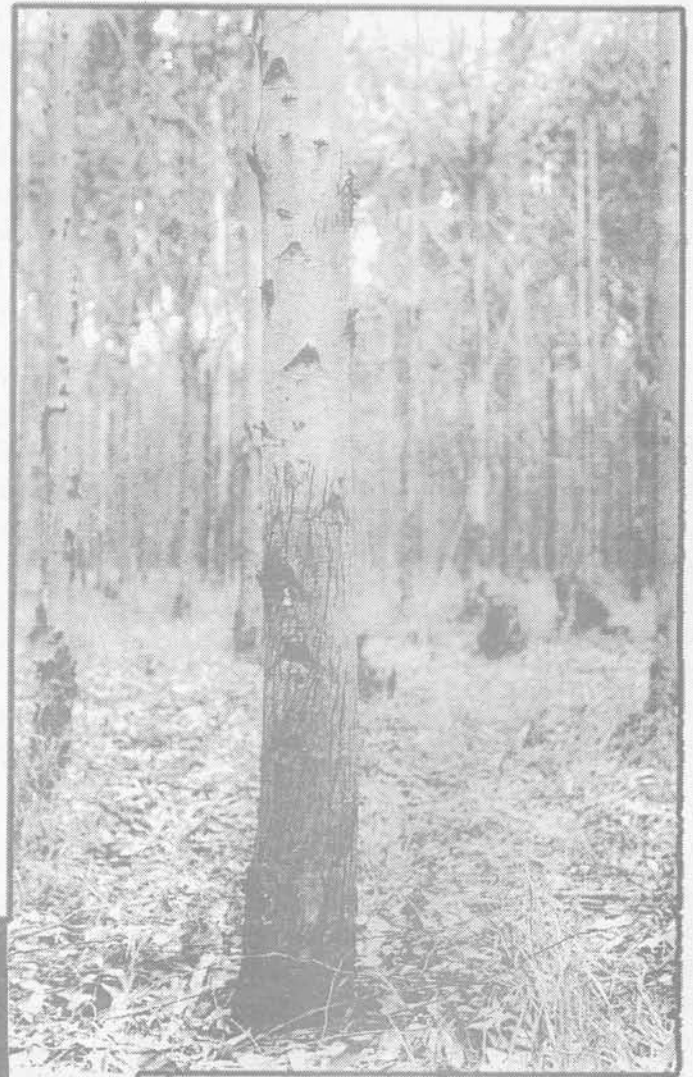
.....close relations

The genus *Endothia* is closely related to *Cryphonectria*. It contains only one pathogen, namely *E. gyrosa*, which is associated with pin oak blight in North America as well as cankers on many other

woody genera. *Endothia gyrosa* also occurs in South Africa and Australia, where it causes cankers on *Eucalyptus* spp. The remaining two species in this genus, are saprophytes.

.....a new species

An interesting story of taxonomy in the making has to do with *E. gyrosa* on *Eucalyptus* in South Africa and Australia. *Endothia gyrosa* from these two countries, does not have the same morphology as *E. gyrosa* from North America. DNA sequence data confirmed that the fungus from South Africa and Australia is different to *E. gyrosa* from North America. The fungus on



Right: *Endothia* cankers on the base of a *Eucalyptus* tree.
Below: *Cryphonectria* canker at the base of a mature *Eucalyptus grandis* tree.

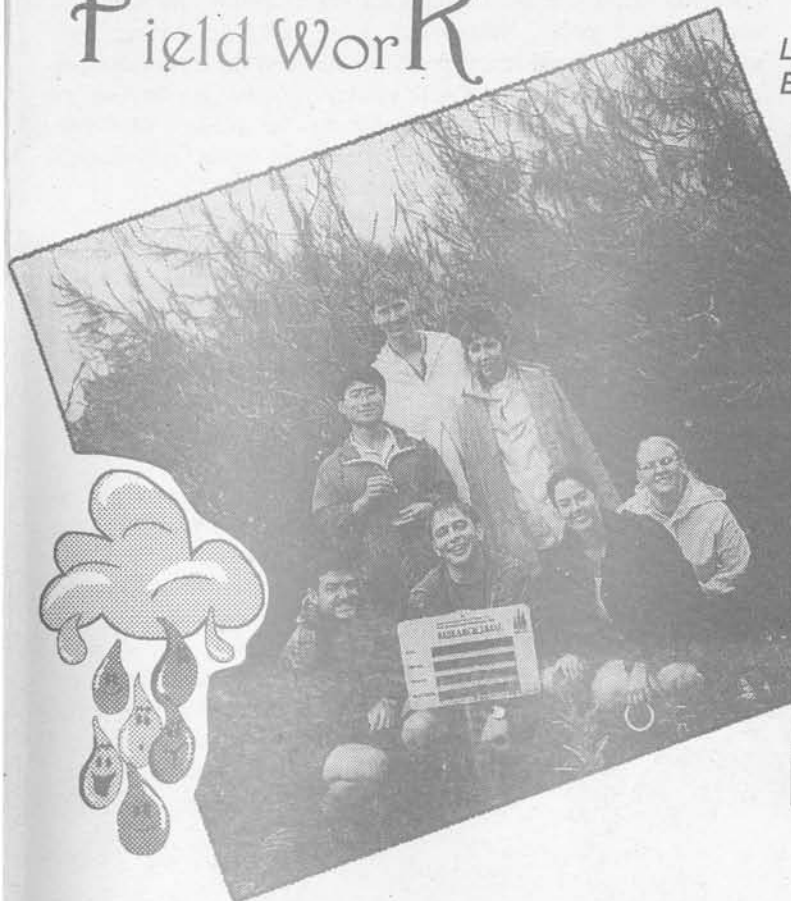


Eucalyptus is, therefore, a new species. This new species has morphological characteristics of both the genera *Endothia* and *Cryphonectria*, making it difficult to place in the correct genus. Based on DNA sequence data this new fungus should reside in *Cryphonectria*. We, therefore have another species of *Cryphonectria* in South Africa on *Eucalyptus* and it will be named *C. eucalypti*.

Field Work

Left: During a long, very wet inoculation trial for SAFCOL

Below: What could that be!?



Bacterial blight of eucalypts

Bacterial blight has spread from an initial outbreak in a nursery in KwaZulu/Natal to plantations of various species, clones and hybrids of eucalypts. Typical symptoms of the disease include die-back of young shoots and leaf blight. The blight is confined to young leaves and they often looked scorched.

The biology or rather etiology of bacterial diseases of plants is slightly different from diseases caused by fungi. Bacteria can only enter their hosts through natural openings and through wounds which could be caused by, for example, insects. From the pattern of infection evident on the leaves, we believe that infection is most probably occurring through stomata. Environmental conditions have to be optimal for infection to take place. In the case of this disease, cool conditions and free water on the plant surface appear to be essential for infection to occur.

Diseases caused by bacteria are notoriously difficult to control. The use of antibiotics is expensive and they are potentially a health risk unless formulated for use on plants. In nurseries, strict sanitation practices have to be implemented. This includes removing infected plants, preventing the movement of people from infected to uninfected areas and watering plants later in the day so as to prevent the accumulation of water on plant surfaces. We have noticed that in plantations, trees usually outgrow the disease but damage while they are still young can be severe.



Please report any outbreaks of
this disease to the TPCP.



Caressing the Web: FABI goes high-tech

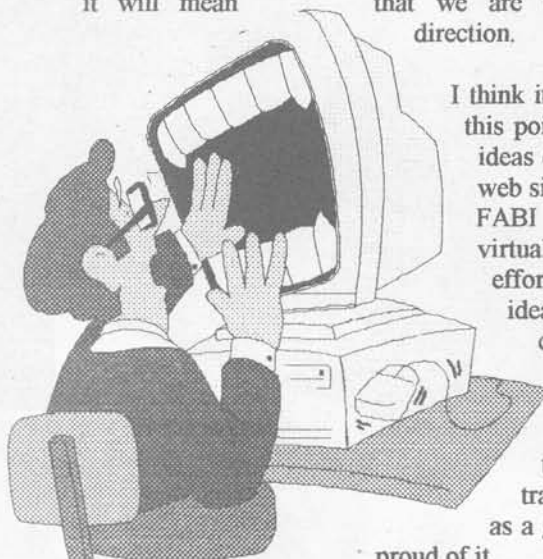
Only ten years ago, the internet seemed like a vast, untouchable network of cables running underground, permitting access to only a select few. Even though that view is not entirely correct, the internet does have the ability to intimidate even the toughest of souls. What's up with all of that network jargon, stuff like FTP, HTTP and websites and browsers?

The truth is that the internet has grown to be the largest and most effective means of communication on earth. It is also the most cost effective, and has the possibility of changing the way the human race will progress in future. It is thus not surprising that FABI has seen the internet as a way of presenting itself to the world while putting the best foot forward. In fact, this notion has persisted from the early days of the TPCP, which had a web site at the University of the Orange Free State even before the ideas around FABI took form.

Not surprisingly, FABI's web presence has grown from merely informing people that it exists to a frequently visited place of learning. It is, in fact, one of the most frequently visited web sites hosted by the University of Pretoria, aside from the University itself's pages. This means that the FABI web site has evolved from a mere web presence to a highly prized asset.

A few of the reasons for this evolution includes the ability to view information on the most important forest pathogens online, a catalogue of people associated with FABI (including their research interests and recent publications), and the recent addition of a virtual tour of the FABI enterprise. The last mentioned section is still a work in progress, but will be finished soon with the addition of extra tours to the sixth floor in the Agricultural Building and the nursery on the farm.

The success and strength of FABI's web site is proven by the fact that it is used by other institutes and academic departments as a blueprint for how things can be done. There is also no doubt in my mind that the virtual tour will soon be copied by other friendly web presences. This will be a major victory for FABI, as it will mean that we are moving in the right direction.



I think it will be appropriate at this point to mention that the ideas employed on the FABI web site come from all of the FABI family. As such, the virtual tour is also a group effort... people dishing up ideas on improving the current tour, as well as what can be added in future. The FABI web site is, therefore, true to the FABI tradition of doing things as a group, and we are very proud of it.

Lastly, it is of importance to print FABI's web address here. This is the entry point to everything associated with FABI, including the TPCP and FMBC's pages and the virtual tour:

<http://www.up.ac.za/academic/fabi/tpcp>

IMPORTANT : PLEASE READ THIS

In order for us to coordinate our services to you please help us by using the following contact address:

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