



THE TPCP AT THE START OF 1992

The end of 1991 marked the end of the second successful year of existence of the Tree Pathology Cooperative Programme (TPCP). Indeed 1991 was a remarkable year with many new challenges for our team of tree pathologists. The number of diseases with which we are having to cope has increased markedly and we have found ourselves severely stretched in terms of the the necessary "person power" to attend to all these problems. On the other hand we have had to prioritise our activities more carefully which is always a positive exercise.

The Department of Environment Affairs and Forestry formally joined the TPCP at the beginning of this year. This was indeed an exciting development and can only be to the advantage of the Industry as a whole. Diseases of course know no boundaries and, where new diseases are encountered, it is important that we deal with these problems on a broad front. Dealing with such problems to the exclusion of a large portion of the industry can only be to the detriment of us all.

The annual meeting of the board of the TPCP was held at Bloemfontein during the course of the 13th and 14th February. The format of this meeting was considerably different to that of the previous year and turned out to be a most exciting and worthwhile experiment. Team members of the TPCP presented short talks on their activities during

the past 12 months. Board members were thus informed on topics including the discovery of Endothia canker, Pythium root disease of eucalypts, Cryphonectria canker, Sphaeropsis diseases, pine seedling root disease and the threat of guava wilt to eucalypts to mention just a few. The occasion was also used to formally constitute the membership of the Department to the TPCP. Mr. Nic De Waal was present to sign the agreement on behalf of the Department and all agreed that this development would augre well for tree pathology research in South Africa.

One of the most exciting developments during 1991 was the establishment of field surveys by some members in order to evaluate the extent of losses due to disease. Two groups are currently undertaking such surveys and a



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substantial portion of the effort at this stage is to establish acceptable techniques for the evaluations. At this stage, it is important to determine how intensively plantations must be sampled to retrieve a reliable impression of damage. In addition a level of accuracy in terms of diagnosis must be decided upon given that the surveys will be undertaken by personell that have not been trained specifically in tree pathology. Nevertheless, a great deal of progress has been made in this project and some of the parties involved in H.L. & H. have even produced a brief field guide to the identification of common eucalypt diseases. This guide has already been tremendously helpful to survey teams.

Ultimately, our industry requires a system by which regular surveys are made of plantations to assess damage

due to disease. Data from these assessments will make it possible for us to evaluate the relative susceptibility of species and clones to various disease problems. Correlations with climatic and site factors will also be possible. Such a database must ultimately be one of the most powerful tools of the industry.

TPCP team members have continued to present lectures to update staff of member groups on disease problems and research results. These lectures are organised on request and the format followed has varied depending on the specific requirements of the group. Ideally such lecture groups are restricted to between 20 and 30 participants

and are held on an annual basis. The aim here is to develop a relationship between field staff and the TPCP and thus to encourage continuous communication throughout the year. In this way new disease problems are likely to be identified early and foresters will also be assured of continuous support for on-going problems.

BLANCHETTE

VISITS SOUTH AFRICA

Professor Robert A. Blanchette of the Department of Plant Pathology at the University of Minnesota was the recipient of the 1992 Hans Merensky fellowship and visited South Africa to undertake a two week lecture tour in early March. Professor Blanchette is one of the foremost tree pathologists in the world and has also had a long standing relationship with team members of the TPCP. His interests include the response of trees to infection by pathogens and various aspects of biological pulping.

During his visit, Bob Blanchette presented seven lectures on various aspects of tree pathology and biological pulping. These lectures were held at Stellenbosch, Pietermaritzburg, Sabie, Johannesburg and Bloemfontein and Blanchette's tremendous knowledge was thus very adequately shared with foresters, people interested in pulp production as well as tree pathologists in

South Africa. Many students of pathology also had the opportunity to meet Blanchette and to experience his tremendous enthusiasm for his subject.

Other than presenting lectures, Bob Blanchette had the opportunity to see a wide range of eucalypt and pine diseases in the country. He also inspected various pathology trials including those to screen eucalypt clones for resistance to *Cryphonectria* canker. He was thus able to advise foresters and pathologists on means to reduce the impact of diseases and to improve research programmes relating to these problems.

The visit of Bob Blanchette to South Africa must certainly be included amongst the highlights of this year's forestry calendar. In this sense the forestry industry owes a special vote of thanks to the Hans Merensky foundation for their generous support of this visit.

THE RESEARCH TEAM OF THE TREE PATHOLOGY COOPERATIVE PROGRAM

The research team of the Tree Pathology Cooperative Program is varied. It includes full time staff of the University of the Orange Free State (Prof M.J. Wingfield, Dr W.J. Swart and Mr G.H.J. Kemp), colleagues and students attached to other organisations such as Mrs N. Nicol of the ICFR, technical assistants funded by the University or through membership fees and post graduate students (at present seven) who are mainly funded by the FRD. Staff from various of the Departments in the University obviously provide advice and support where this is required.



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SELECTED ABSTRACTS FROM PRESENTATIONS

BY THE TPC P TEAM MEMBERS AT RECENT CONFERENCES

SUSCEPTIBILITY OF *EUCALYPTUS GRANDIS* CLONES AND HYBRIDS TO *CONIOTHYRIUM* STEM CANKER

A species of *Coniothyrium* has recently been found in Zululand, South Africa, causing serious stem cankers on *Eucalyptus grandis*. A field trial was therefore conducted to evaluate the susceptibility of different *E. grandis* clones and hybrids to this disease. Artificial inoculations were made on six-month-old trees and lesion development was measured after six weeks, six months and one year respectively. Significant variation in susceptibility between clones was found. Although clones of *E. grandis* tended to be highly susceptible in general, those selected in Transvaal were more resistant than clones selected in Natal. Hybrids of *E. grandis* with *E. tereticornis* were most resistant. These results suggest that opportunities exist to avoid *Coniothyrium* stem canker through utilisation of clones and hybrids tolerant to the disease.

FUTURE PROSPECTS FOR THE MOLECULAR CHARACTERIZATION OF PLANT PATHOGENIC FUNGI

Accurate identification of fungi is tantamount to the solution of many plant pathological problems. Classically, such identification has rested, almost entirely on morphological characteristics. This approach is often subjective and therefore, not particularly reliable. The relatively

A NEW AND IMPORTANT CANKER DISEASE OF *EUCALYPTUS* CAUSED BY *ENDOTHIA GYROSA*.

During countrywide surveys of *Eucalyptus* plantations for Cryphonectria canker, cankers distinctly different from those associated with *C. cubensis* were observed. These cankers were less severe than those typical of *C. cubensis* and were exemplified by cracked and slightly swollen areas on the bark. *Endothia gyrosa* a well known pathogen of woody plants including *Eucalyptus* spp., was consistently associated with these cankers. The pathogen is easily distinguished from *C. cubensis* by the presence of orange-brown stromata and non-septate ascospores. Inoculations on *Eucalyptus grandis* and *Psidium guajava* (Myrtaceae) resulted in lesions similar to those observed on naturally infected trees. The disease associated with *E. gyrosa* is widespread in South Africa, and research is required to establish control strategies.

recent application of molecular characteristics to identify individuals or populations of fungi has solved some of these problems and had fascinating results in terms of the evolutionary biology of pathogens. The technology in this field is developing rapidly. This is particularly exemplified by the introduction of the Polymerase Chain Reaction. With this technique, fungi that could not have been studied previously, either due to their lack of

A NEW AND SERIOUS ROOT DISEASE OF *EUCALYPTUS* ASSOCIATED WITH A SPECIES OF *PYTHIUM*

A serious root disease of *Eucalyptus grandis* has occurred in the Kwambonambi area of Northern Natal during the past three years. The disease typically occurs on young trees that rapidly wilt and die after roots and collars become girdled. Isolations from roots and root collars of young trees consistently yielded a species of *Pythium* that has been tentatively identified as *P. splendens*. Inoculations on two clones of *E. grandis* resulted in extensive lesions indicative of a high degree of virulence in the fungus. *Pythium* spp. have not previously been associated with diseases of *Eucalyptus* under field conditions and further studies on this important disease are thus required.

ability to grow in culture or the fact that they are represented only by dried herbarium specimens, can be included in comparative studies. Only a small part of the potential of molecular techniques for the characterization of plant pathogenic fungi has been realized. Opportunities in molecular taxonomy for plant pathologists and mycologists are tremendous and a knowledge of this field will be essential in the future.

SCREENING FOR RESISTANCE TO *SPHAEROPSIS* *SAPINEA* IN *PINUS RADIATA*

The Department of Plant Pathology at the University of the Orange Free State, under the auspices of the TPCP, has recently embarked on a collaborative project with the Division of Forest Science and Technology of the CSIR (Forestek) to screen selections of *Pinus radiata* for resistance to the important pathogen, *Sphaeropsis sapinea*. The strategy will involve artificial inoculation of 6-12-month-old *P. radiata* plants in the greenhouse and assessment of the relative susceptibility of selected families.

Based on previous studies that have investigated the relative susceptibility of *Pinus* spp. to *S. sapinea*, cambial lesions that result from artificial inoculation with the pathogen have proved to be an excellent criterion, or "indicator trait", for discerning the relative disease susceptibility between *Pinus* species. Results of field inoculations on various

Pinus spp. were well correlated with empirical data at testing to the relative susceptibility of the species. There was also a perfect correlation between greenhouse and forest results.

The indirect screening technique described above has numerous advantages. Firstly, it makes provision for a consistent and uniform "challenge" by the pathogen of all plants being screened; no "disease escapes" are thus possible. Secondly, variation with the pathogen is minimal as isolates used for inoculations are specially selected for high levels of virulence. Finally, it is considerably less labour intensive and time-consuming, and thus also more cost efficient, than direct screening techniques involving field trials with older trees.

The maintenance and production of sufficient *S. sapinea*

inoculum in the laboratory, the inoculation of selected plant, followed by assessment and finally, verification of results in the laboratory are the most essential components of the project for which the laboratory facilities of the Department of Plant Pathology at the University of the Orange Free State will be utilized. Plants will be inoculated in greenhouses at Forestek, Sabie by staff of the Department of Plant Pathology at suitable intervals. Verification of inoculations by means of isolations from symptomatic plants will then be conducted in the lab. Families selected in the greenhouse for resistance or tolerance to *S. sapinea* will eventually also be screened in the forest. By means of this strategy, it is anticipated that seed orchards comprised of *S. sapinea* resistant clones of *P. radiata*, and eventually *P. patula* as well, will soon be in production.

IMPORTANT : READ THIS

Some difficulty continues to be experienced during the last few months with the receipt of samples sent to the Tree Pathology Cooperative Program for diagnosis. These have been sent to various members of the TPCP team as well as to the general University address. In order for us to coordinate our services to you please help us by using the following contact address:

TREE PATHOLOGY COOPERATIVE PROGRAMME

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Die optimale benutting van 'n natuurlike hulpbron kan nie verwesenlik word voordat 'n bewuswordingsfase en daarna 'n opleidingsfase waarby almal, van die boer tot die voorligter en die breër omgewingsbewuste publiek, betrek word nie.

Die Chinese het 'n spreekwoord wat sê:

'Beplan jy vir 'n jaar, plant rys,
beplan jy vir 'n dekade, plant bome
maar beplan jy vir 'n leeftyd,
leer en onderrig mense!'