

Tree Breeding

A short course

The year 2006 has seen the 13th in a series of international courses in tree breeding hosted by the CSIR. This course brings together tree breeders, geneticists, managers and foresters from around the world who are interested in sharing and expanding their knowledge of tree breeding. The course combines theoretical principles with practical aspects and empowers participants to apply this knowledge to breeding programmes at all levels of development and implementation. Examples from *Eucalyptus* and *Pinus* breeding programmes are discussed.

Past courses have drawn participants from more than 32 countries around the globe and established valuable contacts and networks for those attending. Comments from past participants include:

“I came here to learn more about how breeding works, especially conventional breeding and how it is being practised on the ground. I am fully satisfied that the course really fulfilled my needs” – Solomon Islands

“I personally learnt a lot, had a great time and would highly recommend it!” -Australia

“The knowledge gained here will help me develop myself and my team when I am back in the field.” - Brazil

“The course gave me a broad insight into tree breeding.” – South Africa

“The course presenters demonstrated professionalism in all aspects of their presentation. Well-formulated lecture notes.” - Zimbabwe

WHO ARE WE?

The CSIR is one of the leading research and development, technology and innovation organisations in Africa. The primary focus of the CSIR tree breeding programme over the past four decades has been on the genetic improvement of eucalypt and pine species and hybrids for both pulp and solid wood products. The CSIR has also developed tools and breeding techniques to optimise gain, and accelerate breeding, so as to maximise return on investment. The course will be presented by the CSIR tree improvement team and other South African experts, recognised as leaders in their field.

OBJECTIVES OF THE COURSE

The course covers all the principal aspects of breeding tree species, including some of the latest advances in breeding technology.

- The course will enable participants to keep abreast with the latest developments in tree improvement principles and practices, e.g., one-stop pollination (OSP), intellectual

property management, wood property prediction, genotype by environment interaction, BLUP (Best Linear Unbiased Prediction) and much more.

- The course will empower breeders and managers with established tree breeding programmes and those who are planning to initiate programmes for the first time to make more informed decisions regarding breeding strategies, mating and trial designs as well as selection strategies.
- Course participants will gain both the **theoretical** background and **practical** exposure to breeding techniques and implementation of the theory.
- This is an ideal opportunity to network with participants from around the globe and well known South African experts in their field, thereby gaining valuable business and technical contacts in the industry.
- Participants will be exposed to some of the latest research results in the South African industry.
- Have fun whilst exploring the wonders of tree breeding.

The course takes the form of lectures, discussions and visits to research trials and facilities, as well as practical exercises.

WHO SHOULD ATTEND?

All tree breeders, researchers, foresters and managers who want to update their knowledge and develop their skills in tree improvement should attend. The course is intended for those who want to be exposed to the latest information on tree breeding as well as fundamental tree improvement techniques and principles.

Participants should have a working knowledge of mathematics/statistics.

COURSE CONTENT

The course lectures and manual cover the following main themes:

- World trends in forestry
- Introduction to cytology and genetics
- Basic statistical concepts of importance (self study)
- Data capture and verification
- Collection, introduction and conservation of genetic diversity
- Breeding strategies
- Quantitative genetics
- Clonal forestry
- Hybridisation
- Mating designs
- Experimental designs
- Trial establishment and maintenance
- Vegetative propagation
- Advanced selection techniques and genetic gain
- Seed orchards

- Controlled pollination and pollen handling
- Wood properties and wood quality
- Tree pathology
- Biotechnology in forest tree improvement
- Intellectual property management.

WORKSHOP

Course participants will have the opportunity in a workshop session, to present and discuss examples of applications of breeding techniques in their particular work situation. Problems and challenges can be highlighted, and strategy or any other breeding related questions can be discussed in the workshop with fellow participants and Dr Steve Verry, who facilitates the discussion. These sessions are extremely valuable and lead to challenging debates around breeding bottlenecks, challenges, practical problems and strategies. They also allow participants an opportunity to share their own experiences from a wide range of breeding contexts. Participants are encouraged to prepare background material on particular aspects of their work that they would like to share with the group. Alternatively, participants may elect to present and discuss broader aspects of tree breeding and the inherent challenges.

LECTURERS

Lecturers from the CSIR, private forestry companies and universities present the course.

ENQUIRIES

For more information, please contact the course coordinator

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