

Forest Genetics and Tree Breeding in the Age of Genomics

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Report from the conference on “Forest Genetics and Tree Breeding in the Age of Genomics - Progress and Future” organized by Research Group 2.02.00 Conifer Breeding and Genetic Resources (<http://iufro-down.boku.ac.at/iufro-net/d2/wu20200/ev20200.htm>) together with multiple working parties related to breeding and genetic resource management from November 1-5, 2004, in Charleston, South Carolina, USA.

Genetically improved plantations from breeding programs have had and continue to make significant impacts on forest productivity, wood supplies, and sustainability of forest resources. Forest genetics and tree breeding, especially the potential application of biotechnology and genomics in the future, are therefore issues of wide spread interest. The IUFRO conference “Forest Genetics and Tree Breeding in the Age of Genomics - Progress and Future” brought together geneticists, breeders, applied and basic scientists, managers and professional foresters to give insight into the state of the art and exchange views on potential future developments.



The conference revealed that significant progress has been made in forest genetics research and tree breeding in the last three decades. Many breeding programs in the world have progressed rapidly from provenance testing to advanced-generation breeding. Substantial genetic gains have been achieved for most tree species in adaptation, productivity, pest resistance and wood quality. New breeding strategies, selection and testing methods are being developed to improve breeding efficiency to capture much greater genetic gains in tree breeding programs. However, the traditional breeding programs are being challenged by the overwhelming level of new information in biotechnology and genomics.

These new advances in biotechnology/genomics— especially in somatic embryogenesis (SE) technology – have had a great impact in recent years on the deployment of genetic materials for several major breeding programs. SE has also offered great opportunities for genetic transformation and production of clonal forestry with improved productivity, reduced disease, and enhanced wood quality in plantations.

Based on up-to-date information provided by conference participants on this and other breakthroughs in genomics research, such as genome sequencing, conference participants explored opportunities for integration of new genomics and biotechnology into major areas of breeding and genetic resource management. However, some key challenges remain such as successful transformation systems for major species, gene expression, risk analysis and last but not least the acceptance of the public.

The participants of this international conference exchanged the latest information on forest genetics and tree breeding, with special focus on the potential application of biotechnology and genomics in the future. A total of 231 people from 22 countries participated and over 120 papers and posters were presented.

The **full report** (<http://iufro-down.boku.ac.at/iufro-net/d2/wu20200/ev20200.htm>) and the **conference proceedings** (http://www.ncsu.edu/feop/iufro_genetics2004/proceedings.pdf) can be accessed online. For further information, contact: Professor Bailian Li, Department of Forestry and Environmental Resources, North Carolina State University, Raleigh, USA. Email <Bailian_Li@ncsu.edu>