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# **Biotechnology Research Paves the Road** for the Trees of the Future

Björn Sundberg<sup>1</sup>, Alexander A. Myburg<sup>2</sup>, Brenda D. Wingfield<sup>3</sup>

The recent sequencing of the poplar tree genome is creating immense possibilities for forest tree research. Scientific tools are now available to unravel the genetic mechanisms underlying important traits in commercial forestry such as wood quality, disease resistance, abiotic stress and reproductive biology. Such knowledge will form the basis of modern tree breeding that will produce the trees of the future. Genomic sequencing of forest trees will, however, not only pave the road for a new era in practical forestry, but it also puts basic research on forest trees in the frontline of plant science.

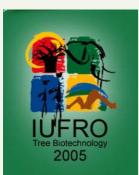
The IUFRO Working Party 2.04.06 organizes biennial international meetings on the genomics, molecular biology and biotechnology of forest trees. The most recent IUFRO Tree Biotechnology meeting held in Pretoria, South Africa was the first in the post-genomic era of forest trees. Presentations on the poplar genome and research enabled by this tremendous new resource were obvious highlights of the meeting

With the genome data in hand, it is now possible to investigate the detailed evolution of a forest tree genome and its relationship to other plant genomes. Such comparisons allow us to ask " What genes make a tree?" and will greatly accelerate our journey towards a more complete understanding of the genes that underlie important traits in forest trees. One outcome of the post-genomic era is largescale biology and the creation of huge databases of genes, proteins and metabolites. The organization, bioinformatics and sharing of such data were a central discussion theme of the meeting. The sequencing of other tree genomes such as that of Eucalyptus species was also discussed.



IUFRO Tree Biotechnology 2005 - Scientific Committee

The heart of the meeting remained, however, presentations on experimental research providing knowledge about the general principles behind tree growth and development, and their biotechnological applications. Many excellent presentations provided information on genes involved in central developmental processes such as seasonality, shoot and wood development, insect and disease resistance, wood production and lignin, cellulose and hemicellulose biosynthesis. The scientific excellence of the meeting was also demonstrated by the fact that many leading non-tree scientists came to present their research in other model systems. The industrial importance of the field was devoted a specific session where leading forest biotech companies presented their views on the impact of economic, scientific and societal value chains on the future application of forest biotechnology. The participation of several major pulp and paper companies in the meeting reinforced the great economic potential of this research.



- (1) Umeå Plant Science Centre, 901 83 Umeå Sweden. (Chair of Working Party 2.04.06.)
- (2) Forestry and Agricultural Biotechnology Institute (FABI), University of Pretoria,
- Pretoria, 0002, South Africa. (Meeting Organizer and Deputy of Working Party 2.04.06.) Forestry and Agricultural Biotechnology Institute (FABI), University of Pretoria, (3) Pretoria, 0002, South Africa. (Meeting Organizer).

The IUFRO Tree Biotechnology 2005 meeting was hosted by the Forestry and Agricultural Biotechnology Institute (FABI) at the University of Pretoria in Pretoria, South Africa. Major sponsors of the meeting included Sappi, Mondi Business Paper South Africa and SweTree Technologies. The meeting attracted more than 200 delegates representing 26 countries, 45 universities and 44 forest research institutions or biotech companies. More information and abstracts from the meeting can be found at www.iufro.up.ac.za.



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By Richard W. Guldin, John A. Parrotta, and Eeva Hellström IUFRO Task Force on the Forest Science-Policy Interface IUFRO Occasional Paper 17, ISSN 1024-414X, Vienna 2005

#### Purpose of the Guidelines

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Society is the ultimate beneficiary of forestry research. But to generate value for society, research results must be used by someone — policy-makers, forestry practitioners, landowners, educators, other researchers. The science-policy interface is all about utilizing scientific knowledge more effectively. Often, research is planned and conducted before giving adequate thought to exactly how the results will be transformed into usable information. The purpose of these guidelines is to provide advice to researchers and research leaders on how to plan, conduct, and organize research activities so that results can more quickly and easily be transformed into usable information for problem-solving and policy-making. Although not all research is focused on policy-relevant questions, the advice in this report can increase the impact of research on forest policy and improve the practice of forestry, thereby creating more value more quickly for society from forestry research.

The publication is available on the IUFRO Web site at: www.iufro.org/publications/series/occasional-papers/. Free printed copies can be ordered from IUFRO Headquarters at <office@iufro.org> (Mailing costs will be charged for larger quantities only.)



## International Bamboo Inventory Training Workshop

24 October - 4 November 2005, Beijing and Zhejiang Province, China

The Workshop was held by the International Network for Bamboo and Rattan (INBAR), the International Center of Bamboo and Rattan (ICBR), FAO and IUFRO.

There are only few countries with national bamboo inventories, and the bamboo inventory methodology is often very poor. Consequently, the major objectives of the workshop were to train participants from INBAR member countries in on-the-ground and remote sensing methods for the bamboo resources assessment. 40 invited participants from 18 countries in Asia, Africa and Latin America took part in the training workshop.



The main outcome of the training workshop was the launching of two task forces for on-the-ground and remote bamboo resources assessment. Both task forces are led by INBAR specialists: Dr. Fu, Jinhe (on-the-ground) and Mr. Shyam Paudel (remote sensing). Manuals are to be completed in two years. *Contact Dr. Fu <jfu@inbar.int> for more details.* 



### Walter Liese -80 Years Old Congratulations!

Professor (emer.) Dr. forest. Dr. h.c. (mult.) Walter Liese, IUFRO President from 1977 to 1981 and Honorary Member of IUFRO since 1982, was born on January 31, 1926, in Berlin and grew up in his nearby hometown Eberswalde, the birthplace of IUFRO. From 1963 to 1991 he was

Head of the Institute for Wood Biology at the University of Hamburg and, at the same time, Director of the Institute for Wood Biology and Wood Protection at the Federal Research Centre for Forestry and Forest Products, Hamburg (BFH). For 5 years during this period he was also Executive Director of BFH. He has always been very supportive of IUFRO, also as the German representative in the IUFRO International Council.

After his retirement, his scientific activities focused almost entirely on bamboo, the ''poor people's timber'', and on the dissemination of his knowledge and experience to those who could make best use of it, the rural population in East and Southeast Asia, Central Africa and Central America. During the last 15 years, Walter Liese travelled many times into these regions, gave lectures and provided advice. In the same period, he published about 70 papers on bamboo and rattan, among them two books on bamboo anatomy and bamboo preservation.

We would like to congratulate him on the occasion of his birthday and on his extraordinary career and achievements.



# Meetings

### **IUFRO Co-sponsored Meetings**

For a full list of IUFRO events, please visit our <u>online calendar</u>. Find more details on the <u>homepages</u> of IUFRO Units involved.

May 17-20, 2006 Managerial Economics and Accounting in an Evolving Paradigm of Forest Management Rottenburg, Germany IUFRO RG 4.05.00 Contact: Wolfgang Tzschupke <tzschupke@hs-rottenburg.de > http://www.has-rottenburg.de/IUFRO-conference/

May 20-21, 2006 **3**<sup>rd</sup> **Workshop on Genetics of Bark Beetles and Associated Microorganisms**  *Asheville, NC, USA* IUFRO WP 7.03.05 Deadline for reservations: 1 April 2006 **Contact:** Barbara Bentz, <bbentz@fs.fed.us>

#### May 25–26, 2006

Segundo Seminario Interuniversitario de Estudiantes de Postgrado en Ciencias Forestales

Valdivia, Chile Co-sponsored by IUFRO Division 6 **Contact:** María Dolores Aguilera, Secretaria, Escuelade Graduados, <graduadosforestal@uach.cl>

#### June 8-10, 2006

#### Cultural Heritage and Sustainable Forest Management: The Role of Traditional Knowledge

Florence, Italy

Italian Academy of Forestry Science Organized by: IUFRO RG 6.07.00; IUFRO Task Force on Traditional Forest Knowledge

**Contact:** Valentina Marinai, <info.forest@unifi.it> Department of Environmental Forestry Science and Technology; University of Florence, Via San Bonaventura 13; 50145 Firenze, Italy. Tel + fax : 00 39 055 30231282 http://www.forestlandscape.unifi.it/chsfm\_2006.asp

#### June 17-21, 2006

#### Gender and Forestry: International Seminar with Field Trip Umeå, Sweden

IUFRO WP 6.08.01 (formerly 6.18.01) **Contact:** Gun Lidestav, <Gun.Lidestav@ssko.slu.se> Dept of Forest Resource Management and Geomatics, SLU, 901 83 Umeå, Sweden Telephone: +46 90 786 8391, Fax: +46 90 778116 Web site: <u>http://www.sfak.slu.se/</u> <u>ShowPage.cfm?OrgenhetSida\_ID=5421</u>

#### June 18-23, 2006

Small-scale Forestry and Rural Development: The Intersection of Ecosystems, Economics and Society *Galway, Ireland* IUFRO RG 3.08.00 Small-scale Forestry **Contact:** Sarah Wall, <sarah.wall@gmit.ie> Tel: +353 91 742394, Fax: +353 91 751107 http://ns2.gmit.ie/information/conferences/Forestry/

#### July 3-7, 2006

#### Alien Invasive Species and International Trade Radom, Poland

Inaugural Meeting of IUFRO WP 7.03.12 At The Regional Directorate of State Forests **Contact:** Hugh F. Evans, Forestry Commission, Forestry Authority, Forest Research Station, Alice Holt Lodge, Wrecclesham Farnham, Surrey GU10 4LH, United Kingdom. E-mail(pers): <hugh.evans@forestry.gsi.gov.uk>

#### July 9-13, 2006

Beyond Borders – Forest Tree Rusts from a Global Perspective California, USA 2006 Conference of the IUFRO Working Party 7.02.05 Rusts of Forest Trees Contact: Jim Walla <j.walla@ndsu.nodak.edu> http://www.ndsu.nodak.edu/instruct/walla/ 2006Announcement.html

#### August 8-10, 2006

#### International Conference on Forest and Water in a Changing Environment

Beijing, China Co-sponsored by IUFRO. Sponsored and organized by the Chinese Academy of Forestry ,Beijing Forestry University and USDA Forest Service, Southern Research Station. **Contact:** John A. Stanturf, < jstanturf@fs.fed.us> Shirong Liu, liusr@forestry.ac.cn> http://www.caf.ac.cn/fwce/Second\_circular\_E.doc

#### September 4-8, 2006

#### Beech Silviculture in Europe's Largest Beech Country Poiana Brasov, Romania

An international conference and field trip of IUFRO WP 1.01.07 Ecology and Silviculture of Beech Organizer: Norocel-Valeriu Nicolescu, University of Brasov http://www.rifr-ac.ir/english/group/beechforest/ news.htm



Sustainable Resource Management

#### Call for Applications

The international master's program "Sustainable Resource Management" at the School of Forest Science and Resource Management, Technische Universität München, invites graduates (Bachelor/Diploma) from all over the world to apply for admission until March 31<sup>st</sup> 2006. In the 2-year program, international and German students will be prepared for professional work in the various fields of resource management. They will learn important concepts and techniques for sustainable management and acquire special management skills. More information.



#### September 11–14, 2006 Methodology of Forest Insect and Disease Survey in Central Europe

Ort/Gmunden - Austria IUFRO Working Party 7.03.10 Federal Research and Training Centre for Forests, Natural Hazards and Landscape, Forest Training Centre (BFW) Contact: Hannes Krehan, <Hannes.Krehan@bfw.gv.at> Tel.: +43-1-87838 1128; Fax.: +43 -1 87838 1250

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#### September 18-22, 2006

Networks in Forestry Extension -

#### Achievements, Emerging Issues and Future Action Riga, Latvia

8<sup>th</sup> Extension Working Party Symposium, IUFRO WP 6.06.02 Contact: Juris Oslejs, Riga str. 111, Salaspils, LV-2169, Latvia; Tel: +371- 7942555 or +371-9421692 (mobile), Fax: +371-7901359, E-mail: <info@silava.lv>

http://iufro8extensymp.silava.lv

#### September 19-23, 2006

#### Breeding and Genetic Resources of Five-needle Pines Valiug (of Resita), Romania

Organized by IUFRO WP 2.02.15 and the Forest Research and Management Institute of Bucharest, Romania Contact: Ioan Blada, Sos. Stefanesti 128, Post Office 11, P.O. Box 11.04, Sector 2, Tel. / Fax: +4 021 350 32 45 E-mail: <ioan\_blada@yahoo.com>

#### http://www.for.gov.bc.ca/hre/iufro06/index.htm

#### September 24-27, 2006

#### OAK 2006: Advances in The Principles And Practices of **Oak Silviculture And Genetics**

Stevens Point, Wisconsin, USA Joint meeting of IUFRO WP 1.01.06 Ecology and Silviculture of Oaks, and WP 2.08.05 Genetics of Quercus. Contact: Robert Rogers <oak2006@uwsp.edu> College of Natural Resources, University of Wisconsin http://www.uwsp.edu/forestry/oak2006 .

#### October 4-7, 2006

#### **Ecosystem Goods and Services from Planted Forests** Bilbao, Spain

Co-sponsored and supported by IUFRO Division 4, CIFOR and IUCN.

Organized by the NETFOP project through the Institute of Silviculture at Freiburg University and the European Institute of Cultivated Forests (IEFC - project centre of the European Forest Institute).

Contact: Joachim Schmerbeck, E-mail: <joachim.schmerbeck@waldbau.uni-freiburg.de> http://www.waldbau.uni-freiburg.de/bilbao.html conference86@iefc.net

#### Call for Papers - Deadline March 31, 2006 N Deposition:

Problems and Benefits for Forest Ecosystems Special Issue of Int'l Journal of Environmental Studies Edited by IUFRO RG 7.01.03 Yusuf Serengil, <yserengil@istanbul.edu.tr > Dale W Johnson, <dwj@cabnr.unr.edu> Lucy J Sheppard, <lis@ceh.ac.uk>

#### October 9-13, 2006

#### Low Input Breeding and Genetic Conservation of Forest **Tree Species**

Maritim Pine Beach Resort, Antalya, Turkey **IUFRO** Division 2 Joint Meeting Contact: Fikret Isik <Fikret\_isik@ncsu.edu> http://www.akdeniz.edu.tr/english/iufro/theme.htm

#### October 22-28, 2006

Forest Health in Managed Forests

La Serena, Chile Two-day session in the course of the II Latin American IUFRO Congress. Joint meeting of IUFRO RG 7.02.00 Forest Pathology and 7.03.00 Entomology Contact: Andrew Liebhold, <aliebhold@fs.fed.us>

### October 23-27, 2006

II Congreso Latinoamericano IUFRO La Serena, Chile Contact: Santiago Barros, INFOR <seminarios@infor.gob.cl >. IUFRO 6.03.04 Web site



#### October 25-27, 2006

#### Forest Xchange - International Conference on Knowledge Management and Transfer Freiburg, Germany

Co-sponsored by IUFRO Div. VI, Task Force Public Relations in Forest Science; WP 6.06.02; WP 6.06.03; WP6.15.00 Contact: Roderich von Detten <info@forestxchange.org> Phone: +49 (0)761 / 4018-214 http://www.forestxchange.org

#### December 3-6, 2006

#### 1<sup>st</sup> Iberoamerican Wood Protection Congress Mérida, Venezuela

Organized by RIPMA (Red Iberoamericano de Protección de la Madera) Co-sponsored by IUFRO 5.03.00 Wood Protection Contact: Congress Secretariat, GICOM, Laboratorio Nacional de Productos Forestales Conjunto Forestal, Vía Chorros de Milla, Mérida 5101-A, Venezuela; Tel. int.: + 58 274 240 1684; Fax int.: + 58 274 240 1691 <osenbla@gmail.com>, <ripmamerida@hotmail.com>

# Other Meetings

#### April 19-21, 2006

#### International Conference on the Roles of Forests in Rural **Development and Environmental Sustainability** Beijing, China

Sponsored by the Chinese Society of Forestry, Korean Forest Society, Japanese Forest Society Contact: Ms. Guan Xiuling, Ms. Feng Caiyun, E-mail: <csf\_org@forestry.ac.cn> , Fax: 0086-10-62889819

#### September 26-29, 2006 **INTERPRAEVENT 2006**

Niigata University, Japan International Symposium on Disaster Mitigation of Debris Flow, Slop Failures and Landslides Contact: <ip2006@gs.niigata-u.ac.jp> http://www.agr.niigata-u.ac.jp/interpraevent/