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INSTITUTE OF FOREST BIOTECHNOLOGY

BIOSYLVAN News

GLOBAL BIOTECHNOLOGY FORUM AT CONCEPCIÓN, CHILE

Forest Biotechnology Workshop

The occasion was the United Nations Industrial Development Organization's (UNIDO) Global Biotechnology Forum at Concepción, Chile that extended from March 2-5, 2004. Announced attendance for that international affair was 1,100. Among the dignitaries addressing the delegates at the opening ceremony were Carlos Magariños, Director General — UNIDO, Néstor Kirchner, President — Argentina, and Ricardo Lagos, President — Chile.

Sandwiched within the Forum was the Forest Biotechnology Workshop. It was the only such workshop within the four-day event. Questions arose why forestry had received such prominence when other high-profile disciplines such as agronomics, fisheries, pharmaceutics, and medicines were nowhere to be seen. The answer was that some very enterprising people had seized an opportunity. Those people were Dr. Claudio Balocchi, Director of Forest Genetics for Bioforest Ltd, and Drs. Sophia Valenzuela and

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IFB Hosts A Workshop On Intellectual Property

The Center for Intellectual Property Policy (CIPP) at McGill University in Montreal, Canada held a workshop, *Agricultural Biotechnology and Intellectual Property: a new framework* on June 3 – 4, 2004 that was hosted by IFB. They have received a grant from the Social Sciences and Humanities Research Council of Canada (SSHRC) to examine intellectual property rights relating to biotechnological innovation in the health and agricultural sectors. The research objectives of this program are:

- To develop and disseminate three alternative legal models for the protection of health and agricultural biotechnology innovation.

- To develop and disseminate thorough and balanced critical analysis of the ethical, legal, management, political and economic facets of each of the legal models.

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American Chestnut Sequencing Project

IFB convened a group of scientists in Research Triangle Park on March 23, 2004 to begin the process of submitting a grant to the Plant Genome Program of the National Science Foundation. Institutions represented at that meeting were NC State University, Penn State University, State University of New York at Syracuse, Southern Research Station (US Forest Service), University of North Carolina at Chapel Hill, The American Chestnut Foundation and IFB. That meeting led to a follow-up session at Asheville, NC on May 3, 2004. The follow-up meeting was convened by IFB, but was chaired by John Carlson (Penn State) in the absence of Ron Sederoff (NC State). Present at this session, in addition to Carlson, were: Bill Powell (Syracuse), Tom Kubisiak (SRS, USFS), Paul Sisco and Fred Hebard (The American Chestnut Foundation), and Susan McCord and Bob Kellison (IFB).

The major goal of the initiative is to 'develop a genomics platform that will lead to the restoration of American chestnut'. Specific goals are:

1 Genomics platform for American chestnut restoration, including integrated maps.

2 High resolution DNA markers for selection of blight (*Chryphonectria parasitica*) and *Phytophthora cinnimommi* resistance.

3 Proof-of-concept to identify genes controlling resistance.

WORKSHOP

RESTORATION OF CHESTNUT TO FOREST LANDS WITHIN THE NATIONAL PARK SYSTEM

At the request of the National Park Service (NPS), Drs. Kim Steiner and John Carlson organized and co-chaired the workshop on Restoration of Chestnut to Forest Lands Within The National Park System. Hosted by NPS, the workshop was held May 4-6, 2004 at the North Carolina Arboretum, Asheville, NC. The majority of the 84 registered participants were from the National Park Service and US Forest Service, but others represented were from state forest services, universities, foundations, and institutes. The first two days were devoted to presentations on all aspects of American chestnut, from its original distribution, its uses and its demise to the progress made in recovery of the species, from breeding programs to biotechnology. Some discussion was also had about deployment of the recovered species and the legal issues associated with colonization of a species that might include foreign genes, either from a backcross hybridization program or from genetic engineering.

The third day was spent in breakout sessions on the feasibility of restoring the species to public lands (National Parks and National Forests). A diversity of opinions resulted from this session, with no consensus about recolonization. A contingent of people stayed through the fourth day for a tour of the breeding and testing program of The American Chestnut Foundation at Meadowview, VA, under the guidance of Fred Hebard.

We found this meeting to be very well organized, and loaded with information. A proceeding of the conference is to follow.

USDA APHIS Biotechnology Regulatory Services

By John Cordts, Biotechnologist
USDA APHIS

USDA/ Animal and Plant Health Inspection Service (APHIS), Biotechnology Regulatory Services (BRS) is responsible for enforcing regulations under 7 CFR 340 that protect American agriculture and the environment while allowing for the safe field testing of genetically engineered (GE) organisms. It is a top priority of USDA to ensure that the genetically engineered organisms of today do not pose a risk to other plants and animals tomorrow.

The Federal Plant Pest Act and the Plant Quarantine Act authorizes APHIS to regulate plant imports to the United States, and their interstate movement. It is responsible also for release—for field-testing—of genetically modified organisms that is or could feasibly become a plant pest. A plant pest is one that is deemed a risk to other plants and ecosystems.

The Coordinated Framework

The responsibility for oversight of biotechnology products is shared by three Federal Agencies: USDA's APHIS, the U.S. Environmental Protection Agency (EPA), and the U.S. Department of Health and Human Service's Food and Drug Administration (FDA). This system was delineated under the 1986 Coordinated Framework, in which Agencies that were generally responsible for evaluating certain product types, or for particular uses, were also responsible for evaluating those same kinds of products using modern biotechnology. As APHIS gains more knowledge and understanding of genetically engineered plants and the technology, it continuously reviews and updates the regulations. APHIS updated the regulations in 1993 and 1996 and is in the process of considering further revisions based on advances in technology and other new developments.

How APHIS Regulates GE Organisms

BRS determines the conditions under which GE organisms can be introduced into the U.S. The conditions allow for the importation, interstate movement and field release of the materials only after rigorous conditions and safeguards are set. BRS exercises its authority through a permit system. An individual or organization wishing to move or field test a GE plant must obtain the necessary permit(s) before proceeding.

Developers of new genetically engineered products can petition APHIS for a determination of non-regulated status of these products. Deregulated articles are no longer subject to APHIS oversight and, after evaluation by EPA and FDA (when required), can be used in food, feed and breeding programs in the same way as conventional products.

USDA-APHIS, in meetings with the Canadian Food Inspection Agency (CFIA), has developed two documents (Appendix I, Molecular Genetic Characterization Data and Appendix II, Environmental Characterization Data for Transgenic Plants Intended for Unconfined Release). Those documents provide guidance to developers of the data that regulatory agencies may require for deregulation of a given GE plant. Although developed primarily for crop plants, Appendix II may be useful also to those working on GE trees or other perennials as it outlines the wide range of biological/ environmental interactions that occur when growing plants outdoors. Both of these documents can be located on the USDA-APHIS-BRS website (*http://www.aphis.usda.gov/brs/index.html*).

APHIS-BRS organized a public meeting in July 2003 that was designed to gather input from stakeholders on issues that might be unique to fruit and forest trees to provide further guidance to developers. Documents from that meeting should be available in the near future at the above-mentioned site.

Forest Biotechnology Workshop

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Jaime Rodriguez, Faculties of Forest Sciences and Biochemistry, University of Concepción. Those 3 were among 11 individuals enrolled in a class on Introduction to GMOs and Biosafety in Forestry. The organizer of that class was Dr. George Tzotzos from UNIDO's headquarters in Vienna, Austria. Balocchi, Valencia and Rodriguez persuaded Dr. Tzotzos and co-teachers to use a forestry example as a class project and, further, they cajoled the teacher into creating three three-hour sessions on the Forum program for forest biotechnology.

Planning for the Forest Biotechnology Workshop began in January 2003. Bob Kellison joined the team to form the forestry planning committee and, in his absence, they elected him chair. During the intervening months, commitments were received from leading forest biotechnologists around the world. All speakers arrived at the appointed time, save one where there was illness in the family and she sent an able substitute. The topics, authors, and country of origin were:

TOPIC	AUTHOR	COUNTRY
The Future of Forest Biotechnology (Keynote address).	***Mike Carson,* Christian Walter, Sue Carson**	New Zealand
Operational Applications in Forestry	***John Pait***	USA
Aging, Maturation and Revigorization	***Roberto Rodriguez***	Spain
Genomics Applied to Eucalyptus: The Genolyptus Project	***Dario Grattapaglia***	Brazil
Molecular Markers & Certification	**Giancarlo Bounous**, ***Roberto Botta***	Italy
Proteomics and Other Techniques	***Mathias Fladung***	Germany
Microarrays and Other Techniques	***Lyn Van Zyl***	USA
Introduction to GMOs and Biosafety In Forestry	***Claudio Balocchi, Sofia Valenzuela***	Chile
GM Populus and Biosafety	***Steve Strauss***	USA
GM Trees	**Maud Hinchee**, ***Barbara Wells***	USA
Biotechnology Applied to Conservation and Insects and Diseases	***Kevan Gartland***	Scotland
Biotechnology Applied to Wood Properties	***Vincent Chiang***	USA

Note: The ***italicized*** name signifies the person giving the presentation.

An audience of about 100 was in attendance at each of the three sessions, and there was good interaction between the speakers and the audience. The follow-up to the meeting will be a compilation of the papers into a bound copy, and an abstracted paper that will be submitted to ***Science.*** (The proceedings from the workshop will soon be available from our website *www.forestbiotech.org*).

IFB Hosts A Workshop On Intellectual Property

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- To use a transdisciplinary methodology to arrive at legal models that integrate ethical, economic and legal perspectives.

The workshop was well attended with representation from diverse organizations such as: Center for Genome, Ethics, Law and Policy at Duke University, Organization for Economic Co-operation and Development (OECD), American Association for the Advancement of Science (AAAS), Hoover Institution, Sheffield Institute of Biotechnological Law

and Ethics in the United Kingdom, Canadian Biotechnology Advisory Committee, EMBRAPA in Brazil, Donald Danforth Plant Sciences Center and Resources for the Future. Attendees participated in working breakout sessions, facilitated discussions and listened to presentations from the members of the Intellectual Property Modeling Group. The workshop stimulated thoughtful input and will produce a report on this first of four workshops.

IFB board member Lori Knowles prepared a briefing paper that was sent to the participants prior to the workshop and outlined the project questions and goals. The IFB was keenly interested in this workshop as it considers models for intellectual property sharing for its Heritage Trees program.

Biotechnology: The Genetic Modification of Forest Trees

In conjunction with the Forest History Society, IFB is collaborating with two world-renowned geneticists to write an account of the genetic improvement of forest trees. The publication will be a continuum of the Forest History Society Issues Series that includes:

- ***American Forests: A History of Resiliency and Recovery*** by Douglas W. MacCleery.
- ***Newsprint: Canadian Supply and American Demand*** by Thomas R. Roach
- ***Forest Pharmacy: Medicinal Plants in American Forests*** by Steven Foster
- ***America's Fires: Management of Wildlands and Forests*** by Stephen J. Pyne
- ***Forest Sustainability: The History, The Challenge, The Promise*** by Donald W. Floyd
- ***Canada's Forests: A History*** by Ken Drushka

The authors of the publication that is to be available by November 1, 2004 are William J. (Bill) Libby, Professor of Forest Genetics (retired), University of California, Berkeley, and Rowland Burdon, Scientist (retired), New Zealand Forest Research Institute, Rotorua. The authors, in addition to a colleague from Australia, are writing a book on the genetic improvement of Monterey pine (*Pinus radiata*). That species is the one that has found such favor as an industrial plantation tree in Chile, New Zealand and southern Australia. It is also found as an exotic at other locations around the world although on a much smaller scale than in the three countries mentioned.

Copies of the six Issues Series are available by contacting Andrea Anderson, Administrative Assistant, Forest History Society, 701 Vickers, Ave., Durham, NC 27701. Phone: 919-682-9319; e-mail: recluse2@duke.edu The seventh one, Biotechnology: The Genetic Modification of Forest Trees, will be available by November 1, 2004.

From the President

The Institute of Forest Biotechnology (IFB) is well within its fourth year of existence. From day one there has never been a question about its need. Suggestions for collaborations with other organizations come as much from offshore as they do nationally. Two prominent offshore collaborations were the 2002 meeting in Scotland on forest biotechnology in Europe and the 2004 Forest Biotechnology Workshop that was held in Chile.

Inquiry has come from various parts of the world regarding the part IFB could play in saving tree species on the brink of disaster.

Activities have accelerated during the year. Foremost among those initiatives is the emphasis placed on Heritage Trees®. Heritage Trees are those that are threatened, endangered or have special historical or social value. Restoration and preservation of individual trees and species have application internationally. Inquiry has come from various parts of the world regarding the part IFB could play in saving tree species on the brink of disaster.

The American Chestnut Foundation (TACF) and the American Chestnut Cooperators Foundation, and others before them have been working to restore American chestnut for decades. The breeding programs, especially the backcross breeding program involving American and Chinese chestnut have been yielding good results in producing a tree with the phenotypic traits of American chestnut and the disease resistance of Chinese chestnut. Regardless of the positive results, however, production of a disease-free tree from sexual reproduction on a consistent basis is a big hurdle. Enter biotechnology to complement the breeding programs. Identification of the genes for disease resistance in Chinese chestnut can lead to a directed breeding program that is more efficient than conventional breeding, and eventually the potential for artificial insertion of those genes into American chestnuts that would give a disease-resistant tree.

The potential restoration of a Heritage Tree such as American chestnut, flowering dogwood or butternut has tickled the imagination of several conservation groups, the Forest Service and industry. All of this bodes well for IFB.

IFB's Complement of Board of Directors Nearing Completion

At IFB's Annual Meeting in April (2004), the complement of the Board of Directors came one step closer to fulfillment, with 17 of the 19 members now in place. Elected to the board were **George S. (Sam) Foster,** Acting Director, Wildlife, Fish, Water and Air Research, *USDA Forest Service*, Washington, DC; **Noah Pickus,** Associate Director, Kenan Institute for ethics, *Duke University*, Durham, NC; **Roger Sedjo,** Senior Fellow and Director, Forest Economics and Policy Program, *Resources for the Future*, Washington, DC and **George H. Weyerhaeuser, Jr.,** Senior Vice President, Technology, *Weyerhaeuser Company*. Federal Way, WA. The remaining two board members are anticipated to be in place by the fall (November 15) meeting.

The Board also set standards for rotation of board members and completed fulfillment of the seven-member Executive Committee. A notable accomplishment was the election of **Alan Lucier,** Senior Vice President, *National Council for Air and Stream Improvement,* Research Triangle Park, NC. Dr. Lucier succeeds **Steven Burke,** Senior Vice President, Corporate Affairs, *North Carolina Biotechnology Center,* Research Triangle Park, NC. Mr. Burke was the founding father of IFB, and he has guided it as Chair since its formation in October 2000. Our heartfelt thanks are extended to Steven for his commitment and devotion to IFB during the organization's formative years.

Board Of Directors

In each issue of Biosylvan News, we recognize two of our board members. This time the honor goes to Ken Munson and Lori Knowles, both of whom were recently elected to the Board of Directors Executive Committee.

Kenneth R. Munson is General Manager of Forestry Operations and Technology for International Paper. He has worked in the forest products industry for 20 years in positions of operations management, and research and technology management in the South, Pacific Northwest and the Northeast. Prior to joining industry, he served on the forest science faculty at the University of Florida. He has B.S. and M.S. degrees in wildlife science and soil science, respectively, from Oregon State University and a Ph.D. in forest soil science from the University of Florida. He was elected as a director of the Institute of Forest Biotechnology in 2002. He is also director of ArborGen.

"Biotechnology applied to forest trees holds exciting potential for improvements in forest productivity and sustainability. The Institute of Forest Biotechnology is perfectly positioned to foster constructive dialogue among all who have a perspective about this important subject."

Lori P. Knowles is a Research Associate of the Health Law Institute, University of Alberta, Canada. She holds law degrees from Canada, the United Kingdom and the United States. Prior to joining the Health Law Institute, she was Associate for Law at The Hastings Center, a bioethics think tank.

Ms. Knowles has been a consultant to President Bush's Council on Bioethics; President Clinton's National Bioethics Advisory Commission; the U.S. Food and Drug Administration; Genome Canada; the Canadian Biotechnology Advisory Committee; and the U.S. National Academy of Sciences, among others. She is a member of the Scientific Advisory Board of Genome Canada and the Ethics Oversight Committee for the US Department of Veterans Affairs DNA Tissue Bank. She is also a member of the Board of Directors of the Pinchot Institute for Forest Conservation in Pennsylvania.

"The Institute of Forest Biotechnology stands alone in its commitment to explore the ethical, societal and ecological dimensions of forest biotechnology around the globe. In bringing together different stakeholders to articulate and address these issues the IFB is helping define responsible uses of forest biotechnology".

Personnel

Ben H. Box. Dr. Ben Box served as the Director of Development for IFB from October 1, 2003 to March 31, 2004. During that time he made contact with many of his acquaintances while opening the doors for financial and moral support for our organization. The acquaintances ranged from people he knew as he was rising through the ranks from instructor at Louisiana State University to Executive Vice President, Southern Forest Institute, Atlanta, GA, to Dean, College of Forest and Recreation Resources at Clemson University, to Executive Assistant to the President at Clemson University and finally to Executive Director/CEO of the University Center of Greenville, Greenville, SC.

Ben opened many doors during his stay with us. His charm as the 'perfect southern gentleman' was largely responsible for his winsome ways. We recall hearing one of his colleagues of years past say that 'Ben is the most couth man I've ever met'. That phrase struck us as odd at the time because the only way we had ever heard the word used was in the negative, such as 'uncouth'. After getting to personally know Ben, we're sure that the colleague had him perfectly pegged.

We will always be thankful for Ben's sunny disposition and for the doors he opened for IFB.

Cynthia J. Sollod. Dr. Cynthia Sollod learned about the Institute of Forest Biotechnology through her work with BioAbility, a sister organization within Research Triangle Park. At BioAbility, she headed a research team conducting information studies and analyses on a broad range of topics related to the biotechnology, pharmaceutical, and life sciences industries. With advanced degrees in forest pathology from NC State, she yearned to have a forestry connection. After learning about us, she volunteered her services for a special project. Her work has resulted in a four-page document describing the Heritage Trees® Program and can be viewed on the IFB web site. We are greatly appreciative of Cynthia for her devotion to the task.

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One-of-a-kind Workshop

Within the UNIDO sponsored ***Global Biotechnology Forum*** held in Concepción, Chile was the ***Workshop Biotecnología Forestal***. It was the only such workshop at the forum and brought the spotlight, as well as interested attendees, to forest biotechnology. Read more about the workshop inside this issue of the *BioSylvan News*.

Also Read About

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