



BIOSYLVAN News

Status of IFB

Lest there be doubt, the Institute of Forest Biotechnology (IFB) is alive and kicking. We were incorporated on October 9, 2000 as a 501 (c) (3) non-profit organization with the mission of *working for societal, ecological and economic benefits from appropriate uses of biotechnology in forestry worldwide.*

That date coincides almost perfectly with the downturn in the world economy so, upon reflection, we could not have picked a worse time to garner funds for financial sustainability. Our plan was to obtain funds from foundations for creation of an endowment on which the Institute would operate. That goal remains intact; it is just taking us longer to get to self-sufficiency than we had anticipated. In the interim, we are grateful to the North Carolina Biotechnology Center, USDA Forest Service, International Paper Company, ArborGen and Scottish Enterprise for major contributions, and to Arauco, CellFor and Weyerhaeuser Company Foundation for significant but lesser amounts of financial support.

Even with our limited funding, IFB is growing. For the past year, we have been

fortunate to collaborate with Dr. Floyd Bridgwater, while he was on sabbatical from Project Leader, Forest Genetics, Southern Research Station, USDA Forest Service, Gulfport, Mississippi. His sabbatical task was to develop a strategy for biotechnology research for the Southern Research Station. That report is in the review process. Upon acceptance by his

The Institute works for societal, ecological and economic benefits from appropriate uses of biotechnology in forestry worldwide.

administration, a decision will be made on how the strategy is to be deployed.

A further sign of growth is the employment of Dr. Benton H. Box on a part-time basis to serve as Director of Development for IFB. Among his other attributes, Dr. Box has served as Executive Vice President, Southern Forest Institute; Dean, College of Forest Resources and Recreation, Clemson University; Acting Vice Provost and Vice President of Agriculture and Natural Resources, Clemson University; and Executive Director/CEO of the University Center of Greenville (South Carolina). With his wide array of contacts in the forestry and natural resource fields, we think he is a natural to help with long-term funding development for IFB.

Will Frankenfood Save the Planet?

An article by this title occurred in the October (2003) issue of *The Atlantic Monthly*. Authored by Jonathan Rauch, a senior writer for *National Journal* and a writer in residence for the Brookings Institution, the conclusion is **yes**; Frankenfood will save the planet.

Being city borne and not attuned to the practices of farming, Mr. Rauch set out on his own to see why many environmental groups in the U.S. and elsewhere were vehemently opposed to the production of genetically modified food. His travels took him to Southside Virginia. There he learned about minimum-till and no-till farming. The farmers were raising lush crops of wheat, corn, soybeans and cotton with yields at least

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Meetings

Natural Cedar Pencils Hot Items at BIO 2003 and XII World Forestry Congress

Susan McCord and Bob Kellison took IFB on the road to the BIO 2003 Conference in Washington, DC and to the XII World Forestry Congress in Quebec City to inform attendees of our presence and programs. BIO 2003 was held in Washington, DC, June 23 – 25, 2003 and was attended by over 17,000 people from US and international biotech companies, state and local governments, and universities. Despite being closeted with hundreds of displays at the events, some adorned with bells, whistles and balloons, IFB was noticed because of its eye-catching display that was designed by Robert Peterson of the North Carolina Biotechnology Center. The display at the BIO Conference consisted of three panels that portrayed our mission and cornerstones, all of which were supported by the vision of a stand of trees in the background. A single-panel poster with a similar theme was displayed at the XII World Forestry Congress held September 22 – 26, 2003, in Quebec City, Canada and boasted 4,000 attendees. Board members Steven Burke, Maud Hinchee, Don Doering and Bob Friedman stopped by to offer their support at the BIO 2003 Conference and board member Dennis Le Master stopped by during the poster session at the XII World Forestry Congress.

The most notable reaction at each of the events was ‘what is forest biotechnology?’ With our array of handouts, we dived into the topic. We know that the message was retained by a number of the visitors because of follow-up contacts. We also know that the biggest hit at each of the events was the natural cedar pencils that were there for the asking. Emblazoned on each one were Institute of Forest Biotechnology, and our web site *www.forestbiotech.org*. Our stock of six gross disappeared long before our handouts, with many comments about the attraction to something made from wood among all the offerings of electronic and plastic giveaways.

The penchant for lead pencils led us to a bit of sleuthing on the history of the implement. They had their origin in England about 1560 when rods of graphite were positioned between small slats of wood. The technology was advanced in Germany where the slats of wood containing the graphite were glued together. Pure graphite that was unique to the mines of England was also replaced by graphite powder, sulfur and a binding agent. The French also got into the act by mixing powdered graphite and clay to form sticks of ‘lead’ that were hardened by placing them in a furnace.

The technology came to America in the first half of the 19th century with small manufacturing plants in the Boston area. Mass production began after the Civil War, largely in the New York area, where more than 20 million pencils were consumed annually in 1870. Even though round lead was an available technology at that time square lead was the product of choice until the latter part of the 1800s. At the height of pencil manufacturing in the years preceding World War I, about two billion pencils were turned out in the world of which 750 million were produced in America. During that time, and in specialty shops today, pencils were and are manufactured for a diverse clientele, including those for south-paws. That got us at IFB to wondering if we are oblivious to social norms; all of our pencils were for right-handed people.

The contest is on to select a favor for our next exhibit. Experience has taught us that it need

Southern Spoken Here

Two southern gentlemen are standing in a field discussing the war in Iraq when their concentration is diverted. Their dialogue follows. See if you can interpret their conversation. No peeping. Answer on page 7.

CM Ducks.

AR Not.

OSAR.

CM Wings.

LIB. MR Ducks.

not be something flamboyant and expensive. It might be an oddity or something with associated utility and nostalgia. We don't think a lug wrench will do it, but a watch fob might. Send us your ideas.

USDA APHIS Genetically Engineered Forest and Fruit Trees Meeting

A public meeting was held at the USDA APHIS offices in Riverdale, MD on July 8 – 9, 2003 and was directed to open discussion of risk assessment criteria for genetically engineered trees and whether the current policies for agronomic crops are sufficient. This meeting was attended by about 50 people with representation from the three government regulatory agencies, APHIS, EPA, and FDA, university researchers from across the nation, non-governmental groups, such as the American Lands Alliance and Greenpeace, non-partisan groups such as IFB and PEW Initiative on Food and Biotechnology, and forest industry. Several presentations were made to give some background and provide a platform for discussion in the breakout sessions. Board members Al Lucier, Maud Hinchee, Ron Sederoff and Susan McCord gave 5-minute statements at the meeting. In addition, Board Member Bob Friedman was in attendance.

Enhancing The Southern Appalachian Forest Resource

A Forestry Educational Outreach Program, Hendersonville, NC, October 2-3, 2003.
The IFB helped to sponsor this meeting with a \$2,000 contribution and participated as a speaker. The two-day symposium, organized by NC State University, had the objective of engaging economic, ecological and social principles and practices for the Southern Appalachian forest. Held at the Kanuga Conference Center, Hendersonville, NC, the symposium attracted more than 150 attendees that ranged from ecologists to industrial loggers. IFB was one of the eight sponsors of the symposium, and Bob Kellison gave a talk on "The Value of Biotechnology to Southern Appalachian Forests".

Iufro Task Force on GMO of Trees

Professor Risto Seppälä, Finnish Forest Research Institute, President of the International Union of Forest Research Organizations (IUFRO), and IFB board member, was instrumental in organizing an IUFRO Task Force on Genetically Modified Forest Trees. With the able assistance of IUFRO's Vice President for Research and Development, Eric Teissier du Cros from France, the charge given the TF was to have a position paper in place for the IUFRO World Congress in Australia, August 2005. The Task Force will produce a state of knowledge report on forest biotechnology, its applications, and possible risks to humans, other plants and the environment. A holistic approach will be used to ensure that all possible facts, evidence, risks and perceptions within a broader scenario are included. The report will be constructed in such a way as to be of benefit to specialists in the field, policy makers and the general public. The original members of the TF by country:

Tannis Louise Beardmore,* Canada; **Steven Burke,** United States; **Matthias Fladung,** Germany; **Norbert Frank,** Hungary; **Peter Herbst,** Austria; **Jung Oh Hyun,** South Korea; **Bob Kellison,*** United States; **Steen Magnussen,*** Canada; **Sharmane MacRae,*** Australia; **Mike Menzies,*** New Zealand; **Maricio Merlo (Chair),** Italy; **Pasi Puttonen,*** Finland; **Roger Sedjo,*** United States; **Reini Stettler,** United States; **Michael Wingfield,** South Africa.

The organizational meeting of the TF took place in conjunction with the XII World Forestry Congress in Quebec City, Quebec. Shortly before the onset of that meeting the named chair of the TF, and the person that had almost single handedly developed a working paper for the meeting, died of a heart attack. Bob Kellison stepped in as the acting chair for the Quebec meeting. With seven members present (see asterisks), in addition to IUFRO's executive Eric Teissier du Cros, the TF endorsed the elevation of Sharmane MacRae to chair. Portions of the report were assigned to members both present and absent. Results from the writing assignments are to be submitted to Chair Sharmane MacRae by January 1, 2004. Following MacRae's fitting the pieces together into a single entity, the document will be distributed to readers Reini Stettler (United States) and Christel Palmberg (Italy) to identify the areas needing additional effort.

The invitation is open for others to participate in forming IUFRO's position on forest biotechnology. Anyone wishing to have an input should contact Sharmane MacRae at sharmane.macrae@csiro.au.

Will Frankenfood Save the Planet?

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twice those raised by their parents and they were doing this on farmland that had not been ploughed. The secret: using seeds that had been genetically engineered for insect and disease resistance, for tolerance to a single application of a herbicide that would kill weeds but not the crop, and for greater productivity on a low-nutrient diet, *i.e.*, reduced amounts of fertilizers. The greatest impression, however, was not in crop yield but in soil condition. The no-till soils were black and teeming with earthworms because of the lack of tillage, incorporation of the organic matter that had been left on site, and the greatly reduced amounts of pesticides and fertilizers. In adjoining fields with conventional farming he observed wind and water erosion from the exposed soils, and bland-colored soils without teeming microorganisms. Soil erosion and fertilizer runoff are major impediments to improved water quality of the James and York Rivers and to the adjoining Chesapeake Bay. Minimum-till and no-till farming are greatly reducing the impacts on those water bodies.

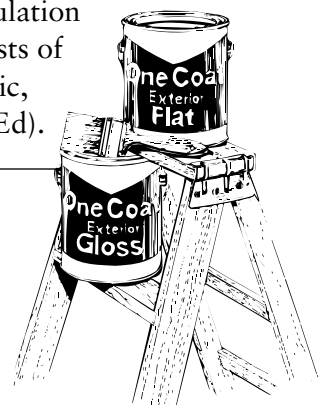
Mr. Rauch makes the analogy that as agriculture goes so goes the world. The basis for that conclusion is the United Nations projection that the world's population will increase from 6.3 billion today to 8.9 billion in 2050, at which point the population growth will plateau. To feed those 2.3 billion extra people in addition to providing the protein for an ever-increasing affluent society will require that the food supply double or even triple. Today, 38 percent of the earth's land area is cropland or pasture and is increasing by 0.3 percent a year, which equates to an annual loss of forestland equal to the size of Greece or Nicaragua.

Without increased productivity on existing cropland, the remaining forestland, including tropical rain forests will likely disappear.

Transgenic crops raise the concern of unpredictable outcomes such as the potential to escape into wild environments to form 'superweeds' and the consumption and inhalation of modified products and their derivatives that might lead to human clinical problems. Therefore, it is essential that the crops be grown to specification by regulation. That said, however, the potential benefits are so great that the opportunity cannot be foregone. One example of this potential is the tomato in which a gene has been inserted to allow the plant to prosper on salty soils. Much of the land in the Fertile Crescent, the birthplace of civilization, is unusable for row crops today because of the salinity of the soil that materializes after irrigating over decades and even centuries. A transgenic salt tolerant tomato was developed in 2001 that can sequester, in its leaves, as much as six or seven percent of its weight in sodium. Reclamation of that land by the transformed tomato and similarly genetically engineered crops would help preserve forested and other environmentally friendly landscapes from conversion to new agricultural land for generations to come.

Even though Mr. Rauch restricted his remarks to agronomic crops a similar scenario can be considered for cultivated forest crops. Increased productivity and improved wood quality on selected sites may allow fiber consumption to increase with population growth while maintaining forests of unique composition for aesthetic, recreation and historic value. (Ed).

Wayne was a house painter without scruples. Over the years he'd learned that he could make the oil-based paint go further by adding turpentine. The paint job didn't last as long as with the undiluted stuff but, what the heck, it looked good after application. One day a big job came open to repaint a church. His low bid won him the job and he set to, with thinned paint. While he was hard at work



Special Assignment Report



Bridgwater

Dr. Floyd Bridgwater
Project Leader, Southern In-
stitute of Forest Genetics
USDA Forest Service

One short year ago in Sep-
tember 2002 I began a year
in North Carolina. One of
the things I was tasked to
do by the Director of the

Southern Research Station (SRS), Dr. Peter
Roussopoulos, was a problem analysis for my
Research Work Unit, the Southern Institute
of Forest Genetics (SIFG) in cooperation with
the Institute of Forest Biotechnology (IFB).

ed set of individuals representing private forest
industries, agencies responsible for managing
public lands, and policy makers in our two
neighboring countries, Canada and Mexico.
Their input will be critical to making the prob-
lem analysis a useful, functional tool in plan-
ning our research for the next several years.

My association with IFB permitted me to
participate in two conferences, a workshop
on Fraser fir, a Heritage Tree species, and the
workshop on “Modifying Reproduction of
Urban Trees”. Both were well attended and
informative. I also spent five weeks at the Uni-
versity of British Columbia interacting with

“The opportunity to step back from the daily demands of ongoing projects and to consider the future direction for the biotechnology component of the SIFG has given me the opportunity to reflect on the potential for our unit to serve a broad constituency in the south.”

Pete was instrumental in the formation of the
IFB and believed that my association with the
Institute would help to formulate a consensus
research policy and direction for the unit that
would serve as our research roadmap for the
next several years. The SIFG has traditionally
conducted research that supported forest in-
dustry with a strong component of research to
try to understand the genetic mechanisms of
resistance to diseases, in particular, fusiform
rust. Over the past several years the SIFG has
developed a strong molecular genetics compo-
nent in our research unit. The area of molecu-
lar genetics research is currently one of the
fastest developing areas of research, spurred
by the human genome project.

At this writing, the problem analysis is in its fi-
nal draft form and will soon be sent to a select-

scientists at the University of British Columbia
and the British Columbia Forest Service on
issues of science and policy regarding the ap-
plication of forest biotechnology.

The opportunity to step back from the daily
demands of ongoing projects and to consider
the future direction for the biotechnology
component of the SIFG has given me the op-
portunity to reflect on the potential for our
unit to serve a broad constituency in the
south. At present, I am working with Bob Kel-
lison of IFB to develop a memorandum of un-
derstanding between the SRS and IFB to pro-
vide a liaison between the two organizations
with the goal of further strengthening our
past close ties and to provide a mechanism for
continued dialog and collaboration.

*a thunderstorm arose and a bolt of lightning knocked him from his scaffold into the church
graveyard where puddles of the washed off paint were accumulating. Wayne recognized that
the ensuing clap of thunder and the washed-off paint were an omen so he got on his knees and
prayed: “Oh, God! Forgive me! What should I do?” And from the thunder a mighty voice spoke
“Repaint! Repaint! And thin no more!”*

Board of Directors

Al Lucier. Dr. Lucier earned his PhD in the College of Forest Resources at North Carolina State University. He is Senior Vice President with the National Council for Air and Stream Improvement, Inc. (NCASI) in Research Triangle Park, NC. He directs NCASI's forestry research and coordinates planning of NCASI's overall technical program, and has diverse administrative responsibilities. NCASI is a nonprofit environmental research institute supported primarily by member companies in the forest products industry. Al was involved in the initial conceptual and practical development of the IFB. He, along with Bob Kellison and Steven Burke

Robert Friedman. Dr. Friedman received his PhD from the University of Wisconsin, Madison in Ecological Systems Analysis. He is currently Vice President for Environmental and Energy Policy for The Center for the Advancement of Genomics (TCAG) and The Institute for Biological Energy Alternatives (IBEA), two not-for-profit organizations started by Dr. J. Craig Venter. TCAG is a policy center dedicated to understanding the societal implications of the new science of genomics through policy analysis and education of the general public and elected officials. It seeks to better understand the broad social and ethical issues of genomic medicine and other aspects of human genomics, and the public issues associated with biological/genomic approaches to mitigating greenhouse gas concentrations and biological energy production. IBEA is a re-

IFB is worthy of broad support because it is a unique and valuable platform for understanding the risks and benefits of forest biotechnology and for seeking practical, well-balanced approaches to critical issues and opportunities.”

brought together a community of people with diverse backgrounds across North Carolina to think and talk about forest biotechnology. Over a period of two years in several committee structures, through the Advisory Committee on Forest Biotechnology, the Planning Task Force and Charter Committee, these discussions became the foundation for the Institute of Forest Biotechnology. Al has served as a founding member of the IFB Board and Executive Committee since 2001 and as the first chair of IFB's Heritage Trees Committee beginning in April 2003. He said recently, "IFB has a difficult and important mission — to work for societal, ecological and economic benefits from appropriate uses of biotechnology in forestry worldwide. IFB is worthy of broad support because it is a unique and valuable platform for understanding the risks and benefits of forest biotechnology and for seeking practical, well-balanced approaches to critical issues and opportunities."

search-based institution dedicated to exploring new approaches to producing carbon-neutral fuels and carbon sequestration using microbes, microbial pathways, and plants. More information on these two organizations can be seen at www.tcag.org and www.bioenergyalts.org. Previously, Bob was Senior Fellow and Vice President for Research at The H. John Heinz III Center for Science, Economics and the Environment, as well as Senior Associate for the Environment Program at the Office of Technology Assessment, U.S. Congress.

Ron Sederoff.

Congratulations to IFB Board Member Dr. Ron Sederoff who was recently elected a Fellow of the American Association for the Advancement of Science (AAAS) in recognition of his pioneering work in the application of molecular genetics and genomics to forest-tree species. The AAAS is the world's largest general scientific society, and the publisher for the journal **Science**.



Sederoff

Bob was a member of the Charter Committee prior to the incorporation of IFB and a Founding Board Member since 2001. He has served as a valuable voice of reason, direction and conscience. The IFB has gained immeasurably from his thoughtful participation.



Biology and Borders: *The Future of the Global Bio Economy*

An upcoming program of Bio Economic Research Associates (bio-era™), a leading provider of independent research and advisory services on the economic and societal impacts of human-induced change to biological systems, is *Biology and Borders: The Future of the Global Bio Economy*. Living systems and our knowledge of biology are rapidly changing. Increasing scientific knowledge and technical capabilities and increasing scale and scope of human impact create uncertainties, opportunities and risks for stakeholders in biological systems.

Forestry comprises one sector where biological systems and human impacts form borders; intellectual, physical and political. Dr. Floyd Bridgwater will participate in the Biology and

Borders scenarios process through a Memorandum of Understanding between the US Forest Service and IFB. He will spend a year working on this collaborative project with IFB. Some critical questions of the process will be: What is the bio economy? How will new genomic, proteomic, and metabolomic technologies transform the value chains in the bioresource industries? What are the possible outcomes of political conflicts over the use of GMOs? How will governments and other stakeholders respond to the growing spread of invasive weeds, insect pests, plant and animal diseases, and human pathogens? What are the economic and trade implications of changing species distributions over time in response to changes in land use, climate, or environmental disruption or depletion?

Humor is no stranger to tragedy. In the aftermath of Hurricane Isabel that swept through northeastern North Carolina and beyond damage was counted in the tens of millions of dollars. Elizabeth City was one of the most ravaged municipalities in the area. Folks were without the basics of life for days and even weeks on end. Spared among all the rubble was the downtown Baptist church together with its Family Life Center. In a telephone call from a long-time former minister to the beleaguered church it was learned that the church, in conjunction with relief agencies, was ladling out thousands of meals a day. The present minister was also proud to report that the Family Life Center was sleeping 140 people a night. "Heck, that's nothing," replied the former minister " I slept 140 people during worship service every Sunday morning for 30 years".

Translation:

See them ducks.
They are not.
Oh, yes they are.
See them wings.
Well, I'll be. Them (they) are ducks.

Global Biotechnology Forum

The purpose of the Global Forum is to examine biotechnological opportunities and challenges in the developing world. It will explore policy, legal, socio-economic, technology and management issues that have a bearing on the development, accessibility and application of technologies capable of contributing to sustainable development.

The meeting, scheduled for March 2 – 5, 2004 and hosted by the United Nations Industrial Development Organization (UNIDO), will feature sessions on forest biotechnology on 3 separate days.

Ricardo Lagos, President of Chile, Kofi Annan, Secretary General UN, and Carlos Magariños, Director General-UNIDO will give welcoming addresses. IFB board members Bob Kellison, Maud Hinchee, John Pait and Kevan Gartland are invited speakers at the forum. Forestry topics will include embryogenesis, genomics, proteomics, biotechnology applied to wood products, conservation and insect and disease resistance. For more information on this forum visit www.gfb2004.cl.

Institute of Forest Biotechnology

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INSTITUTE OF FOREST BIOTECHNOLOGY

Meetings of Interest

Biotechnology Global Forum, Concepcion, Chile.
March 3-5, 2004.

The Forum being organized by the United Nations Industrial Development Organization (UNIDO) will include Bioethics, Biosafety, Intellectual Property Protection, Emerging Opportunities, Knowledge Networks and Technology Transfer. Forest biotechnology will occupy an integral place in the conference. The web site for UNIDO contact is *www.bwf2003.cl*.

IFB Publications

The meeting proceedings from *Forest Biotechnology in Europe: Impending Barriers, Policy, and Implications* is available upon request and can be downloaded from our website at *www.forestbiotech.org*.

The first Annual Report for IFB is now available for distribution.