

NABC

news

Fall 2003 no. 27

Providing an open forum for exploring issues in agricultural biotechnology



NABC'S PRINCIPAL OBJECTIVES ARE TO:

- provide an open forum for persons with different interests and concerns to come together to speak, to listen, to learn, and to participate in meaningful dialogue and evaluation of the potential impacts of agricultural biotechnology
- define issues and public policy options related to biotechnology in the food, agricultural, biobased industrial product, and environmental areas
- promote increased understanding of the scientific, economic, legislative, and social issues associated with agricultural biotechnology by compiling and disseminating information to interested people
- facilitate active communication among researchers, administrators, policymakers, practitioners, and other concerned people to ensure that all viewpoints contribute to the safe, efficacious, and equitable development of biotechnology for the benefit of society
- sponsor meetings and workshops and publish and distribute reports that provide a foundation for addressing issues.

Ralph W.F. Hardy, President

Allan Eaglesham, Executive Director

Susanne Lipari, Executive Coordinator

Boyce Thompson Institute, Room 419

Tower Road

Ithaca, New York 14853

phone: 607-254-4856 fax: 607-254-1242

nabc@cornell.edu

<http://www.cals.cornell.edu/extension/nabc>

Letter from the Chair . . .

At least once during every Council meeting—and if he can create the opportunity, then more than once—Ralph Hardy reminds us that NABC is an open and unbiased forum. It's a marketplace of thoughts and ideas, one that celebrates all points of view on agricultural biotechnology. Public institutions of higher education have much the same function, and in my role at the University of Illinois, I am sometimes asked to explain our institutional position on biotechnology. The next question invariably has something to do with who we are listening to. Do we still take our cues from agricultural producers? Or have we fallen under the control of corporations?

Someone once defined universities as groups of people bound together by a centralized heating system, and so it should come as no surprise that we, like NABC, can have no official position on agricultural biotechnology. But like NABC, we do listen, and more and more, questions about listening are being linked to changing concepts of customer.

For those who make a living someplace in an agricultural value chain, the concept of customer is pretty clear—they literally do have customers, and they have important economic relationships with them. The NABC community is a little bit different, because we are in the public sector. We don't have customers in the traditional sense, but we use the word stakeholders a lot. What we mean are the people who care about, and are impacted by, the re-



Steven G. Pueppke
NABC Chair, 2003-2004

search that we do, including biotechnology.

I grew up pre-biotechnology on a farm in the Red River Valley of North Dakota. We grew wheat and oats and barley, and we had pigs and cows, and we knew exactly who the customer was. For the grains, it was the Arthur Farmers Elevator Company and sometimes Amenia Seed and Grain (I hauled some of the grain myself). And for the animals, it was the West Fargo Stockyards. My father managed the farm to get the fattest check he could from the elevator and the stockyards.

The local land-grant university was about 40 miles down the road, and they had a clear sense of stakeholders, too. The stakeholders were farmers like my father, and North Dakota State University did what it could to be of service. Mostly, this

continued on page 6

Highlights of NABC 15

Biotechnology: Science and Society at a Crossroad

Sandra Ristow and Eugene Rosa
Washington State University, Pullman, WA

NABC's fifteenth annual meeting, co-hosted by Washington State University and Oregon State University, June 1–3, 2003, was held in Seattle at the Westin Hotel, a few blocks from landmarks such as the Pike Place Market and the Space Needle. As with NABC 13 in Chicago, there was some anticipation of disruptive street protests; however, all remained quiet, at least outside of the meeting hall.

The theme and modular structure of NABC 15 were chosen to juxtapose contrasting opinions on agricultural biotechnology. The 160-plus attendees included owners of organic farms and businesses, university professors, administrators, representatives of biotechnology industries, governmental and non-governmental organizations, and members of the local and national press.

The new half-day modular format comprised formal presentations followed by panels of questioners who engaged speakers on specific points. Then, speakers responded to questions and comments from the audience. The panel questioners then became discussion leaders at breakout sessions where attendees had further opportunities to air their views and ask questions on issues raised in the modules.

Plenary speakers who set the tone for the meeting were Lawrence

Busch, Distinguished Professor of Sociology, Michigan State University, and R. James Cook, Professor of Plant Pathology, Washington State University. In his address, "Lessons Unlearned: How Biotechnology is Changing Society," Dr. Busch pointed out possible errors of omission of the biotechnology industry in introducing their products without properly preparing all elements of the market: technology developers, government regulators, sellers, farmers, and consumers. He drew an analogy from the game of curling: in order to successfully introduce a revolutionary technology into society, many forces are needed as sweepers to get the technology over the goal line. Dr. Cook, in his plenary address, "Biotechnology: Cause and Consequence of Change in Agriculture," said that the driving forces for most farmers to adopt technology include the potential for the crop to increase profits, to save labor, to protect the environment, and to meet the demand for safe and wholesome food. He argued that it is the "management used to grow a variety and not the variety itself that has impact on the environment." He presented examples of beneficial genetically modified plants that reduce the use of pesticides or confer disease resistance. He advocated a vision for genetic modifications in minor crops with a less-costly regulatory process.

Module II—Sustainability, Environmental and Production Issues—moderated by Terri Lomax (Fundamental Space Biology Division, NASA), brought out several contrasting viewpoints. Fred Kirschenmann of the Leopold Center, arguing that the current agricultural system is unsustainable, called for an ecosystems approach to achieve sustainability. He questioned whether transgenic technology's single-tactic approaches will ensure the food security for future generations that is now regarded as a basic human right. John Anderson of Monsanto argued that economics is possibly the most powerful force driving the acceptance of transgenic technologies on the rural landscape, with markets ultimately determining the fate of genetically modified crops. Kay Walker-Simmons, USDA-ARS, noted that the "core responsibilities of the ARS include conserving, safeguarding and characterizing genetic resources." Special new functions of the agency include biotechnology risk assessment, ensuring biosafety and examining the effects of genetically engineered crops in agricultural production systems.

Module III, titled Consumer Issues and Trade, was moderated by Thomas Wahl (WSU IMPACT Center). It included discussions on labeling of genetically modified foods (Nicholas Kalaitzandonakes, Uni-

NABC 15: Workshops Summary

William Lacy, University of California, Davis, CA

Recorders

*Bruce Chassy
University of Illinois
Urbana, IL*

*Martin Lemon
Monsanto Company
Roseville, CA*

*C.Y. Hu, Elizabeth Jaeger
Oregon State University
Corvallis, OR*

*Randy Woodson
Purdue University
West Lafayette, IN*

*Linda Kirk Fox, James Zuiches
Washington State University
Pullman, WA*

*Kevin Kephart
South Dakota State University
Brookings, SD*

*James McFerson
Washington Tree Fruit Res. Commission
Wenatchee, WA*

Discussion Facilitators

*Phillip Bereano, Eugene Rosa
University of Washington
Seattle, WA*

*William Boggess
Oregon State University
Corvallis, OR*

*Karla Chambers
Stahlbush Island Farms
Corvallis, OR*

*William Aal
Tools for Change Institute
Seattle, WA*

*Brewster Kneen, Cathleen Kneen
The Ram's Horn
Sorrento, BC*

*Kurt Volker
Syngenta
Yakima, WA*

*Gregory Jaffe
Center for Science in the Public Interest
Washington, DC*

A total of nine workshop “break-out” sessions were convened. Most attendees participated in three different sessions that focused on:

- ◆ Science and society at a crossroad.
- ◆ Sustainability, environmental, and production issues.
- ◆ Consumer issues and trade.

Six key themes emerged from the material provided to me by the recorders, as follows.

Systems

One overarching theme was the need to take a systems perspective or utilize an ecological framework for long-term sustainability. An important issue within that theme was the role of modern reductionist science and technology, and particu-

larly biotechnology. An underlying question that continued to surface involved the complementarity or antithetical relationship between a systems perspective and logical positivism and biotechnology. At the same time, some tension was expressed between those who seek to reduce complexity, to simplify, and to specialize, and those who embrace complexity. One person observed that “complexity breeds expense” (and expense is to be avoided), whereas another noted that “complexity breeds delight.” With those distinctive orientations, many participants questioned whether biotechnology could be compatible with the goal of sustainable systems and enhance the capacity of the community to renew itself.

It was suggested that to use biotechnology in a systems framework, one must avoid employing the technology as a shortcut to address a symptom or problem in the system, but should, instead, use the new technologies to expand our understanding of complex systems. One group noted that there is beauty, elegance, and complexity in agricultural systems. We should support research that helps us understand those systems, even if we disagree on specific technologies.

Risk

A second theme was risk and a number of issues surrounding it. It was acknowledged that risk characterization, risk assessment, and risk management are distinctive yet in-

terrelated, complex and often-controversial activities. A critical component is risk characterization and definition. What should be considered within the framework of risk assessment? There was general agreement that it should encompass human-health and environmental risks, broadly defined to include allergenic proteins, insect resistance, non-target organisms, and gene flow. Some participants, however, believed it should include economic, social, and ethical risks, such as those associated with corporate control of the food system, inequitable distribution of benefits and risks, as referenced in a 1996 National Research Council report, *Understanding Risk: Informing Decisions in a Democratic Society*.

Some noted that risk assessment is often framed by experts in technical terms that biological and physical scientists can address, ignoring some of the broader and more diverse concerns of the society, and, thereby, undermining the public's trust in risk analysis. As a consequence, a number of people suggested following the precautionary principle in making decisions in an uncertain world. More specific issues included the time frame and timing for risk assessment, since certain risks may not surface until months or years later or when a particular activity or process is scaled up. Others noted the importance of improved communication and access to information and reports. Public participation in the overall process was seen as essential to the success of risk-assessment, management, and policy decisions.

Rights

A third theme was the broad question of consumer rights, consumer

information, and consumer safety. Embedded in that issue was the specific topic of labeling. This issue was also recognized as being very complex. Should it be part of the regulatory process? Should labeling be required as part of the "pride in ownership" chain of the product? Concern was expressed regarding the complexity of labeling in the food-supply chain, from seed, to processor, *etc.*, to multi-ingredient products. How can labels be exact, correct, yet informative? Should they be related to the process or the product? Should they address composition, content, derivation process, characteristics? Should there be symmetry in labeling other products? Is this simply a marketing ploy, or is it a mechanism to allow choice for consumers? Several discussants noted that organic foods are, in effect, providing choice. Perhaps. Tolerances need to be incorporated into the approval process. Others wondered if labeling is often a substitute for direct contact between producer and consumer. Since survey data have been mixed, it was unclear whether consumers really want labels. Labeling may be just one of a number of tools needed to inform and empower consumers.

Perceptions

A related issue, and fourth theme, was consumer perceptions, acceptance, and preferences. There have been many surveys of consumer attitudes to, and perceptions of, agricultural biotechnology. Efforts to address these attitudes and perceptions must begin with an understanding of the diverse reasons why people hold those views. Some studies have shown that people have particular perceptions of biotechnology based on issues as di-

verse as human and animal health, environmental sustainability, economic concentration, social justice and equity, sanctity of nature, and religious values. Moreover, some cited studies have shown that, as public knowledge increases, perceptions both of benefits and of risk/costs of the new technologies increase. Finally, some participants noted that the focus needs to be on what the public and consumers want, rather than on what they will accept. However, what they want—and why—is very complex.

LGUs

A fifth theme was the role of the public research system and the land grant universities. The LGUs have a significant role to play in biotechnology, sustainable agriculture, organic agriculture, minor-crop research, environmental and resource management, nutritional and dietary health, and community and economic development. However, there is a lack of funding for these institutions, and, in particular, for organic farming, alternative farming approaches, ecology, long-term sustainable systems, and non-proprietary research. One question raised was, "Is science for sustainability possible in an era of specialized, expert knowledge and commercialized, private knowledge?" A strong, independent public-sector research system was identified as a critical component for generating knowledge in these important areas.

Crossroad

Finally, several groups revisited the overarching theme of the meeting: *Science and Society at a Crossroad*. Major changes are occurring in population, the environment, cli-

MARK YOUR CALENDARS: JUNE 13–15, 2004

Agricultural Biotechnology: Finding Common International Goals

NABC 16 WILL BE HOSTED BY THE UNIVERSITY OF GUELPH

Agriculture is a global activity that everywhere serves the same basic role of providing food, fiber, and a diversity of other products that increasingly includes industrial feedstocks. Despite these commonalities, the activity itself is remarkably varied throughout the world. Differences in climate, nutrient and water availability, pests and weeds, wealth distribution, technology, social structures and trade policies are among the variables that account for dramatically different agricultural practices across the globe.

Over the past decade, applications of biotechnology have made an increasingly large impact on agricultural production systems, particularly in North America. This development has not been without significant consequence. It has prompted passionate debate in North America and Europe about the safety of genetically modified (GM) plants and the foods derived from them, with resulting consequences on trade in these products. Many previous NABC meetings have dealt with these issues, but there is no sign that the debate about the pros and cons of agricultural biotechnology will wane soon.

The potential for utilization of biotechnology in agricultural production systems in other parts of the world has met with a range of responses. Strong voices oppose the transfer of western corporate prac-

tices, and strong voices encourage the use of biotechnology to help agriculture thrive in regions where the climate, soil, or pest conditions seriously diminish crop productivity. It is not yet apparent whether this debate is being won or lost by either side, but it is clear that the issues are as complex as the agricultural systems in which they work.

As with the debate about safety and acceptance of GM crops, previous NABC meetings have also often touched on issues associated with applying agricultural biotechnology internationally. NABC 16 will be an opportunity to shift the emphasis of the dialogue and information exchange specifically to the international arena. It is intended that this meeting will provide a forum to discuss goals that are common across agricultural systems on which biotechnology may have an impact. Among these are reducing the ecological footprint of agriculture, and ensuring adequate and safe food and sustainability. Regardless of being a proponent or opponent of agricultural biotechnology, such goals are likely to be accepted by most. By focusing on common goals, it is more likely that win-win scenarios can be created, not only for the countries where those technologies are being developed and widely adopted, but also for those countries where the needs for innovation are greatest. It is also

recognized that, by focusing on common goals, there may develop the recognition that biotechnology is appropriate in certain situations but not in others.

In order to catalyze the international discussion, the NABC 16 program will rely as much as possible on international speakers who are familiar with the complexities of applying biotechnology in diverse situations. Organizations such as the CGIAR (Consultative Group on International Agricultural Research) institutes and GFAR (Global Forum on Agricultural Research) will be encouraged to participate, both with speakers and attendees. Workshops will enable attendees to discuss the role of agricultural biotechnology internationally, not only from the perspective of what is currently happening, but also from the standpoint of considering the types of research that should be carried out to meet recognized goals.

It is intended that NABC 16 achieve two things. First, it will be an opportunity to learn more about the biotechnology research in progress internationally. Indeed, it will be of great interest to participants to learn more about the programs underway in Asia, South America and Africa. Secondly—and as importantly—it is hoped that by remaining focused on common international goals, or needs, the conference will encourage the develop-

continued from page 1

was to help him be the most efficient and profitable producer of commodities as possible.

There were these people in Minneapolis who milled grain, and my father was convinced that they schemed every day to extract more profits from the North Dakota farmer. But there wasn't really much to do about it, so my father, who is now 76 years old, spent his whole career working real hard at maximizing the number of loads of grain he could haul each year to the Arthur Farmers Elevator—and the price he could get per bushel. My two brothers have now embarked on exactly the same path, the main difference being that my father started with 480 acres and they have more than 5,000.

What's changed in the last 35 years, and that's how long ago I left the farm, is an increasing realization that the elevator and stockyards are not really the customer. I know that some agricultural producers made the discovery by themselves, but often it was the other way around. Some guy or woman stands up, waves their hands, and announces that they are the customer. And then they proceed to tell us what they want.

Some fascinating tensions have come along with this change in the concept of customer, and at the root of much of this unease are reactions to biotechnology. The man who ran the elevator was our neighbor (I still remember his name). He was easy to find, and we understood one another. The miller in Minneapolis was another thing entirely, and as the grain bin was filling with durum wheat, it would have been impossible for any of us to think of shop-

pers or diners in Italian restaurants as our customers. And, I suppose, those enjoying the linguini could not have imagined that one day they might feel empowered to have a say in the use of technology back on the farm.

Slowly, the system is learning to adjust to the hand-waving crowd—the people who didn't used to care but now have opinions about GMOs, who question certain agricultural husbandry practices, who don't like changes in scale of production or vertical integration, or who look at land through an environmental lens and see agriculture as just another kind of land use. They have inserted themselves into our world of technology, and as we saw in Seattle, they can challenge our assumptions. More and more, they are making what I call value-based food decisions.

If you go to the McDonalds homepage—or any other food company Website, there's always a prominent link to the Division of Values. They never call it that—McDonalds uses the phrase Quality Systems and Food Solutions, but if you start reading, you see that they are addressing issues that customers tell them are important. For McDonalds in March of 2003, it was housing guidelines for laying hens. More recently, we've heard about policies to ban prophylactic use of antibiotics in animal feeds.

My wife, who has a PhD, buys organic eggs and chickens. She drives right past the local supermarket and way out into the country, where she pays twice as much as she has to, and she feels good about it. We've talked about this over the dinner table, and I've come to learn

that she's making a value-based decision. She's not worried about health risks associated with supermarket poultry. She knows better than that. But she is interested in the lifestyle of chickens, and, I think, the lifestyle of the farmer who produces them. And she's not alone.

Collectively, we've made a huge mistake in dealing with value-driven consumers. Many of my scientist colleagues at the university rant and rave about such people. They want to grab them and shove their versions of good science down their throats, failing, of course, to understand that food-buying decisions are based on values and not on science. And many of our farmers and farmer leaders have resorted to similar tactics.

Just a couple of months ago, a mainstream farm paper carried a perspective by a person who had been on a European marketing tour. It's all about the pampered consumer—"veggieburger-and-organic potato Euroconsumers who dictate social, retail, and ag policies for the continent." About people who try to tell farmers "how to keep chickens from experiencing anxiety or where to place Holsteins for the maximum visual benefit of visiting city-dweller." And ominously, "they're coming to get us."

Contrast that with Big John, who wrote this to an e-mail forum sponsored by *Progressive Farmer* in 2001: "In any business if you want to be successful you find out what product that the market wants and you provide it to them. If the market doesn't want GM crops or meat that has been treated with hormones don't try to shove it down their throats, give the markets what

continued from page 2

versity of Missouri-Columbia), traceability of ingredients in food products (Peter Phillips, University of Saskatchewan) and cross-national studies on what consumers are willing to pay for genetically modified foods (Jill McCluskey, WSU IMPACT Center).

In Module IV on Applications for Agriculture in Developing Countries, Dave Hoisington (CIMMYT, Mexico) and Chris Ngichabe (KARI, Kenya) presented their work on the production and field-testing of insect-resistant maize for east Africa. They noted both the scientific and sociological obstacles of placing this product in the hands of growers.

In Module V, Caution at the Crossroad: Evaluating Pathways to Assure Sustainability in Agriculture, moderated by Charles Benbrook (Benbrook Consulting Services), there was a spirited discussion on the precautionary principle by Carolyn Raffensperger (Science and Environmental Health Network) and a cautionary presentation by Tom Lumpkin (AVRDC, Taiwan) who asked, "Should we be Pharming with Food Crops?" Paul Jepson (Oregon State University Integrated Plant Protection Center) examined philosophical perplexities and ethical enigmas inherent in the adoption of agricultural biotechnology.

Speakers at the luncheons and dinner complemented module discussions. Dennis Gonsalves (USDA-ARS Pacific Basin Agricultural Research Center) showed that a single gene change in papaya could prevent papaya ringspot virus disease and save an entire industry and local economies. However, political issues are preventing broad accep-

tance of ringspot-free papaya. Consultant Mike Thornton detailed the demise of a genetically engineered crop, the NewLeaf™ potato. Rapid initial acceptance was followed by adverse publicity and processors found that the genetically modified potato did not add value to their business. As market signals from their primary buyers became less certain, growers decided they could not afford the risk of planting NewLeaf™ potatoes. Gary Toenniessen of the Rockefeller Foundation advocated "giving a voice" to the millions of small-scale farmers in Africa and Asia. He decried a lack of operational freedom resulting from the many patents that block the public use of new technologies. He described PIPRA, the Public-sector Intellectual Property Resource for Agriculture, a coalition recently formed by several leading agricultural universities and research institutes along with the Rockefeller and McKnight Foundations, to support plant biotechnology research for developing countries while allowing universities to retain a portion of their patent rights on new technologies.

In a special presentation, Joseph Jen, USDA Under Secretary for Research, Extension and Economics, provided a "USDA Perspective on Genomics" in which he reviewed research investments in genomics of agriculturally important species and in risk-assessment related to biotechnology.

A comprehensive coverage of the meeting, including transcripts of the panel discussions, questions from the audience, and a summary of discussions in the breakout sessions will be available in *NABC Report 15*:

Biotechnology: Science and Society at a Crossroad, which will be published in early 2004.

continued from page 6

they want. If America's farmers don't wake up and learn this lesson, I can guarantee that farmers from other countries will fill the markets that we leave open by our own pig-headedness."

I don't know where the NABC membership falls in this debate, but we probably wouldn't all agree. Do we in agriculture just passively respond, giving the customers what they want, no matter what? Or do we have some sort of collective obligation to deliberately guide and educate through periods of disruptive technological change?

If it was me, I wouldn't drive past the supermarket to go out in the country for organic eggs. But like all of those owners of SUVs, I don't respond very positively when I go out to purchase something and find myself on the receiving end of a lecture. So now we're back to Ralph's issues of openness and lack of bias. I hope that in the years ahead, NABC can help the system find that elusive sweet spot, the one that just balances the wishes of the customer with the technological viability of the system delivering the food.



continued from page 4

mate, energy, science, and the food system, and various groups from government, industry, university, non-profit organizations, and producer communities have often talked past each other and their positions have become polarized. We are at a crossroads and need to find areas of common ground for the common good. We need to focus on how we can communicate and work together to pursue common goals. Several participants noted that we need to think not in terms of "either/or" but rather in terms of "both/and."

In conclusion, I am reminded of a quote by Winston Churchill, who said: "We must take change by the hand or it will take us by the throat." Perhaps now, at this crossroad, it is time for us to take change by the hand.



continued from page 5

ment of decision-making about how, where, and when biotechnology might be applied.

Questions and comments may be directed to:

Katie Meyer
International Research
Coordinator
Office of Research
University of Guelph
Guelph
Ontario N1G 2W1
519-824 -4120 ext. 58923
519-821-5236 fax
intlres@uoguelph.ca

Boyce Thompson Institute, Room 419
Tower Road
Ithaca, New York 14853

