
Highlights of NABC 15, Biotechnology: Science and Society at a Crossroad

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

The meeting theme, emphasizing a crossroad of competing perspectives, and the modular structure of NABC 15 were chosen to enable participants to speak, listen, and to learn about a diversity of issues relating to agricultural biotechnology. That diversity was reflected in the 160-plus attendees: owners of organic farms and businesses, university students and professors, administrators, representatives of biotechnology industries, non-governmental organizations, members of the local and national press, etc.

A key innovation of NABC 15 was the organization of the meetings into five half-day “modules,” comprising formal presentations followed by panels of expert questioners who engaged and queried speakers on specific points. The speakers then fielded questions and comments from the audience. The panel members 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; some found the transition challenging—from expert questioner with strong personal views to discussion leader.

BIOTECHNOLOGY: SCIENCE AND SOCIETY AT A CROSSROAD

Module I, moderated by Neal Van Alfen, consisted of keynote speakers, Lawrence Busch, Distinguished Professor of Sociology, Michigan State University, and James Cook, Professor of Plant Pathology, Washington State University. Their presentations appropriately set the “crossroad” theme of the meeting. 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 technologies 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. In short, the biotechnology industry followed past practices in introducing new products, ignoring the unique features of genetic modification and the multifaceted concerns of a wide range of stakeholders (sweepers) it generated. As a result, Busch concluded that “agricultural biotechnology, despite a few successes here and there, has thus far been a failure.”

Dr. Cook argued (“Biotechnology: Cause and Consequence of Change in Agriculture”) that the driving forces for most farmers to adopt a new technology include the potential to increase profits, to save labor, to protect the environment, and to meet demands for safe and wholesome food. He argued that it is the “management used to grow a crop variety and not the variety itself that has impact on the environment.” Cook presented examples of genetically modified plants that reduce the use of herbicides and pesticides or confer disease resistance. He advocated a vision for genetic modifications in minor crops for which the current regulatory processes involving EPA, USDA, and FDA would need to be less costly.

SUSTAINABILITY, ENVIRONMENTAL, AND PRODUCTION ISSUES

Module II, 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 would 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, outlined the roles of the ARS in addressing the genetic modification of crops, noting that the “core responsibili-

ties of the ARS include conserving, safeguarding and characterizing genetic resources." Special new functions of the agency include biotechnology risk assessment, biosafety, and the effects of genetically engineered crops in agricultural production systems.

CONSUMER ISSUES AND TRADE

Module III was moderated by Thomas Wahl (Washington State University IMPACT Center). It included discussions on the remarkable complexities in the labeling of genetically modified foods (Nicholas Kalaitzandonakes, University of Missouri-Columbia), the traceability of ingredients in food products (Peter Phillips, University of Saskatchewan) and cross-national studies—in Japan, China, and Norway—on what consumers are willing to pay for genetically modified foods (Jill McCluskey, WSU IMPACT Center).

BIOTECHNOLOGY: APPLICATIONS FOR AGRICULTURE IN DEVELOPING COUNTRIES

In Module IV, David Hoisington (CIMMYT, Mexico) and Christopher 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.

CAUTION AT THE CROSSROAD: EVALUATING PATHS TO ASSURE SUSTAINABILITY IN AGRICULTURE

In Module V, Charles Benbrook (Benbrook Consulting Services) moderated a spirited tie-up discussion subsequent to presentations on the precautionary principle by Carolyn Raffensperger (Science and Environmental Health Network), on need for caution when "pharming" food crops by Thomas Lumpkin (AVRDC, Taiwan), and on philosophical perplexities and ethical enigmas inherent in the adoption of agricultural biotechnology by Paul Jepson (Oregon State University Integrated Plant Protection Center).

ANCILLARY PRESENTATIONS

Speakers at the luncheons and dinner complemented the module discussions. Consultant Mike Thornton detailed the demise of a genetically engineered crop, the NewLeaf™ potato. Rapid initial acceptance by growers was followed by adverse publicity, raising consumer concerns, and processors found that the genetically modified potato did not add value to their business. With its rejection in 2000 by McDonalds and others, the NewLeaf™ potato provides an exemplary case of the fate of a biotechnology food product when consumer worries impact fast-food giants. As market signals from their primary buyers became less certain, growers decided they could not afford the risk of planting the genetically modified potato.

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—as happened in Hawaii. He also described and underscored the importance of early and continued engagement of growers and other stakeholders in the successful adoption of the genetically modified papaya. However, political issues are preventing acceptance of ringspot-free papaya elsewhere. This story illustrated how public-sector scientists can perform all phases, from research to regulatory approval, for a biotechnology product.

Gary Toenniessen of the Rockefeller Foundation advocated “giving a voice” to the millions of small-scale farmers in Africa and Asia. He decried the lack of freedom to operate that results from the many patents that block the public use of new technologies. He described the Public-sector Intellectual Property Resource for Agriculture (PIPRA), 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.

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.

THE ROAD TO TAKE?

The application of modern biotechnology to food and agriculture holds promise of a revolution as dramatic and far-reaching as the domestication of plants 10,000 years ago. Will the road to that revolution be smooth, rough, involve many detours, or lead to a dead end? This question, punctuating the previous fourteen NABC meetings, received a focus and refinement with NABC-15’s theme of a “crossroad.” At what crossroad does biotechnology currently find itself and which road will it take? What other crossroads can be expected in the future?

Keynote presentations, plenary sessions, and break-out workshops produced a wide range of crosscutting perspectives on biotechnology’s current crossroad. Two themes emerged: communication difficulties and risk. Communication between the pro- and anti-agbiotech “camps” was problematic throughout the meeting. However, there was consensus that progress was made in the workshop break-out sessions, and future opportunities for dialogue of this type were requested. Various risks are the bases of concern among a wide variety of biotechnology stakeholders; particular risks vary by stakeholder. Some segments of the public worry about the health risks of genetically modified foods while others worry about the risk of concentrated economic power in society. Producers and farmers worry about the substantial financial risks

associated with shifts to bioengineered crops. Some scientists worry about the risk of unintended consequences (such as creating resistance to herbicides and insecticides) while others debate the very meaning of risk and the conditions under which it should be assessed and managed.

How in democratic societies can these various risk concerns be reconciled? Although there is no easy answer to this question, one thing is certain: the question itself and the responses it attracts from science, from industry, from government, and from publics will determine the road that biotechnology will take. They will also determine the nature of future crossroads.