**Mini-Review** **MR-127E**

# BIOTECHNOLOGY AND THE PUBLIC GOOD: NABC6 CONFERENCE REPORT

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**28 June 1994**

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Following U.S. FDA (Federal Drug Administration) approval of rbST (recombinant bovine somatotropin) in November 1993, and of the "Flavr-Savr" tomato in May 1994, the Sixth Meeting of the National Agricultural Biotechnology Council (NABC6), held 23-24 May 1994, offered consumers, producers, policymakers, environmentalists, and researchers a chance to discuss biotechnology's potential positive and negative impacts on agriculture, and more. NABC, which is funded by 18 Canadian and U.S. universities, is dedicated to providing an open forum for dialogue on agricultural biotechnology and encouraging its development for the benefit of society.

Three plenary sessions provided background on the issues to be discussed in more detail in four workshop sessions, where recommendations were formulated for presentation to government and private policymakers.

## PLENARY I: Current and Next Generation Agricultural Biotechnology Products

Dr. T. Fraley (Monsanto Agricultural Group) stated that biotechnology would be one of many tools contributing to feeding the additional 90 million people who join the world's population annually. He reported that over a seven-year period, field testing has gone from zero to the 1,600 tests on biotechnology products conducted in 1994; 10 of these products are already in the U.S. regulatory pipeline. Current research is on insect-tolerant crops, expected to be approved within the next two years, as well as on disease and weed control. Dr. Fraley listed the outstanding issues in marketing biotechnology products as public acceptance, new laws, food labelling requirements, food safety and allergies, and international trade restraints, as well as legal challenges by "anti-science" groups.

A conference participant disagreed that anyone who raised questions was "anti-science," and challenged Dr. Fraley for not addressing the ethical issue of whether biotechnology was benefiting mankind. The participant criticized the irreversible genetic changes that could be introduced into living organisms and the inability to "recall" any unintended mutation. Another conference participant questioned the long-term effects of biotechnology and FDA claims that it takes a scientific approach to labelling biotechnology products.

Dr. W.F. Hardy (President of the Boyce Thompson Institute for Plant Research), the next plenary speaker, hoped that participants would leave the conference with a new perspective. His role was to describe the likely biotechnology agenda and the framework for considering the public good. In order of priority, he listed: freedom of choice, knowledge/training, human health, economics, environment, sustainability, global interdependence and other. As examples of biotechnology products approved or on the horizon, he gave: a clotting enzyme for cheese-making; self-nitrogen fertilizing corn, rice and wheat; replacements for fossil fuels; biodegradable polymer containers; better yielding crops; therapeutics; and oral vaccines. Finally he discussed funding at the pre-commercialization stage.

**PLENARY II: Biotechnology and the Public Good**

Hope Shand (Research Director of the non-profit Rural Advancement Foundation International) spoke on introducing biotechnology into the rural third world, where the genetic diversity developed over 12,000 years is now being threatened by the patenting of plants and animals. Biotechnology may stimulate research but it makes seeds too expensive for poor farmers. As examples, she mentioned a natural protein sweetener, transgenic cotton, and soybeans.

Another issue discussed was the replacement of natural crops by synthetic equivalents. For example, in Madagascar 100,000 farmers are dependent on the vanilla crop, which is about to be replaced by a cheaper bio-synthetic product. It is foolish to try to transfer technology to those who in the first place provided the indigenous genetic resources placed under patent, yet who now cannot afford to buy patented seeds. Such farmers fall under the control of agro-chemical companies which manipulate the food system and sell both seeds and their proprietary herbicides. Ms. Shand questioned the chemical industry's claim that many of these herbicides are environmentally benign.

She argued that legal systems, such as those covering intellectual property rights, have not caught up with public realities, with the result that patents are being accorded to public property. Ms. Shand concluded by saying that the Convention on Biological Diversity signed last year had two shortcomings: it excluded gene collections acquired before the Convention and it did not include international protocols to protect native species.

Dr. R.J. Cook (Chief Scientist, Competitive Grants Program, USDA - NRI) described biotechnology as part of a continuum of technological evolution in which we have always been adjusting plants and animals to suit our needs. He outlined some of the industrial advances in the poultry and dairy industries but stressed that small applications needed support too, in order to maintain crop diversity.

**PLENARY III: Agricultural Biotechnology in Developing Nations**

The opening speaker, John Dodds (Managing Director Agricultural Biotechnology for Sustainable Productivity Program [ABSP], Michigan State University) cited the Philippines to illustrate the potential for developing germ plasms on an environmentally sustainable small scale. He also described applications of biotechnology in conservation of genetic resources; Cuba, for example, has a program to protect indigenous seed resources.

The ABSP Program aims to promote productivity of a limited number of crops from basic research through to commercial production in selected countries, with North and South scientists working together. Other aspects of the program include workshops, a newsletter, posters, internships and information access.

The next speaker was Magdy Madkour (Director, Agricultural Genetic Engineering Research Institute, Egypt). Half of that country's population relies on agriculture, yet only 6% of its land is suitable for crop production. The goals of the Institute are to use biotechnology to increase crop returns per unit of land and water, reduce dependency on imported products, reduce pesticides and improve the nutritional quality of the food produced.

The third presenter was the most outspoken of the three. Jose De Souza Silva (Chief, Secretariat for Supporting State Agencies Agricultural Research, Brazilian Public Corporation for Agricultural Research) declared that scientific neutrality is a myth and that scientific advances are shaped by social and economic forces. He pointed to four contradictions: while

biotechnology appears to be a plausible solution to countering hunger, it is not working (Brazil is the fourth largest exporter of agricultural products but the sixth most ill-fed); biotechnology products offer production potential but the replacement of traditional crops may also involve massive labour displacement; agricultural biotechnology, which could promote social goals, is instead becoming a profit-driven business in which genetic resources are patented and nature is treated as a commodity; finally, developed countries often inadvertently take actions that hurt the advancement of developing countries.

**WORKSHOP 1: Setting the Agricultural Biotechnology Agenda**

Dr. Susan Offutt (Executive Director, Board on Agriculture, U.S. National Research Council) suggested that market signals set the agenda but complicating factors include subsidies, benefits and costs, and the relationship of the private sector to public goods. To quality, efficacy, and safety, she added a fourth criterion for evaluating biotechnology: social and environmental impacts.

Garth Youngberg (Executive Director, Henry A. Wallace Institute for Alternative Agriculture) noted that companies should invite public involvement by farmers, public interest groups and others in the planning and decision-making phases of biotechnology research and development.

In the workshop discussions that followed, the agenda-setting process took precedence over the stated goal of identifying promising areas for biotechnology. Participatory decision-making was deemed essential to ensure that applications of biotechnology served the public good. The workshop concluded that more public participation would enable agenda setting to reflect more accurately our society's diversity of values, interests and priorities and encourage integration of environmental and social science into biological science programs. Also mentioned as key were: better information, perhaps monitored by a central agency; "no-vested-interest" funding; more research on risk assessment, and school and university courses that explain biotechnology and its implications.

The need for an accessible and consistent regulatory system, in which regulators could exercise conscience as well as oversight, was stressed.

Workshop participants stressed the importance of acting upon NABC recommendations.

**WORKSHOP 2: Biotechnology and the Structure of Agriculture**

A description of the structure of agriculture now includes the controversial total food/fibre system which calls into question the traditional "family farm" ethic. As a result, though biotechnology might help resolve the conflicts between the environment and agriculture, most legislators tend to take a "hands-off" approach.

This workshop raised four issues: the role of biotechnology in helping agriculture to be responsive to the consumer (through national standards of consumption, labelling and access to information); encouragement for universities to retain their independence and take on non-commercially viable research; accessibility of the technology (a patent system designed with the public good in mind, more forums for discussion and a stronger public sector research system); and development of standards for sustainability, health and safety, socio-economic considerations and equity.

**WORKSHOP 3: Agricultural Biotechnology and Global Interdependence**

It was explained that in the global community grain stocks are at their lowest level since 1962. There are great expectations about the potential of biotechnology to help sustain the earth's population but most of the development funds come from the private sector. The issues seem to be equity, rights and access; institutional linkages and biosafety; and socio-economic impact studies. We need a panel to help resolve issues of intellectual property rights; tools to encourage linkages and data retrieval; and a better system of monitoring impacts, acceptability, and wealth distribution.

**WORKSHOP 4: Environmental Stewardship and Agricultural Biotechnology**

Two kinds of errors pose an environmental risk: inappropriate technology and poorly applied technology. Scientists are working on assessment criteria to maintain biodiversity and enhance soil and water quality. Education plays an important role in environmental stewardship as does long-term research on assessing ecological risk. Tax measures were recommended to fund such research.

## CONCLUDING PLENARY

The panel called for a sense of proportion in viewing not just the risks but also the benefits of agricultural biotechnology, which members saw on a continuum of agricultural development. They pointed out that decision-makers require scientifically based information, not emotionally based opinion. The importance of dialogue and consultation was stressed. Since NABC started, there has been a growing emphasis on access to information and increased public participation to ensure that biotechnology develops for the public good. The panel now identified the need to go beyond dialogue and to produce practical results.