Mini-Review **MR-148E**

RESOURCE MANAGEMENT IN CHALLENGED ENVIRONMENTS: NABC 9 CONFERENCE REPORT

Sonya Dakers
Science and Technology Division

19 June 1997

Library of Parliament
Bibliothèque du Parlement

Parliamentary Research Branch

RESOURCE MANAGEMENT IN CHALLENGED ENVIRONMENTS: NABC 9 CONFERENCE REPORT

The National Biotechnology Council (NABC) is a consortium of 25 not-for-profit agricultural research and educational institutions established in 1988. The Council offers an open forum for persons with different interests and concerns to participate in meaningful dialogue on issues in agricultural biotechnology.

NABC 9, held 1-3 June 1997, focused on biotechnology's promise for aiding resource management in challenged environments. This was a particularly apt topic for the site chosen for the conference, which was Saskatoon, Saskatchewan. Saskatchewan, which, among other challenges, experiences severe growing conditions, has made ag biotechnology a centrepiece for economic development efforts.

Three plenary sessions provided background information on ag biotechnology developments at the national and international levels. The forum then broke into three workshops where recommendations were formulated on more specific aspects of ag biotechnology for presentation to government and private policymakers.

PLENARY I: AG BIOTECHNOLOGY IN THE 21st CENTURY, THE PROMISE AND THE PITFALLS

Dr. Robert W. Herdt, Director for Agricultural Sciences and Acting Director for Global Environment at the Rockefeller Foundation, highlighted the potential and the limitations of biotechnology in assisting agriculture to meet the basic needs of an ever-growing human population. He focused on the work being done in raising productivity, increasing disease and pest resistance, and promoting sustainable agriculture.

He pointed out, however, that the traits being developed will help productivity only indirectly since most of the work is being done on herbicide tolerance. Many of the field trials are being conducted on vegetables and grains such as canola that are not staples in the developing world, where, indeed, only about 10% of the field trials are actually being carried out. Of the $2.5 billion being spent annually on ag biotech, only $75 million is being spent in the developing world. More research is needed on producing crops that respond to low soil fertility, drought and salinity.

The second speaker, Mark Winfield, Director of Research, Canadian Institute for Environmental Law and Policy, argued that society's perception of the risks associated with biotechnology might tend to limit its usefulness and expressed the view that public acceptance had not necessarily increased with understanding. He reported that an Advisory Commission is to be established to assist the Canadian government in coming to terms with the social and ethical issues involved in biotech-related decision-making.

Mr. Winfield considered that impact analysis of biotechnology was tending to lag behind the technology itself. Nor was there any follow-up or monitoring process once approvals were granted. He questioned whether biotech applications were related to enhancing food supply or were rather more suited to serving western industrial agricultural practices. He considered there were some dangers associated with promoting a form of agriculture that was not only highly dependent on external inputs but might also have ecological implications. Low tech, which might be a preferable option, was not being researched to the same extent.

People appeared ready to take certain risks in relation to pharmaceutical biotech that they were ready to take in relation to food. According to Mr. Winfield, public confidence in relation to new products depends on the robustness of the regulatory system. On 15 May 1997, Canada put in place its *Novel Food Regulations* to regulate such foods as biotech derivatives.

PLENARY II: PERSPECTIVES ON BIOTECHNOLOGY FOR AGRICULTURE IN CHALLENGED ENVIRONMENTS

Four speakers spoke on the challenges to industry, producers, and consumers of producing food under difficult conditions. Saskatchewan, with 80% of Canada's arable land, supports a multi-billion dollar agricultural business; however, producers face climatic and geographic challenges. Long, very cold winters, followed by hot, dry summers and limited precipitation, hinder crop production. As Saskatchewan is a landlocked province, all agricultural products must be shipped by truck or rail hundreds or thousands of miles for export. One of the ways in which Saskatchewan has met these challenges is by becoming an internationally recognized centre for agricultural research, with a prime emphasis on agricultural biotechnology.

It was reported that technology had enabled production to overcome diseases, insects, and dryland conditions and would probably continue to have a role in increasing production. Industry saw biotech as a tool for creating new products and an engine of growth in which over 500 companies had invested $1.7 billion in R&D. Revenues were $3.5 billion annually in Canada.

The challenges for the industry are to find different products to suit different needs, increase public awareness, and ensure there are enough trained people for the 12,000 new jobs projected for the year 2000.

Another speaker reviewed the biotechnology regulatory experience in Japan, Australia, and North America. While all three are adapting their regulatory systems to include new biotech products, North America appears to be ahead in commercialization and approvals. Public awareness is growing on this continent, according to surveys conducted, but is still below 25%.

A need for an action plan was identified that would include designing a national communications strategy for products coming on to the market, assigning it the resources needed, and finally implementing it. Monitoring progress would also be necessary. The speaker expressed the view that there was a role for NABC in all stages of this project.

The last two speakers dealt with the environmental aspects of biotechnology and its impact on organic farming, and the environment generally. A Biosafety code is being developed to cover the transboundary movement of products.

PLENARY III: GLOBAL CHANGE AND AGRICULTURAL PRODUCTION

Professor Reeves, the Director General of CIMMYT (International Centre for Maize and Wheat Improvement), put the issues under discussion into a global perspective. CIMMYT has outreach in 16 poor developing countries. It is concentrating on developing crop technologies that will help under-developed African and Asian economies. Despite a projected doubling of demand for wheat and maize, spending on such research is now at $7 billion a year, down from $9 billion in 1981. To keep up yield efficiency, the need is for robust genetic material that is durable against diseases. To date, genetic engineering is not being used as much as marker-based technology. CIMMYT allows free access to its genetic resources and is looking for partnerships with countries like Canada that have expertise in grains.

WORKSHOP 1: BIODIVERSITY CONSERVATION FOR SUSTAINABLE AGROECOSYSTEMS

Participants in this workshop examined the impact of biotechnology products and related new technologies on biodiversity. Not enough is known about whether biotech methods impede or enhance biodiversity and whether biotech products could have more impact than conventional systems on such things as sustainability. For instance, what might be the impact of replacing traditional crops with new products and in what circumstances might biotech products pose more risks to biodiversity than conventional strategies? As mentioned, an international protocol is being negotiated on Biosafety.

It was felt that farmers might tend to use biotech products if it helped the “bottom line.” It was suggested there was a need to quantify the benefits of biotech for agroecosystems. While the advances were expected to continue, these would be seen more often in the private sector. Private ownership might tend to inhibit investment in areas where it was needed, and it was not at all clear where the requisite funding, for instance, to conserve desirable genetic

resources, would be generated.

To deal with issues such as increasing understanding, the cost of protecting genetic resources, and accountability, the workshop recommended:

- that governments recognize that loss of biodiversity represents a significant problem;
- that the impact of biotech on biodiversity be communicated to policymakers;
- that NABC promote partnerships and mechanisms within the academic community in order to foster biodiversity; and
- that NABC leadership approach governments about addressing biodiversity issues and maintaining germ plasm banks.

WORKSHOP 2: REGULATORY AND ECONOMIC ASPECTS OF ACCESSING INTERNATIONAL MARKETS

Participants in this workshop explored the consequences of ag biotechnology on marketing products. An examination of regulation at the international level revealed regulatory disarray. The need for harmonization and product as opposed to process-based regulatory systems was identified. Labelling was advocated to encourage consumer acceptance.

Laws and policies (especially in developing countries) were required to protect intellectual property rights (IPR). Another concern was instituting a systems approach to R&D that would break down some of the barriers to coordinating research. The lack of availability of risk capital was seen as a limitation on proceeding to the commercial stage.

WORKSHOP 3: BIOTECHNOLOGY AND SOCIAL ISSUES IN RURAL AGRICULTURAL COMMUNITIES

Participants in this workshop evaluated the impact of adopting new technologies on producers and rural communities. On the one hand, timely access to new technologies could represent a key to competitiveness for producers; on the other hand, producers need to have unbiased scientific information in order to assess any safety or health risks.

It was suggested that case studies of successful applications and cost-benefit

analyses would be helpful. There also needed to be more public debate and a coordinating mechanism for developing a code of ethics. The Advisory Commission should presumably be of some help in promoting a dialogue.

CONCLUDING PLENARY

Workshop leaders provided a summary of discussions at the workshop level. A final summing-up was provided by Eugene G. Sander, Vice-Provost and Dean of Agriculture, University of Arizona. He commented that making ag biotechnology work in "challenged environments" was a complex process, and could not be fixed by merely transferring genes. Responding to the specific needs of developing countries in such environments did not appear to be as yet well in hand. The jury was still out on whether biotech was the one or appropriate tool for feeding our ever-increasing world population; not enough was known about possible unintended results.

The consensus seemed to be that ag biotechnology was neither good nor bad in its own right, that it was a tool, and that its usefulness depended on its application. To date, more progress has actually been made in increasing yield through markers and classical plant breeding than through recombinant DNA. There is still confusion about the terminology and impacts, and this must be resolved before solutions become apparent.