



Biotechnology: Potential boon for smallholder farmers, if prioritized



Though not a magic bullet “cure all,” agricultural biotechnologies can and should be used in developing countries to improve smallholder farmers’ livelihoods, but farmers themselves need to be involved in decision-making, according to participants at an international technical conference on agricultural biotechnologies last week.

During 01-04 March 2010, roughly 300 people from nearly 70 countries attended the International Technical Conference on Agricultural Biotechnologies in Developing Countries (ABDC-10), organized by the Food and Agriculture Organization (FAO) of the United Nations and held in Guadalajara, Mexico. Attendees included representatives from international organizations, civil society, national governments, and national agricultural research programs. Their goal in gathering was to assess the progress of biotechnologies across various agricultural sectors—crops, forestry, livestock, fisheries, and agro-industries—and to generate a forward-looking consensus on ways that biotechnologies can assist smallholder farmers in developing countries.

Investment in and improvement of agriculture is vital for the more than one billion people who go to bed hungry each night, as well as for many farming families who survive on only a few dollars a day. Adoption of effective and cost-efficient agricultural biotechnologies is one way to address the food demands of a rapidly-expanding and more affluent world

population, while also confronting the challenges of increasing land degradation and climate variability.

“Two billion people live on small farms, about one-third of our population,” said Rodney Cooke, of the International Fund for Agricultural Development (IFAD), while addressing the general session. “Investment in agriculture is two-and-a-half-to-three times more effective in increasing the income of the poor than non-agricultural investments.”

The FAO predicts that by 2050 there will be a 70% increase in food demand, requiring at least 170 million more acres of cropland. Meeting this demand looks difficult, because crop yields have slowed from an annual increase of 3-6% to only 1-2%, in the last decade.

Agricultural biotechnologies can sustainably improve food security and help smallholder farmers escape poverty. However, many of these advanced technologies are under-utilized in developing countries, where a large portion of smallholder farmers live. Overcoming this will require increased investments, international cooperation, effective national policies and regulatory frameworks, and collaboration with farmers and the various value-chain actors, said ABDC-10 participants. Several farmers and farmer representatives in attendance repeatedly stressed the importance of bottom-up development in applying biotechnology.

During the conference, participants divided their time between plenary sessions in the morning and small group meetings in the

afternoon. Topics included region- and sector-specific issues, as well as multidisciplinary topics such as empowering public participation in decision making; prioritizing the role of the farmer; and development of genomic resources. All participants discussed successes and failures in biotechnology projects in developing countries. The CGIAR was responsible for leading several group sessions; participating CG members included the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), the International Center for Agricultural Research in the Dry Areas (ICARDA), CIMMYT, and the Generation Challenge Program (CGP).



Careful notes were taken and reviewed during each parallel session to ensure an accurate presentation to the plenary session the following day.

CIMMYT director general Tom Lumpkin addressed the plenary session in a presentation on the use of biotechnology in the CGIAR. Tom Payne, head of CIMMYT’s wheat germplasm bank, was a panel member for a group session on the conservation and sustainable use of genetic resources. Jean-Marcel Ribaut, Carmen de Vicente, and Rajeev Varshney (ICRISAT) of the GCP also presented on accessing genetic resources, genomic applications, and molecular breeding in developing countries, respectively. ▶

▶ “To meet the challenges of increased food demand in a sustainable way, biotechnologies are essential for the future,” Lumpkin said, stressing as well that such technologies need to show tangible results and the efficient use of time and money.

Payne explained that the CGIAR has 11 gene banks conserving over 530,000 samples of wild and domesticated crops in public trust, but that these genetic resources are not always accessible or useful to breeders. “There are so many accessions but so little information,”

he said, adding that the CGIAR is collaborating on a new portal to improve access to the genetic resources (www.global-alis.org).

Additionally, CIMMYT was represented at the ABDC-10’s knowledge share fair, providing publications and information on the center’s biotechnology work. Highlighted projects included rust resistance wheat, nitrogen use efficient maize for African soils, water-efficient maize for Africa, and the conservation and use of maize and wheat genetic resources. ■

CRIL keeps busy

The Crops Research Informatics Laboratory (CRIL) has been very busy lately, with staff crisscrossing the globe to participate in training and information exchange. From 05 February to 05 March, CRIL members were involved in at least five information sharing events. Several involved collaboration with other CGIAR centers.

In early March, Arlet Portugal, and Juan Carlos Alarcón attended an International Crop Information System (ICIS) meeting in Perth, Australia, during which they met with staff from the International Rice Research Institute (IRRI) and Beyer CropScience, and members of the Department of Agriculture & Agrifood from the countries of Brunei and Australia. Talks focused on future development of ICIS and user needs. In February, Portugal had previously worked with data managers and breeders from CGIAR centers and other national agriculture research institutes to help them manage data in the current version of ICIS.

Further training on ICIS took place at CIMMYT-El Batán led by Claudio Ayala, Ismael Barrera, and Andrés Corona, and at the International Institute of Tropical Agriculture (IITA) in Nigeria, where it was led by Hector Sánchez. One of CRIL’s goals is to integrate CIMMYT and IITA’s maize programs in ICIS to facilitate information sharing. At IITA, the training included scientists focused on maize, cassava, banana, and cowpea, and IITA expressed interest in following the CRIL approach to implement ICIS for these crops. Additionally, the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) will implement ICIS for sorghum and chickpea.

Last month Guy Davenport presented plans for a new, user-friendly and configurable version of ICIS at the Molecular Breeding Platform (MBP) launch workshop in Hyderabad, India. And in Maputo, Mozambique, Sánchez outlined data management for the Water Efficient Maize for Africa Project (WEMA) at that project’s annual progress meeting. ■

Global Futures project launched

The Socioeconomics Program (SEP) is collaborating in a new project aimed to evaluate promising technologies, investment, and policy options for improving agricultural productivity and global food security.



The Global Futures for Agriculture project, launched in early March 2010, is led by the International Food Policy Research Institute (IFPRI) and builds upon the already existing economic model IMPACT (International Model for Policy Analysis of Agricultural Commodities and Trade). This model has been used in the past for projecting future production, consumption, and trade of key agricultural commodities while taking into account the effects of climate change, water availability, population growth, urbanization, and other major drivers of global change. The Global Futures for Agriculture project improves upon this model by including location-specific biophysical data; current and future technology options; climate risk; and the impact of potential agricultural investments on global food supply and demand, food prices, economic growth, and poverty alleviation.

The SEP will play a major role in assessing the future outlooks for maize and wheat, and will work on improving database information and creating model scenarios for these two crops. Crop and water availability simulation models will also complement modeling of climate change risks on crop yields and production. All will be important for refining and calibrating the IMPACT model.

A new associate scientist to be based in Nairobi, Kenya, will be hired to work with other scientists on this project, and will closely collaborate with CIMMYT breeders, agronomists, and economists to improve the center’s foresight on alternative futures for maize and wheat in terms of improving global food security and system sustainability. Additionally, CIMMYT will work with the International Livestock Research Institute (ILRI) and the International Center for Research in Agroforestry (ICRAF) to set up a High Performance Cluster of computers able to run the IMPACT model in Nairobi. ■