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Iowa, Host to the World: International Biotechnology Information Conference

By Mary Ponomarenko

What do the President of the Korean Federation of Housewives Clubs, the CEO (chief executive officer) of the Kenyan Cereal Producers, Argentinean technical advisors to Codex Alimentarius and Ministry of Agriculture officials from Botswana, Bulgaria, Brazil and Thailand have in common? They were among more than 100 plant and animal research scientists, policy makers, and consumer and farm organization leaders, representing over 50 countries, who came to Iowa in October 2005 to learn more about biotechnology and to participate in the World Food Prize ceremony.

The fourth International Biotechnology Information Conference, sponsored by the U.S. Grains Council using development funds from FAS (the Foreign Agricultural Service), the Iowa Corn Promotion Board, the Nebraska Corn Board, the National Corn Growers Association and the Partnership to Cut Hunger and Poverty in Africa, drew a record number of participants—a testament to the growing reputation of the conference and the increasing importance of the subject.

"Our goal is to foster greater international understanding of biotechnology by giving the decision makers a first-hand look at the entire corn production chain," said Gordon Wassenaar, past chair of the Iowa Corn Promotion Board and host to the group. "Delegates are taken from the laboratory to my farm and from a terminal elevator to the grocery store. It really gives them a chance to see U.S. agriculture at its best and experience our way of life both on the farm and as consumers."

Photo courtesy of Mary Ponomarenko, FAS Grain and Feed Division

The World Food Prize, known as "the Nobel Prize for food and agriculture," is the foremost award recognizing breakthrough achievements improving the quality, quantity or availability of food.

Consideration and Conversation Were the Order of the Day

Participants visited farms, grain storage and transportation facilities, and public and private laboratories. The program included U.S. and international producer panels and a biosafety regulation discussion panel. The World Food Prize ceremony was a highlight of the conference.

Although U.S. organizations sponsored the event, a European served as the conference moderator. A key lesson learned was that although the United States and the EU (European Union) have many common views and experiences regarding science, our views on policy differ. The conference emphasized the need for three vital elements—good science, good policy and good communication.

What Is Biotechnology?

Bio means "life" and technology means "tools." Biotechnology is the scientific manipulation of living organisms, especially at the molecular genetic level, to produce useful products. It is not a radical departure from past breeding and selection practices, although it does enable scientists to work at the molecular level of selection. And did you know the word first appeared in print in 1919?

Biotechnology is only a tool. Therefore, sound production practices and regulation are key to assessing and managing potential risk and addressing biosafety questions, as with any new product introduction.

What Did We Learn About Risk Assessment and Risk Management?

Risk is a function of hazard, whether you are assessing risk to people, animals or the environment. In biology, as in many aspects of our daily lives, zero risk is not possible. It is important to balance the potential benefits of a new technology with the possible risks.

One potential risk posed by biotech products is the introduction of proteins that are allergenic to humans or animals. Laboratory techniques used to assess the safety of biotech products are sophisticated to the point of identifying a single gene, marking it, and then tracing and testing the protein it produces. Extensive testing and analysis eliminates use of any gene that produces a protein with characteristics common to allergens.

In fact, with an increased understanding of allergens, researchers are hopeful biotechnology will aid in the removal of the allergens commonly found in traditionally produced foods, including soybeans and rice.

Over 90 feeding studies on cows, sheep, pigs, chickens, fish and rabbits have demonstrated that animal tissues retain no biotech components from consuming genetically modified feed, eliminating concerns about potential residual effects on humans from consumption of products from these animals.

Studies show that biotech crops can have positive effects on the environment. Biotech crops such as Bt corn or cotton specifically target a particular insect pest, while traditional farming practices often require the use of broad-spectrum pesticides that kill many more species of insects, including beneficial ones.

Biotech crops require significantly lower pesticide and herbicide use and can be cultivated with low- and no-till practices. Less chemical runoff leaves water cleaner and soils healthier.

Yet despite the tremendous acceptance of biotech crops in developed countries with large commercial production—i.e., the United States, Argentina and Canada—biotechnology may actually have more benefit and applicability for small subsistence farms in the poorest countries of the world. More than 8 million producers worldwide use biotechnology, about 90 percent of them small farmers in developing countries.

AfricaBio, a nonprofit organization, administered Bt corn demonstration plots in South Africa. They found yield increases of 25-65 percent. The overwhelming success of Bt cotton with small producers in India forced a policy change for acceptance in that country.

In addition, the poorer, smaller producer has less access to the chemical inputs, and the safety equipment and procedures required to use them, which are necessary to grow traditional crops. Transgenic crop production is a sound technology for small producers, but requires different management practices. This is a growing research priority.

Sound Science Does Not Speak for Itself

Sound public policy must be built on sound science; sound science and sound policy can only be brought about by sound communication. History has shown that scientific facts do not effectively speak for themselves.

Andy Benson, vice president of international relations for the International Food Information Council, discussed surveys that sharply outline some public opinion differences in the United States and the EU. Over 75 percent of U.S. consumers surveyed feel their food is safe, and more than 60 percent believe biotechnology benefits them. U.S. consumers generally trust government regulators and the scientific community.

In the EU, less than 3 percent of people polled trust government officials, less than 6 percent trust scientists, and less than 9 percent trust the medical profession. Conversely, more than 50 percent trust information from consumer groups. These perceptions are tied to public health policy failures in recent years.

Participants had a chance to talk with scientists one-on-one while touring Iowa State University during the International Biotechnology Information Conference.
Photo courtesy of U.S. Grains Council

Photo courtesy of Mary Ponomarenko, FAS Grain and Feed Division

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Dr. Borlaug's Wish List

A Nobel Peace Prize recipient in 1970, father of the Green Revolution for his groundbreaking work in rice and wheat genetics and co-founder of the World Food Prize, Dr. Norman E. Borlaug has promoted new technologies to increase food production for the poorest of the poor. Now over ninety, Dr. Borlaug still brings a passion to his work and shares his vision with all who will listen. At the conference, he said that despite all of our collective accomplishments, the world food supply will have to double by 2050 to keep up with population growth. Most of the production will have to take place in the countries where it is consumed, primarily on land already in production.

Dr. Borlaug discusses the importance of biotechnology with Larry Jons, U.S. Grains Council Membership and Communications Advisory Team member and Iowa Corn Promotion Board delegate.
Photo courtesy of U.S. Grains Council

His personal wish list includes witnessing the transfer of rice's natural immunity against rust to other cereal crops and seeing the transfer of bread wheat's proteins to rice and corn.

Dr. Borlaug challenged the audience to fight against the fear of new technology and move forward on these pressing issues.

The World Food Prize and the Blue Revolution

The World Food Prize, known as "the Nobel Prize for food and agriculture," is the foremost award for breakthrough achievements improving the quality, quantity or availability of food. It recognizes accomplishments in any field that contribute to the world food supply, including food and agricultural science and technology, manufacturing, marketing, nutrition, economics, poverty alleviation, political leadership and the social sciences.

Dr. Robert Havener and Dr. Borlaug founded the prize in 1986 to emphasize the importance of a nutritious, sustainable food supply for all people. By honoring those who have worked successfully toward this goal, the prize calls attention to what has been done to improve the world food supply, and what can be accomplished in the future.

In keeping with the tradition of Dr. Borlaug and the Green Revolution, this year Dr. Modadugu V. Gupta was chosen as the sixth World Food Prize laureate. Dr. Gupta has led the "Blue Revolution" in freshwater aquaculture with a lifetime of exceptional achievement in developing and spreading simple technologies for aquaculture. He has enriched the diets and the lives of more than a million of world's poorest people by enhancing the growth and yield of fish species through genetic modification.

Through his leadership in the international Network on Genetics in Aquaculture, Dr. Gupta has helped spread biodiversity across Asia and Africa. He participated in developing biosafety frameworks and trained nearly 300 scientists from developing countries, ensuring that international cooperation and research in freshwater aquaculture can continue to expand and improve.

Scientific facts are filtered through policy and public opinion. This underscores the importance of making science understandable to policy makers, public opinion shapers and the general public.

Biotechnology Now and in the Future

New varieties of crops may offer many benefits—higher yields, applicability in developing as well as developed countries, lower use of toxic chemical inputs and a proven safety record with humans, animals and the environment.

Experts at the conference agreed that biotechnology is a valuable tool for addressing the problems of hunger, malnutrition and even obesity. New research continues to improve the nutritional content of subsistence crops, like cassava. Researchers are also attempting to eliminate transfats from soy oil and to generate better soy proteins.

Biotechnology is entering a phase of plant-derived biologics. Research is ongoing to develop that plants which can produce therapeutic proteins for pharmaceutical use. Tobacco, potatoes, tomatoes and bananas are being used to research the production of vaccines against diseases such as cholera and hepatitis B. These breakthroughs could have the significant benefit of reducing the costs of pharmaceuticals in developing countries.

Improving the efficiency of irrigated agriculture is also critical. Irrigation accounts for 70 percent of current global water use; irrigated crops account for 40 percent of the world's food harvest. Researchers are therefore striving to increase drought tolerance in many crops.

There are no simple answers to the complex questions posed by biotechnology. However, insightful dialogue

can provide a more meaningful context for understanding the pro's and con's and lead to further appropriate questioning and better public policy decisions. This was the essence of the International Biotechnology Information Conference. ■

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e-Sources: Selected Web Resources

The following Web sites have additional information related to biotechnology and the World Food Prize.

International Biotechnology Information Conference Web site:
http://www.grains.org/news/latest_news/2005ibic.html

World Food Prize Home Page: http://www.worldfoodprize.org/

USDA Agricultural Biotechnology Web site:
http://www.usda.gov/wps/portal/!ut/p/_s.7_0_A/7_0_1OB?nav=BIOTECH&parentnav=AGRICULTURE&navtype=RT

FAS Biotechnology Web site:
http://www.fas.usda.gov/itp/biotech/biotech_trade.asp

International Service for the Acquisition of Agri-biotech Application Web site:
http://www.isaaa.org/

The conference also allowed time for field visits. Here, a grower and member of the Iowa Corn Promotion Board explains why he uses genetically modified seeds in crop rotation to a participant.
Photo courtesy of U.S. Grains Council

Photo courtesy of Mary Ponomarenko, FAS Grain and Feed Division