Biotechnology Has Potential To Feed World's Poor

BALTIMORE, Md. – Offering the potential to "customize" plants for local growing conditions, biotechnology can increase crop productivity and improve nutritional value to help feed the world's poor.

But the poor won't benefit unless the public sector strengthens agricultural research internationally, especially in developing countries, according to Dr. G.H. Toenniessen, deputy director of agricultural sciences for The Rockefeller Foundation.

"That (research) system must focus on crops of importance in marginal land areas and on traits of importance to poor farmers," Toenniessen told the October 18-22 annual meeting of the American Society of Agronomy (ASA), Crop Science Society of America (CSSA), and the Soil Science Society of America (SSSA) at the Baltimore Convention Center.

The challenge in helping the world's poor is to focus biotechnology on the rural, marginal land areas, according to Toenniessen. People in these areas are poor because their land is not suitable for intensive crop production, and they scratch out a living without irrigation, fertilizers or places to sell any surplus from their farms.

"The solution will not occur in the United States because food production here is already generating surpluses that the world's poor are unable to access," said Toenniessen. he added that the solution will not necessarily come from prime growing grounds of developing countries either.

Using India as an example, Toenniessen said it is a net exporter of cereals, yet its rural poor lack the money to buy the grains and, therefore, do not benefit from advancements that occur in prime growing areas.

Toenniessen maintains that the "Only real solution" is to increase production and efficiency of crops grown by poor farmers, crops in marginal areas are often ignored by the private sector because they lack potential for profit.

He said one success story is rice biotechnology, where $80 million invested over the last 10 years has developed successful varieties for developing countries.

Toenniessen cited success in manipulating carotenoid biosynthetic pathways in crops in order to increase production of beta carotene—a source of provitamin A. Vitamin A deficiency is a serious problem in developing countries, but increasing the vitamin for human consumption has received little attention. On the other hand, he said, similar work in crops for animal feed has flourished.

According to the speaker, market forces—the potential for sales and profits—motivate private research. he said the public sector—primarily governments will have to take up the challenge to enhance the nutritional value of food for humans. he pointed out efforts to manipulate gene structures to deliver more iron, since some 2.5 billion people worldwide are iron deficient.

He said crops also need to be developed to endure stresses of drought, flood and cold—as well as resist disease and insects in these marginal areas.

Public research will improve "orphan crops"—a catch-all term for crops that don't receive attention in the commercial market. Crops such as cassava (a root crop), chickpeas, sorghum and millet are important in areas where rice, wheat and maize can't be grown.

Funding and "intellectual property rights' are two major challenges to publicly-supported research centers, according to Toenniessen.

Not only do public institutions need to fund their research, they are increasingly faced with additional costs in acquiring the rights to use certain developments.

He said the former free exchange of information is now inhibited when companies and institutions take out intellectual property rights on their discoveries. the information is no longer shared unless agencies pay for them or guarantee that the information will be confined to research.

International research centers need to produce varieties that will go into commercial production to feed people and be sold in local markets, Toenniessen said. The question is whether public institutions will have legal rights to the technology.

KEYSTONE FARM SHOW