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Biotech Corn Can Boost Yields to Help Meet Growing World Food Demands

Rising incomes in developing world will make corn the No. 1 crop in 2020

MANILA, Philippines (Nov. 6, 2003) — Wider global adoption of the first generation of biotech corn or maize could produce an additional 35 million metric tons of corn — more than a 5 percent increase globally. That increase could give developing countries a significant boost in meeting rising demand for corn which, by 2020, will surpass wheat and rice as the world's No. 1 crop, according to a report from a nonprofit organization whose mission is to help alleviate hunger and poverty by sharing crop biotechnology applications.

The report, from the International Service for the Acquisition of Agri-biotech Applications (ISAAA), said rising incomes in the developing regions of Asia and Latin America are triggering a shift to more meat consumption, which will cause a dramatic increase in demand for corn-based animal feeds.

Bt corn — enhanced with a naturally occurring protein from a soil bacterium (*Bacillus thuringiensis*) that protects plants from insect pests such as corn borers — can cut in half the estimated 9 percent loss of the global corn harvest to insect pests. The pest-resistant corn also can make food and feed safer by minimizing insect damage that causes the incidence of harmful mycotoxins, according to the report. In addition, the wider adoption of Bt corn could cut pesticide spraying by up to half, or 5,000 metric tons, it said.

"Bt corn offers a unique opportunity to provide developing countries with safer and more affordable food and feed, which can make a major contribution in alleviating the hunger and malnutrition that claim 24,000 lives a day in Asia, Africa and Latin America," said Clive James, chair of ISAAA and author of the report, "Global Review of Commercialized Transgenic Crops: 2002 Feature: Bt Maize."

The report said average yield gains for Bt corn over traditional varieties were an average of 5 percent higher in the United States, 6 percent higher in Spain, and about 10 percent higher in Argentina and South Africa. In Spain, the only country in the European Union to grow a significant area of the biotech crop, growers realized gains of 170 euros per hectare* due to increased productivity and insecticide savings.

In field trials, Bt corn yields were 24 percent higher in Brazil, up to 41 percent higher in the Philippines, and between 9 and 23 percent higher in China. Second-generation biotech corn — such as the newly approved variety in Canada and the United States that wards off rootworm — will produce even more gains with $1 billion in annual benefits to the United States alone.

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The report also noted that developing countries will consume 80 percent of the additional corn needed by 2020, with the lion's share of this increased production being grown by developing world farmers, who make up 98 percent of the world's 200 million corn farmers.

"This is a daunting challenge for developing world farmers, many of them small and resource poor," said James. "The fact that biotechnology incorporates beneficial traits into the seed makes these crops a very appropriate tool for small farmers, as witnessed by the 5 million small farmers in Asia, Latin America and Africa who have already adopted Bt cotton."

The first year of experience for farmers in the Philippines, the first country in Asia to approve a biotech food crop for commercial planting, illustrates why.

"My previous harvest of traditional corn was 80 sacks of corn kernels per hectare," said Rafael Sarmiento, who farms 1.3 hectares near General Santos City in the Philippines. "With Bt corn, I now harvest close to 132 sacks of corn kernels per hectare." In fact, the report said increased yields from Bt corn production were able to meet the subsistence requirements of a family of five in the Philippines, while conventional corn could not.

Carlos Andico, who farms 2 hectares nearby, added, "I earn big with Bt corn because I only spend for fertilizers and do not need to spray. I could have lived comfortably much earlier if Bt corn was introduced years ago."

In addition to the yield gains, increased farmer incomes and reduced pesticide spraying, the report said, "There is now clear evidence that food and feed products from Bt corn are often safer than the corresponding products from conventional corn because of lower levels of the mycotoxin fumonisin."

Fumonisin is produced when insects burrow into the corn stalks and kernels, allowing fungi to enter and produce harmful mold. While mycotoxin levels are closely monitored in the industrial world, they are not monitored in many developing countries in the tropics where the threat from fungal infection is greatest.

"Minimizing insect damage through Bt corn has significantly reduced concentrations of fumonisin in food and feed," James said. "This is a major benefit in developing countries where levels of the harmful mold are higher in food and feed and where corn is directly used as food by a significant portion of the population."

In 2002, Bt corn accounted for approximately 7 percent of the global corn area — about 10 million hectares. The study projects adoption of Bt corn could be extended to between 28 and 32 percent of the global corn area — 40 to 45 million hectares. Wider adoption and benefits could be made available from five second-generation Bt corn varieties expected to be commercialized in the next three years, ISAAA said.

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The International Service of the Acquisition of Agri-biotech Applications (ISAAA) is a not-for-profit organization with an international network of centers in the Philippines, Kenya and the United States. It is working to make agricultural biotechnology available in developing countries and to ensure its safety. Clive James, chairman and founder of ISAAA, has lived and worked for the past 25 years in the developing countries of Asia, Latin America and Africa. He is a widely recognized expert in agricultural research and development, global food and feed security and crop biotechnology.

*1 hectare = 2.47 acres