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Predicted Second Wave of Biotech Growth and Development Begins

Developing countries recognize biotechnology as a key to food self-sufficiency and prosperity

BEIJING, CHINA (Feb. 23, 2010) – Last year, ISAAA predicted biotech crops were poised for a new wave of growth. Substantial gains have already been made in 2009 that are starting to bring that prediction to fruition. With 14 years of regulatory experience, growth can be accelerated moving forward.

One of the most significant advances in 2009 included a landmark November decision by China issuing biosafety certificates for biotech insect-resistant rice and phytase maize. As rice is the most important food crop globally, feeding half of humanity, and maize is the most important feed crop in the world, these biosafety clearances can have enormous implications for future biotech crop adoption in China, Asia, and around the world. The crops must complete 2 to 3 years of standard registration field trials prior to commercialization.

“With last year’s food crisis, price spikes, and hunger and malnutrition afflicting more than 1 billion people for the first time ever, there has been a global shift from efforts for just food security to food self-sufficiency,” said Clive James, chairman and founder of ISAAA. “With a current population of 1.3 billion, biotech crops are a critical component for China and other countries to gain self-sufficiency.”

As the largest rice producing country, China suffers significant losses from rice borer. Bt rice has the potential to increase yields up to 8 percent, decrease pesticide use by 80 percent (17 kg/ha) and generate US\$4 billion in benefits annually.

“This would have a direct and extensive increase on the prosperity of about 440 million Chinese who rely on rice production,” said Dr. Dafang Huang, former director at the Chinese Academy of Agricultural Sciences. “With hundreds of millions of small farmers in our country, biotech crops can serve as an engine for agricultural economic growth and bring prosperity to these small farmers.”

China is also the second largest maize producer in the world, with about 100 million farmers growing 30 million hectares of the grain. Increasing prosperity in the country is creating an increased demand for animal protein, making maize a key resource. The improved phytase maize will allow China's 500 million pigs and 13 billion chickens and other poultry to more easily digest phosphate, improving the animal's growth and reducing the amount of the nutrient excreted. Currently, phosphate must be purchased and added to feed, and it contributes to environmental pollution.

"China's global leadership in approving biotech rice and maize will likely become a positive role model and influence acceptance and speed of biotech food and feed crop adoption throughout Asia and globally," James said.

China is just one of 16 developing countries that grew biotech crops in 2009. Growth of biotech crops has been substantially higher in developing nations – 13 percent or 7 million hectares in 2009 compared to just 3 percent or 2 million hectares in industrialized countries. As a result, almost half (46 percent) of the global hectareage of biotech crops were planted in developing countries, where 13 million small farmers benefitted.

"This strong adoption puts to rest the idea that biotech crops can only benefit larger farmers and industrialized countries," Huang said. "In fact, countries like China, with hundreds of millions of small farmers, have identified biotech crops as a key to self-sufficiency to make it less dependent on others for food, feed, and fiber."

During 2009 there was a noticeable growth in appreciation for the essential role of agriculture by global society. In fact, the G8 recently approved US\$20 billion over three years "to help farmers in the poorest nations improve food production and help the poor feed themselves."

The late Norman Borlaug, founding patron of ISAAA and to whom this year's report is dedicated also recognized this need. He stated that, "what we need is courage by the leaders of those countries where farmers still have no choice but to use older and less effective methods. The Green Revolution and now plant biotechnology are helping meet the growing demand for food production, while preserving our environment for future generations."

2009 Key Highlights

In 2009, 14 million farmers planted 134 million hectares (330 million acres) of biotech crops in 25 countries, up from 13.3 million farmers and 125 million hectares (7 percent) in 2008. Notably, in 2009, 13 of the 14 million farmers, or 90 percent, were small and resource-poor farmers from developing countries.

Trait hectares or "virtual hectares" reached 180 million hectares, up 14 million hectares from 2008. Eight of the 11 countries planting crops with stacked traits were developing nations.

Brazil surpassed Argentina as the second largest grower of biotech crops globally. Impressive growth of 5.6 million hectares to 21.4 million hectares, up 35 percent from 2008, was the highest absolute growth for any country in 2009.

Burkina Faso's biotech cotton area soared from 8,500 hectares to a substantial 115,000 hectares, or from 2 percent to 29 percent of the country's total cotton area – the largest percentage growth on record at 1,350 percent. Progress continued in the rest of Africa with a significant 17 percent increase in South Africa to reach 2.1 million hectares and a 15 percent increase in Egypt to total 1,000 hectares of Bt maize.

Bt cotton in India has revolutionized cotton production in the country with 5.6 million farmers planting 8.4 million hectares in 2009, equivalent to a record 87 percent adoption rate. India gained US\$1.8 billion from Bt cotton in 2008 alone and reduced insecticide use by half.

Costa Rica reported biotech crops for the first time in 2009, exclusively for the seed export market, while Japan began commercialization of a biotech blue rose.

Six European countries planted 94,750 hectares of biotech crops in 2009, down from seven countries and 107,719 hectares in 2008, as Germany discontinued its planting. Spain planted 80 percent of all the Bt maize in the EU in 2009 and maintained its record adoption rate of 22 percent from the previous year.

The top eight countries, each growing more than 1 million hectares, were: United States (64.0 million ha.), Brazil (21.4 million ha.), Argentina (21.3 million ha.), India (8.4 million ha.), Canada (8.2 million ha.), China (3.7 million ha.), Paraguay (2.2 million ha.), and South Africa (2.1 million ha.). The remaining countries included: Uruguay, Bolivia, Philippines, Australia, Burkina Faso, Spain, Mexico, Chile, Colombia, Honduras, Czech Republic, Portugal, Romania, Poland, Costa Rica, Egypt and Slovakia.

Growth Drivers for Second Wave of Adoption

Biotech rice and the drought tolerant trait have been identified as the two most important drivers globally for future biotech crop adoption. China's biosafety clearance of insect-resistant rice is likely to spur faster development of biotech rice and other biotech crops in other developing countries. Meanwhile drought tolerant maize is expected to be deployed in the United States in 2012 and sub-Saharan Africa in 2017.

Other key highlights marking the beginning of the second wave of growth in 2009 include the approval of SmartStax, a novel biotech maize containing eight different genes for insect and herbicide resistance and planting in the United States and Canada of the first Roundup Ready 2 Yield soybeans – the first product of a new class of technology that allows more efficient, precise gene insertion to directly impact yields.

ISAAA predicts future adoption increases will also come from:

- significant expansion of biotech soybean, maize, and cotton in Brazil.
- commercialization of Bt cotton in 2010 by Pakistan, the fourth-largest cotton growing country.
- expansion of Bt cotton in Burkina Faso with potential adoption of biotech cotton and/or maize in other African countries including Malawi, Kenya, Uganda, and Mali.
- adoption of golden rice by the Philippines in 2012 and Bangladesh and India before 2015.

Other smaller hectare crops are also expected to be approved by 2015, including potatoes with pest and/or disease resistance, sugarcane with quality and agronomic traits, and disease resistant bananas. Wheat remains the last major staple crop without approved biotech traits. However, political will for the crop is growing globally. China may be the first country to approve biotech wheat as early as 5 years from now. Traits such as disease resistance are well advanced while sprouting tolerance and enhanced quality traits are being field-tested. China's public investment in the crop is likely the largest worldwide.

ISAAA expects the number of biotech farmers globally to reach 20 million or more in 40 countries on 200 million hectares in just more than five short years in 2015.

For more information or the executive summary, log on to www.isaaa.org.

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The International Service for the Acquisition of Agri-biotech Applications (ISAAA) is a not-for-profit organization with an international network of centers designed to contribute to the alleviation of hunger and poverty by sharing knowledge and crop biotechnology applications. Clive James, chairman and founder of ISAAA, has lived and/or worked for the past 25 years in the developing countries of Asia, Latin America, and Africa, devoting his efforts to agricultural research and development issues with a focus on crop biotechnology and global food security.