

Global Status of Commercialized Biotech/GM Crops: 2014

By Clive James, Founder and Emeritus Chair of ISAAA

KEY FACTS & FINDINGS

19 YEARS CONTINUED GROWTH, DIVERSITY AND BENEFITS:

Growth

- In 2014, a record 181.5 million hectares of biotech crops were grown globally – an increase of 6 million hectares from 2013 and more than 100-fold gain since 1.7 million hectares were planted in 1996.
- More than 60 percent of the world's population resides in the 28 countries planting biotech crops. Of these countries, 20 are developing and eight industrial.
- Eighteen million farmers planted biotech crops in 2014, 90 percent of whom were small, resource-poor farmers, representing some of the poorest people in the world.
- The United States continued to lead biotech crop production with 73.1 million hectares, an increase of 3 million hectares over 2013. This surpassed the growth rate of Brazil, which had recorded the highest year-to-year increase for the past five years and added 1.9 million hectares in 2014.

Diversity

- More than 10 food and fiber crops are approved for commercial planting, ranging from major commodities like maize, soybean, and cotton, to fruits and vegetables such as papaya, eggplant and squash.
- Newly-approved crops in 2014 included food crops such as the Innate™ potato in the United States, vegetable *Bt* brinjal/eggplant in Bangladesh, and biotech sugarcane in Indonesia.
- Not only are the crops themselves diverse, but so are the issues they address. United in their ability to boost benefits to the consumer and increase crop productivity for farmers, traits include drought tolerance, insect and disease resistance, herbicide tolerance, increased nutrition and food quality.

Benefits

- The latest provisional information for the period 1996 to 2013, provided by Brookes and Barfoot of PG Economics, indicates biotech crops continue to have a significant, positive impact on food security, sustainability and climate change by:
 - Increasing crop production valued at US\$133 billion
 - Saving approximately 500 million kg a.i. (active ingredient) of pesticides
 - In 2013 alone, reducing CO₂ emissions by 28 billion kg, equivalent to taking 12.4 million cars off the road for one year; compared to CO₂ emission reductions equal to removing 11.8 million cars in 2012
 - Helping to alleviate poverty for more than 16.5 million small farmers and their families, totaling 65 million people – some of the poorest in the world.
- A rigorous meta-analysis conducted by Klumper and Qaim (2014) from Europe analyzed nearly 150 published biotech crop studies using primary data from farm surveys or field trials worldwide and reconfirmed the environmental benefits of biotech crops. The analysis noted that, since 1995, GM technology has:
 - Reduced chemical pesticide use 37 percent
 - Increased crop yields 22 percent
 - Increased farmer profits 68 percent

Takeaway. The growth, diversity and benefits of biotech crops continue to evolve and they can make a significant contribution to feeding a growing population. As the fastest adopted crop technology in recent times, biotech crops are part of the solution to food security and climate change – very real problems both consumers and farmers face around the world. Whereas biotech crops are essential for global food security, they are not a panacea. Adherence to good farming practices such as rotations and resistance management are a must for biotech crops, just as they are for conventional crops.

THE INTEGRAL ROLE OF PUBLIC-PRIVATE PARTNERSHIPS:

Increased Crop Productivity and Expedited Delivery

- Aid agencies and foundations have established projects to donate and transfer biotech crop applications from the private and public sector in industrial countries for the benefit of small, resource-poor farmers in developing countries for the past decade. A few examples:
 - One of the smallest and poverty-stricken countries in the world, Bangladesh, approved *Bt* brinjal/eggplant for planting in October 2013. Less than 100 days after approval, commercialization of the crop was initiated and 120 farmers planted 12 hectares of *Bt* brinjal in 2014. The strong political will and support from the government observed in this model sets the stage for other developing countries to follow suit.
 - The Water Efficient Maize for Africa (WEMA) Project aims to deliver biotech-based drought tolerant maize to select African countries as early as 2017. Made possible by a public-private partnership, the technology is first targeted at South Africa, followed by Kenya, Uganda, Mozambique and Tanzania.
 - The donated technology, DroughtGard™ saw a 5.5-fold year-to-year increase in planted hectares in the United States in 2014. This represents strong farmer acceptance of the drought tolerant maize.

Takeaway. Public-private partnerships continue to be successful for increasing crop productivity by developing and delivering approved products to the farmer. As evident in the success story of Bangladesh, “political will” and government support are essential to ensure available and approved technologies reach farmers quickly.

BIOTECH CROPS IMPACT CONSUMERS AND FARMERS:

New Approvals Reconfirm Benefits to Consumers

- The United States approved the Innate™ potato for cultivation in 2014. The potato will address consumer health and perception concerns, while also reducing food waste – an integral need to achieve food security. The Innate potato:
 - Decreases potential for producing acrylamide (a potential carcinogen) when potatoes are cooked at high temperatures
 - Will not discolor when peeled and has fewer bruising spots, increasing consumer satisfaction and precluding up to 40 percent yield loss from bruising
 - Increases shelf-life
- As the fourth most important food crop in the world, field trials of biotech potato are currently being conducted in Bangladesh, India and Indonesia to assess their resistance to late-blight disease, the cause of the 1845 Irish potato famine, in which one million people died. If successful, this technology will result in higher productivity and increase the quality of this important food staple to consumers' tables.
- Approval of the *Bt* brinjal in Bangladesh and drought tolerant sugarcane in Indonesia also represents biotech crops filling the void of important foods needed in the countries.

Takeaway. Through continuous research, development, acceptance and adoption, biotech crops have and will continue to address consumer concerns and needs ranging from nutritional value to aesthetic factors that impact purchasing decisions and address the problem of food waste.

ISAAA is a not-for-profit organization, sponsored by public and private sector organizations. All biotech crop hectare estimates in all ISAAA publications are only counted once, irrespective of how many traits are incorporated in the crops. Detailed information is provided in ISAAA Brief 49 “Global Status of Commercialized Biotech/GM Crops: 2014” by Clive James, Founder and Emeritus Chair of ISAAA, who has lived/worked in developing countries for the last 30 years and published extensively on biotech crops and food security. For further information, please visit <http://www.isaaa.org> or contact ISAAA SEAsiaCenter at +63 49 536 7216, or email to info@isaaa.org.