



**HIGHLIGHTS
OF
ISAAA BRIEF NO. 35 - 2006
GLOBAL STATUS OF COMMERCIALIZED BIOTECH/GM CROPS: 2006**

by
Clive James, Chair ISAAA Board of Directors*

Brief 35, the eleventh in an annual series, was released on 18 January 2007 in New Delhi, India. ISAAA Brief 35 characterizes the global status of commercialized genetically modified (GM) crops in 2006, now more often called biotech crops, as referred to consistently in the Brief. The focus on developing countries is consistent with ISAAA's mission to assist developing countries in assessing the potential contribution of biotech crops to food security and alleviation of poverty and hunger. The principal aim is to present a consolidated set of data that will facilitate a knowledge-based discussion of the current global trends in biotech crops.

- 2006 marked the first year of the second decade of commercialization of biotech crops, 2006-2015. In 2006, the global biotech crop area continued to soar as the 100 millionth hectare barrier (250 millionth acre) was breached, when for the first time more than 10 million farmers (10.3 million) in 22 countries planted 102 million hectares of biotech crops, up from 90 million hectares planted by 8.5 million farmers in 21 countries in 2005. This unprecedented high adoption rate is testimony to the trust and confidence of millions of small and large farmers in crop biotechnology in both industrial and developing countries.
- Over the last eleven years, 1996 to 2006, farmers have consistently increased their plantings of biotech crops by double-digit growth rates every single year since biotech crops were first commercialized in 1996. Remarkably, the global biotech crop area increased more than sixty-fold in the first eleven years of commercialization, making biotech crops the fastest adopted crop technology in recent history. The global area of approved biotech crops in 2006 was 102 million hectares, equivalent to over 250 million acres, up from 90 million hectares or 220 million acres in 2005. The increase of 12 million hectares or 30 million acres between 2005 and 2006, was the second highest in the last five years, and equivalent to an annual growth rate of 13% in 2006. It is noteworthy that more than half (55% or 3.6 billion people) of the global population of 6.5 billion live in the 22 countries where biotech crops were grown in 2006 and generated significant and multiple benefits. Also more than half (52% or 776 million hectares of the 1.5 billion hectares of arable land) of the cropland in the world is in the 22 countries where approved biotech crops were grown in 2006.
- A historic milestone was reached in 2006 when the accumulated area of biotech crops planted in the last eleven years, 1996 to 2006, exceeded 500 million hectares (577 million hectares) for the first time. Notably, one new country, Slovakia an EU country, joined another five EU biotech crop countries bringing the total number of EU countries planting biotech crops in 2006 to six, equivalent to almost one quarter of the total number of 25 EU countries. Spain continued to be the lead country in the EU planting approximately 60,000 hectares in 2006. Importantly, the collective Bt maize hectareage in the other five countries (France, Czech Republic, Portugal, Germany, and Slovakia) increased over 5-fold from approximately 1,500 hectares in 2005 to approximately 8,500 hectares, albeit on small hectareages; growth in these five countries is expected to continue in 2007.
- In 2006, 22 countries grew biotech crops, 11 developing countries and 11 industrial countries; they were, in order of hectareage, USA, Argentina, Brazil, Canada, India, China, Paraguay, South Africa, Uruguay, Philippines, Australia, Romania, Mexico, Spain, Colombia, France, Iran, Honduras, Czech Republic, Portugal, Germany, and Slovakia.
- In 2006, the US followed by Argentina, Brazil, Canada, India and China were the six principal adopters of biotech crops globally, with India for the first time replacing China at number five in world ranking by planting more Bt cotton than China. The US retained its number one position globally with 54.6 million hectares (53% of global biotech area), followed by Argentina 18.0 million hectares, Brazil 11.5 million hectares, India 3.8 million hectares and China 3.5 million hectares. Of the 54.6 million hectares in the US, approximately 28% were stacked products containing two or three biotech traits in a single variety. The stacked products, currently deployed in the US, Canada, Australia, Mexico, South Africa and the Philippines, are an important and growing future trend which is more appropriate to quantify as "trait hectares" rather than hectares of adopted biotech crops. Accordingly, number of "trait hectares" globally in 2006 was 117.7 million hectares compared with 102 million hectares of biotech crops globally, a 15% variance.
- The largest absolute increase in biotech crop area in any country in 2006 was in the US at 4.8 million hectares, followed by India 2.5 million hectares, Brazil 2.1 million hectares, with Argentina and South Africa with 0.9 million hectares each. India had the largest year-on-year proportional increase, with almost a three-fold or 192 % increase from 1.3 million hectares in 2005 to 3.8 million hectares in 2006, followed by South Africa at 180% from 0.5 million hectares in 2005 to 1.4 million hectares in 2006, and the Philippines with over a 100% increase from approximately 0.1 million hectares in 2005 to 0.2 million hectares in 2006.

- Biotech soybean continued to be the principal biotech crop in 2006, occupying 58.6 million hectares (57% of global biotech area), followed by maize (25.2 million hectares at 25%), cotton (13.4 million hectares at 13%) and canola (4.8 million hectares at 5% of global biotech crop area). Herbicide tolerant alfalfa, the first perennial biotech crop to be introduced globally was planted on 80,000 hectares in the US and RR® Flex herbicide tolerant cotton was introduced on over 800,000 hectares in the US and Australia. Virus resistant papaya, a fruit/food crop, was recommended for commercialization by China's National Biosafety Committee in the last quarter of 2006.
- In 2006, herbicide tolerance, deployed in soybean, maize, canola, cotton and alfalfa continued to be the most dominant trait occupying 68% or 69.9 million hectares followed by Bt insect resistance at 19.0 million hectares (19%) and stacked traits occupied 13.1 million hectares (13%). Stacked traits were the fastest growing trait group between 2005 and 2006 with 30% growth, compared with 17% for insect resistance and 10% for herbicide tolerance.
- Biotech crops were grown by approximately 10.3 million farmers in 22 countries in 2006, up from 8.5 million farmers in 21 countries in 2005. Notably, 90%, or 9.3 million of the beneficiary farmers were small resource-poor farmers from developing countries, whose increased incomes from biotech crops contributed to the alleviation of their poverty. In 2006, approximately 9.3 million small resource-poor farmers (up from 7.7 million in 2005) benefited from biotech crops - the majority were in China with 6.8 million, 2.3 million in India, 100,000 in the Philippines and several thousand in South Africa including many women Bt cotton farmers, with the balance in the seven developing countries, which grew biotech crops in 2006. This initial modest contribution of biotech crops to the Millennium Development Goal of reducing poverty and hunger by 50% by 2015 is an important development, which has enormous potential in the second decade of commercialization from 2006 to 2015.
- During the period 1996 to 2006, the proportion of the global area of biotech crops grown by developing countries increased every year. More than one-third (40%) of the global biotech crop area in 2006, equivalent to 40.9 million hectares, was grown in developing countries where growth between 2005 and 2006 was substantially higher (7.0 million hectares or 20% growth) than industrial countries (5.0 million hectares or 9% growth). The increasing collective impact of the five principal developing countries (China, India, Argentina, Brazil and South Africa) is an important continuing trend with implications for the future adoption and acceptance of biotech crops worldwide.
- In the first eleven years, 1996 to 2006, of the commercialization of biotech crops the accumulated global biotech crop area was 577 million hectares or 1.4 billion acres, equivalent to more than half of the total land area of the USA or China, or 25 times the total land area of the UK. The continuing rapid adoption of biotech crops reflects the substantial and consistent improvements in productivity, the environment, health, economics, and social benefits realized by both large and small farmers, consumers and society in both industrial and developing countries.
- Global accumulated impact of biotech crops for the decade 1996 to 2005, in terms of net economic benefits to biotech crop farmers, was \$27 billion (\$13 billion for developing countries and \$14 billion for industrial countries). The accumulated reduction in pesticides from 1996 to 2005 was 224,300 MT of active ingredient, equivalent to a 15% reduction in the associated environmental impact of pesticide use on these crops.
- There is cause for cautious optimism as the unprecedented growth in biotech crops, witnessed in the first decade of commercialization 1996 to 2005, continues in 2006, the first year of the second decade of commercialization 2006 to 2015. Indeed growth between now and 2015 may well surpass that in the first decade, as more biotech crops will be developed in mega-investment projects to meet ambitious biofuel targets. It is evident that biotechnology offers very significant advantages for increasing efficiency of biofuel production in both industrial and developing countries and will be a major factor in biofuel development in the future. Adherence to good farming practices, such as rotations and prudent management of insect resistance for biotech crops will remain critical, as it has been during the first decade. Continued responsible stewardship must be practiced, particularly by the countries of the South, which will be the major deployers of biotech crops in the coming decade.

(1 hectare = 2.47 acres)

***Information about ISAAA and the author**

A not-for-profit public charity, cosponsored by the public and private sectors, working to alleviate poverty in developing countries, by facilitating the sharing of knowledge, and transfer of crop biotechnology applications, to increase crop productivity and income generation, particularly for resource-poor farmers, and to bring about a safer environment and more sustainable agricultural development. ISAAA is a small International Network with a global hub in the Philippines and centers in Nairobi, Kenya, and at Cornell University, Ithaca, New York, USA. 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, devoting his efforts to agricultural research and development issues with a particular focus on crop biotechnology and its contribution to global food security and the alleviation of poverty, hunger and malnutrition.

Further information about ISAAA can be obtained from its website www.isaaa.org. Please contact the ISAAA Center in SouthEast Asia: e-mail publications@isaaa.org for your copy of Brief 35. You may purchase a copy on-line at <http://www.isaaa.org> for US\$50. This includes a hard copy of the full version of Brief 35 and a special Executive Summary which will be expressly delivered to you by courier. The publication is available free of charge to eligible nationals of developing countries.