

Pocket K No. 16

Global Status of Commercialized Biotech/GM Crops in 2011

In 2011, the global area of biotech crops continued to increase for the 16th year at a sustained growth rate of 8% or 12 million hectares (30 million acres), reaching 160 million hectares or 395 million acres (Figure 1). Biotech crops have set a precedent in that the biotech area has grown impressively every single year for the past 16 years, with almost a remarkable 94-fold increase since commercialization began in 1996. Thus, biotech crops are considered as the fastest adopted crop technology in the history of modern agriculture.

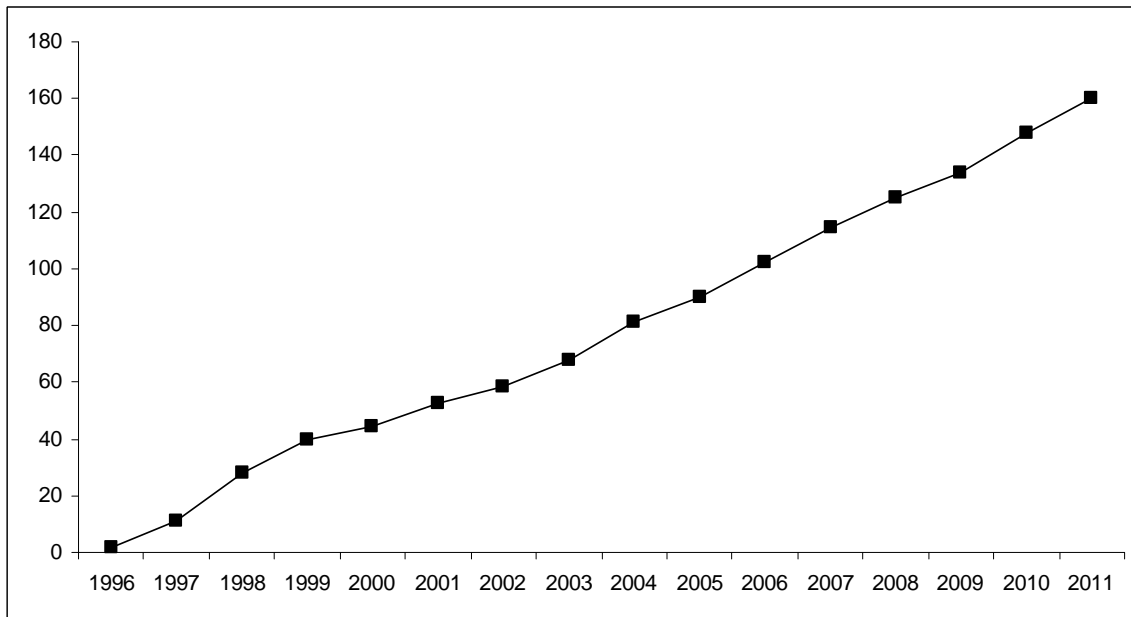


Figure 1. Global Area of Biotech Crops, 1996 to 2011 (Million Hectares)

Source: Clive James, 2011.

In 2011, a total of 16.7 million farmers planted biotech crops in 29 countries, wherein over 90% or 15 million (up from 14.4 million in 2010) were small and resource-poor farmers from developing countries. The highest increase in any country, in absolute hectareage growth was Brazil with 4.9 million hectares and the highest proportional increase was Mexico with a 146% increase to reach 175,500 hectares.

In summary, during the period of 1996 to 2011, biotech crops have been successfully grown in accumulated hectareage of 1.25 billion hectares (3.1 billion acres).

	Hectares (Million)	Acres (Million)
1996	1.7	4.3
1997	11.0	27.5
1998	27.8	69.5
1999	39.9	98.6
2000	44.2	109.2
2001	52.6	130.0
2002	58.7	145.0
2003	67.7	167.2
2004	81.0	200.0
2005	90.0	222.0
2006	102.0	250.0
2007	114.3	282.0
2008	125.0	308.8
2009	134.0	335.0
2010	148.0	365.0
2011	160.0	395.0
TOTAL	1,257.0	3,111.0
<i>Increase of 8%, 12 million hectares (30 million acres) between 2010 and 2011.</i>		
<i>Source: Clive James, 2011.</i>		

Distribution of Biotech Crops in Industrial and Developing Countries

Figure 2 shows the relative area of biotech crops in industrial and developing countries from 1996-2011. In 2011, almost half of the global biotech crop area of 160 million hectares, equivalent to 79.8 million hectares, was grown in 19 developing countries. It is noteworthy that in 2011, all four countries that exhibited proportional growth in biotech area of 10% or more were developing countries; they were in descending order of percentage growth: Mexico (146% increase), Brazil (19%), India (13%), and China (11%). As in the past, in 2011, percent growth in biotech crop area continued to be significantly stronger in the developing countries (11% and 8.2 million hectares) than industrial countries (5% and 3.8 million hectares). Thus, year-on-year growth measured either in absolute hectares or by percent, was higher in developing countries than industrial countries between 2010 and 2011.

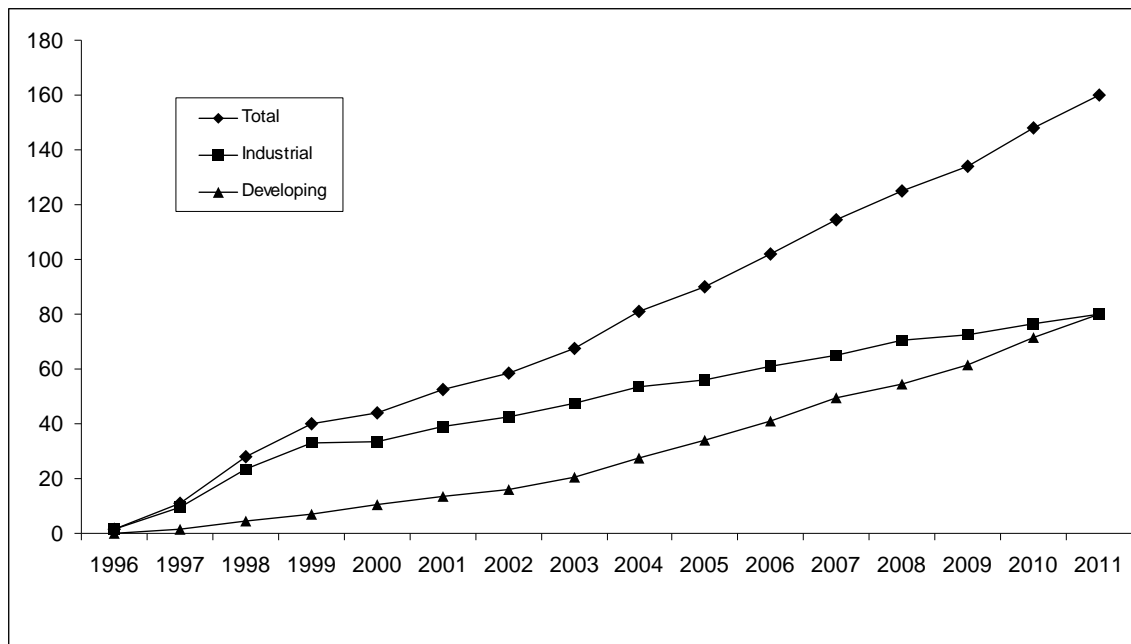


Figure 2: Global Area of Biotech Crops, 1996 to 2011: Industrial and Developing Countries (Million Hectares)

Source: Clive James, 2011.

Distribution of Biotech Crops, by Country

Biotech crops were grown commercially in all six continents of the world. Of the 29 countries planting biotech crops in 2011, 17 countries planted 50,000 hectares or more to biotech crops (Table 2). These mega-countries included the USA, Brazil, Argentina, India, Canada, China, Paraguay, Pakistan, South Africa, Uruguay, Bolivia, Australia, Philippines, Myanmar, Burkina Faso, Mexico, and Spain.

It is noteworthy that in 2011, Mexico had the highest growth rate (146%) between 2010 and 2011 and Brazil had the highest absolute growth of biotech crops (4.9 million hectares) in any country in 2011.

Table 2. Global Area of Biotech Crops in 2010 and 2011: by Country (Million Hectares)**

Country	2010	2011
USA*	66.8	69.0
Brazil*	25.4	30.3
Argentina*	22.9	23.7
India*	9.4	10.6
Canada*	8.8	10.4
China*	3.5	3.9
Paraguay*	2.6	2.8
Pakistan*	2.4	2.6
South Africa*	2.2	2.3
Uruguay*	1.1	1.3
Bolivia*	0.9	0.9
Australia*	0.7	0.7
Philippines*	0.5	0.6
Myanmar*	0.3	0.3
Burkina Faso*	0.3	0.3
Mexico*	0.1	0.2
Spain*	0.1	0.1
Colombia	<0.1	<0.1
Chile	<0.1	<0.1
Honduras	<0.1	<0.1
Portugal	<0.1	<0.1
Czech Republic	<0.1	<0.1
Poland	<0.1	<0.1
Egypt	<0.1	<0.1
Slovakia	<0.1	<0.1
Romania	<0.1	<0.1
Sweden	<0.1	<0.1
Costa Rica	<0.1	<0.1
Germany	<0.1	<0.1

* Biotech mega-countries which grew more than 50,000 hectares, or more, of biotech crops in 2010.

** Rounded-off to the nearest hundred thousand.

Source: Clive James, 2011.

Dominant Biotech Crop in 2011

Herbicide tolerant soybean continued to be the dominant biotech crop in 2011, occupying 75.4 million hectares or 47% of global biotech area (Table 3). It was grown commercially in the USA, Argentina, Brazil, Paraguay, Canada, Uruguay, Bolivia, South Africa, Mexico, Chile, and Costa Rica. The second most dominant crop was biotech maize with stacked traits, which occupied 37.3 million hectares or 23% of the global biotech area. It was grown commercially in the USA, Brazil, Argentina, South Africa, Canada, the Philippines, Uruguay, Honduras, and Chile.

Biotech cotton was the third most dominant crop grown in 2011. Bt cotton was planted in more than 17.9 million hectares in India, China, Pakistan, Myanmar, Burkina Faso, Brazil, USA, Argentina, Australia, Colombia, and Costa Rica. This is equivalent to 11% of the global biotech area.

Crop	Million Hectares	% Biotech
Herbicide tolerant soybean	75.4	47
Stacked traits maize	37.3	23
Bt cotton	17.9	11
Herbicide tolerant canola	8.2	5
Herbicide tolerant maize	7.7	5
Bt maize	6.0	4
Stacked traits cotton	4.9	3
Herbicide tolerant cotton	1.8	1
Herbicide tolerant sugar beet	0.5	<1
Herbicide tolerant alfalfa	0.2	<1
Others	0.1	<1
Total	160.0	100

Source: Clive James, 2011.

Global Adoption of Biotech Soybean, Maize, Cotton, and Canola

Another way to provide a global perspective of the status of biotech crops is to characterize the global adoption rates as a percentage of the respective global areas of the four principal crops – soybean, cotton, maize and canola, in which biotechnology is utilized.

In 2011, 75% (75.4 million hectares) of the 100 million hectares of the soybean planted globally were biotech (Figure 3). Biotech cotton was planted to 24.7 million hectares, which is 82% of the 30 million hectares of global cotton, an increase from the 21.0 million hectares of biotech cotton planted in 2010. Of the 159 million hectares of global

maize planted in 2011, 32% or 51.0 million were biotech maize. Finally, herbicide-tolerant biotech canola was planted in 8.2 million hectares or 26% of the 31 million hectares of canola grown globally in 2011. If the global areas (conventional and biotech) of these four crops are aggregated, the total area is 320 million hectares, of which 50% or 160 million hectares were biotech, up from 47% in 2010. Two-thirds of these 320 million hectares are in developing countries farmed mainly by small, resource-poor farmers.

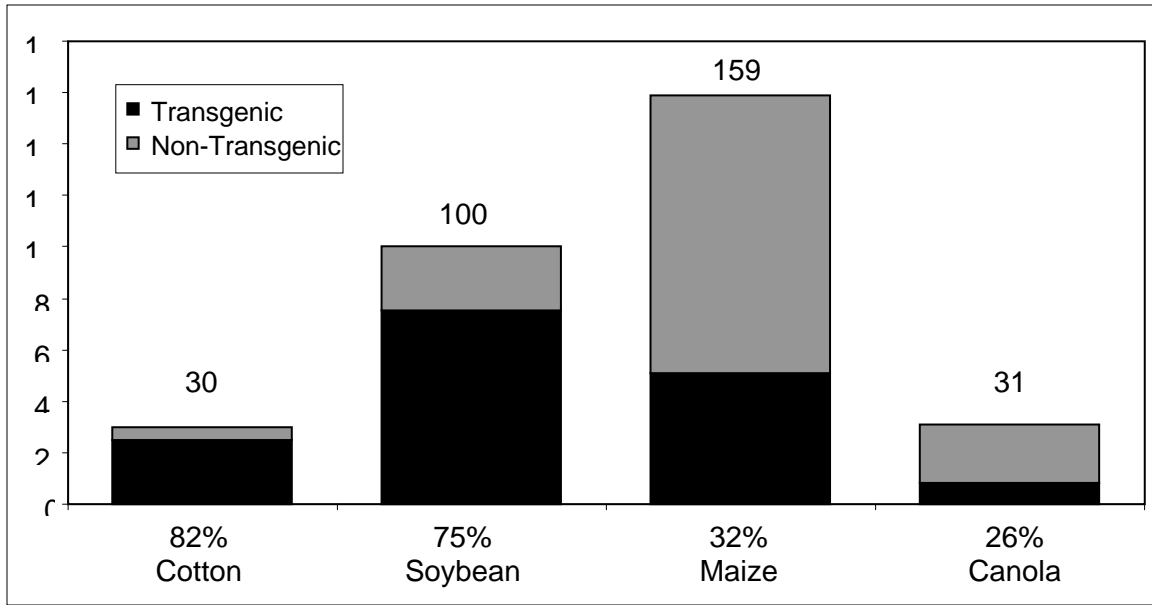


Figure 3: Biotech Crop Area as % of Global Area of Principal Crops, 2011 (Million Hectares)

Source: Clive James, 2011.

The Global Value of Biotech Crops

In 2011, the global market value of biotech crops was US\$13.3 billion representing 22% of the US\$59.6 billion global crop protection market in 2011, and 35% of the ~US\$34 billion global commercial seed market. Of the US\$13.3 billion biotech crop market, US\$10.3 billion (77%) was in the industrial countries and US\$3.0 billion (23%) was in the developing countries. The market value of the global biotech crop market is based on the sale price of biotech seeds plus any technology fees that apply. The accumulated global value of biotech crops since 1996 is estimated at US\$87.4 billion. The global value of the biotech crop seed market is projected at ~US\$14 billion for 2012.

Future Prospects

The future of biotech crops looks encouraging. Commercialization of drought tolerant maize is expected in 2013; Golden Rice in 2013/2014; and biotech maize in China with a potential of ~30 million hectares to be followed by Bt rice. Biotech crops could possibly contribute in accomplishing the 2015 Millennium Development Goals, particularly in decreasing poverty by half, through maximizing crop productivity, which could be achieved by public-private sector partnerships.

Reference

James, C. 2011. Global Status of Commercialized Biotech/GM Crops: 2011. ISAAA Brief No. 43. ISAAA: Ithaca, NY.

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