

## Global Status of Commercialized Biotech/GM Crops in 2008

In 2008, the global area of biotech crops continued to soar for the thirteenth consecutive year at a sustained growth rate of 9.4%, or 10.7 million hectares (26.4 million acres) (Figure 1). This is the third highest increase in global biotech crop area in the last five years. The use of two or three stacked traits that confer multiple benefits in a single biotech variety can further increase the figure to 1.66 million hectares or about 32% higher than the estimated 1.25 million hectares.

It is noteworthy that three additional countries have been added to the global list of biotech soybean. Bolivia now joins other Latin American countries growing biotech crops such as Argentina, Brazil, Mexico, Paraguay, Uruguay, Chile, Colombia and Honduras. A total of 1.3 million farmers planted biotech crops in 2008. Of these farmers, 90% or 12.3 million (up from 11 million in 2007) were small and resource-poor farmers from developing countries such as China, India, Philippines and South Africa.



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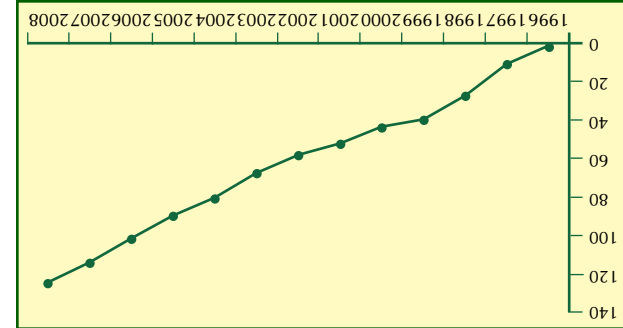
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INTERNATIONAL SERVICE FOR THE ACQUISITION OF AGRIBIOTECH APPLICATIONS

Figure 1. Global Area of Biotech Crops, 1996 to 2008 (Million Hectares)



Source: Clive James, 2008.

In summary, during the period 1996 to 2008, an accumulated total of approximately 800 million hectares or 2 billion acres of biotech crops have been successfully grown as a result of approximately 70 million repeat decisions by farmers to plant these crops. This is equivalent to more than half the total land area of the USA and China, or 25 times the total land area of the United Kingdom. The unprecedented 78-fold increase in the last decade has made it the fastest adopted crop technology in recent history and hence, reflects the growing acceptance of biotech crops by farmers in both industrial and developing countries.

Table 1. Global Area of Biotech Crops, 1996 to 2008

Year	Acres (Million)	Hectares (Million)	TOTAL
1996	4.3	1.7	
1997	27.5	11.0	
1998	69.5	27.8	
1999	98.6	39.9	
2000	109.2	44.2	
2001	130.0	52.6	
2002	145.0	58.7	
2003	167.2	67.7	
2004	200.0	81.0	
2005	222.0	90.0	
2006	250.0	102.0	
2007	282.0	114.3	
2008	308.8	125.0	
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Increase of 9.4%, 10.7 million hectares (26.4 million acres) between 2007 and 2008.  
 Source: Clive James, 2008.

### The Global Value of Biotech Crops

In 2008, the global market value of biotech crops was US\$7.5 billion representing 14% of the US\$52.72 billion global crop protection market in 2008, and 22% of the ~US\$34 billion 2008 global commercial seed market. Of the US\$7.5 billion biotech crop market, US\$5.7 billion (76%) was in the industrial countries and US\$1.8 billion (24%) was in 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, since biotech crops were first commercialized in 1996, is estimated at US\$49.8 billion. The global value of the biotech crop market is projected at over US\$8.3 billion for 2009.

### Future Prospects

The future of biotech crops looks encouraging. The number of biotech crop countries, crop and traits, and hectareage are expected to double between 2006 and 2015, the second decade of commercialization. Developing countries like Vietnam are potential candidates for adopting biotech crops in next one or two years. The second decade of commercialization is likely to feature more growth in Asia. There will be continued growth in stacked traits in North America, with strong growth expected in Brazil. The mix of crop traits will become richer with quality traits making their debut with implication for acceptance, particularly in Europe. The use of biotechnology to produce oral vaccines, and pharmaceutical and specialty products will also be featured. However by far, the most important potential distribution of biotech crops will be their contribution to the humanitarian Millennium Development Goals of reducing poverty and hunger by 50% by 2015, the end of the second decade of commercialization of biotech crops.

Taking all these global developments in both industrial and developing countries into account, the outlook for the period 2006 to 2015 points to continued growth in the global hectareage of biotech crops, up to 200 million hectares, with at least 20 million farmers growing biotech crops in up to 40 countries, or more.

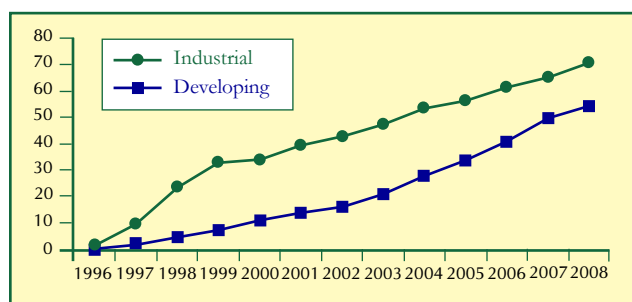
### Reference

James, C. 2008. Global Status of Commercialized Biotech/GM Crops: 2008. ISAAA Briefs No. 39. ISAAA: Ithaca, NY.

## Distribution of Biotech Crops in Industrial and Developing Countries

Figure 2 shows the relative area of biotech crops in industrial and developing countries from 1996-2008. In 2008, more than 40% of the global biotech crop area, equivalent to 54.5 million hectares, was grown in 15 developing countries. Developing countries that exhibited exceptionally strong growth included India (23% increase over last year) and Philippines (33% increase) in Asia, and Uruguay (40% increase) and Argentina (5% increase) in Latin America. In fact, 4 out of the top 5 countries with the highest year on year percentage growth between 2007 and 2008 were developing countries. However, unlike the previous five years when growth was consistently stronger in developing than in industrial countries, in 2008 growth was similar. Specifically, developing countries experienced 10% growth (5.1 million hectares) and industrial countries experienced 9% growth (5.6 million hectares).

**Figure 2. Global Area of Biotech Crops, 1996 to 2008: Industrial and Developing Countries (Million Hectares)**



Source: Clive James, 2008.

## Distribution of Biotech Crops, by Country

Twenty-five countries grew biotech crops in 2008, 15 of which were developing countries. Biotech crops were grown commercially in all six continents of the world. The three new biotech crop countries in 2008 were Bolivia, producing more than 600,000 hectares of RR<sup>®</sup> soybean or 63% of the total national crop hectareage; Egypt commercializing 700 hectares of insect-resistant biotech maize; and Burkina Faso growing 8,500 hectares of Bt cotton for seed multiplication and initial commercialization.

Of the 25 countries planting biotech crops in 2008, 14 countries planted 50,000 hectares or more to biotech crops (Table 2). These mega-countries included USA, Argentina, Brazil, India, Canada, China, Paraguay, South Africa, Uruguay, Bolivia, Philippines, Australia, Mexico and Spain, reflecting a more balanced and broader group of countries adopting biotech crops.

Six countries had the largest increase in absolute area of biotech crops of 0.5 million hectares or more between 2007 and 2008 were: USA, Argentina, India, Brazil, Bolivia and Canada. Modest growth in crop biotech area was reported in Paraguay, Uruguay, Philippines, and Australia. Australia had the highest percentage year-on-year growth in 2008, with an increase of 100% in biotech area over 2007 during which the country has suffered a very severe drought, followed by Uruguay (40%), Philippines (33%), India (23%), Argentina (10%), Canada (9%), USA (8%) and Brazil (5%).

**Table 2. Global Area of Biotech Crops in 2007 and 2008: by Country (Million Hectares)**

Country	2007	2008
USA*	57.7	62.5
Argentina*	19.1	21.0
Brazil*	15.0	15.8
India*	6.2	7.6
Canada*	7.0	7.6
China*	3.8	3.8
Paraguay*	2.6	2.7
South Africa*	1.8	1.8
Uruguay*	0.5	0.7
Bolivia*	--	0.6
Philippines*	0.3	0.4
Australia*	0.1	0.2
Mexico*	0.1	0.1
Spain*	0.1	0.1
Chile	<0.1	<0.1
Colombia	<0.1	<0.1
Honduras	<0.1	<0.1
Burkina Faso	<0.1	<0.1
Czech Republic	<0.1	<0.1
Romania	<0.1	<0.1
Portugal	<0.1	<0.1
Germany	<0.1	<0.1
Poland	<0.1	<0.1
Slovakia	<0.1	<0.1
Egypt	--	<0.1
<b>TOTAL</b>	<b>114.3</b>	<b>125.0</b>

Source: Clive James, 2008.

\* Biotech mega-countries which grew more than 50,000 hectares, or more, of biotech crops in 2008.

## Dominant Biotech Crops in 2008

Herbicide tolerant soybean continued to be the dominant biotech crop in 2008, occupying 65.8 million hectares or 53% of global biotech area (Table 3). It was grown commercially in the USA, Argentina, Brazil, Paraguay, Canada, Uruguay, South Africa, Mexico and Chile. The second most dominant crop was biotech maize with stacked traits, which occupied 24.5 million hectares or 20% (Table 3) of the global biotech area. It was grown commercially in the USA, Canada, South Africa, the Philippines, Honduras, Argentina, and Chile.

Biotech cotton was the third most dominant crop grown in 2008. Bt cotton was planted in more than 11.9 million hectares in India, China, Brazil, Argentina, USA, Colombia, Mexico, Australia, Burkina Faso and South Africa. This is equivalent to 9% of the global biotech area.

**Table 3. Dominant Biotech Crops in 2008**

Crop	Million Hectares	% Global Biotech Area
Herbicide tolerant Soybean	65.8	53
Stacked traits Maize	24.5	20
Bt Cotton	11.9	9
Bt Maize	7.1	6
Herbicide tolerant Canola	5.9	5
Herbicide tolerant Maize	5.7	4
Stacked Traits Cotton	2.6	2
Herbicide tolerant Cotton	1.0	1
Herbicide tolerant Sugarbeet	0.3	<1
Herbicide tolerant Alfalfa	0.1	<1
Others	<0.1	<1
<b>TOTAL</b>	<b>125.0</b>	<b>100%</b>

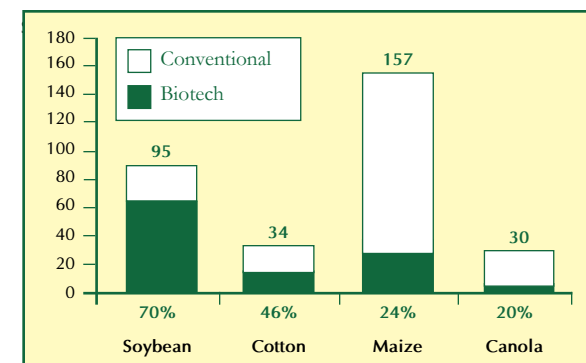
Source: Clive James, 2008.

## 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 2008, 70% of the 95 million hectares of the soybean planted globally were biotech — an increase over 2007. Biotech cotton was planted to 15.5 million hectares (46%) in 2008, an increase from the 15 million hectares planted in 2007 (Figure 3). Of the 157 million hectares of maize planted in 2008, 24% or 37.3 million were biotech maize. Finally, herbicide-tolerant biotech canola was planted in 5.9 million hectares or 20% of the 30 million hectares of canola grown globally in 2008. If the global areas (conventional and biotech) of these four crops are aggregated, the total area is 316 million hectares, of which 40% were biotech, up from 38% in 2007. More than two-thirds of these 316 million hectares are in developing countries farmed by small, resource-poor farmers.

**Figure 3. Biotech Crop Area as % of Global Area of Principal Crops, 2008 (Million Hectares)**



Source: Clive James, 2008.