Pocket K No. 16

Biotech Crop Highlights in 2017

In 2017, the 21st year of commercialization of biotech crops, 189.8 million hectares of biotech crops were planted by up to 17 million farmers in 24 countries. From the initial planting of 1.7 million hectares in 1996 when the first biotech crop was commercialized, the 189.8 million hectares planted in 2017 indicates ~112-fold increase (Table 1). Thus, biotech crops are considered as the fastest adopted crop technology in the history of modern agriculture.

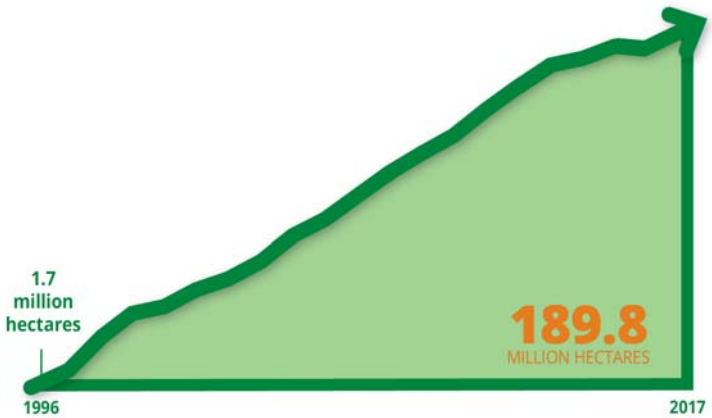

FIGURE 1. GLOBAL AREA OF BIOTECH CROPS, 1996 TO 2017 (MILLION HECTARES).
Source: ISAAA, 2017

Table 1. Global Area of Biotech Crops, 1996 to 2017

Year	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
2012	170.3	420.8
2013	175.2	433.2
2014	181.5	448.0
2015	179.7	444.0
2016	185.1	457.4
2017	189.8	469.0
Total	**2,339.5**	**5,780**

Source: ISAAA, 2016.

Biotech Crops in Industrial and Developing Countries

For the past six years, developing countries have planted more biotech crops than industrial countries (Figure 2). In 2017, 19 developing countries planted 53% (100.6 million hectares) of the global biotech hectares, while 5 industrial countries took the 47% (89.2 million hectares) share. This trend is expected to continue in the upcoming years due to the increasing number of countries in the southern hemisphere adopting biotech crops and the commercialization of new biotech crops such as rice, which is mostly grown in developing countries.

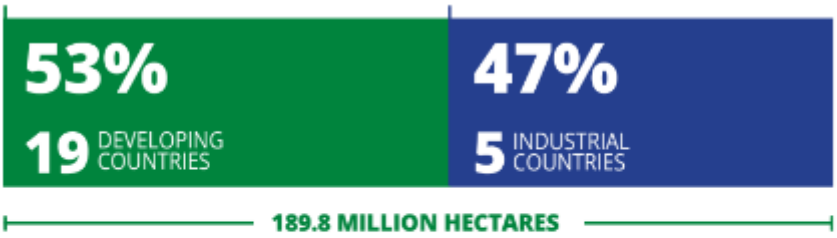

FIGURE 2.
DISTRIBUTION OF BIOTECH CROPS IN DEVELOPING AND INDUSTRIAL COUNTRIES IN 2017

Source: ISAAA, 2017

Distribution of Biotech Crops, by Country

Of the 24 countries that planted biotech crops in 2016, 18 countries were considered as biotech mega-countries, which grew at least 50,000 hectares. USA remained as top producer of biotech crops globally, which planted 75 million hectares in 2017, covering 40% of the global biotech crop plantings. Brazil landed on the second spot, with 50.2 million hectares or 26% of the global output.

Table 2. Global Area of Biotech Crops in 2016 and 2017: by Country (million hectares)

Rank	Country	2016	2017
1	USA*	72.9	75.0

2	Brazil*	49.1	50.2
3	Argentina*	23.8	23.6
4	Canada*	11.6	13.1
5	India*	10.8	11.4
6	Paraguay*	3.6	3.0
7	Pakistan*	2.9	3.0
8	China*	2.8	2.8
9	South Africa*	2.7	2.7
11	Bolivia*	1.2	1.3
	Uruguay*	1.3	1.1
12	Australia*	0.9	0.9
13	Philippines*	0.8	0.6
14	Myanmar*	0.3	0.3
	Sudan*	0.1	0.2
15	Spain*	0.1	0.1
17	Mexico*	0.1	0.1
18	Colombia*	0.1	0.1
19	Vietnam	<0.1	<0.1
20	Honduras	<0.1	<0.1
21	Chile	<0.1	<0.1
22	Portugal	<0.1	<0.1
23	Bangladesh	<0.1	<0.1
24	Costa Rica	<0.1	<0.1
25	Slovakia	<0.1	0
26	Czech Republic	<0.1	0
	Total	**185.1**	**189.8**

*Biotech mega-countries which grew more than 50,000 hectares, or more.
**Rounded-off to the nearest hundred thousand.

Source: ISAAA, 2017

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

The most planted biotech crops in 2017 were soybean, maize, cotton, and canola. Although there was only 3% increase in the planting of biotech soybean, it maintained its high adoption rate of 50% of the global biotech crops or 94.1 million hectares. This area is 80% of the total soybean production worldwide (Figure 3).

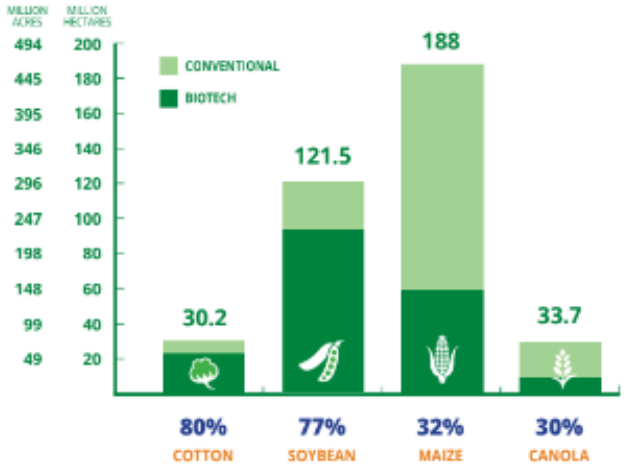

FIGURE 3. GLOBAL ADOPTION RATES (%) FOR TOP 4 BIOTECH CROPS (MILLION HECTARES)

Source: ISAAA, 2017

Biotech maize occupied 59.7 million hectares globally, which was 32% of the global maize production in 2017. A slight decline (1%) in the biotech maize area from 2016 is due to the unfavorable weather conditions in Latin America, low market price, lesser pest incidence, high year-end stocks and the problem of counterfeit seeds in the Philippines.

Biotech cotton was planted to 24.1 million hectares in 2017, which indicates a decrease by 8% from 2016. The 8% increase in total biotech cotton area globally was due mainly to the improved global market value and the high adoption rate of insect resistant/herbicide tolerant cotton in 2017.

Biotech canola increased by 19% from 8.6 million hectares in 2016 to 10.2 million hectares in 2016. This raise is attributed to the two-digit increases in biotech canola plantings in the USA, Canada, and Australia, addressing the demand for edible oil.

In 2017, farmers in the USA and Canada planted biotech alfalfa. Approximately 1.14 million hectares of herbicide tolerant alfalfa and 80,000 hectares of low lignin alfalfa were planted in the US, while Canada planted 3,000 hectares low lignin alfalfa. Low lignin alfalfa was first commercialized in 2016, and offers 15 to 20% increase in yield.

Aside from soybean, maize, cotton, canola, and alfalfa, the following biotech crops were also planted in different countries: sugar beet, squash, papaya, eggplant, potato, and apple.

The Global Value of Biotech Crops

According to Cropnosis, the global market value of biotech crops in 2017 was US$17.2 billion. This value indicates that there was a 9% increase in the global market value of biotech crops from 2016, which was US$15.8 billion. This value represents 23.9% of the US$70.9 billion global crop protection market in 2016, and 30% of the US$56.02 billion global commercial seed market. The estimated global farmgate revenues of the harvested commercial “end product” (the biotech grain and other harvested products) are more than ten times greater than the value of the biotech seed alone.

Future Prospects

The continuous growth in the adoption of biotech crops is attributed to the technology's positive impact on the environment, human and animal health, as well as on the improvement of socioeconomic conditions of farmers and the general public. However, critics continue to spread non-scientific allegations about biotech crops that affect regulations and approvals. Studies have confirmed that delays in biotech crop approvals lead to immense economic losses and opportunity costs.

The benefits of biotech crops to farmers and consumers will only continue to be available if there is continuous implementation of science-based regulations, which focus on the benefits such as agricultural productivity with consideration to environmental conservation and sustainability, and most importantly to the large portion of the world population undergoing poverty and malnutrition, who are waiting for improvement in their state of living.

Reference

ISAAA. 2017. Global Status of Commercialized Biotech/GM Crops: 2017. ISAAA *Brief* No. 53. ISAAA: Ithaca, NY.

Pocket Ks are Pockets of Knowledge, packaged information on crop biotechnology products and related issues available at your fingertips. They are produced by the Global Knowledge Center on Crop Biotechnology (http://www.isaaa.org/kc).

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