



BIOTECH COUNTRY FACTS & TRENDS

Burkina Faso

2015 was the eighth year for farmers in Burkina Faso to benefit significantly from Bt cotton (Bollgard II™).

The total Bt cotton planted in Burkina Faso in 2015 was 350,000 hectares, or 50% of the total cotton planting area in the country. This represents a 23.8% drop in adoption from the 73.8% in 2014. The anxiety created by two coups in a span of one year and subsequent government transitions may have contributed to a downside on the agricultural sector in general.

Based on average cotton holding of 3.16 hectares, the number of farmers growing Bt cotton in 2015 was approximately 110,760.

Burkina Faso has maintained a leadership role on biotechnology

and biosafety matters in the Western African region. Aside from sustained Bt cotton adoption, the country provides a model of how effective partnerships with diverse stakeholders – public, private sector, and the farming community can deliver the benefit of biotechnology sustainably.

BENEFITS OF BT COTTON IN BURKINA FASO

Bt cotton adoption generates an economic benefit of more than US\$70 million/year for Burkina Faso, based on yield increases of 20.5%, plus 66.7% reduction in insecticides sprays, from a total of 6 sprays required for conventional cotton, to only 2 for Bt cotton.

The real and potential economic impacts of insect resistant cotton are therefore highly significant

as increases in the prices of agricultural inputs used to combat destructive cotton pests remain a major challenge in the other West African states that have not embraced the technology.

It is estimated that the economic gains from Bt cotton for Burkina Faso for the period 2008 to 2014 was US\$178 million, and US\$41 million for 2014 alone.

SOURCES

James, Clive. 2015. 20th Anniversary (1996 to 2015) of the Global Commercialization of Biotech Crops and Biotech Crop Highlights in 2015. ISAAA Brief No. 51. ISAAA: Ithaca, New York. Food and Agriculture Organization of the United Nations. <http://www.fao.org/countryprofiles/> The World Bank. <http://www.worldbank.org/>

COUNTRY PROFILE

Population: 18.2 million
GDP: US\$10.7 billion
GDP per Capita: US\$1,480
Agriculture as % GDP: 34%
Agricultural GDP: ~US\$3.6 billion
% employed in agriculture: 92%
Arable Land (AL): 6 million hectares
Ratio of AL/Population*: 2.0

Major crops:

- Cotton • Millet • Peanuts • Maize
- Sorghum • Rice • Shea nuts

Commercialized Biotech Crop: Bt Cotton

Total biotech crop area and (%) increase in 2015:
0.350 Million Hectares (-20%)

Increased farm income, 2008-2014: US\$178 million

*Ratio: % global arable land / % global population

For more information, contact:

ISAAA SEAsiaCenter
GS Khush Hall, IRRI
Los Baños, Laguna 4031 Philippines
Telefax: +63 49 5367216
Email: knowledge.center@isaaa.org

www.isaaa.org



BIOTECH COUNTRY **FACTS & TRENDS**

Myanmar

2015 is the 10th consecutive year of planting Bt cotton in Myanmar.

Myanmar has significantly benefited from planting the long staple insect resistant Bt cotton variety named "Silver Sixth" or "Ngwe chi 6" for 10 years.

In 2015, *Ngwe chi 6* was planted on 325,000 hectares, a marginal increase from 318,000 hectares in 2014, with an adoption rate of 93%.

The 93% adoption rate in 2015 is 5% increase from 88% adoption in 2014.

Around 460,000 small farmers (average of 0.7 hectare of cotton) planted Bt cotton this year, an increase from 454,000 in 2014.

BENEFITS OF BT COTTON IN MYANMAR

In the last ten years (2006 to 2015), smallholder cotton farmers in Myanmar rapidly adopted Bt cotton variety *Ngwe chi-6* which replaced almost all conventional cotton varieties. The large scale adoption of *Ngwe chi-6* significantly increased the total area under long staple cotton in the country.

Myanmar for the first time in 2015, planted its new home-grown Bt cotton variety *Ngwe chi-9* on 60 hectares. Myanmar's National Seed Committee (NSC) officially registered and approved the commercial cultivation of insect resistant cotton *Ngwe chi-9* developed by the Department of Industrial Crops Development

of the Ministry of Agriculture and Irrigation.

Estimates indicated that enhanced farm income from Bt cotton is US\$185 million for the period 2006 to 2014 and the benefits for 2014 alone at US\$37 million.

SOURCES

James, Clive. 2015. 20th Anniversary (1996 to 2015) of the Global Commercialization of Biotech Crops and Biotech Crop Highlights in 2015. ISAAA Brief No. 51. ISAAA: Ithaca, New York. Food and Agriculture Organization of the United Nations. <http://www.fao.org/countryprofiles/>
The World Bank. <http://www.worldbank.org/>

COUNTRY PROFILE

Population: 59.3 million

GDP: US\$55.8 billion

GDP per Capita: US\$1,160

Agriculture as % GDP: 38.8%

Agricultural GDP: US\$22.3 billion

% employed in agriculture: 66%

Arable Land (AL): 10.8 million hectares

Ratio of AL/Population*: 0.8

Major crops:

- Rice
- Beans
- Groundnuts
- Cotton
- Pulses
- Sesame
- Sugarcane

Commercialized Biotech Crop: Bt Cotton

Total biotech crop area and (%) increase in 2015:

0.325 Million Hectares (0%)

Increased farm income, 2006-2014: US\$185 million

*Ratio: % global arable land / % global population

For more information, contact:

ISAAA SEAsiaCenter

GS Khush Hall, IRRI

Los Baños, Laguna 4031 Philippines

Telefax: +63 49 5367216

Email: knowledge.center@isaaa.org

www.isaaa.org



BIOTECH COUNTRY **FACTS & TRENDS**

Mexico

Mexico is the last of the six "founder biotech crop countries" having grown Bt cotton since 1996.

In 2015, Mexico planted 141,000 hectares of biotech crops, down from 170,000 hectares in 2014, comprised of 123,000 hectares of biotech cotton, and 18,000 hectares of biotech soybean.

The adoption rates for biotech cotton is 96%, and 10% for biotech soybean.

Of the total 128,000 hectares of cotton planted in Mexico in 2015, 123,000 hectares, or 96% is biotech.

Of the 123,000 hectares of biotech cotton planted in Mexico in 2015, 118,000 hectares are stacked and 5,000 hectares are herbicide tolerant (HT).

ADOPTION OF BIOTECH CROPS

Soybean adoption in Mexico in 2015 at 18,000 hectares is almost double the 2014 hectareage of 10,000 hectares with an adoption rate of 10% for both years.

Since 1996, Mexico has approved 158 biotech events for food/feed use and cultivation: alfalfa (5 events), Argentine canola (13), cotton (30), maize (68) potato (13), rice (1) soybean (22), sugar beet (1), and tomato (5).

A legal ban on planting biotech maize in Mexico was introduced in 2013, which was overturned in August 2015 by a court decision.

It is hoped that Mexico will adopt a national, science-based strategy that will protect the centers of origin of maize, and will ensure that Mexico

will benefit from biotech maize which can contribute to national food security and mitigate new challenges, such as more frequent and severe droughts.

BENEFITS FROM BIOTECH CROPS IN MEXICO

Mexico is estimated to have enhanced farm income from biotech cotton and soybean by US\$293 million in the period 1996 to 2014 and the benefits for 2014 alone is US\$55 million.

SOURCES

James, Clive. 2015. 20th Anniversary (1996 to 2015) of the Global Commercialization of Biotech Crops and Biotech Crop Highlights in 2015. ISAAA Brief No. 51. ISAAA: Ithaca, New York.
Food and Agriculture Organization of the United Nations.
<http://www.fao.org/countryprofiles/>
The World Bank.
<http://www.worldbank.org/>

COUNTRY PROFILE

Population: 127 million
GDP: US\$1,178.1 billion
GDP per Capita: US\$9,750

Agriculture as % GDP: 4%
Agricultural GDP: US\$47.1 billion
% employed in agriculture: 13%

Arable Land (AL): 25.8 million hectares
Ratio of AL/Population*: 1.0

*Ratio: % global arable land / % global population

Major crops:

- Maize
- Wheat
- Soybean
- Rice
- Cotton
- Coffee

Commercialized Biotech Crops:

- Bt Cotton
- HT Soybean

Total biotech crop area and (%) increase in 2015:
0.141 Million Hectares (-50%)

Increased farm income, 1996-2014: US\$384 million

For more information, contact:

ISAAA SEAsiaCenter
GS Khush Hall, IRRI
Los Baños, Laguna 4031 Philippines
Telefax: +63 49 5367216
Email: knowledge.center@isaaa.org

www.isaaa.org



BIOTECH COUNTRY FACTS & TRENDS

Colombia

Biotech cotton has been grown for 13 years in Colombia.

Colombia grew a total of 89,000 hectares of biotech crops in 2015, a 10% decrease from 99,000 hectares in 2014 probably due to low crop prices driving farmers to decrease plantings of both maize and cotton.

Of the 89,000 hectares biotech crops planted in Colombia in 2015, 16,000 were biotech cotton and 73,000 hectares were biotech maize.

Of the 73,000 hectares biotech maize, 94% (68,620 hectares) is stacked trait insect resistant (IR)/ herbicide tolerant (HT), and 6% HT (4,380).

In 2015, 96% of biotech cotton in Colombia have the stacked traits Bt/ HT.

BIOTECH CROP ADOPTION

Biotech maize was previously grown under a pre-commercial project "controlled planting program" in two regions, one on the Coast and Llanos region and the other in the interior of the country.

Biotech cotton has been grown for 13 years in Colombia.

Since 2009, Colombia has approved 73 events for food/feed use and cultivation: cotton (9 events), flax (1 event), maize (39 events), rice (2 events), soybean (10 events), wheat (1 event), rose (2 events), and carnation (8 events).

BENEFITS FROM BIOTECH CROPS IN COLOMBIA

A 2011 study on the benefits of biotech cotton for women in

Colombia indicates that it saved them time and money from spending less time on weeding and hiring men to spray insecticides.

Colombia is estimated to have enhanced farm income from biotech crops by US\$124 million in the period 2002 to 2014 and the benefits for 2014 alone is estimated at US\$22 million.

SOURCES

James, Clive. 2015. 20th Anniversary (1996 to 2015) of the Global Commercialization of Biotech Crops and Biotech Crop Highlights in 2015. ISAAA Brief No. 51. ISAAA: Ithaca, New York. Food and Agriculture Organization of the United Nations. <http://www.fao.org/countryprofiles/> The World Bank. <http://www.worldbank.org/>

COUNTRY PROFILE

Population: 48.2 million

GDP: US\$370 billion

GDP per Capita: US\$7,750

Agriculture as % GDP: 7%

Agricultural GDP: US\$25.9 billion

% employed in agriculture: 17%

Arable Land (AL): 2.2 million hectares

Ratio of AL/Population*: 0.1

*Ratio: % global arable land / % global population

Major crops:

- Coffee
- Maize
- Cotton
- Bananas
- Rice
- Sugarcane

Commercialized Biotech Crops:

- Bt Maize
- Bt Cotton

Total biotech crop area and (%) increase in 2015:

0.089 Million Hectares (-10%)

Increased farm income, 2002-2014: US\$124 million

For more information, contact:

ISAAA SEAsiaCenter
GS Khush Hall, IRRI
Los Baños, Laguna 4031 Philippines
Telefax: +63 49 5367216
Email: knowledge.center@isaaa.org

www.isaaa.org



BIOTECH COUNTRY FACTS & TRENDS

Sudan

2015 was the fourth year of commercial planting of Bt cotton in Sudan.

The introduction of Bt cotton in Sudan enhanced cotton productivity and restored cotton as a main cash crop and a major contributor to the country's economy.

A total of 120,000 hectares of Bt cotton were planted in Sudan in 2015, up from 90,000 hectares, a 33% increase from 2014.

Close to 45,000 farmers planted Bt cotton compared with the initial 10,000 beneficiaries who have an average of about 1 to 2.5 hectares of land.

In just four years, Sudan has recorded a 95% adoption rate of Bt cotton.

A key development in 2015 was the approval of three additional GM varieties (Hybrid JKCH1974; Hybrid JKCH1050 and O.P SCRC37) for commercial planting by the National Biosafety Council (NBC) and the National Variety Release Committee. The approval will expand the choice for farmers and complement the first and only Bt cotton variety "Seeni 1" that was released for commercial production in 2012.

The new varieties yield about 2-3 times higher than local non-Bt varieties Abdin and Hamid, and significantly higher than "Seeni 1."

Bt cotton saved 37% of the direct cost of cotton production: the cost of producing non-Bt cotton was much higher at US\$372 for one feddan (0.42 hectares) compared with US\$246 for Bt cotton. The

net profit for a farmer planting Bt cotton was US\$170 per feddan (equivalent to US\$410 per hectare).

The increase in hectareage of Bt cotton between 2012 and 2015 is clear evidence that farmer experience was positive in the first year of planting in 2012 and has provided the incentive for a large increase in adoption in 2015.

SOURCES

James, Clive. 2015. 20th Anniversary (1996 to 2015) of the Global Commercialization of Biotech Crops and Biotech Crop Highlights in 2015. ISAAA Brief No. 51. ISAAA: Ithaca, New York. Food and Agriculture Organization of the United Nations. <http://www.fao.org/countryprofiles/>
The World Bank. <http://www.worldbank.org/>

COUNTRY PROFILE

Population: 40.2 million

GDP: US\$58.8 billion

GDP per Capita: US\$2,160

Agriculture as % GDP: 33%

Agricultural GDP: US\$19.4 billion

% employed in agriculture: 48%

Arable Land (AL): 21.05 million hectares

Ratio of AL/Population*: 3.0

*Ratio: % global arable land / % global population

Major crops:

- Cotton
- Wheat
- Sugarcane
- Cassava
- Sorghum
- Millet

Commercialized Biotech Crop: Bt Cotton

Total biotech crop area and (%) increase in 2015:
0.120 Million Hectares (+33%)

For more information, contact:

ISAAA SEAsiaCenter
GS Khush Hall, IRRI
Los Baños, Laguna 4031 Philippines
Telefax: +63 49 5367216
Email: knowledge.center@isaaa.org

www.isaaa.org