Since 2015, India is the world's top cotton producing country, surpassing 35 million bales despite the slowed down global cotton market.

For the first time in 14 years of planting insect resistant (IR) Bt cotton, India recorded a drop in area planted by 0.8 million hectare.

A total of 7.2 million farmers in India planted 10.8 million hectares IR cotton in 2016, which is 96% of the total 11.2 million hectares of cotton in the country.

The major states growing IR cotton in India include: Maharashtra, Gujarat, Andhra Pradesh and Telangana, Madhya Pradesh, Punjab, Haryana, Rajasthan, Karnataka, Tamil Nadu, and Odisha.

Commercialization of Bt cotton increased 215-fold at 10.8 million hectares in 2016 from only 50,000 hectares in 2002.

India was estimated to have enhanced farm income from IR cotton by US$19.6 billion in the 14-year period 2002 to 2015, and US$1.3 billion in 2015 alone.

**BIOTECH CROP APPROVAL**

Bt technology accelerated the adoption of cotton hybrids in India, from 45% in 2002 to 96% in 2016. By 2015, a total of 1,167 Bt cotton hybrids have been released for commercial cultivation across 10 growing states in India, compared to only three hybrids in 2002.

In 2014-2016, the Genetic Engineering Appraisal Committee (GEAC) resumed regular meetings, and approved the field trials of GM mustard, chickpea, rice, cotton, maize, sugarcane, and Bt brinjal.

**FUTURE PROSPECTS**

After many years, the GEAC met six times, and prepared and released a new set of guidelines titled “Guidelines for the
Environmental Risk Assessment of Genetically Engineered Plants, 2016” emphasizing proper assessment of environmental effects. Two other documents were released by GEAC, to help in understanding the concepts and data generation by developers and biosafety assessment by regulatory bodies and experts.

In January 2016, the GEAC constituted a Sub-Committee of scientific experts to thoroughly address the dossier of biotech mustard, which was under consideration for environmental release. The transgenic mustard hybrid DMH-11 and parental lines containing events bn 3.6 and modbs 2.99 with barnase, barstar and bar genes were developed by the Centre for Genetic Manipulation of Crop Plants (CGMCP) of the University of Delhi.

In the next 8 months, the Sub-Committee and the Department of Biotechnology’s Biosafety Support Unit deliberated on the biosafety dossier, and prepared a comprehensive document “Assessment of Food and Environmental Safety (AFES).” This was presented to the GEAC for consideration in its meeting on June 20, 2016 (MOEF&CC, 2016a).

The report contains a thorough assessment of the biosafety data generated by the applicant, its comparison with international assessment by well-known regulatory agencies such as the European Food Safety Authority, Office of the Gene Technology Regulator, and Canadian regulatory authorities, and existing scientific literature on the subject in the peer reviewed journals, as well as addressing the specific uses of mustard in Indian context.

The Sub-Committee believes that biotech mustard is “as safe as conventional mustard” and “does not raise any public health or safety concerns for human beings and animal health,” and concludes that the environmental release of parental lines for hybrid production DMH-11 “may not pose any risk to biodiversity and the agro-system.”

**BENEFITS FROM BIOTECH CROPS IN INDIA**

A cumulative ~68 million small-holder cotton farmers planted Bt cotton in the 15-year period showing high repeat decision of planting IR cotton.

Notably, the increase from 50,000 hectares of Bt cotton in 2002 to 10.8 million hectares in 2016, represents an unprecedented 215-fold increase in 14 years. Estimates by Brookes and Barfoot (2017) indicate that India enhanced farm income from IR cotton by US$19.6 billion in the 14-year period 2002 to 2015 and US$1.3 billion in 2015 alone.

Fourteen peer-reviewed research studies have been conducted over the years, three studies were conducted prior to the commercialization of Bt cotton from 1998 to 2001, whereas eleven studies were carried out to assess ex-ante impact of Bt cotton, which were reported during the post commercialization of Bt cotton from 2002 to 2013. The results of these studies on Bt cotton were consistent with the study undertaken by Gandhi and Namboodiri in 2006 showing yield gains of approximately 31%, a significant 39% reduction in the number of insecticide sprays, leading to an 88% increase in profitability, equivalent to a substantial increase of approximately US$250 per hectare (Gandhi and Namboodiri, 2006).

**SOURCE**


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