



In 2018, more than 6 million farmers from India's 10 major cotton-growing states planted 11.6 million hectares of Bt cotton, reaching 95% adoption rate.

Since 2015, India has been the world's top cotton producing country, planting more than a quarter of the world's cotton.

In 2018, India achieved higher planting of the officially approved insect resistant (IR) cotton to 11.6 million hectares, an increase of 200,000 hectares over 2017. In 2017-18, the adoption of officially approved IR cotton represents 95% of the 12.24 million hectares of cotton planted in India. IR cotton is the only biotech crop planted in India since 2002.

Since India's adoption of IR cotton in 2002, adoption rate increased exponentially, reaching 95% in 2013. This indicates farmer's acceptance that is a manifestation of the benefits they derive from the technology. The fluctuations in the adoption rate after 2013 was due to instability of global cotton prices and market demand.

During the 2017 Kharif cotton season, adoption rate went down to 93% after an all-time high of



96% in 2016 when India reported the cultivation of unapproved IR/ herbicide tolerant (HT) cotton, estimated at 3.5 million packets planted over approximately on 760,000 hectares. Thus, the current 95% adoption rate and 6% biotech crop area indicate the restoration of farmers' confidence on the Bt cotton technology and a sign of demand for the approval of next generation biotech cotton technology including stacked IR (Bt)/HT cotton.

COUNTRY SITUATIONER

A large number of cotton farmers planted unauthorized stacked trait IR (Bt)/HT cotton in major cotton growing areas in Central and Southern zones in Kharif 2017. To contain the spread of unapproved IR/HT cotton, the Prime Minister's office in India ordered a probe. The probe was conducted by the Field Inspection and Scientific Evaluation Committee (FISEC) of



the Department of Biotechnology in 2018 (PIB, 2018a). A six-month probe nailed down the perpetrators of illegal Bt/HT cotton and resulted in curbing of illegal trade activities in Kharif 2018-19 (LiveMint, 2018).

The successful management of pink bollworm contributed to the rebound in cotton planting and production in 2018-19. Cotton farmers in Maharashtra saw an unusual outbreak of pink bollworm in 2017-18 cotton seasons due to the widespread cultivation of substandard, counterfeit and unapproved Bt cotton, non-compliance of refugia and more importantly, lack of understanding of farmers about Bt technology. The nationwide campaign for the management of pink bollworm, implemented in cotton growing States, focused on dryland farmers in Maharashtra in 2018. The campaign contributed to increasing farmer's awareness resulting in significant control of pink bollworm in 2018 Kharif season (Times of India, 2018).

The home-grown GM mustard developed by the Centre for Genetic Manipulation of Crop Plants (CGMCP) of the University of Delhi still awaits commercial release. Despite a thorough safety and performance assessment conducted in 2017 by the Genetic Engineering Appraisal Committee (GEAC) of the

Ministry of Environment, Forests, and Climate Change (MOEF&CC), the commercial approval of GM mustard in India is still pending. On October 26, 2017, the MOEF&CC decided to keep matters related to environmental release of transgenic mustard pending further review based on receipt of various representations from different stakeholders (MOEF&CC, 2017).

In 2018, the GEAC instructed the developer of GM mustard to assess the safety of GM mustard on honeybee and other pollinators, however, the studies were not initiated due to lack of study protocols and uncertainty about the approval process. While urging the society to take a considerate view on this homegrown innovation of GM mustard, Dr. K. Vijay Raghavan, Principal Scientific Adviser to the Prime Minister said "GM mustard is safe and useful but commercial release of the seed is a socio-political issue" (The Hindu, 2018).

BENEFITS FROM BIOTECH CROPS IN INDIA

Estimates by Brookes and Barfoot (2018) indicated that India had enhanced farm income from IR cotton by US\$21.1 billion in the 13-year period 2002 to 2016 and US\$1.5 billion in 2016 alone. These

immense benefits have been enjoyed by more than 7.5 million farmers and their families and have contributed greatly to the improvement of economic status in the community.

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

ISAAA. 2018. Global Status of Commercialized Biotech/ GM Crops in 2018: Biotech Crop Continues to Help Meet the Challenges of Increased Population and Climate Change. *ISAAA Brief* No. 54. ISAAA: Ithaca, New York.

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