

Genetically Engineered Bt Cotton: Reckless Gamble for Profit that Placed Indian Cotton Farmers in Corporate Noose

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The dubious performance (failure) of genetically engineered Bt cotton, officially India's only GM crop, should serve as a warning as the push within the country to adopt GM across a wide range of food crops continues. This article provides an outline of some key reports and papers that have appeared in the last few years on Bt cotton in India.

In a [paper](#) that appeared in December 2018 in the journal Current Science, P.C. Kesavan and M.S. Swaminathan cited research findings to support the view that Bt insecticidal cotton has been a failure in India and has not provided livelihood security for mainly resource-poor, small and marginal farmers. This paper was not just important because of its content but also because M.S. Swaminathan is considered to be the father of the Green Revolution in India.

The two authors provided evidence that indicates Bt crops are unsustainable and have not decreased the need for toxic chemical pesticides, the reason for these GM crops in the first place.

The authors cite the views of Dr K.R. Kranthi, former Director of the Central Institute for Cotton Research in Nagpur. Based on his research, [he concluded](#) in December 2016:

“Bt-cotton plus higher fertilizers plus increased irrigation also received a protective cover from the seed treatment of neonicotinoid insecticides such as imidacloprid, without which majority of the Bt-cotton hybrids which were susceptible to sucking pests would have yielded far less. It can safely be said that yield increase in India would not have happened with Bt-cotton alone without enhanced fertilizer usage, without increased irrigation, without seed treatment chemicals, and the absence of drought-free decade.”

In effect, levels of insecticide use are now back to the pre-Bt era as is productivity due to pest resistance and crop failures.

Following on from this, an [April 2018 paper](#) in the journal Pest Science Management indicates there has been progressive bollworm resistance to Bt cotton in India over a seven-year period. The authors conclude:

“High PBW [pink bollworm] larval recovery on Bt-II in conjunction with high LC₅₀ values for Cry1Ac and Cry2Ab in major cotton-growing districts of central and southern India provides evidence of field-evolved resistance in PBW to Bt-I and Bt-II cotton.”

This alongside other problems related to Bt cotton has had disastrous consequences for farmers. In a 2015 paper [Professor Andrew Paul Gutierrez and his colleagues](#) say:

“Bt cotton may be economic in irrigated cotton, whereas costs of Bt seed and insecticide increase the risk of farmer bankruptcy in low-yield rainfed cotton. Inability to use saved seed and inadequate agronomic information trap cotton farmers on biotechnology and insecticide treadmills. Annual suicide rates in rainfed areas are inversely related to farm size and yield, and directly related to increases in Bt cotton adoption (i.e., costs).”

In a new December 2018 paper, [Gutierrez sends](#) a warning to those considering rolling out GM food crops in India:

“... recent calls by industry and its clients to extend implementation of the hybrid technology in aubergine (brinjal, eggplant) and mustard and likely other crops in India will only mirror the disastrous implementation of the failed hybrid Bt technology in Indian cotton and, will only serve to tighten the economic hybrid technology noose on still more subsistence farmers for the sake of profits.”

He concludes that Bt cotton has placed many resource-poor farmers in a stranglehold. Bt cotton prevents seed saving and farmers must purchase costly seed, which leads to suboptimal planting densities. Stagnant/low yields have followed, insecticide use has grown and new pests resistant to insecticide/Bt toxins have emerged.

Gutierrez says that leading Indian agronomists have proposed that adoption of pure-line high density short-season varieties of rainfed cotton which could more than double current yields and would avoid heavy infestations of pink bollworm, thus reducing insecticide use and pesticide disruption. This cotton is not a new technology and predates Bt cotton.

Given what Gutierrez says, it is quite timely that Kesavan and Swaminathan question regulators' failure in India to carry out a socio-economic assessment of GMO impacts on resource-poor small and marginal farmers. They call for “able economists who are familiar with and will prioritize rural livelihoods and the interests of resource-poor small and marginal farmers rather than serve corporate interests and their profits.”

This mirrors what Gutierrez and his colleagues argued in 2015 that policy makers need holistic analysis before new technologies are implemented in agricultural development.

Naturally, corporations and many pro-GM scientists wish to avoid such things as much as possible. They try to convince policy makers that as long as the science on GM is sound (which [it isn't](#), despite what they proclaim), GM should be rolled out regardless. They regard regulators and regulations as a mere hindrance that is preventing GM from helping farmers. Deregulating GM is the order of the day. It's a reckless approach. We need only look at Indian cotton farmers whose lives and livelihoods have been devastated due to the ill thought out roll-out of Bt technology.

Kesavan and Swaminathan criticise India's GMO regulating bodies due to a lack of competency and endemic conflicts of interest and a lack of expertise in GMO risk assessment protocols, including food safety assessment and the assessment of

environmental impacts. Many of these issues have been a common thread in five high-level official reports in India that have advised against the commercialisation of GM crops:

The 'Jairam Ramesh Report', imposing an indefinite moratorium on Bt Brinjal [February 2010];

The 'Sopory Committee Report' [August 2012];

The 'Parliamentary Standing Committee' [PSC] Report on GM crops [August 2012];

The 'Technical Expert Committee [TEC] Final Report' [June-July 2013]; and

The Parliamentary Standing Committee on Science & Technology, Environment and Forests [August 2017].

In her numerous submissions to India's Supreme Court, prominent campaigner Aruna Rodrigues has been scathing. She [recently told me that](#):

"It is proven in copious evidence in the Supreme Court in the last 13 years that our regulators are seriously conflicted: they promote GMOs openly, fund them (as with herbicide-tolerant mustard and other public sector GMOs) and then regulate them. Truth is a massive casualty. This is not lightly stated."

She added that "failed hybrid Bt cotton in India" has put farmers on a pesticide treadmill as increasing levels of pest resistance becomes manifest.

Prior to this, in 2017, [Rodrigues also said](#):

"Never has an agri-tech been sold as a 'magic bean' to farmers, like Bt cotton, with opprobrium attaching to our regulators and ministries of governance who supported and continue to support this technology-castle built on sand, in the absence of evidence and when the hard data said the opposite."

In the rush to plant these 'magic beans', the area planted under Bt cotton has often displaced vital food crops at a time when India should surely have been looking to achieve food security and self-sufficiency.

Writing in India's [The Statesman newspaper](#) in 2015, for example, the knife-edge existence of the people that rich corporations profit from was highlighted in the case of Babu Lal and his wife Mirdi Bai who had been traditionally cultivating wheat, maize and millet on their farmland in Rajasthan. Their crops provided food for several months a year to the 10-member family as well as fodder for farm and dairy animals, integral to the mixed farming system employed.

Company agents (unspecified – but Monsanto and its subsidiaries dominate the GM cotton industry in India) approached the family with the promise of a lump-sum payment to plant Bt cotton seeds in two of their fields. Lal purchased pesticides to help grow the seeds in the hope of receiving the payment, which never materialised because the company agent said the seeds produced had 'failed' in tests.

The family faced economic ruin, not least because the food harvest was much lower than

normal as the best fields and most labour and resources had been devoted to Bt cotton. It resulted in Lal borrowing from private moneylenders at a high interest rate to meet the needs of food and fodder. On top of this, the company's agent allegedly started harassing Lal for a payment of about 10,000 rupees in lieu of the fertilisers and pesticides provided to him. Several other tribal farmers in the area also fell into this trap.

The promise of a lump-sum cash payment can be very enticing to poor farmers, and when companies co-opt influential villagers to get new farmers to agree to plant Bt cotton, farmers are reluctant to decline the offer. When production is declared as having failed, solely at the company's discretion it seems, a family becomes indebted.

According to that article, there was growing evidence that the trend to experiment with Bt cotton has disrupted food security in certain areas and had introduced various health hazards and had damaged soil due to the use of chemical inputs.

Before finishing, it is certainly worth mentioning Stone and Flachs's [2017 paper](#) on how certain interests within and beyond India are attempting to break traditional farming cotton cultivation practices with the aim of placing farmers on yet another corporate treadmill. This time, the aim appears to be to introduce herbicide-tolerant (HT) cotton in India on the back of Bt cotton. The authors indicate just how hugely financially lucrative for corporations the relatively 'undeveloped' herbicide market is in India. These HT cotton seeds have now appeared illegally on the market.

Ultimately, as Gutierrez implies, the bottom line is cynical corporate interest and profit – not helping Indian farmers or some high-minded notion about feeding the world. Just ask Babu Lal and thousands like him!

Of course, given the track record of HT crops, it is another disaster in the making for Indian farmers and the environment. This warning has already been made clear by the Supreme Court appointed Technical Expert Committee, which regards HT crops as being wholly inappropriate for India.

With various GM crops waiting in the wings, India should continue to adopt a precautionary approach towards GMOs as advocated by Jairam Ramesh and not implement another reckless gamble with farmers' livelihoods, the nation's health and the environment. About nine years ago, based on a rigorous consultation with international scientific experts regarding the commercialisation of Bt brinjal, Ramesh concluded that without any management of resistance evolution, Bt brinjal would fail in 4-12 years. Jairam Ramesh pronounced a moratorium on Bt brinjal in February 2010 founded on what he called "a cautious, precautionary principle-based approach."

Isn't such failure what we now witness with Bt cotton? It serves as a timely warning for implementing a widespread GMO food crop regime in India. The writing is on the wall.

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Colin Todhunter was named in August 2018 by Transcend Media Services as one of 400 Living Peace and Justice Leaders and Models in recognition of his journalism. Join him on [Twitter](#).

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