

DON'T BELIEVE THE ANTI-GMO CAMPAIGN

Relevant for: Indian Economy | Topic: Major crops, Cropping patterns in various parts of the country incl. Various Agriculture Revolutions

“India has one of the strongest regulatory protocols for field trials of GM crops.” Bt Cotton being harvested near Salem, Tamil Nadu, in 2005.>Shaju Joh>

A review article, “Modern technologies for sustainable food and nutrition security”, which appeared in the November 25 issue of the peer-reviewed journal *Current Science*, is deeply worrying. The article was authored by geneticist P.C. Kesavan and leading agriculture scientist M.S. Swaminathan and describes Bt cotton as a “failure”. As the Principal Scientific Adviser to the Government of India, K. VijayRaghavan, rightly said, this paper is “deeply flawed”. It has the potential to mislead the public and the political system.

While the general public can be easily swayed by unauthenticated reports, the authors, as scientists, should have relied on hardcore scientific evidence before making such adverse comments. The statement that “only in very rare circumstance (less than 1%) may there arise a need for the use of this technology [GM]” is not in consonance with their other statements such as the one in the concluding paragraph: “Genetic engineering technology has opened up new avenues of molecular breeding. However, their potential undesirable impacts will have to be kept in view. What is important is not to condemn or praise any technology, but choose the one which can take us to the desired goal sustainably, safely and economically.” Professor Swaminathan also said in a response to the criticism of the article: “Genetic modification is the technology of choice for solving abiotic problems like drought flood, salinity, etc. It may not be equally effective in the case of biotic stresses since new strains of pests and diseases arise all the time. This is why MSSRF [M.S. Swaminathan Research Foundation] chose mangrove for providing genes for tolerance to salinity.”

Abiotic stress in crops is a major hazard and does not fall under the less than 1% category mentioned in the review article. Major science academies of the world such as the U.S.'s National Academy of Sciences, the African Academy of Sciences and the Indian National Science Academy have supported GM technology. The U.S. National Academy of Sciences, after a massive consultation process, published a 420-page report in 2016 with the observation that “Bt in maize and cotton from 1996 to 2015 contributed to a reduction in the gap between actual yield and potential yield under circumstances in which targeted pests caused substantial damage to non-GE varieties and synthetic chemicals could not provide practical control”.

In 2016, 107 Nobel laureates signed a letter challenging Greenpeace to drop its anti-genetically modified organism (GMO) technology stance. They stated that the anti-GMO campaign is scientifically baseless and potentially harmful to poor people in the developing world. Data from a large number of peer-reviewed publications have shown that, on average, GM technology adoption has reduced pesticide use by 37%, increased crop yield by 22%, and increased farmer profits by 68% (“A Meta-Analysis of the Impacts of Genetically Modified Crops”, published in *PLOS One* by Wilhelm Klümper and Matin Qaim in 2014). Yield gains and pesticide reductions are larger for insect-resistant crops than for herbicide-tolerant crops. Yield and profit gains are higher in developing countries than in developed countries. Data from a billion animals fed on GM corn have not indicated any health hazards. Those in the Americas and elsewhere consuming Bt corn or soybean for over 15 years have not reported any health issues. It is preposterous to think that governments would allow their people and animals to be fed “poisonous” food. Even reports based on faulty studies in experimental animals that stated that GMOs cause cancer were withdrawn. Major food safety authorities of the world have rejected

these findings.

Bt cotton is not a failure in India. The yields hovering around 300 kg/ha at the time of introduction of Bt cotton (2002) have increased to an average of over 500 kg/ha, converting India from a cotton-importing country to the largest exporter of raw cotton. There was a small dip for a couple of years and the yield has now increased to over 550 kg/ha. The question to be asked is, what would have the yield been if Bt cotton had not been introduced in 2002?

It is unfortunate that farmer distress is being wrongly attributed to Bt cotton failure. Farmers continue to grow Bt cotton. The development of resistance can be tackled through practices like Integrated Pest Management and by stacking Bt genes to fight secondary pests. The priority is to accelerate development of Bt cotton varieties that can be packed densely in fields and increase the yields to over 800 kg/ha, as is the case with other countries.

GM mustard (DMH-11) is a technology to create mustard hybrids. Being a self-pollinator, mustard is difficult to hybridise through conventional methods. Genetic modification allows different parents to be combined easily, helping yields go up substantially. The herbicide glyphosate is only used for selection of hybrids and is not meant for farmer fields. In any case, reports on the probable carcinogenic potential of the herbicide have not been accepted by major science academies. Yield data can only be assessed in farmers' fields. For this, trials are necessary. The question then is: why are the trials being scuttled? The moratorium on Bt brinjal is the most unfortunate step taken by the government in 2010 and has crippled the entire field of research and development with transgenic crops. Bangladesh has used India's data to successfully cultivate Bt brinjal, despite all the negative propaganda. Reports indicate that as many as 6,000 Bangladeshi farmers cultivated Bt brinjal in 2017. How long will it take for Bt brinjal to enter India from Bangladesh?

India has one of the strongest regulatory protocols for field trials of GM crops. Many scientists have been part of the monitoring processes, and it is an insult to the integrity of our scientists to indict the Review Committee on Genetic Manipulation and the Genetic Engineering Approval Committee as lacking in expertise and having vested interests. The paper by Dr. Kesavan and Dr. Swaminathan seems to have got most things wrong for whatever reason. GM technology is not a magic bullet. It needs to be evaluated on a case-by-case basis. There is definitely scope for improvement in terms of technology and regulatory protocols. But it is time to deregulate the Bt gene and lift the embargo on Bt brinjal. A negative review from opinion-makers can only mislead the country. In the end, it is India that will be the loser.

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The government's maternity benefit programme must be implemented better and comply with the Food Security Act

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