

IT'S IN THE GENES

GM FOOD Scientists are divided over the fallout of commercial farming of genetically modified crops

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Genetically Modified (GM) crops are in the news again and, scientists have warned, it is going to affect you sooner than later.

Six years after the then environment and forest minister Jairam Ramesh put a permanent moratorium on Bt Brinjal, the issue of GM crops has resurfaced in a new avatar — Genetically Engineered (GE) Mustard.

Why Bengal must take guard in this scenario — in spite of the Mamata Banerjee government being opposed to all forms of GM crops — is because it is the largest consumer of mustard in India. The state government is opposed to the commercial release of GE Mustard.

“We are against commercial cultivation of all GM crops. Some people did approach us with a few proposals to allow the cultivation but we rejected the idea. We have talked to experts and scientists from both sides. But as a matter of principle, we will not allow anything in this state if it affects our farmers,” agriculture minister Purumendu Basu said.

SCIENTISTS AND ANTI-GM ACTIVISTS IN KOLKATA, APPREHEND THAT IF THE CENTRE ALLOWS COMMERCIALISATION OF GE MUSTARD IN THE COUNTRY, IT WILL BE DIFFICULT FOR BENGAL TO KEEP ITSELF IMMUNE FROM THE SPREAD OF THE CROP

Scientists and anti-GM activists in Kolkata, however, apprehend that if the Centre allows commercialisation of GE Mustard in the country, it will be difficult for Bengal to keep itself immune from the spread of the crop.

“We are the sixth largest producer of mustard in the country but we are the No. 1 consumer. We have to depend on states such as Rajasthan and Uttar Pradesh for our supplies. So, if GE Mustard reaches the market, our consumers will be left with no choice,” said Dushar Chakrabarty, a geneticist at the Indian Institute of Chemical Biology (IICB) and a former member of the state biotechnology council.

Incidentally, Bangladesh had shown the green light to commercial cultivation of Bt Brinjal a few years ago, amid concerns in India, particularly in Bengal, over the possibility of the seeds of Bt Brinjal getting smuggled into this side of the border. Both Basu and the PK Majumdar, advisor to chief minister Mamata Banerjee on agricultural matters, had expressed their concerns over the issue in 2010.

So, what is GE Mustard and how did it come into being?

It was developed by a team of scientists from the Centre for Genetic Manipulation of Crop Plants at Delhi University, led by its former vice-chancellor Deepak Pental. It has been named DMH-11.

The team took genes from a soil microbe: one gene produces an enzyme “Barnase” that kills the male reproductive cells of the mustard. The second gene, called “Barstar”, counteracts it. Mustard flowers have both male and female parts in one flower. Pental and his team inserted the ‘Barnase’ gene in an Indian Mustard variety to kill the male part. The ‘Barstar’ was introduced into east European mustard. The resulting GM mustard hybrid, it is claimed, gives 25-30 per cent more yield than the best varieties such as ‘Varuna’ currently grown in the country.

“Our research has found that Indian mustard lines, when crossed to east European types of mustard, provide hybrids with 20-30 per cent more yield. The GE system — also called the barnase/barstar system — is for making hybrid seeds in large quantities. We have many varieties of mustard, but it is time to increase mustard productivity by using high-yielding hybrids,” Pental — considered the father of GE Mustard — told HT.

Experts leading the anti-GM movement in India however pointed out that the case is not as rosy as being portrayed by the advocates of GM crops. Firstly, the Barnase gene is one of the most lethal genes known to man. If by any chance it is let loose it would kill anything — from mustard to man. Secondly, the scientific community is yet to know whether GM food could be harmful to the people and whether GM crops

could contaminate other crops in the farms.

“The Genetic Engineering Approval Committee, the apex body in India authorized to approve the use of genetically modified crops, is trying to cover up all data on GM Mustard, including those on bio-safety. We still don’t know for certain how GM Mustard may affect us. Nothing is being disclosed and no data is being put on the public domain. GM crops, if commercialized, will not only leave farmers at the mercy of multinationals — because they would have to buy seeds almost every year from the companies — but could also trap consumers because they would be forced to eat GM products,” said AK Ghosh, former head of the Zoological Survey of India.

But Pental said that there was “no hush-hush business”.

“Our research has been carried out with public money. Most of the work has been published. Bio-safety studies are being looked into by GEAC. Our job is to submit the data to GEAC. It will take a view and only then all data would be made public.”

The country had shown the green signal to Bt Cotton in 2002. Although the proponents of genetically engineered crops claim that Bt Cotton has been a success, scientists said that it has failed miserably and all the tall claims made to promote it have fallen flat.

“The proponents of Bt Cotton claimed that it was resistant to bollworm pest — considered a major risk. But, last year, pink bollworm infestations were reported in Bt seeds. It was also expected that Bt Cotton would reduce the need of pesticides. But data from Central Institute for Cotton Research reveal that the use of pesticides actually increased among cotton cultivators,” said Kavita Kuruganti of the Alliance for Sustainable Agriculture (Asha) and a co-convenor of Coalition for GM-Free India.

On July 18, the GEAC called a special meeting to hear the views of the anti-GM lobby and the members of civil society opposing GM food. Earlier in June, the GEAC considered a proposal to permit commercialization of transgenic mustard.

Alarm
Experts said the damage done the day when Bangladesh allowed the cultivation of transgenic crop. A few experts have even shot off a letter to the former environment minister, Jagdish Natharajan, to check smuggling of the crop into Bengal.

ard. But the anti-GM lobby shot off an angry letter to the ministry accusing GEAC of being opaque, unscientific and non-participatory and accusing the government of supporting the interests of seed companies and chemical makers.

“We are in no hurry to allow commercial cultivation of GE Mustard. We will take into account each and every aspect, including safety and welfare of our farmers and consumers,” an official of the Union ministry of environment, forest and climate change told HT.

But the anti-GM lobby apprehends that that way the government is moving, it may plan to launch GE Mustard by the end of this year when the Rabi season starts.

Scientists like Pental say, “We have many varieties of mustard but time has come to increase mustard productivity by high yielding hybrids. When GE Mustard lines are used to develop hybrids, the farmers and the country will benefit immensely.”

Rapesed in Canada is 85 per cent hybrid. In China, it is around 75 per cent and in Europe, 90 per cent. Once hybrids in mustard are released, these will replace the varieties. No country has made it big without being S&T friendly. India imported around 85,000 crore worth of edible oil in the 2015-16 fiscal.”

This view is, however, countered by experts like Ghosh and Kuruganti. They claim that there are alternatives to increase yield and productivity. One could introduce a system of mustard intercropping, similar to that of SR technique available for paddy.

“GM technique should be our last resort. We scientists are not paranoid. There are reasons for which we are opposing this. Let there be public consultations as it was done in the case of Bt Brinjal. Who will gain out of this GE Mustard? Will it be the farmers, the consumers, the scientists or some vested interests?” Ghosh asked.

THE GM TIMELINE SO FAR

- 2001: Illegal leakage of GM cotton seeds in India, grown on thousands of hectares
- 2002: Bt Cotton approval by regulators
- 2004: Swaminathan Task Force Report on Application of Agri-Biotechnology accepted by government
- 2006: Supreme Court orders suspension of open air field trials for a brief time
- 2009: Regulatory body GEAC gives green signal to Bt Brinjal commercial cultivation
- 2010: Jairam Ramesh, the then Minister for Environment, puts an indefinite moratorium on Bt Brinjal
- 2012: Parliamentary Standing Committee on Agriculture

- 2013: Report on GM food crops and asks for all open releases to be suspended
- 2013: Government introduces a Biotech Regulatory Bill in Parliament which subsequently lapsed
- 2013: Supreme Court’s Technical Expert Committee gives its report to the Court
- 2014: GM mustard allowed for large scale trials (BRL II)
- 2015: GM mustard commercial cultivation application filed by Delhi University’s GMCP with GEAC
- 2016: Union Government tries to push GM mustard; activists and scientists voice opposition to it



THE BIG DEBATE FARMERS CAN'T SAVE SEEDS OF GM CROP & HAVE TO SPEND HUGE MONEY ON SEEDS EVERY YEAR

Who gains from GM Mustard?

India has a tradition of agro-biodiversity and is regarded as one of the 17 mega diverse countries out of more than 200 in the world. With soaring human population, in a finite space of 2.4% of global area, India is increasingly facing an imbalance between demand and supply of commodities such as edible oil.

A Technology Mission on Oilseeds was launched way back in 1982. The doubling of oilseed production between 1985 and 1993 enabled the country to avoid humiliating dependence on oil import and save foreign exchange. Also, oil seed production jumped within a decade (11 mt to 22 mt).

With increasing globalisation, India began lowering import duties enabling cheaper edible oil to flow in. India imports

oil, roughly 50% of domestic requirement, putting a financial burden in excess of Rs 9,000 crore annually on the state exchequer.

The government is moving fast towards a multi-crop technology to produce genetically modified crops. Nations have never allowed any natural cross breeding between lower organisms such as bacteria with higher organisms such as plants. GM technology has been repeatedly questioned. Since the European Union’s moratorium on GM food continues, its promoters are searching for new pastures in countries such as India and Bangladesh.

The question is who gains out of such introduction of GM food crop in a country like India? Majority of Indians no longer depend on mustard oil, as other edible oils such as soybean oil, sunflower oil, rapeseed oil and rice-bran oil have taken a major share of the edible oil market. The question of bio-safety is vital and every Indian citizen

consume it. The Supreme Court had made it compulsory in 2007 that bio-safety data must be placed in public domain.

Large scale field trials may only be conducted when a crop has comprehensively cleared all bio-safety protocols in rigorous, independent, long-term testing and appraisal. But in reply to more than one RTI applications on GM mustard, the issue of bio-safety remains unanswered. Interestingly, conventional mustard production has already shown an upsurge from 9 quintal per hectare in 1980 to 1991 to 12.82 quintals, peaking at 16.35 quintal per hectare in Gujarat by 2013-14.

Mustard yield can still be increased further if farmers are assured of a remunerative price and an adequate Mandi infrastructure comes up for sale of the crop. As much as 70% of the mustard crop is cultivated in Rajasthan, Madhya Pradesh and Haryana,

states are overproduction and lack of buyers. All these three states have denied issuing ‘No Objection’ certificate to GM mustard.

It’s the multi-national GM crop companies who have spent significantly more money in universities, especially in the developing countries, and use them as frontal agencies. This has been evidenced in West Bengal, Tamil Nadu, Delhi and elsewhere.

The GM mustard crop can only benefit such companies as Dhara 14 in the future. Farmers can’t save seeds of GM crop and has to spend significantly more money to procure seeds every year. It’s ultimately a big business in the name of food security in the country and one can always guess who will be the real beneficiaries.

The writer is former director of the Zoological Survey of India and former member of National Environment Council and presently associated with the

