

GM Mustard: Facts against Myths Propagated

MYTH	FACTS
<p>“Commercialization of GM Mustard is necessary to increase mustard productivity. It has shown 28% increase in yield”.</p>	<ul style="list-style-type: none"> • Govt. of India admitted in an affidavit in the Supreme Court (Oct. 2016) that no claim has been made that GM mustard out-yields non-GMO hybrids, and that the developers have nowhere claimed that yield increase is due to the three transgenes. • The reported yield increase (28%) of GM mustard hybrid is over its parents (EH2 & Varuna) and inappropriately selected checks/controls. Not over presently available high yielding varieties and hybrids. • Farmers are already cultivating at least five higher yielding hybrids and varieties, as per data from the ICAR system. Replacing them with low yielding GM mustard might in fact reduce mustard crop yields in India and can't be justified. • Nine out of 12 countries that have higher productivity of mustard / rapeseed do not grow genetically modified mustard.
<p>“Once released, GM mustard would cover 10% to 25% mustard cultivation extent”.</p>	<ul style="list-style-type: none"> • Due to many reasons, including low test weight (3.3 gm/1000 seeds compared to 4 to 5 gms that farmers prefer), farmers generally do not adopt Delhi University hybrids. • In the last 10 years, at least 3 non-GM mustard hybrids have been released by DU, which altogether barely cover 0.5% of the cultivated area till date, that too after intense promotion through govt. schemes.
<p>“India’s import bill for edible oil is around Rs. 65,000 crores. GM Mustard will save oil import bill by Rs. 79 crores to Rs. 1116 crores by improving yields and reducing import requirement.”</p>	<ul style="list-style-type: none"> • Given no proven yield gain with GM mustard, this claim is spurious. Including GEAC, no agency has verified this claim. Regulators don’t undertake this responsibility, of assessing benefit claims. • During the era of Yellow Revolution (1986 to 1996), India became 97% self-sufficient in edible oil. After trade liberalization, this self-sufficiency was sacrificed. • To reduce edible oil import, there is a need for conducive policy environment, like higher MSPs, assured procurement, increased import duty so that our farmers don’t get priced out due to cheaper subsidized imports, better irrigation facilities, better extension etc. These policy shortcomings are not being addressed. It is well known that farmers are being punished with very low prices right now for oilseeds. • Even after releasing many high yielding varieties and hybrids, the area and production of mustard has remained stagnant in the last 10 years. • Without addressing the main factors contributing to high import bill, accepting a reductionist unproven solution is unintelligent.
<p>“GM mustard is safe for human consumption”.</p>	<ul style="list-style-type: none"> • Long term independent testing was not done to ascertain and claim that GM mustard is safe for human consumption. This is an aspect of biosafety assessment that was highlighted in the Bt brinjal debate too. It was strongly recommended by the Technical Expert Committee (TEC) of the Supreme Court, but clearly ignored. It is also something that BJP promised in its 2014 election manifesto. • Even though this GM mustard is a herbicide-tolerant crop, <u>testing was done without spraying the herbicide Glufosinate</u> (for other HT crops in the pipeline such protocols are being adopted). • Safety testing (number of tests and protocols adopted) is not comparable even to the inadequate testing carried out for Bt. Brinjal, which has been kept under moratorium. • GM mustard being an HT crop, usage of herbicide will increase, leading to higher toxic residues in mustard. Glufosinate Ammonium is known to cause negative neurological and teratogenic effects. Its breakdown product (NAG) is also documented to cause negative impacts, in scientific studies. • Many of the required safety tests were not done on a claim that they are unneeded, based on results of compositional analysis done in a private unaccredited lab, outsourced by NIN. However, the compositional analysis indeed showed significant differences which were brushed aside as variations due to agro-climatic reasons. Why were such agro-climatic conditions not controlled for in a study meant to assess safety is a big question. • In the meager safety testing done, conclusions were drawn based on results achieved through scientifically invalid protocols and improper standardization.

<p>“GM mustard is not Herbicide Tolerant”.</p>	<ul style="list-style-type: none"> • What defines whether the plant is herbicide tolerant (HT) or not is its genetic makeup, not the purpose of insertion of new gene/s. • Dossier related to Molecular Characterization and Expression of Genes, submitted to GEAC proves expression of Bar protein, which imparts HT character in F1- the hybrid seed. • The double enhancer promoter gene tagged to the herbicide tolerant gene- Bar, that too in male parent is to ensure powerful expression of HT character in commercially cultivated crop. This is a dead give-away about the unstated intention of the crop promoters to create a herbicide tolerant commercial trait. • The developer, Dr. Pental has accepted that it is a Herbicide Tolerant crop. He has developed at least two variants of HT mustard and the third variant is under development. So, DU’s intentions of developing HT crops are pretty clear and evident, whatever specious arguments are provided. • The crop developers and regulators are making a false distinction between a herbicide tolerant gene having been inserted (Bar gene for use in breeding and seed production, as a marker) and that herbicide tolerance is not a commercial trait in the current instance. They are doing so to justify the basic lacunae in testing and to give “scientific” coverup to the fact that rigorous testing about impact on environment and health has not been done by using the herbicide spray on trial plots. They are also doing so because they want to bring in HT crops through the backdoor given that credible Committees have recommended against HT crops’ entry into India.
<p>“GM mustard is safe for the environment”</p>	<ul style="list-style-type: none"> • Even though GM mustard is an HT crop, field testing was carried out without spraying the herbicide. This is a serious omission because HT crops result in environmental impacts including greater use of herbicides, loss of habitat for beneficial organisms, impact on pollinators, impact on soils, creation of super-weeds etc. • No protocol has been developed to test HT crops in India till date. • Impact on honeybees and other beneficial insects was not tested with scientific rigour and the studies undertaken have serious lack of reliability on findings and conclusions. • No testing of long term impact on soil, water and biodiversity was done. • As Genetically Modified Organisms (GMOs) and their products are not permitted in organic farming, cultivation of GM mustard will over time end organic farming of mustard (as has happened in the case of others GMOs) and also impact the use of mustard crop as a useful component of organic farming. • Cultivation of GM mustard will contaminate local mustard germplasm, including in the wild, impacting genetic diversity, which is the storehouse for traits (disease, drought, saline resistance) to maintain agri resilience and for future breeding. • Protocols for Environment Impact Assessment were developed by the Developer himself. • Most environmental studies were done by the GM crop developers themselves. • The Indian guidelines for environmental risk assessment which were released only recently were not applied to this GM mustard.
<p>“Farmers will not spray Herbicide Glufosinate on mustard as it is not recommended by GEAC & Central Insecticide Board & Registration Committee (CIBRC)”</p>	<ul style="list-style-type: none"> • This is untenable reasoning given that Indian farmers will end up using the crop as a herbicide tolerant crop, if approved, and will not wait for any recommendation or regulation. • In any case, both the Indian pesticides regulatory regime and the GMO regulatory regime have proven themselves incapable and unaccountable in their regulation and there can be no hope that they will be able to implement any restriction on farmers to prevent the use of herbicide on this GM crop. • Proven illegal cultivation of Bt cotton and HT cotton as well as unacceptable levels of pesticide residues in the food chain, use of restricted and even banned pesticides on various crops are testimony to the lack of regulation of GM seeds and pesticides in India.

<p>“Agronomic trials are conducted on scientific basis”</p>	<ul style="list-style-type: none"> • Protocols of ICAR-AICRP for release of new variety / hybrid were ignored. • Some of the conditions laid by GEAC for conducting trials were not followed. • No valid ‘comparators’ were used including the mandated comparator. Hybrid GM mustard must be compared with a non-GM hybrid. Instead, GM mustard was compared with a 40 year old variety. • Although parents of the GM mustard were swapped during research, the data was submitted as if it was the same hybrid. This is scientifically invalid considering the role of extra-chromosomal inheritance. • Developers evolved test protocols themselves and trial data were tampered. • After the scientific fraud got exposed, regulators are now re-writing the very objectives for which agronomic evaluation permission was given for GM mustard since they are unable to explain away the justification for deviation from laid and prescribed protocols.
<p>“Only a handful of ideologically-driven ‘professional’ activists are opposing GM mustard”</p>	<ul style="list-style-type: none"> • About 1 lakh people have registered their opposition through various means. • Fifty six leaders of almost all major farmers’ unions of India (including Bharatiya Kisan Sangh and Bharatiya Kisan Union) have opposed it openly and repeatedly. • More than 200 scientists and medical doctors have raised their voice against it. • Several retired judges and senior bureaucrats have opposed it. • Agriculture is a state subject. No state has come forward asking to approve GM mustard. Meanwhile, decision-makers in many state governments like Chief Ministers, Agriculture Ministers, Agriculture Secretaries and other bureaucrats have written/stated their objections against GM mustard/crops. These states include Rajasthan (which grows 46% of Indian mustard), Madhya Pradesh, West Bengal, Bihar, Tamilnadu, Kerala, Karnataka, Bihar, Punjab, Haryana and Delhi. • States like Madhya Pradesh, Gujarat and Rajasthan do not allow even field trials. • Many APMCs of Mustard cultivation areas of Gujarat have registered their resistance. • At least two union Cabinet Ministers have openly opined against GM mustard/foods. • Both the Parliamentary Standing Committee and Technical Expert Committee of the Supreme Court have warned against introduction of HT crops and for those crops where India is a Center of Origin/Diversity. India is a Center of Diversity for mustard. • Hundreds of civil society groups working on issues of health, environment and farmers’ issues have opposed it. This includes organizations like Beekeepers Association of India, Organic Farmers Association of India and Swadeshi Jagaran Manch. • Several political parties and their affiliates have objected to the release of GM mustard.
<p>“This GM mustard is <i>swadeshi</i> and so, there is no IPR issue. No need to worry about seed sovereignty”.</p>	<ul style="list-style-type: none"> • For much of the transgenic material used to create this GM mustard, Bayer (a multinational, which has acquired Monsanto recently) had patents in other countries. Nothing prevents Bayer from acquiring Indian patents even now. • While DU has also taken some patents on this GM mustard, there is no guarantee that the rights will not be transferred to a profiteering agency. • GM mustard is tolerant to Glufosinate Ammonium (GA), a herbicide. Bayer holds an active patent on GA in India. GM mustard will increase use of GA. Bayer will benefit out of this. • Contamination of non-GM crop by male sterility inducing Barnase gene will lead to loss of yield in farmers’ fields. There is also the issue of crop damage due to herbicide drift that neighboring non-GM farmers would experience. To protect themselves from this, farmers will be compelled to opt for GM seed. Farm-saved seed will also have sterility inherited, compelling farmers to opt for the external seed supply source, thereby eroding seed sovereignty. • HT GM mustard being a hybrid, farmers will be compelled to buy seeds every year.
<p>“Regulators’ job in the GEAC is to only look at biosafety”</p>	<ul style="list-style-type: none"> • It is clear that some agency or department in the government has to be responsible for various pending issues related to farmers’ choices, consumer choices, trade security, Ayurveda impacts, impacts on organic farming, labeling, liability regime etc. Without resolving these issues, how can a policy decision be taken on commercializing GM mustard, based on unscientific and incorrect safety clearances by GEAC?

<p>“Limited release of GM mustard for commercial cultivation is possible”.</p>	<ul style="list-style-type: none"> • Nothing will remain “limited” in the context of open fields of farmers. Bees and other pollinators cannot be limited and controlled and biological contamination is inevitable. • There is no control over end use of seeds and pesticides in India, it cannot be regulated and controlled. • Large scale illegal and continued cultivation of HT cotton now, and the very entry of Bt cotton into India illegally is a clear evidence for this lack of ability and will to regulate. • Pollen flow cannot be controlled, and this idea is untenable.
<p>“State governments will have power to disallow through licensing procedures for commercial seed sales even if the Centre approves”.</p>	<ul style="list-style-type: none"> • No effective mechanisms exist to check cross border movement of GM seeds across states. There is no end-use regulation related to GM seeds in India. In such a context, talking about licensing mechanism under Essential Commodities Act as an effective mechanism or provision that upholds the Constitutional Authority of states over Agriculture and Health is laughable. • As per present regulation, licensing at state level is meant for seed sales, not for crop cultivation which farmers can do with smuggled seeds. • It is clear that state governments will have to bear the consequences of approval of GM seeds by the Centre, whether they license it in their own state or not. This is an unfair proposition, with the Centre’s lack of authority and accountability in this matter apparent.
<p>“Nothing has happened to those who are consuming GM oil. Indians are already consuming through import”.</p>	<ul style="list-style-type: none"> • Lack of evidence is not proof of safety. • There is no evidence that exists to show that the various health problems that are being faced in GM-oil consuming countries as well as in India are not connected to such GM food consumption. • There is no labeling or segregation in place. No epidemiology is possible without such labeling and segregation. • In any case, it would take many years to ascertain chronic health impacts. • Only 1.2% of edible oil import into India is of GM canola (rapeseed). • Cultivation of GM mustard in India will have more negative impacts than just that of consumption. We can’t equate agricultural production and end (processed) product import. • Further, with cultivation of GM mustard, we are talking not just of a processed product but more direct consumption of HT GM mustard seeds, leaves etc.
<p>“Transgenic Male Sterility is more reliable and so, it is preferred over non-GMO Cytoplasmic Male Sterility (CMS) to develop hybrids”.</p>	<ul style="list-style-type: none"> • No scientific evidence has been given to support this claim. • Breakdown of transgenic Male Sterility was recorded to the extent of at least 7% during the trials, but the report submitted to GEAC falsified this observation claiming that there was no breakdown at all. • Many hybrids have been developed based on naturally occurring safe Cytoplasmic Male Sterility (CMS) in <i>Brassica</i> in India & abroad. • As data show, yields of those countries (like UK, Poland, France, Germany, Czech Republic etc.) using hybrids based on CMS are significantly higher than in the 3 countries (USA, Canada and Australia), which have opted for GM hybrids.
<p>“Permission for commercial cultivation of GM mustard is necessary for further breeding of hybrids”</p>	<ul style="list-style-type: none"> • Further research for breeding hybrids that have special characters and better yield potential does not require commercial cultivation clearance of a GM crop. The existing procedure for research on GM crops needs to be followed for any further breeding objectives, not commercial cultivation permission or even de-regulation as is being asked by the crop developers.

It is apparent that GM technology is unsafe, unneeded, uncontrollable. The need for GM mustard has not been established. More than 50 GM varieties of other crops are in the pipeline. Most of them are controlled by seed multinationals including HT Cotton, HT/Bt Maize and GM Rice. GM mustard approval is to pave way for these GMOs, in the garb of a public sector GMO. GM mustard is a brazen, back-door entry to a HT crop.

APPROVAL OF GM MUSTARD IS APPROVAL TO LIES IN THE NAME OF SCIENCE.

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