

# GMO “Terminator Mustard” in India

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*“The claim that ‘Terminator Mustard’ will increase yields by 30% is scientifically false and a blatant lie... The traits being introduced by GM mustard are known to be hazardous and are illegal...”*

India is the home of oilseed diversity — coconut, groundnut, linseed, niger, mustard, rapeseed, safflower and sesame. Our food culture have evolved with our biodiversity of oilseeds. Sarson is called sarsapa and rajika in Sanskrit. Diverse varieties of sarson are grown and used in India, including Krsna Sarsapa (Banarsi Rai), Sita Sarsapa (Peela Sarson), Rakta Sarsapa (Brown Sarson), Toria and Taramira.

On August 27, 1998, the Indian government, reacting to the tragedy of adulteration of mustard oil in Delhi with argemone, diesel and waste oil, announced a policy of free import of soybean, while simultaneously banning sale of mustard oil. While it was referred to as the “dropsy epidemic”, our visits to hospitals revealed multiple symptoms because of the multiple sources of adulteration. The interesting thing about the mustard tragedy was that all brands were affected, but only in Delhi. A typical adulteration is in one brand, across the supply chain.

It was during those days that women from the slums of Delhi called us at Navdanya and said, “Our children are going to bed hungry because they cannot eat food cooked in soya oil... bring our mustard back”.

Women prefer natural oils such as mustard to hydrogenated fats such as dalda, both for health reasons and taste. Hydrogenated fats contain trans fats, which contribute to heart problems and strokes. Soya oil is too industrial — it uses benzene, a known carcinogen. Food should give us health, not disease, and the poorest of women are aware of this fundamental fact.

Navdanya, with the National Women’s Alliance for Food Sovereignty (Mahila Anna Swaraj), started the Sarson Satyagraha to bring back pure mustard oil. The slogan, “Sarson bachao, soyabean bhagao”, rang on the streets of Delhi in 1998. The first bottle of Satyagraha Mustard Oil was gifted to the then chief minister of Delhi, Sahib Singh Verma. Today we are able to enjoy our mustard oil because of the Sarson Satyagraha of 1998.

Our mustard is once again under threat, this time from genetic engineering of mustard for sterility and herbicide tolerance by Dr Deepak Pental, Delhi University’s former vice-chancellor. Not only do we not need genetically engineered mustard, the traits being introduced by genetically modifying mustard are known to be hazardous and are illegal under international and national law.

Dr Pental, who has spent time in Tihar jail for plagiarising a colleague's work on mustard, is now blatantly violating laws that protect our biodiversity and farmers' rights.

The genetically modified organism (GMO) mustard is based on what has been called the "Terminator Technology" to make the harvested seed sterile. The United Nations Convention on Biodiversity has banned the use of "Terminator Technology". It is also illegal under India's Protection of Plant Variety and Farmers Right Act, 2001. The patent for this technology is held by the US' department of agriculture and Delta & Pine Land (a company now owned by Monsanto).

Dr Pental has used "Terminator Technology" based on the barnase gene which is lethal to cells. In addition to the terminator trait, GMO mustard has been engineered to be resistant to the herbicide Glufosinate, which halts photosynthesis, resulting in plant death. When Glufosinate is sprayed in fields, all other plants die except the herbicide resistant GMO.

These are technologies for killing life, not for growing food. They must be banned.

In India, on our small farms, we grow mustard with wheat. Such mixtures increase productivity as well as farmers' incomes. A herbicide-resistant GMO mustard will kill the wheat, lowering farm productivity and undermining our food security. Herbicide-resistant crops also put evolutionary pressure on weeds, contributing to the emergence of superweeds. In the US, due to increased herbicide use, 50 per cent of farmlands are over-run by superweeds.

The demand for pure organic mustard oil is growing in India since most edible oils are "blended" with GMO soya oil or GMO Bt cotton seed oil. The introduction of GMO mustard with terminator traits will deny Indian citizens the right to safe and pure mustard oil because of the risk of contamination.

The GM DNA can enter cells of unrelated species and be incorporated into the cell's genome through horizontal gene transfer. The genes involved are fatal.

Barnase is known to be harmful, if not lethal, to all cells, animal and human cells included. When perfused into rat kidneys, barnase causes kidney damage. When the recombinases used for gene splicing are expressed at high levels in the sperm cells of transgenic mice, the males become 100 per cent sterile.

Because we need independent assessment of the long-term impact of these technologies, in 2012, the Technical Expert Committee (TEC) of the Supreme Court recommended a 10-year moratorium on GMO trials to create a robust system for biosafety regulation. Such regulation cannot be left to those involved in risky experiments, people and companies who are also trying to push hazardous GMOs onto our farms and into our food.

In addition, the TEC recommended that no herbicide resistant crops be introduced in India because our farmers are small and herbicides will destroy our biodiverse food crops. It also recommended that we do not genetically engineer crops of which we are a "centre of diversity". India is the home of genetic diversity of mustard.

Every law, every scientific principle of biosafety is thus being undermined to push "Terminator Mustard" on India's farmers and thalis. GMO mustard is being justified on grounds that we are importing edible oils and GMO mustard will reduce imports by increasing production. The claim that this "Terminator Mustard" will increase yields by 30

per cent is scientifically false and a blatant lie. Compared to the non-GMO hybrid, the GMO hybrid cannot have higher yields.

India is importing edible oils because imports were forced on us. When soya oil started to flood India's markets in 1998, the international price was \$150 per tonne, while the subsidy from the US government to its soya producers was \$190 per tonne. In effect, this was dumping.

The Indian government further subsidised soya oil for the public distribution system by Rs 15,000 per tonne, making imported soya oil artificially cheaper than domestically produced mustard oil.

We need to get rid of these distorting subsidies and unjust trade rules to defend our food sovereignty and ensure Indians get healthy and safe food that's "Made in India" by Indian farmers.

We need to stop the insanity of transforming mustard — the symbol of spring and abundance in our culture — into a toxic crop with terminator genes, sprayed with lethal herbicides that kill everything green and directly damage our health.

On July 31, 2015, we renewed the Sarson Satyagraha by taking a pledge at Mahatma Gandhi's memorial at Rajghat to protect the diversity, purity and safety of our mustard because "Anna Swaraj" is our birthright.

*Vandana Shiva is the executive director of the Navdanya Trust*

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