

FIELD TRIALS OF GM CROPS, BIOSAFETY AND HUMAN HEALTH

The permission granted to conduct field trials of genetically modified (GM) crops in India by the environment minister, inspite of the matter being subjudice before the Supreme Court, might lead to irreversible contamination of the germ plasm of the farm and forest wealth of the country, having largest areas of arable and irrigated land. Sensing this seriousness, the six member technical experts' committee of the Supreme Court too had unequivocally recommended an indefinite moratorium on such trials, unless the shortcomings in the regulatory process were plugged. However, out of respect for the dissenting note of the nominee of the ministry of agriculture, R.S. Paroda, the Supreme Court has opted to offer one more opportunity to the government to further clarify its stand, by issuing a show cause notice to the government, before deciding on the petition seeking a moratorium against such fateful trials. But, the government instead of filing the reply and waiting for the apex court's decision has shown undue haste in granting this controversial permission. For a country like India, what would be left, if its agri-biodiversity and the germ plasm of vast and diverse flora is contaminated or destroyed? **For the sake of scientific research and development (R&D), the trials should have been ordered in close green houses of either glass or PVC.**

The GM crops have been reported to have caused severe health problems among the subjects fed on these crops. Even, several FDA scientists in the US have agreed that the GM foods in general create unpredicted allergies, toxins, antibiotic resistant diseases, and nutritional problems. In the early 1990's when rats were fed with genetically modified (GM) tomatoes, they refused to eat them, and when force-fed, several of them developed stomach lesions and seven out of forty died within two weeks. A UK government-funded study has found alarming evidence that rats fed on GM potato developed potentially pre-cancerous cell growth, decline in immunity, partial atrophy of the liver, and inhibited development of their brains, livers and testicles. It has also been found that the rats fed on GM corn had problems with blood cell, kidney and liver formation. Mice fed on GM soy developed problems with liver cell formation and pancreatic functions, and the livers of the rats fed on GM canola were heavier. The Pigs fed on GM corn on several Midwest farms developed false pregnancies or sterility. When cows were fed on GM corn in Germany, they are reported to have died mysteriously. Twice the numbers of chickens are reported to have died, when fed on GM corn, compared to those fed on natural corn. In a human feeding study conducted showed that the gene inserted into soybeans spontaneously got transferred from the GM food into the DNA of gut bacteria of the subjects. It means that the bacteria inside our intestines may create the novel protein inside by virtue of this gene getting into these bacteria. If it (novel protein) was allergic or toxic, it can potentially affect people in long term, even after the subjects would give up eating GM soyabeen, or other GMOs. For instance, if the antifreeze gene being attempted to be added from cold water fish, into tomato, to create frost resistant tomato would reach into the cells of the body or to bacteria in the gastrointestinal tract, or into the foetus of the consumer. How shall it behave, is unpredictable. Though, this attempt of transplanting antifreeze gene of fish has now been dropped. But, the antibiotic genes being transferred into fruits and vegetables, might create severe problem for healthcare if they would ever get transferred in the human body. An expert panel of the World Health Organization (WHO) has also cautioned against the use of antibiotic resistant genes in genetic engineering.

Outcrossing (i.e. movement of alien genes transplanted into the GM crops into conventional crops or related species in wild) or mixing of crops obtained from ordinary non-GM seeds, with those grown from GM seeds, may have fatal effect on food safety and food security as well as on the biosafety of the flora of the country. Traces of a maize-type, approved for cattle feed have also appeared in the maize products for

human consumption in the US.

Contamination of the conventional crops from the GM has been occurring world over, wherever the GM crops have been grown commercially or on trial in open. Mexico has already imposed a moratorium on new plantings of GM maize since 1998, though, it still allows the import of GM crops for consumption. Yet, the DNA from a genetically modified corn has been discovered in wild maize even on remote mountains in Mexico. Contamination of local corn varieties from genetically engineered corn in Mexico might even cause their extinction. If this diversity of local corn in Mexico is lost, future food security would be at stake. The GM contamination register of Greenpeace International and Green Watch UK has reported 26 instances of contamination of normal crops or food from GM crops, world over ranging from Saudi Arabia, Switzerland, Germany, Philippines, China, US, Slovakia, Finland, Belgium, France, Austria, South Africa, Netherland, Namibia, Romania, Italy etc., while many of these countries have a moratorium on GM crops. The case of the Star-Link Corn, GM maize of the Aventis Company is also worth mention here; wherein, this ill fated GM corn was alleged to have caused allergy in Japan and Korea which had to be recalled. The Aventis had to pay \$ 60 million (Rs. 400 crore at today's exchange rate) in damages in 2000 for contamination of taco shells (a food product). In the US, large farming companies can maintain separate inventories of GM and non GM crops. Shall it be feasible for small illiterate Indian farmers and traders in India to maintain segregate inventories?

Since, in all the GM crops, an alien gene from any other plant, animal or micro-organism is transplanted to import an attribute of that alien specie; the pollen grains of the GM crops bearing that alien gene can contaminate the germ plasm of the neighboring flora (including normal crops or a related wild specie), through cross pollination. Hundreds of plant varieties have already been engineered by importing genes from other plant or animal species. For example, a frost resistant tomato is developed by transplanting the gene of cold water fish, which gives cold resistance to that fish. Likewise, the genetically modified B.T. Cotton which is resistant to boll-worm is developed by transplanting the gene from a bacteria, *Bacillus Thorengiansis*, which produces a toxin capable to kill the boll worm that attacks cotton crop. This toxin producing gene might also reach our food chain by cross pollinating any food crop. Though It does not happen normally, but cannot be altogether ruled out in the years to come. Any mutation, either benign or malevolent, may also occur in the GM crops and this mutation, if takes place and the malevolent mutation can contaminate the neighbouring vegetation silently with that malevolence. The mutation may occur within next generation or may not occur for millenniums to come. Since, a mutation can neither be predicted nor be ruled out in the GM crops, or even in the vegetation contaminated by the pollens of the GM crops, scientists recommend the use of terminator technology for GM crops. So, the chances of mutation as well as contamination of the neighbouring vegetation, by cross pollination are totally ruled out. But, if terminator seeds are sown, their off springs lack capability to germinate, the farmers would not get seeds from their crops reaped from terminator technology based seeds. So, the farmers sowing terminator seeds, would be deprived of their seed wealth. In India, the poor farmers cannot afford to buy the costly patented seeds every year. So they would have no option, except to go for contract farming for the seed producing foreign multi-national companies (MNCs).

Thus in view of all these severe repercussions, the permission granted for the trial of these GM crops be withdrawn and meanwhile, no state government should allow these trials within their territories. The states like Haryana, Maharashtra etc, which are being reported to be having no objection to such trials may also clarify their stand for a moratorium on the trial of GM crops without effective regulatory safeguards.


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