

## Genetic Engineering

Genetic engineering (GE) or Genetic Modification refers to techniques that are used to change the genetic makeup of cells of plants and animals to bring about a desired function e.g. insect resistance, herbicide tolerance, etc.

While the science of genetic engineering envisions a world of possibilities in harnessing the diversity of nature in various convenient ways, the technology and actual practice has been quite crude and imprecise leading to unpredictable, unnatural processes which are irreversible.

There are many issues that have to be resolved at this juncture when, the government has almost decided to commercialise its first genetically engineered food crop, Bt brinjal. There is a new authority in the anvil for the approval of GM crops, the national biotechnology regulatory authority which hopes to reduce the 'unnecessary convolutions' in the approval process and fast-track approvals. The roles of all the ministries might get reduced to an advisory role in the new act.

## Health impacts

The report documents many peer reviewed studies to support the health impacts of GE crops. There is a paucity of accurate information; a direct result of the meagre scientific attention the issue has been accorded. What information exists has not been adequately collated. However, there have been sporadic studies conducted by independent scientists and the findings are rather disturbing. Immune system disorders, allergic reactions, increased vulnerability of children over adults for the effects as well as the possibilities of Horizontal gene transfer between GM food and other micro organisms- all of them exist and are important questions to be answered by the health authorities of any country.

## Regulation: past imperfect: Future tense

A track record of keeping all field trials in a safe and contained manner has never been achieved by the authorities in the country. Whenever an independent investigation is done- it has found violations like not destroying the produce after trial, farmers unaware of the trials and consuming GM food, even instances of trial produce reaching the market and sold. To make things worse, information regarding the safety tests of GM crops has been denied. Information requests have even been dragged to the courts on grounds of confidentiality of the information. In the 19 year history of the GEAC (Genetic Engineering Approval Committee) has never issued guidelines regarding the regulation of imported GM food products while imports of illegal GM food has been found and reported in Indian markets.

## The end of choice for Consumers and Farmers

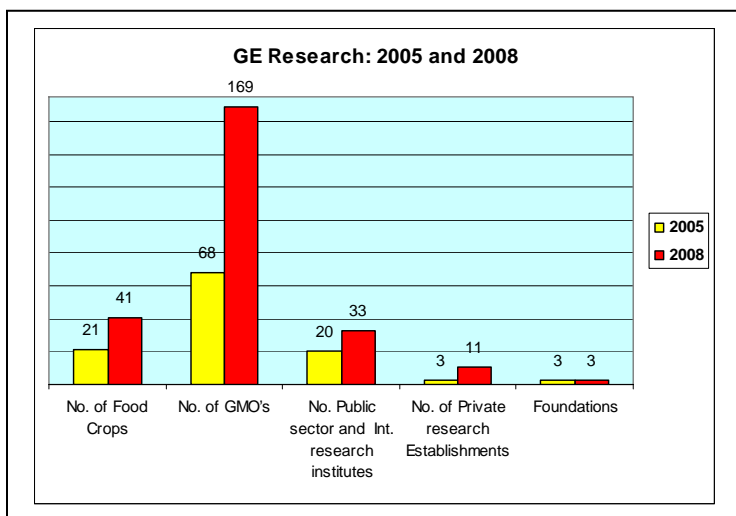
With all these issues unresolved, the right to choose is the only option a consumer is left with in order to protect himself from a food technology so mired in controversy. But there is no framework for giving a choice for a GM or a GM free food in the

regulatory system in India. The GEAC terms the approval of a transgenic crop as “deliberate release” and this leaves no space for distinguishing a GM and a non-GM variety. As a result of this – cases of contamination become inevitable. This is exposed in a case of case of an organic farmer in Mysore District of Karnataka. This incident is the precedent to the fact that Farmers will have no choice other than to grow GM in the future and any economic losses due to contamination cannot be compensated because there is no regulation on liability for contamination. While labeling of GM food – which is not yet mandatory in India- seems to have kept the issue of choice of consumers in Europe – incidents of illegal GM food keeps surfacing. Almost every time it was the civil society organizations that found the contamination incidents and alerted the governments which acted quickly on them. The LL 601 incident – contamination from a field trial 8 years back, completely dashed hopes of how long can a contamination last- and how insidious can it be. With increasing investment in GE research and amendments in the regulatory system (essentially ensuring quick approvals), we will be left with little or no choice if we fail to assert our right to choose. There is only one definite outcome of the genetic engineering of food -- the end of choice.

### The Silent GM Food Explosion

While the first GM food crop is yet to clear bio safety approval, there has been a quantum jump in investment in GM research, especially in the last three years.

Compared to 2005, where the research was focused on 21 crops containing staple cereals, lentils, vegetables, fruits, and the research investment was low. Today Rice alone has about 24 different GMOs. Tomato is the second most experimented food crop with 23 events. The other major crops are sorghum and tobacco closely followed by brinjal, groundnut, pigeon pea, potato, mustard, sugarcane, cowpea and soy. Brinjal however is the first crops to go into large scale field trials and is thus expected to be the first crop to be approved.



Over 236 GMOs, of which 169 are food crop varieties, are in different stages of trials at different private and public institutes in India. An alarming number of food crops are undergoing open field trials, which implies that the scope of contamination is magnified.

### Transgenic medicines and trees:

Another new area of research is the genetic engineering of medicinal herbs and trees. Unlike crops, medicines are not an issue of food rather they are a whole new range of health and economical implications. The Indian Systems of Medicine have identified 1500 medicinal plants, of which 500 species are mostly used in the preparation of drugs. The effectiveness of these drugs mainly depends upon the



proper use and sustained availability of genuine raw materials. With transgenic herbs, the fundamentals of traditional medicine and healing may need to be re-questioned. Likewise, If GM tree plantations of various species become widespread; the long-term effects on forest ecosystems are likely to be devastating. There are also questions over the long-term effectiveness of this approach, as the target insects can develop resistance.

Genetic gamble:

Food crises, the weak regulatory system, a practically non-existent health ministry, low health literacy and a naïve and gullible population makes it easier for people in power to influence the market, the laws and acts, and actively promote GM foods without any sense of accountability. This needs to be urgently addressed.

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