Hazards of GMOs Bharat Dogra

All over world the controversy over genetically engineered (GE) food and genetically modified (GM) crops, commonly called genetically modified organisms (GMOs) is heating up as more and more evidences become available on their extremely serious hazards and threats. What needs to be emphasised is that these warnings have the support of some of the world's most eminent and well-qualified independent scientists and experts in the field.

In May 2000 761 scientists from 79 countries signed an open letter to express their serious concern about the hazards GMOs pose to environment, food security, human and animal health. This statement of world's scientists was presented to the UN convention on Biological Diversity in Nairobi in year 2000.

In 2003 the Independent Science Panel, which consists of expert independent scientists from 11 countries covering a wide range of relevant disciplines reviewed the evidence on the hazards of GMOs. This review concluded that many GM crops contain gene products known to be harmful. For example, the Bt proteins that kill pests include potent immunogens and allergens. Food crops are increasingly being engineered to produce Pharmaceuticals, drugs and vaccines in the open environment, exposing people to the danger of inappropriate medication and their harmful side effects. Herbicides tolerant crops–accounting for a majority of all GM crops worldwide–are tied to the broad-spectrum herbicide glyphosate and glufosinate ammonium. These have been linked to spontaneous abortions, birth defects and other serious health problems for human beings, animals and soil-organisms. GM varieties are unstable, with the potential to create new viruses and bacteria that cause diseases, and to disrupt gene function in animal and human cells.

Earlier in the USA several prominent scientists (including Nobel laureates) got together to form the Washington-based Union of Concerned Scientists (UCS) and pleaded for caution in the commercial introduction of new genetically engineered products.

Howard Riss the executive director of UCS, said that they do not oppose continued research and development in this field, but insist that government approvals needed for commercialisation of transgenic crops should be halted until the government can assess and control the risks.

UCS released a study by Dr Jane Rissler and Dr Margaret Mellon which attracted widespread attention for what it has to say on the possible environment impact of genetic engineering in agriculture.

Among other things, the Rissler-Mellon study warns against the possibility of introduction of new viruses and diseases as well as proliferation of weeds. The possibility of harm will rise as the number and variety of these crops increase. Moreover, the fact that a transgenic crop has been approved as safe in USA will not mean that risks do not exist in the different environment conditions prevailing in other countries.

The Union of Concerned Scientists also studied the question of whether genetically engineered crops should be commercially released. Their 1993 study 'Perils Amidst the Promise', concluded, among other things that :

• No company should be permitted to commercialise a transgenic crop in the United States until a strong government programme is in place that assures risk assessment and control of all transgenic crops and gives adequate consideration to centres of crop diversity in the US and elsewhere in the world.

• The appropriate United Nations organisation should develop international biosafety protocol, which are necessary to ensure that developing countries, especially those harbouring centres of crop genetic diversity, can protect against the risks of genetically engineered crops.

In 1994 several scientists involved in studying the implications and impacts of genetic engineering got together at the International Conference on 'Redefining of Life Sciences' organised at Penang, Malaysia, by the Third World Network. They issued a statement (the Penang Statement, or PS) which questioned the scientific basis of genetic engineering. This statement said:

The new biotechnology based upon genetic engineering makes the assumption that each specific feature of an organism is encoded in one or a few specific, stable genes, so that the transfer of these genes results in the transfer of a discrete feature. This extreme form of genetic reductionism has already been rejected by the majority of biologists and many other members of the intellectual community because it fails to take into account the complex interactions between genes and their cellular, extracellular and external environments that are involved in the development of all traits.

It has thus been impossible to predict the consequences of transferring a gene from one type of organism to another in a significant number of cases. The limited ability to transfer identifiable molecular characteristics between organisms through genetic engineering does not constitute the demonstration of any comprehensive or reliable system for predicting all the significant effects of transposing genes.

The PS concludes, "The supposed social and financial benefits of genetic engineering research projects should be weighed against the environmental, health and financial risks. It is often said by proponents of genetic engineering that the risks are hypothetical. In reality, the benefits that are being claimed are generally even more hypothetical, whilst there is a firmer basis for taking the risks seriously."

A four-part series of experiments conducted over 3 years by the Royal Society for the Protection of Birds and the Centre for Ecology and Hydrology, Lancaster (United Kingdom) concluded that GM crops could be more harmful to many groups of wild life than their conventional equivalents. According to these studies, Bt proteins, incorporated into a significant part of all GM crops, have been found to be harmful to many non-target insects, worms and amphibians. The serious threat to amphibians was also confirmed in research at Pitt's Pymaturing Laboratory of Ecology.

A technical report by Dr Charles Benbrook, former Executive Director of the Board on Agriculture of the US National Academy of Science, concluded in a review of nine years of US agriculture data that the spread of GM crops actually led to an increase in pesticide use instead of the promised reduction. $\Box\Box\Box$