

The impact of genetic modification of human foods in the 21st century by MS Swaminathan

Noted agricultural scientist MS Swaminathan, hailed as the mentor of the Green Revolution that saw India achieve self-sufficiency in foodgrain, feels GM technology, which has generated much heat in the country, will soon become "obsolete" with the advent of nano-technology and other solutions. He also felt that it was "very important" that the loans of farmers across the country be waived — as the new Uttar Pradesh government has done — due to the prolonged drought, climatic aberrations and adverse market conditions.

Speaking on the efforts by a group of scientists pushing for commercial cultivation of genetically modified (GM) crops in India as well as the opposition to this by environment activists, Swaminathan said there was no clear public policy on GM crops. Swaminathan said new technologies were coming, which could be used to achieve the objective of food security but noted that this required concrete political intervention.

support for the farmers. "In India, food production is not just about food but the basis of livelihood, very fundamental livelihood of farmers. The farmers are going through a difficult period. These difficulties have arisen from climatic aberrations, more drought, less water, more heat. So it is important that their issues get much more attention. That is why a loan waiver is important," he contended. Another factor adding to the farmers' agony was poor returns for their yield despite assurances from the government, he said.

"The market conditions are affecting them as they are not getting the announced price (minimum support price). Media reports say the purchase of pulses and oil-seeds is poor as farmers are not getting the announced price," said Swaminathan. A group of 40-odd farmers from Tamil Nadu has been protesting at Delhi's Jantar Mantar for over a month, demanding a loan waiver.

He also felt that the central and state governments should work together to adopt a number of measures — both short term and long term — including the human issues of farmers, various steps to provide incentives, alleviation of human distress and revival of agriculture. Import and export policies, food pricing and food policy are also important," he added. Noting that that the monsoon and the market were the two important determinants for farmers' well-being, Swaminathan said: "I am happy to see that monsoon will be normal this time."

Speaking about the various initiatives launched by the central government such as an insurance scheme for farmers, More Crop and Income Per Drop of Water and the Soil Health Card "very useful" to achieve the goal of doubling the income of agriculturists. Swaminathan was chairman of the committee that prepared a report on the More Crop and Income Per Drop of Water initiative. He said there

should now be an "Evergreen Revolution" and defined this as "increase in productivity in perpetuity where ecology and technology go hand-in-hand".

Genetic engineering of food is the science which involves deliberate modification of the genetic material of plants or animals. It is an old agricultural practice carried on by farmers since early historical times, but recently it has been improved by technology. Many foods consumed today are either genetically modified (GM) whole foods, or contain ingredients derived from gene modification technology. Billions of dollars in U.S. food exports are realized from sales of GM seeds and crops. Despite the potential benefits of genetic engineering of foods, the technology is surrounded by controversy. Critics of GM technology include consumer and health groups, grain importers from European Union (EU) countries, organic farmers, environmentalists, concerned scientists, ethicists, religious rights groups, food advocacy groups, some politicians and trade protectionists. Some of the specific fears expressed by opponents of GM technology include alteration in nutritional quality of foods, potential toxicity, possible antibiotic resistance from GM crops, potential allergenicity and carcinogenicity from consuming GM foods. In addition, some more general concerns include environmental pollution, unintentional gene transfer to wild plants, possible creation of new viruses and toxins, limited access to seeds due to patenting of GM food plants, threat to crop genetic diversity, religious, cultural and ethical concerns, as well as fear of the unknown. Supporters of GM technology include private industries, research scientists, some consumers, U.S. farmers and regulatory agencies. Benefits presented by proponents of GM technology include improvement in fruit and vegetable shelf-life and organoleptic quality, improved nutritional quality and health benefits in foods, improved protein and carbohydrate content of foods, improved fat quality, improved quality and quantity of meat, milk and livestock. Other potential benefits are: the use of GM livestock to grow organs for transplant into humans, increased crop yield, improvement in agriculture through breeding insect, pest, disease, and weather resistant crops and herbicide tolerant crops, use of GM plants as bio-factories to yield raw materials for industrial uses, use of GM organisms in drug manufacture, in recycling and/or removal of toxic industrial wastes. The potential risks and benefits of the new technology to man and the environment are reviewed. Ways of minimizing potential risks and maximizing the benefits of GM foods are suggested. Because the benefits of GM foods apparently far outweigh the risks, regulatory agencies and industries involved in GM food business should increase public awareness in this technology to enhance worldwide acceptability of GM foods. This can be achieved through openness, education, and research.