

inactivation effect on the host genes.¹⁶ As a consequence, this may result in alterations in metabolic pathways and may produce toxic substances.²

In general, herbicide-resistant crops are produced through 2 mechanisms: by changing the herbicide-attacking enzyme genetically, or by introducing detoxifying enzymes.² People are concerned that 1 day those herbicide or pesticide-resistant genes may incidentally pass to bacteria or insects that are intended to be killed, and we will need to use more or develop new kinds of pesticides. On the other hand, in order to isolate the transformants for transferring the gene, selectable markers that are used to identify if the first gene has been inserted into the host successfully are often applied. These markers are encoded with a bacterial enzyme that has been detoxified by antibiotics. Many have argued that the antibiotic ability may also pass to bacteria, which could result in antibiotic-resistant bacteria someday. It was reported by the British Press¹⁷ in 1999 that when GM potatoes were fed to lab rats, it caused damage to vital organs like stomach linings, due to a high possibility of viral infection that is used for transferring the gene into potatoes.

Some GM crops can produce antibiotics that are toxic to pests but not human beings. It is a concern that these pests may mutate and acquire resistance to these antibiotics. On the other hand, GM crops that cause the death of one type of insect, pest, or even bacterium may also disrupt food chains within nature.

Another potential hazard of GM crops to human beings is the occurrence of allergens that may be produced. One of the possible reasons is that the protein that is produced by the new DNA may not be acceptable by the human body. A report from the UK indicated that an increasing percentage of allergies due to the trypsin inhibitor in soya produced by Monsanto has been found. The cause has not been determined yet, but GM soybeans are highly suspected.¹⁶

Environmental

Although the GM crops are intended to kill unwanted insects, they may also kill some beneficial insects like ladybugs, beneficial soil microorganisms, or even birds. There is a possibility that the seeds of GM crops will be carried by wind, rain, birds, or insects to other plants

nearby, which would result in so-called "genetic pollution".¹⁷

Economical and Political

The economic problems that can result from GM crops are that most of the companies that produce GM products also produce other related products used along with the GM products. Therefore, instead of controlling their own crops, farmers are now controlled by those big companies. Furthermore, agriculture in other countries that rely on importing seeds or crops may also be affected. Many Third World countries have decided to reject GM products, and there are still many countries that are discussing the issue.¹⁶

It is necessary to improve consumers' understanding so they are better able to evaluate new developments in food biotechnology. Therefore, in the future, if you have the choice between traditional and GM tomatoes in the supermarket, which one will you pick?

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