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Genetically Modified Crops — Our Future Foods?

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From the dinosaurs in the movie "*Jurassic Park*" to the cloned lamb "Dolly", people have understood the magic of genetic engineering in biological systems. The issue was amplified when the possibilities of human cloning were reported. Although human cloning may be applicable for organ transplantation, blood transfusions, and treatment of certain diseases, including Alzheimer's disease and Parkinson's disease, the ethical problems are being debated. Similar issues were evoked regarding the plant kingdom after the plant revolution in which plants were modified by genetic engineering. To increase the production efficiency and the nutritional values of the food supply, the compositions of various agricultural crops, such as grains, fruits and vegetables that we usually consume, have been altered by this modern technique. To date, various kinds of food that we purchase from the market have been mixed with these genetically altered species, and we have not been informed of it. Like with human cloning, public perception, the acceptance, and the safety of these foods are being discussed.

WHAT ARE GM CROPS?

Plants possessing altered genomes, termed genetically modified (GM) crops, take advantage of genetic engineering techniques by which genes of interest are manipulated in the laboratory and then inserted into plant genomes. In general, a foreign gene that specifies a new protein or alters the levels of expression of an endogenous gene can be introduced. Therefore, GM crops usually have expression of a higher level of a desirable one or a lower level of an undesirable protein. The process of introducing foreign genes into the genome of an organism is called transformation, and different techniques are available depending upon the various systems.[1,2] In higher plants, the transformation is commonly mediated by derivatives of *Agrobacterium tumegaciens,* the bacterium that usually causes tumorous crowns on infected species.[1] DNA sequences, T-DNA (transferred DNA) regions, and *Vir* (virulence) genes in large Ti (for tumor-inducing) plasmids in these bacteria are necessary for the gene transfer to plants. Therefore, the genes of interest can be inserted into the modified T-DNA vector from *Agrobacterium* genes necessary for pathogenesis which have been removed and then are transferred to plants. After being stably incorporated into the plant genome as judged by the co-transfer of an antibiotic-selectable marker gene, the gene of interest will be stable for many generations and probably indefinitely. Another approach to creating the GM

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