



Issue Brief

Genetically Engineered Foods – Scientific Miracles or Minefields?

by Leonard Sahling

Americans possess widely disparate views about the presence of genetically modified organisms (GMOs) in their foods. The vast majority are indifferent to them. They may have a vague awareness and understanding of GMOs, but remain unconcerned about their presence in the food supply. But some Americans possess (and express) strong opinions, either for or against GMOs. Congregated at one end of the opinion spectrum are the proponents who regard GMOs as beneficial, safe, benign, and a scientific boon to mankind. At the other end of the spectrum is a vocal group who are passionately opposed to GMOs. They would prefer either to ban them totally or to impose a system of mandatory labeling on all GMO ingredients found in foods.

The objective of this in-brief report is to outline the key issues and concerns that swirl around GMOs. The intent is not to stake out a position for or against GMOs or related issues, but rather to outline the facts and foster a better understanding of the two dueling points of view.

What are GMOs?

Genetic engineering [GE] involves the “manipulation of an organism’s genes by introducing, eliminating, or rearranging specific genes using the methods of modern molecular biology.”¹ It typically involves splicing a new gene, or genes, into a plant’s DNA in order to introduce new characteristics or traits such as enhancing the growth or nutritional profile of food crops. Scientists do this “either by using bacteria to deliver the new genetic material or by shooting tiny DNA-coated metal pellets into plant cells with a gene gun.”² It’s an imprecise method, but scientists can repeat the process until they succeed in implanting the foreign DNA into just the

right spot in the genome. Most of the genetically engineered plants currently being marketed are transgenic, which means that the newly added gene comes from the DNA of a different species.

Why are these new GE plants and foods being invented?

Until fairly recently, the foremost reason for altering the genetic make-up of plants was to produce new traits or characteristics that would shore up the plants’ defenses against environmental challenges and hazards such as weeds, insect damage, fungal infections, drought, salinity, or extreme weather.

To date, the most common transgenic trait continues to be herbicide tolerance, and this trait is available in all of the major row crops including corn, soybeans, cotton, rapeseed, alfalfa, and sugar beets. Weeds compete with these food crops for nutrients, sunlight, and moisture; and most herbicides cannot differentiate between weeds and food crops. Hence, herbicide-tolerant plants have been engineered to tolerate a specific herbicide such as glyphosate, which is highly effective against most weeds and allows farmers to use just one herbicide to combat their weeds, instead of the many herbicides that they would otherwise typically use. Farmers benefit from herbicide-tolerant plants inasmuch as they require less spraying, fewer pesticides, less tractor traffic in the fields, and lower operating costs.

Insect resistance is the second most common transgenic trait. Absent this trait, insects cause great damage to food crops both in the field and in storage facilities, destroying