

GMO

(GENETICALLY MODIFIED ORGANISMS)



NATURAL SEED



GMO SEED

organicexchange.org



Making Informed Choices

GMO's

“There are no studies that demonstrate the long-term safety of GMO's, their derivatives and products containing them to human health and the environment.”

– Pesticide Action Network

What are GMO's?

Genetically modified organisms (GMO's), also called “transgenic”, are lab-created new organisms, where the plant's characteristics have been altered by the artificial introduction of DNA from a different species. The genetically modified plants will have a new combination of genes—and therefore new combinations of traits. These traits could not have appeared naturally or even through hybridization or cross-breeding, and it cannot be predicted how they will interact with the present eco-systems or what will be their consequences in time.

The terms genetically modified (GM) and genetically engineered (GE) are used interchangeably by the industry.

Are Organic Farmers Allowed to Use GMO's?

No. The use of GM seeds is prohibited for all organic agriculture. Organic standards are process based: they confirm that organic practices have been followed, but do not guarantee that there has been no inadvertent contamination from GMO crops. Testing to detect GM material in organic products is not yet required by organic standards, however it is often done as part of the certification process.

What are the Genetic Traits Engineered Into Cotton?

The three types of genetically engineered traits for cotton are herbicide-tolerant (HT), insect resistant through *Bacillus thuringiensis* (Bt) and a combination of HT and Bt (stacked genes).

Herbicide-tolerant (HT)

Crops engineered to tolerate applications of herbicides, or so-called “herbicide-tolerant” crops (HT), account for the largest share of GE acres. Herbicide tolerance is intended to make weed control easier for the farmers; they can spray the GM cotton with the herbicide to kill weeds, leaving the crop unaffected. This allows for the use of broad-spectrum herbicides, such as glyphosate, which can kill the majority of green plants.

Bacillus thuringiensis (Bt)

Bt is short for Bacillus thuringiensis, a common soil bacterium that produces an insect toxin. By means of genetic engineering, the genes for the active agent (Bt toxin) can be transferred from Bt bacteria to plants. There they produce the toxic agent inside the plant cells, making them resistant to specific groups of insects.

The use of Bt cotton does not eliminate the need for insecticide applications in conventional cotton production for two reasons. Firstly, there may not be enough of a Bt toxin in the plant to kill the caterpillars (some species are more sensitive than others) and they survive and, secondly, other insects which are not affected by Bt may damage the cotton.

Stacked traits

Stacked traits are genetically modified crops that have more than one trait genetically engineered into the seed. For instance, a seed can be both Bt and HT.

What are the Main Concerns About GMO's?

Potential Environmental Impacts

- Loss of biodiversity: GE plants which are designed to kill pests may also kill beneficial insects, resulting in loss of biodiversity.
- Contamination of other plants: GE material can be transferred to other related crops and wild plants via cross-pollination. Once released it is nearly impossible to 'clean up' any unforeseen consequences. Flow of enhanced genetic material to weed species may result in the development of 'super-weeds' that resist control methods.
- Increased pesticide resistance: Some plants engineered to be herbicide resistant have resulted in an increased use of herbicides, adding to the already devastating effects of intensive farming on biodiversity. GE crops may also develop insect resistance and this often encourages the faster development of resistance to pest control products in insect populations, thereby leading to the use of more or stronger pesticides.

Potential Impacts on Human Health and Welfare

- **Financial:** GMO seeds are tightly controlled by the companies that produce them, and there is the concern that this will further consolidate corporate control over the agricultural systems, and undermine the ability of individual farmers to define their own farm systems. GMO seeds are also more expensive than regular ones and cannot be harvested by the farmers; therefore they fuel the cycle of debt that is often one of the greatest financial hardships for farmers.

- Allergens: Because protein sequences are changed with the addition of new genetic material, there is concern that the engineered or modified organism could produce known or unknown allergens.
- Naturally occurring toxins: There is concern that genetic engineering could inadvertently increase naturally occurring plant toxins.

Precautionary Principle

The precautionary principle is one that a number of countries, including Australia, Japan and the EU, have used as their reason for banning the use of GMO's.

The precautionary principle is a moral and political principle which states that if an action or policy might cause severe or irreversible harm to the public or to the environment, in the absence of a scientific consensus that harm would not ensue, the burden of proof falls on those who would advocate taking the action.

“When an activity raises threats of harm to human health or the environment, precautionary measures should be taken even if some cause and effect relationships are not fully established scientifically. In this context the proponent of an activity, rather than the public, should bear the burden of proof.

The process of applying the precautionary principle must be open, informed and democratic and must include potentially affected parties.

It must also involve an examination of the full range of alternatives, including no action.”

- www.sehn.org

RESOURCES

United States Department of Agriculture (USDA) – www.usda.gov

Pesticide Action Network – www.pan-uk.org

Other important issues available in the
Making Informed Choices series, include:

Climate Change

Eco Fibers

Fair Trade

Organic Cotton: Your Healthier Choice

Pesticides



Organic Exchange (OE) is a nonprofit organization with staff in over ten countries committed to expanding global organic fiber agriculture, using organic cotton as the original catalyst. Improving organic cotton production addresses key environmental issues impacting cotton and also facilitates discussions about agricultural issues worldwide including: biodiversity, food security, poverty alleviation, strengthening rural communities, water quality and utilization, soil protection, and climate change impacts.

OE brings together brands, retailers, supply chain partners, farmers, and other key stakeholders to learn about the social and environmental benefits of organic agriculture and develop new business models and tools that support greater use of organic fibers and sustainable textiles.

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