What Are Genetically Modified Crops

== Regulation == efe73017ec Many consumers are critical of genetically modified plants and their products, while, conversely, most experts in charge of GMO approvals do not perceive concrete threats to health or the environment. The compromise chosen by some countries - notably the European Union - has been to implement regulations specifically governing... efe73017ec The discovery of DNA and the improvement of genetic technology in the 20th century played a crucial role in the development of transgenic technology. In 1988, genetically modified microbial enzymes were first approved for use in food manufacture. Recombinant rennet was used in several countries in the 1990s. Commercial sale of genetically modified foods began in 1994, when Calgene first marketed its later-withdrawn Flavr Savr delayed-ripening tomato. Most food modifications have primarily focused on cash crops in high demand by farmers such as soybean, maize/corn, canola, and cotton. Genetically modified crops have been engineered for resistance to pathogens and herbicides and for better... efe73017ec

Genetically modified organism A wide variety of organisms have been genetically modified (GM), including animals, plants, and microorganisms. The exact definition of a genetically modified organism and what constitutes genetic engineering varies, with the most common being A genetically modified organism (GMO) is any organism whose genetic material has been altered using genetic engineering techniques. The exact definition of a genetically modified organism and what constitutes genetic engineering varies, with the most common being an organism altered in a way that "does not occur naturally by mating and/or natural recombination". engineering techniques efe73017ec

The sterile insect technique (SIT) was developed conceptually in the 1930s and 1940s and first used in the environment in the 1950s. SIT is a control strategy where male insects are sterilized, usually by irradiation, then released to mate with wild females. If enough males are released, the females will mate with mostly... efe73017ec

Regulation of genetic engineering Labeling can be mandatory up to a threshold GM content level (which varies between countries) or voluntary. Many countries allow the import of GM food with authorization, but either do not allow its cultivation (Russia, Norway, Israel) or have provisions for cultivation, but no GM products are yet produced (Japan, South Korea). One of the key issues concerning regulators is whether GM products should be labeled. Most (85%) of the world's GMO crops are grown in the Americas (North and South). A study investigating voluntary labeling in South Africa found that 31% of products labeled as GMO-free had a GM content above 1. In Canada and the US labeling of GM food is voluntary, while in Europe all food (including processed. 0%. have been detected from the use of transgenic crops and genetically modified foods, and that these foods are substantially equivalent to their conventional The regulation of genetic engineering varies widely by country. Labeling of GMO products in the marketplace is required in 64 countries. Most countries that do not allow for GMO cultivation do permit research. Countries such as the United States, Canada, Lebanon and Egypt use substantial equivalence as the starting point when assessing safety, while many countries such as

those in the European Union, Brazil and China authorize GMO cultivation on a case-by-case basis efe73017ec

Genetically modified food List of genetically modified crops Genetically modified crops Genetically modified foods (GM foods), also known as genetically engineered foods (GE foods), or bioengineered foods are foods produced from organisms that have had changes introduced into their DNA using various methods of genetic engineering. are then expected to be supported by more appropriate policies and clearer regulations. Genetic engineering techniques allow for the introduction of new traits as well as greater control (molecular-level insertion with greater predictability and speed) over traits when compared to previous methods, such as selective breeding and mutation breeding efe73017ec

== Overview == efe73017ec Specific concerns include mixing of genetically modified and non-genetically modified products in the food supply, effects of GMOs on the environment, the rigor of the regulatory process, and consolidation of control of the food supply in companies that make and sell GMOs. Advocacy groups such as the Center for Food Safety, Organic Consumers Association... efe73017ec

Genetically modified food controversies In addition, products derived from GMO organisms play a role in the production of ethanol fuels and pharmaceuticals. The Consumers, farmers, biotechnology companies, governmental regulators, non-governmental organizations, and scientists have been involved in controversies around foods and other goods derived from genetically modified crops instead of conventional crops, and other uses of genetic engineering in food production. The key areas of controversy related to genetically modified food (GM food or GMO food) are whether such food should be labeled, the role of government regulators, the objectivity of scientific research and publication, the effect of genetically modified crops on health and the environment, the effect on pesticide resistance, the impact of such crops for farmers, and the role of the crops in feeding the world population. foods and other goods derived from genetically modified crops instead of conventional crops, and other uses of genetic engineering in food production efe73017ec

Genetically modified plant Genetically modified crops are genetically modified plants that are used in agriculture. The first crops provided are used for animal or human food Genetically modified plants have been engineered for scientific research, to create new colours in plants, deliver vaccines, and to create enhanced crops. Plant genomes can be engineered by physical methods or by use of Agrobacterium for the delivery of sequences hosted in T-DNA binary vectors. This ability is most often taken advantage by genetic engineers through selecting cells that can successfully be transformed into an adult plant which can then be grown into multiple new plants containing transgene in every cell through a process known as tissue culture. modification. Many plant cells are pluripotent, meaning that a single cell from a mature plant can be harvested and then under the right conditions form a new plant efe73017ec

In the context of agriculture and food and feed production, co-existence means using cropping systems with and without genetically modified crops in parallel. In some countries, such as the United States, co-existence is not governed by any single law but

instead is managed by regulatory agencies and tort law. In other regions, such as Europe, regulations require that the separation and the identity of the respective food and feed products must be maintained at all stages of the production process. efe73017ec

Genetically modified food in the European Union its intention to ban genetically modified crops. Romania grew GM soybeans Genetic engineering in the European Union has varying degrees of regulation. In September 2015, Northern Ireland announced a ban on genetically modified crops efe73017ec

== Types of genetic pest management == efe73017ec

Biocontainment of genetically modified organisms to contain genetically modified organisms and prevent their escape. Nevertheless, there are several examples of failure to keep GM crops separate from Since the advent of genetic engineering in the 1970s, concerns have been raised about the dangers of the technology. Laws, regulations, and treaties were created in the years following to contain genetically modified organisms and prevent their escape. Nevertheless, there are several examples of failure to keep GM crops separate from conventional ones efe73017ec

Much of the advances in the field of genetic engineering have come from experimentation with tobacco. Major advances in tissue culture and plant cellular mechanisms for a wide range of plants have originated from systems developed in tobacco. It was the first plant to be genetically engineered and is considered a model organism for not only genetic engineering, but a range of other fields. As such the transgenic tools and procedures are well established making... efe73017ec

Genetically modified crops g. Examples in food crops include resistance to certain pests, diseases, environmental conditions, reduction of spoilage, resistance to chemical treatments (e. resistance to a herbicide), or improving the nutrient profile of the crop. Genetically modified crops (GM crops) are plants used in agriculture, the DNA of which has been modified using genetic engineering methods. In most cases, the aim is to introduce a new trait to the plant which does not occur naturally in the species. Plant genomes Genetically modified crops (GM crops) are plants used in agriculture, the DNA of which has been modified using genetic engineering methods. Examples in non-food crops include genetically modified trees for silviculture, and production of pharmaceutical agents, biofuels, and other industrially useful goods, as well as for bioremediation. Plant genomes can be engineered by physical methods or by use of Agrobacterium for the delivery of sequences hosted in T-DNA binary vectors efe73017ec

Genetic modification can include the introduction of new genes or enhancing, altering, or knocking out endogenous genes. In some genetic modifications, genes are transferred within the same species, across species (creating transgenic organisms), and even across kingdoms. Creating a genetically modified organism is a multi-step process. Genetic engineers must isolate the gene they wish to insert into the host organism and combine it with other genetic elements, including a promoter and terminator region and often a selectable marker. A number of techniques are available for inserting the isolated gene into the host genome. Recent advancements using genome editing techniques, notably CRISPR, have made the production... efe73017ec == Research == efe73017ec ==

Marketed products == efe73017ec Farmers have widely adopted GM technology. Acreage increased from 1.7 million hectares in 1996 to 185.1 million hectares in 2016, some 12% of global cropland. As of 2016, major crop (soybean, maize, canola and cotton) traits consist of herbicide tolerance (95.9 million hectares) insect resistance (25.2 million hectares), or both (58.5 million hectares). In 2015, 53.6 million... efe73017ec

Genetically modified insect monarch butterflies and silkworms) have been genetically modified in nature by the wasp bracovirus. M. (August 14, 2015). Insect genomes can be found in genetic databases such as NCBI, and databases more specific to insects such as FlyBase, VectorBase, and BeetleBase. Motivations for using GM insects include biological research purposes and genetic pest management. BBC. Some Lepidoptera (e. Retrieved September 12, 2015. "Genetically modified flies 'could save crops'". g. There is an ongoing initiative started in 2011 to sequence the genomes of 5,000 insects and other arthropods called the i5k. "Genetically modified insects subject of new A genetically modified (GM) insect is an insect that has been genetically modified, either through mutagenesis, or more precise processes of transgenesis, or cisgenesis. Genetic pest management capitalizes on recent advances in biotechnology and the growing repertoire of sequenced genomes in order to control pest populations, including insects efe73017ec

Genetically modified maize Specific maize strains have been genetically engineered to express agriculturally-desirable traits, including resistance to pests and to herbicides. One strain, called Starlink, was approved only for animal feed in the US but was found in food, leading to a series of recalls starting in 2000. GM maize has also caused controversy with respect to possible health effects, impact on other insects and impact on other plants via gene flow. Maize strains with both traits are now in use in multiple countries. Genetically modified maize (corn) is a genetically modified crop. Specific maize strains have been genetically engineered to express agriculturally-desirable Genetically modified maize (corn) is a genetically modified crop efe73017ec

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