

The Tomato Crop A Scientific Basis For Improvement World Crop S

Genetically modified crops

cowpea for Africa and insect-resistant brinjal (eggplant). The first genetically modified crop approved for sale in the U.S. was the FlavrSavr tomato, which

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

Farmers have widely adopted...

Plant breeding

animals. The goals of plant breeding are to produce crop varieties that boast unique and superior traits for a variety of applications. The most frequently

Plant breeding is the science of changing the traits of plants in order to produce desired characteristics. It is used to improve the quality of plant products for use by humans and animals. The goals of plant breeding are to produce crop varieties that boast unique and superior traits for a variety of applications. The most frequently addressed agricultural traits are those related to biotic and abiotic stress tolerance, grain or biomass yield, end-use quality characteristics such as taste or the concentrations of specific biological molecules (proteins, sugars, lipids, vitamins, fibers) and ease of processing (harvesting, milling, baking, malting, blending, etc.).

Plant breeding can be performed using many different techniques, ranging from the selection of the most desirable plants for propagation...

Genetically modified food

unsuccessful Flavr Savr delayed-ripening tomato. Most food modifications have primarily focused on cash crops in high demand by farmers such as soybean

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. Genetic engineering

techniques allow for the introduction of new traits as well as greater control over traits when compared to previous methods, such as selective breeding and mutation breeding.

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 few countries in the 1990s. Commercial sale of genetically modified foods began in...

Agriculture

Columbian exchange brought New World crops such as maize, potatoes, tomatoes, sweet potatoes, and manioc to Europe, and Old World crops such as wheat, barley,

Agriculture is the practice of cultivating the soil, planting, raising, and harvesting both food and non-food crops, as well as livestock production. Broader definitions also include forestry and aquaculture. Agriculture was a key factor in the rise of sedentary human civilization, whereby farming of domesticated plants and animals created food surpluses that enabled people to live in the cities. While humans started gathering grains at least 105,000 years ago, nascent farmers only began planting them around 11,500 years ago. Sheep, goats, pigs, and cattle were domesticated around 10,000 years ago. Plants were independently cultivated in at least 11 regions of the world. In the 20th century, industrial agriculture based on large-scale monocultures came to dominate agricultural output.

As of...

Plant genetics

had a basic understanding of heredity and inheritance. This selection over time gave rise to new crop species and varieties that are the basis of the crops

Plant genetics is the study of genes, genetic variation, and heredity specifically in plants. It is generally considered a field of biology and botany, but it intersects with numerous life sciences, including molecular biology, evolutionary biology, and bioinformatics. Plants are used for genetic research in a multitude of disciplines. Understanding plant genetics is essential for improving crop yields, developing disease-resistant plants, advancing agricultural biotechnology and even making advancements in medicine. The study of plant genetics has significant economic and agricultural implications. Thus, there are many plant models that have been developed as well as genetic tools to study plants. Genetic research has led to the development of high-yield, pest-resistant, and climate-adapted...

Genetically modified food controversies

required for GM food crops may no longer be justified on the basis of scientific uncertainty. A well-known risk of genetic modification is the introduction

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. In addition, products derived from GMO organisms play a role in the...

History of agriculture

Al-Andalus. After the voyages of Christopher Columbus in 1492, the Columbian exchange brought New World crops such as maize, potatoes, tomatoes, sweet potatoes

Agriculture began independently in different parts of the globe, and included a diverse range of taxa. At least eleven separate regions of the Old and New World were involved as independent centers of origin.

The development of agriculture about 12,000 years ago changed the way humans lived. They switched from nomadic hunter-gatherer lifestyles to permanent settlements and farming.

Wild grains were collected and eaten from at least 104,000 years ago. However, domestication did not occur until much later. The earliest evidence of small-scale cultivation of edible grasses is from around 21,000 BC with the Ohalo II people on the shores of the Sea of Galilee. By around 9500 BC, the eight Neolithic founder crops – emmer wheat, einkorn wheat, hulled barley, peas, lentils, bitter vetch, chickpeas...

Regulation of genetic engineering

PMID 24041244. We have reviewed the scientific literature on GE crop safety for the last 10 years that catches the scientific consensus matured since GE plants

The regulation of genetic engineering varies widely by country. 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. 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). Most countries that do not allow for GMO cultivation do permit research. Most (85%) of the world's GMO crops are grown in the Americas (North and South). One of the key issues concerning regulators is whether GM products should be labeled. Labeling of...

Irrigation

aspect of agriculture for over 5,000 years and has been developed by many cultures around the world. Irrigation helps to grow crops, maintain landscapes

Irrigation (also referred to as watering of plants) is the practice of applying controlled amounts of water to land to help grow crops, landscape plants, and lawns. Irrigation has been a key aspect of agriculture for over 5,000 years and has been developed by many cultures around the world. Irrigation helps to grow crops, maintain landscapes, and

revegetate disturbed soils in dry areas and during times of below-average rainfall. In addition to these uses, irrigation is also employed to protect crops from frost, suppress weed growth in grain fields, and prevent soil consolidation. It is also used to cool livestock, reduce dust, dispose of sewage, and support mining operations. Drainage, which involves the removal of surface and sub-surface water from a given location, is often studied in conjunction...

Genetic engineering

since 1994, with the release of the Flavr Savr tomato. The Flavr Savr was engineered to have a longer shelf life, but most current GM crops are modified to

Genetic engineering, also called genetic modification or genetic manipulation, is the modification and manipulation of an organism's genes using technology. It is a set of technologies used to change the genetic makeup of cells, including the transfer of genes within and across species boundaries to produce improved or novel organisms. New DNA is obtained by either isolating and copying the genetic material of interest using recombinant DNA methods or by artificially synthesising the DNA. A construct is usually created and used to insert this DNA into the host organism. The first recombinant DNA molecule was made by Paul Berg in 1972 by combining DNA from the monkey virus SV40 with the lambda virus. As well as inserting genes, the process can be used to remove, or "knock out", genes. The new...

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