CHAIR REPORT

GA4

THE IMPACT OF THE USE OF GENETICALLY MODIFIED CROPS IN AGRICULTURE AND ITS ENVIRONMENTAL EFFECTS

President chair

Committee: GA4
Agenda Item:
Student Officer & Role:

Introduction

Genetically modified (or GM) plants have attracted a large amount of media attention in recent years and continue to do so. Despite this, the general public remains largely unaware of what a GM plant actually is or what advantages and disadvantages the technology has to offer, particularly with regard to the range of applications for which they can be used. From the first generation of GM crops, two main areas of concern have emerged, namely risk to the environment and risk to human health. As GM plants are gradually being introduced into the European Union there is likely to be increasing public concern regarding potential health issues. Although it is now commonplace for the press to adopt 'health campaigns', the information they publish is often unreliable and unrepresentative of the available scientific evidence.

Key Vocabulary

Genetically Modified Crops: Genetically modified 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.

Genetic Engineering: Genetic engineering is the process of using recombinant DNA technology to alter the genetic makeup of an organism.

Cultivation: Preparation and usage of land for crops or gardening.

WHO: the World Health Organization is a specialized agency of the United Nations that is concerned with international public health. It was established on 7 April 1948, and headquartered in Geneva, Switzerland. The WHO is a member of the United Nations Development Group.

FDA: Food and Drug Administration is a federal agency of the United States Department of Health and Human Services, one of the United States federal executive departments.

APHIS: US Department of Agriculture's Animal and Plant Health Inspection Service is an agency of the United States Department of Agriculture based in Riverdale, Maryland responsible for protecting animal health, animal welfare, and plant health.

FAO: Food and Agriculture Organization of the United Nations is a specialized agency of the United Nations that leads international efforts to defeat hunger. Serving both developed and developing countries, FAO acts as a neutral forum where all nations meet as equals to negotiate arguments and debate policy

EPA: the Environmental Protection Agency is an independent agency of the United States federal government for environmental protection. President Richard Nixon proposed the establishment of EPA on July 9, 1970 and it began operation on December 2, 1970, after Nixon signed an executive order.

GM: Genetically Modified foods, also known as genetically engineered foods, or bioengineered foods are foods produced from organisms that have had changes introduced into their DNA using the methods of genetic engineering.

Focused Overview

According to the World Health Organization (WHO), genetically modified (GM) foods are foods derived from organisms whose genetic material (DNA) has been modified in a way that does not occur naturally, e.g. through the introduction of a gene from a different organism. Currently available GM foods stem mostly from plants, but in the future foods derived from GM microorganisms or GM animals are likely to be introduced on the market. Most existing genetically modified crops have been developed to improve yield, through the introduction of resistance to plant diseases or of increased tolerance of herbicides. In the future, genetic modification could be aimed at altering the nutrient content of food, reducing its allergenic potential, or improving the efficiency of food production systems. All GM foods should be assessed before being allowed on the market. FAO/WHO Codex guidelines exist for risk analysis of GM food.

For centuries, farmers have bred crops for certain desirable traits. Genetic engineering provides a quicker and more precise way to achieve the same goal, in one generation rather than twenty. Genetically Modified (GM) crops offer improved yields, enhanced nutritional value, longer shelf life, and resistance to drought, frost, or insect pests. Examples of GM crops include corn varieties containing a gene for a bacterial pesticide

that kills larval pests, and soybeans with an inserted gene that renders them resistant to weed-killers such as Roundup. “Nutritionally enhanced” GM crops under development include varieties of wheat free of gluten, a major cause of food allergy; vegetables with higher vitamin E content to help fight heart disease; and “golden rice” genetically engineered to contain vitamin A and iron so as to prevent common nutritional deficiencies in developing countries. In the United States, GM corn is used in many common foods, including cornmeal, tortilla chips, and high-fructose corn syrup (a sweetener in soft drinks and baked goods). In 2010, more than 80 percent of U.S. corn, soybeans, cotton, and sugar beets were GM varieties. Whereas U.S. regulation of GM foods is based on the product, European Union (EU) regulations are based on the process. As a result, the EU regulates GM plants and animals more stringently, and European publics are wary of genetically engineered foods. Internationally, the cultivation of GM crops has grown from six countries in 1996 to 25 countries in 2009, and it is expected to reach 50 countries (mostly in the developing world) by 2020. In 2009, approximately 134 million hectares of land were under GM crop cultivation.

Major Parties Involved and Their Views

EU countries

While marketing and importing GMOs and food and feed produced with GMOs are regulated at the EU level, the cultivation of GMOs is an area left to the EU Members. EU Members have the right to prohibit or restrict the sale or cultivation of approved GMOs based on adverse effects on health and the environment.

USA

Plant GMOs are regulated by the US Department of Agriculture's Animal and Plant Health Inspection Service under the Plant Protection Act. GMOs in food, drugs, and biological products are regulated by the Food and Drug Administration under the Federal Food, Drug, and Cosmetic Act and the Public Health Service Act.

Timeline of Events

Date of Event (Day/Month/Year)	Description of Event
1988	Approval genetically modified microbial enzymes by the US Food and Drug Administration.
1994	The first genetically modified food approved for release. (Flavr Savr tomato)
2000	The first increase in the nutrient value by genetical engineering. (Golden rice)
June 20, 2000	An act that prevents the importation or exportation of injurious pests. (Plant Protection Act)
September 11, 2003	A protocol designed to protect both biological diversity and human life. (Cartagena Protocol)
October 15, 2010	A supplementary protocol that contributes to the biodiversity part of the Cartagena Protocol. (Nagoya-Kuala Lumpur Supplementary Protocol)

Possible Solutions

As previously mentioned, EU already has strict regulations regarding the process of genetic modification or genetic engineering that address public health. More research is required to be able to exactly determine the benefits and drawbacks of GM products. Delegates are expected to focus on the health of their citizens and act

according to what is in favor of the country's benefit. Raising awareness towards research and revisiting current regulations would be greatly advised in order to reach a solution that satisfies both GM crop producers and consumers.

Further Reading

https://academic.oup.com/toxsci/article/63/2/153/1713714
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