

GM Food Newsletter

November 2003
Genetically Modified Food Section



The Story of Corn

Corn is a domesticated plant of the Americans.

As early as 1492 when Christopher Columbus discovered America, corn was raised among the native Americans throughout the territory. It was the most valuable food for them at that time.

Corn was developed from a wild grass, **Teosinte**, originally growing in Central America 7000 years ago. The ancestral kernels of Teosinte were small and they looked very different from today's corn. Over thousands of years, native Americans used traditional breeding methods to improve both the quality and the yields. It was not until the 1700s that "modern corn" took its modern shape.

GM Corn

Human's attempts to improve corn production never end. With the aid of genetic modification, scientists can precisely improve the properties of corn, such as **insect resistance** and **herbicide tolerance**. These properties help reduce crop loss caused by pests and weeds, and hence increase the yields.



Teosinte

Photo by Hugh Iles

Insect Resistance

Bacillus thuringiensis (Bt) is a naturally occurring soil bacterium. It produces a protein that kills insects. Insect resistance of GM corn is achieved by incorporating into the plant cell a gene encoded for production of this Bt protein. The protein will remain in the corn and do no harm. It is very specific to kill only the target insects. It is harmless to humans and animals.

Herbicide Tolerance

Weed control is one of the greatest challenges to farmers in crop production. Growing herbicide tolerant GM corn, farmers can kill the weeds by herbicide without damaging the crop.

Herbicide tolerance of GM corn is achieved through the introduction of a gene from a bacterium conveying resistance to some herbicides. Where a GM corn is modified for herbicide resistance, there is a concomitant reliance on the use of the corresponding herbicide in its cultivation. In contrast to the practice of using multiple herbicides in growing non-GM crops, the cultivation of herbicide resistant corn will generally result in reducing the total amount of herbicides used.



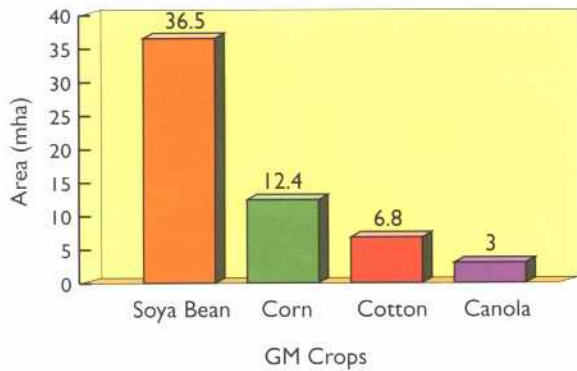
Every new technology brings potential benefits as well as potential problems. Biotechnology is no exception. The main concern of growing GM crops relates to the impacts on ecosystems resulting from unintended movement of genes from the GM species to the wild species through cross-pollination. Some people are worried that herbicide resistance genes in GM crops may be transferred to other plants, including weeds, rendering them herbicide tolerant too.

Therefore, before field trials of a GM crop are approved, the regulatory authorities would conduct thorough risk assessments and issue guidelines on farming practices, for instance, design of buffer zones to segregate GM crops from closely-related species for prevention of cross-pollination.

Statistics¹

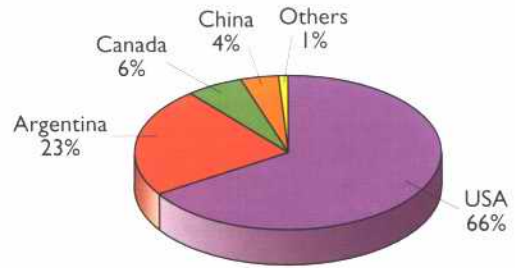
In 2002, of the 140 million hectares (mha) of land planting corn worldwide, 12.4 mha (9%) were planted with GM corn.

GM Crop Production in 2002



In terms of agronomic production, a total of 58.7 million hectares (mha) of land were planted with GM crops. GM soya bean occupied the largest area, followed by GM corn, GM cotton and GM canola.

Major Producers of GM Crops in 2002



The United States of America, Argentina, Canada and China accounted for 99% of the total GM crop production worldwide.

Super Sweet Corn and Indian Corn = GM Corn?

There are wide varieties of corn, some taste great (e.g. the **Super Sweet Corn**) and some look attractive (e.g. the colourful **Indian Corn**). The super sweet corn and indian corn are produced by traditional breeding method, **not by genetic modification**. Super sweet corn got its name because it has higher sugar content than other types of corn. Indian corn has a hard outer shell and kernels in different colours ranging from white to red. That is why it has also become a decorative item besides its food use.

Two other examples of non-GM corn are **Dent Corn** which is often used as livestock feed, and **Popcorn** which is a popular snack.



Indian Corn



Super Sweet Corn

Pre-market Safety Assessment of GM Food

As stated by the World Health Organisation (WHO), GM foods currently available on the international market have passed risk assessments and are not likely to present risks to human health.

WHO and the Codex Alimentarius Commission² have recommended their Member Governments to set up regulatory framework for pre-market evaluation of GM food on a case-by-case basis. Places like Canada, member countries of the European Union, Australia, Japan, Mainland China and Taiwan have already enacted regulatory requirement for the pre-market safety assessment of GM food. To date, more than 50 kinds of GM crop have been approved worldwide.

The HKSAR Government has proposed to implement a pre-market safety assessment scheme for GM food. Details of the pre-market safety assessment requirement will be drawn up for public consultation in due course.



¹ Source: International Service for the Acquisition of Agri-biotech Applications (ISAAA).

² Codex Alimentarius Commission was established by the World Health Organisation and the Food and Agriculture Organisation in 1963. It is recognised by the World Trade Organisation as an international authority for setting food-related standards and guidelines.