GM foods: the debate

28 Oct 2003

Food is big business - an increasing global population has a growing need for access to affordable and nutritious food

The British Government has announced the first results of its trials of genetically modified crops. Environmental impact assessments stated that unforeseen impacts to the natural environment could cause adverse impacts on biodiversity in Britain. These results were announced alongside research into the British public's opinion on whether genetically modified crops and foods would be accepted by consumers. Approximately 85% of respondents said that GM Crops would benefit producers rather than consumers and 91% said they thought that GM crops had a potentially negative effect on the countryside.

The international biotechonology business has been reported to be disillusioned with Europe's anti-GM stance and as such, companies such as Monsanto were reported to be reducing their workforce, shutting its European cereals business. A spokesperson stated: "this results from a strategic decision to realign the companys core businesses in order to focus on those projects that will best capitalise on its market and technological strengths."

But why is the global biotechnology business and genetically modified crops such a contentious issue? What are the geographical patterns and processes that occur or could occur from this? It is important to understand the issues and debates surrounding GM foods.

What are the arguments for genetic modification?

There are many reasons why multinational companies are investing billions of pounds in researching and developing genetically modified crops:

- Food production is very big business as an increasing global human population has an ever growing need for access to and affordable healthy and nutritious food.
- Many companies such as Monsanto argue that their crops hold the potential to benefit the world's environment and people's health by creating seeds and food crops that will withstand pests and diseases. Such genetic modifications would allow any 'weak' genetics to be replaced allowing farmers greater successes with crop yields and, in turn, greater opportunity for financial profit. Such technology would also theoretically allow producers to 'play god' and create new varieties of plants and animals to allow the production of foods to have minimum overheads or costs for example, tomatoes have been genetically modified to be less perishable, allowing greater shelf life storage so that shops can keep their stock for longer and in theory will have less waste.
- Genetics research would allow for greater awareness of plant and animal genes throughout the world that could provide medical properties to alleviate terminal illnesses such as cancer or AIDs.

What are the concerns surrounding genetic modification?

To be able to understand fully why there is such opposition to GM crops it is important that issues are considered in a wider historical and global context:

- **Environmental issues**

Environmental organisations and organic farmers as well as community groups have expressed concern that genetically modified crops will spread unmonitored into the local ecosystem which could cause the extinction of plants and animals, and alter the properties of endemic species. While biotechnology companies argue that the development of genetically modified crops would reduce environmental pollution due little need for herbicides or pesticides, environmentalists argue that there are so many unforeseen problems with genetic mutations that could result from GM crops and that it is better for farmers to apply sustainable farming practices rather than increase intensive GM crop farming.

Soon to be a scene of the past? GM crops that do not need herbicides or pesticides

- **Social issues**

"Rather than reducing world hunger, genetic engineering is likely to exacerbate it. Farmers will be caught in a vicious circle, increasingly dependent on a small number of giant multinationals, such as Monsanto, for their survival ... the truth is that genetically engineered crops will provide a 'better way forward' for Monsanto's profits, but will be a huge step backwards for the world's poor", Sally Shetty, Chief Executive at Action Aid.

Many non-government organisations from countries of the south such as India, South Korea and Mexico believe that genetically modified crops will give greater benefits to the multinational biotechnology firms, rather than to the farmers and people it claims it will help. It has been suggested that many poorer farmers would suffer by getting into increased debt by trying to invest in the new technologies, with no guarantee of a secured market price for their crops once they had grown.

- **The Green Revolution**

Following the implementation of technologies and new strain crops as part of the 'green revolution' in the 1970s and 1980s, many agricultural communities and countries experienced a high level of upheaval and increasing levels of inequality. In South Korea, for example, the numbers of households in debt rose from 76% in 1971 to 98% in 1985, as many agrarian communities in South Korea implemented new agricultural technologies endorsed by their governments. They had been given aid through the use of new machinery and economic trade support by endorsing new farming techniques that had come from Europe and the USA. In the Punjab, India, the high cost of investing in the chemicals and fertilizers for the green revolution led to the number of farmers - dropping by 25% between 1970 and 1980 - being forced out of their livelihoods and into bankruptcy due to the debts incurred by such a scheme. Pesticide use also caused increasing levels of water and soil pollution which impacted on peoples health.

- **Issues of ownership.**

Terminator Technology is the name given to a genetic technique which genetically disables plants from reproducing seed, making them infertile. This means that plants can grow from a seed, but if the seeds are treated with a chemical stimulant such as the antibiotic tetracycline, a genetic process triggered by this stimulant leads to the production of a toxin which, when the plant matures, makes the seeds sterile.

Such technology could allow seed producers to create a captive market in farmers around the globe who store and reproduce seeds every growing season in order to feed their families and communities, by instead, forcing the farmers to buy a fresh supply of seeds each year. Such technology would bankrupt local economies and communities whose local cultures and traditions often focus around natural food production. If biotechnology companies patented and controlled the production of all the seeds of a particular crop, there is the potential that control of all food production could taken away from many groups of people of the world. Large biotechnology companies could claim the genetically modified organisms as the 'products' of their companies.


Could the patenting of seeds in conjunction with 'terminator technology' lead to large companies controlling food production?

Technologies are being created by the United States Department of Agriculture whose spokesperson, Willard Phelps said the primary function of which is "to increase the value of proprietary seed owned by US seed companies and to open up new markets in second and third world countries" where saving seeds could be stopped and enforced patenting regimes could be instigated alongside the introduction of strict controls and fining farmers who grew crops that weren't patented by the biotechnology firms. "Our mission is to protect US agriculture and to make us competitive in the face of foreign competition. Without this, there is no way of protecting the patented seed technology" said USDA molecular biologist Melvin J Oliver.

Such technology however, can only be supported if governments and international trade agreements endorse such technologies. One of the main reasons why the WTO meeting in Cancun collapsed was to do with 23 countries of the south not supporting the US and Europe's biotechnology desires to have TRIPs - the patenting of genetics found in endemic plants and animals.

Biotechnological companies have tried to patent seeds and plants that farmers have used for centuries. Monsanto trying to patent basmati rice to sell to the Indian government ((even though basmati rice and its many strains have been genetically collected for centuries) is an example of how companies might use patents in conjunction with 'terminator technology' in order to gain control over food production.

- **Environmental and health concerns**

Often referred to by anti-GM campaigners as 'Frankenstein foods', Genetically Modified Crops have raised many health workers and consumer fears about what will happen to the food chain and the environment that supports it. Increasingly urban populations forget that plants and animals are dynamic and help to support the main biomes.

Trials have shown that the modified genetic make up of GM crops can spread through chemical and biological processes and that it is hard to contain.

One main area that has concerned British consumers is how GM foods could affect the quality of food they eat and what the potential health impacts are both in the short and long term. Genetic modifications will be around indefinitely and the research carried out so far has done little to instil consumer confidence, despite the expensive advertising by companies such as Burson Marsteller for Monsanto.

The genetic modification of foods, medicines and other human commodities is highly intricate and multi-faceted. It is important when investigating these issues that the researcher does not look at one impact or aspect as if it were unrelated to another impact. The controversy surrounding genetically modified crops is one example of how technologies can be applied and used in ways that can cause different consequences for people in different parts of the world.