GM food -- myth and reality

BY DANIEL JARDINE

The proponents of using genetically modified organisms in food put forward six main reasons as to why GMOs are needed. All six are false and deliberately misleading.

Myth 1: GMOs are needed to "feed the world".

People are hungry because they are poor, not because there's not enough food. And if they can't afford to buy conventional food, they'll hardly be able to afford GM food.

World growth in food production is roughly the same as world population growth, but farmers are pushed off their land so that "cash crops", like coffee and cocoa, can be grown to satisfy the policies of the World Bank and the International Monetary Fund. The even greater concentration of food production in the hands of transnational corporations, which widespread GMO use will promote, will only make this worse.

GMO advocates claim that genetic modifications will develop high-yield crops, but only consider high-yield to mean the amount of grain produced at the given harvest. A more sustainable consideration of "yield" would focus on the number of people fed with a varied and nutritious diet, without degradation of the farming land.

Myth 2: GMO use will benefit farmers.

According to the US National Academy of Sciences, genetically modified herbicide-resistant soybean is less profitable than conventionally bred varieties. Yields were found to be 6-10% lower for GM crops.

Claims that the need for herbicides will decrease with the use of herbicide-resistant crops

were also found to be invalid. Instead, the use of the herbicide Roundup increased considerably -- between 2-10 times more. In many farms, the herbicide use was 10 times larger than on many farms using integrated weed management systems. The weeds had become resistant to the herbicide glyphosate.

Scientists have speculated that the decrease in productivity may be due to genetic engineering reducing the efficiency with which plants use energy, as the energy usage associated with the inserted gene in GM plants is not regulated according to the need of the plant.

This energy misuse may be even greater in the case of GM crops incorporating the Bt toxin as an in-built pesticide -- the plant is putting a lot of energy into producing the Bt protein, 24 hours a day whether it is needed or not.

The promotion of GMOs will only make farmers more dependent on the giant agribusinesses. Farmers, even in the First World, work with very low profit margins (the National Farmers Federation estimates it at 2-3% in this country) but with very high overheads for inputs such as machinery, storage, processing and fertilisers.

GMOs will increase farmers' input costs. The use of, say, herbicide-resistant GM crops will mean the farmer is charged more for the GM seed and is then tied to using a particular brand of herbicide, from a particular agribusiness, to control weeds. Biotech companies are even seeking to develop GM crops whose seed is infertile after one or two generations, thereby requiring expensive repurchasing of seed stock.

Myth 3: The techniques involved in genetic modification are precise.

Biotech companies claim that genetic engineering is so precise that a gene producing a particular trait can be identified and this gene can then be placed into the DNA of the new cell, which will then have this trait. The reality is much cruder than that.

There are two major techniques use to incorporate novel genes into an organism's cells. One involves attaching the genetic material to small gold particles and “shotgunning” them into the cells. The other uses a “vector”, in which an inactivated virus is used to transport the genetic material into the host cell.

In neither case is the biologist able to direct, or even know, where the introduced genetic material is placed in the DNA of the host.

They use antibiotic resistance genes as part of the incorporated genetic material, so that the genetically modified cell can be selected by treating the cell culture with antibiotic to kill off all the cells that don't have the genetic material incorporated into their DNA.

This, however, does not mean that the cell resulting from this procedure is what's required: almost anything could have happened.

Biotech giant Monsanto has released data showing that there was extra genetic material inserted into its GM soya beans. This was not reported in the original applications for release of this GM crop and puts a lie to the claims of regulation authorities, such as the Australia and New Zealand Food Authority, that their testing methods consist of a “rigorous

safety assessment process".

Myth 4: GMOs are safe.

No one really knows whether GMOs are safe or not -- so little work has been done on this and even less has been released to the public. There has, however, been a lot of opinion put out, little of it substantiated.

A recent letter in *Science* magazine reported on a survey of published scientific databases suggested that there are very few published reports containing experimental data. A majority of the reports were just the opinion of the authors, mostly expressing their belief that GM foods are safe, without any experimental data to back up this claim.

One of the few published reports with experimental data tells of GM potatoes, modified to contain a lectin, which were found to have toxic effects on rats' organs, including the brain and the immune system. Similar tests on rats using non-modified potatoes turned up no such results.

The researcher, Dr Arpad Pusztai, lost his job after he mentioned the experiment during a television interview. His critics claim his work was never peer-reviewed -- yet the survey reported in *Science* also found that none of the articles published by biotechnology companies were peer-reviewed either.

Myth 5: Genetic engineering poses little or no chance of gene transfer to unrelated organisms.

Professor Hans-Hinrich Kaatz from Institute for Bee Research at the University of Jena experimented for three years on the effects of GM rapeseed (canola) on honey bees -- and found gene transfer to the bacteria and fungi in the bees' gut.

Pollen collected from bees flying freely around the GM crop was fed to young honey bees in the laboratory. The contents of the young bees' intestines were then cultured and the micro-organisms analysed -- the GM gene that had been inserted into the rapeseed crop was found in these micro-organisms.

Because GMOs are created by the insertion of a foreign gene into the plants' genome, rather than incorporation such as would take place through breeding, it is more likely that this foreign gene will be released into the environment due to the DNA repair and self-correcting mechanisms of cells.

Myth 6: The promotion of genetic engineering has nothing to do with the greed and self-interest of particular transnational corporations.

No matter what the regulation authorities think (or tell the public), the transnational corporations involved in GMOs will find ways to circumvent any restriction placed on them.

A US chemical plant, owned by Monsanto in Anniston, Alabama, produced polychlorinated biphenyls (PCBs) for 70 years. Internal memos have shown that the company knew of releases of the toxic compounds in the 1960s but did nothing other than suppress the information for the next 20 years. The toxins caused cancers and other disorders in the

people and animals living in the area around the plant.

A recent report on behalf of Greenpeace by EcoStat suggests that transnationals' studies on the GMOs they wish to release are so “poorly designed” that “there was virtually no chance that adverse ecological effects could be observed”.

Proponents of GM food claim that its lack of acceptance is because the general public aren't educated enough about it.

If this education process did not involve the assumption that GMOs are to be released into the environment, if it was education from an independent source and if there was a moratorium on the release of GMOs while this education process was going on, then perhaps this would be a start. As it is, when the transnationals say “education”, they mean “public relations-based indoctrination”.

For more information:

For the Greenpeace report on the failings of assessment reports:
<http://www.greenpeacecanada.org/publications/ge/hillbeckreport.pdf>>

Physicians and Scientists for Responsible Application of Science and Technology:
<http://www.psrast.org>

The Gene-Ethics Network, including a GM-free food guide:
<http://www.nor.com.au/environment/genethic>.
