

Food Phobias

Behind the Fuss Over GM Crops

The biggest problem consumers have with agricultural biotechnology is not genetic modification, but misinformation argues

Phillip Killicoat

Ignorance is a key weapon in the arsenal of lobbyists against genetic modification (GM). In a 1998 survey gauging public sentiment towards GM food,¹ respondents were asked the question: 'Do you currently consume any foods that contain DNA?'. Two thirds confidently answered 'No'. Yet ever since humans moved away from hunter-gatherer subsistence, genetic modification has been a fact of life in food production.

The first conscious effort at genetic modification in agriculture is attributed to the 18th century Austrian monk, Gregory Mendel, who systematically cross-bred sweet peas. Since then, hybridisation and controlled cross-cultivation have led to consistent improvements in the yield and nutritional content of crops. When Francis Crick and James Watson discovered DNA in 1953, we gained the capacity to cross-cultivate with a greater degree of precision. Rather than the

mate-and-wait methods of conventional plant cultivation, genetic modification allows plant breeders to develop crop varieties more suitable for diverse growing locations.

Genetically modified crops can be divided into three broad groups depending on which 'generation' they belong to. First-generation GM technology involves altering some aspect of production, leaving the end product identical to a conventional variety. Second-generation plants possess improved nutritional content, such as protein-enriched 'golden rice'. Third-generation plants are currently being developed to provide specific health benefits by way of providing ingestible vaccines for common

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infectious diseases. However, the potential for GM crops to save lives in developing nations is not limited to overcoming hunger. Plant varieties have recently been developed that can detect landmines by changing colour when their roots come in contact with explosives.²

While the potential for GM crops in the developing world is significant, the issues associated with first-generation crops are of greatest concern to Australian farmers. The most common first-generation traits are herbicide tolerance and insect resistance, although drought- and salt-tolerant crop varieties are also being developed and trialled. In 2001, 130 million acres of GM crops (principally soy, cotton, canola, and corn) were grown in 13 different countries. More than five million farmers now grow GM crops in North America, Argentina, China, South Africa and elsewhere.³ Where farmers have not been encumbered by stifling bureaucratic regulations or outright moratoria, they have enthusiastically adopted GM technology, reaping the benefits that come from agronomically—and economically—superior varieties of crops.

If genetic modification of crops is just another step in the process of more efficient and sustainable food production, why does the prospect of GM crop production in Australia elicit such rabid reactions from certain quarters? Critics such as Greenpeace and the Network of Concerned Farmers have received a tremendous amount of media coverage with claims that Australia's environment and exports will be ruined if we adopt GM crops.⁴ How valid are these assertions?

The environment

Anti-GM lobbyists argue that direct genetic modification of crops is unnatural and will deal a devastating blow to delicate ecosystems. They often cite a study from Iowa State University, which concluded that Monarch butterflies experienced an increased incidence of poison-induced death when they ate the leaves of insect-resistant corn. This study has since been discredited because it conveniently ignored the fact that Monarch butterflies are not normally interested in eating corn leaves, and that the quantities of leaf matter

HOLDING AGRICULTURE TO RANSOM—AGAIN

Genetically modified crops are not the first agricultural development to be held to ransom by a coalition of green-left lobbyists and a group of farmers not prepared to adapt to changing practices. Australian farm history is replete with examples of extortionary conduct to prevent adoption of an innovative new technology.

- In the 1950s, dairy co-operatives warned Australians that consumption of margarine would cause cancer because of 'unnatural' hydrogenation. The influential National Party leader of the day, 'Black Jack' McEwan, came up with a novel way of dealing with this new product to appease dairy farmers: instead of an outright ban, legislation was passed that margarine be coloured pink so that people would not confuse it with butter. That margarine was considered a healthier and more convenient alternative to butter was apparently less important than protecting dairy farmers from competition.
- The pasteurisation of milk is even more confounding. From the time Louis Pasteur found a way to kill the harmful bacteria that breed in untreated milk, it took nearly a hundred years for pasteurised milk to be sold without some form of stifling regulation or punitive tax. For many years governments agreed with small-scale dairy operators that pasteurisation was an 'unnatural' process, and gave too much power to the downstream processors. It therefore had to be restricted. Today it is unthinkable to sell milk that has not been pasteurised.
- The commotion over GM crops also bears an uncanny resemblance to the impassioned town-hall debates during the interwar years when tractors were replacing the use of horses in broadacre agriculture. Concern about the environment and monopolistic tractor manufacturers, not to mention the loss of business for local saddlers, were cited as reasons for sticking with horses and leaving expensive tractors to renegade Americans.

the butterflies were force-fed was far in excess of what they would normally consume.

The creation of uncontrollable 'superweeds' is another misplaced concern. The likelihood of herbicide-tolerance being transferred to wild weeds is effectively nil because the tolerance characteristic requires the genetic insertion of novel genes which could not occur through natural breeding processes. In the unlikely event that the tolerance characteristic were somehow transferred, say by way of mutation, then the offending weed could be eradicated by applying a type of herbicide other than that to which the weed had supposedly become tolerant. In any case, integrated weed management techniques can satisfactorily handle any problems associated with weeds or volunteer plants in subsequent crops.

The various 'environmental' arguments used against the adoption of GM appear more concerned with preventing agricultural progress than with preserving ecological systems. Yet by using less herbicide and pesticide, the environment is likely to experience a windfall benefit from the adoption of GM crop varieties. If green activists were true to their objective of environmental sustainability, they would be lobbying for GM agriculture, not against it.

Concentration of supply

GM technology is also opposed because it is being developed and sold by multinational companies (MNCs). As any good socialist knows, MNCs monopolise supply and reap obscene profits and so their products should be boycotted or banned. But what sort of a philosophy is it that will deny farmers an opportunity to improve their practices simply because a company extracts some profit from the transaction? Of course companies want to make profits. But so do farmers. Unless you are a government or a thief, you only make a profit if you provide a product or service that someone wants.

In 1997, Canadian canola grower Percy Schmeiser became a poster boy for the socialist cause when he took on the agrichemical giant Monsanto after the company alleged that he had been illegally cultivating Roundup-Ready canola,

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a Monsanto innovation. Schmeiser denied the claim and in turn filed a counter-suit against the agricultural group for 'contamination' of his crops via pollen flight from bees and drifts from vehicles transporting GM seeds. Unfortunately for Schmeiser, the Canadian Federal Court found that he obtained his seed by less fanciful means ('borrowing' and breeding samples from other farms) and had knowingly used Roundup-Ready canola, thus violating Monsanto's plant breeders' rights (PBR).

Schmeiser toured country town halls in Europe and Australia presenting himself as the victim of a multinational corporation and proselytising that GM technology will spell the end of agriculture. Yet the irony is that he actually found the GM technology useful—so useful that he was trying to produce as much of the herbicide tolerant seed as he could without being caught and without paying for the use of the technology. Moreover, were it not for the existence of the profit motive and defined and enforceable property rights, the herbicide-tolerant GM technology he found so practical would never have been created in the first place.

Most farmers know better than Schmeiser. They understand that the theft of PBR amounts to little more than modern-day cattle-rustling. As stewards of their private property, Australian farmers have a strong incentive to ensure their land's ongoing sustainability. The profit motive ensures this. Many serious farmers are quietly looking forward to the opportunity to take up first-generation GM crop varieties. Adopting herbicide tolerant and insect resistant strains means that farmers will be able to reduce chemical application by up to 70%, and more confidently practise minimum-till cultivation. As a result, farmers can increase their gross profit margin through lower net input costs and higher yield volumes. By reducing tilling

and spraying applications, valuable management time can be freed up for the farmer to undertake other activities. The health benefits for farmers and their families in reducing their exposure to potentially harmful chemicals is also an important consideration for primary producers.

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Market access

A concern often raised in the rural press is the fear that Australia will lose its 'clean, green' image and hence lose agricultural export markets in Europe if we adopt GM crops. The EU parliament has determined that, until further notice, it will only permit imports if they are certified GM-free. EU legislators argue that the precautionary principle must apply to this 'new' technology. Since they cannot be 100% certain that nothing will ever go wrong with the technology at any point in the future, the argument goes that GM agricultural products represent an unreasonable risk to the people of Europe and must therefore be prohibited.

The real motivation for the GM moratorium, however, is to restrict further import competition for European farmers. It is an inconvenient fact that a French farmer who has a 50 hectare block with mixed crops and some assorted livestock is unable to match the prices of an Australian farmer with a 1000 hectare property specialising in two crops for cash export. Fortunately for uncompetitive European farmers, agricultural bureaucrats are able to cajole billions of dollars worth of subsidies out of Brussels.

GM crops would give large-scale New World farmers yet another advantage by making their output even more price competitive. The European farm lobby has attempted to neutralise this threat by having GM crops banned and, as a back-up

plan, recommending the imposition of draconian labelling, traceability and identity preservation requirements. These extra burdens on producers from the New World who use GM technology ought to keep EU farmers in business for a little while longer. Interestingly, genetically modified ingredients used in traditional EU exports—in yeast for beer, in the distilling process for wine, and in the maturation of dairy products—do not have to meet similar segregation and labelling requirements.

To label or not to label?

The weight of evidence suggests that producers and the environment are likely beneficiaries from GM adoption. But how will consumers fare? Since GM crops ultimately mean more efficient farming, consumers will benefit from cheaper food products. GM crops will also be healthier than their conventionally-bred counterparts. The nutritional content of first-generation GM crops is identical to conventional varieties, with the added advantage that they have been exposed to significantly less herbicide and/or pesticide. It is curious that anti-GM lobbyists claim that consuming GM foods will cause cancer, infertility or blindness when scientific evidence indicates that such outcomes are more likely when consuming non-GM crops that have a less predictable genetic make-up and have been exposed to greater quantities of herbicides and pesticides.

GM foods are subjected to much more rigorous testing and trialling than their conventionally-bred counterparts, and are likely to be safer for consumers. North and South Americans have been consuming first-generation GM food products for 15 years and there has been no recorded incidence of ill-health associated with consumption of GM foods.⁵ Australians have been eating meat from livestock that have been fed imported GM soybean for roughly the same period, similarly without incident.

Given the scientific evidence that appropriately tested GM food products have no deleterious health effects, it is highly questionable whether

government should enforce compulsory labelling requirements for first-generation GM foods. The problem with segregation and compulsory labelling is that it not only imposes costs on GM-adopting farmers and downstream processors but also places an onus on non-adopting farmers to prove that their produce does *not* contain GM. Enforcing compulsory labelling for any one section of the farming community therefore imposes a tax on all farmers and, in turn, all consumers.

The most appropriate response from government to calls for the compulsory labelling of first-generation GM crops is to do nothing. If producers perceive that there is a demand for GM-free products they will label their goods as such and voluntarily build alternative supply chains. Consumers can then express their preference by buying products voluntarily labelled GM-free. If demand for GM-free is as strong as some would have us believe then GM-free products will be rewarded with strong sales. There are numerous examples of companies voluntarily responding to consumer demand for information about the manner of food production, a recent case being 'dolphin-safe' tuna labelling. Voluntary labelling works because it allows the concerned section of society to express their preferences without imposing burdens on all producers and consumers.

The biggest potential beneficiaries from the brouhaha over GM labelling may in fact be organic growers. Irrespective of whether their products are actually better for consumers, organic farmers have already differentiated their products according to a perceived consumer demand for more 'natural' methods of food production. Organic growers' vocal opposition to GM might therefore be seen as nothing but implicit advertising: GM is bad, and organic is good, so buy organic.

Australia appears to be inching towards adoption of genetically-modified (GM) crops. Genetically-modified Bt Cotton has been grown in Australia since 1999, and in July 2003 herbicide-tolerant LibertyLink canola from Bayer was approved for commercial production

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by the Office of the Gene Technology Regulator (OGTR). However, GM canola has since been subjected to state-imposed moratoria and will not be commercially adopted for at least the next two growing seasons. It would appear that State governments have succumbed to anti-GM lobbyists who wish to turn back the clock on agricultural innovation.

The question for this farming generation is whether and/or for how long Australian governments will yield to the protests and scaremongering of opponents to agricultural biotechnology. It would be a tragedy if the opportunity to adopt GM crops and maintain world's best practice in agriculture is hijacked by a short-sighted coalition of naysayers. Genetically modified crops may not be an instant panacea for farming viability and world hunger but like the invention and adoption of the tractor, GM technology is a step in the right direction.

Endnotes

- ¹ Per Pinstруп-Anderson, Keynote Address, Australian Association of Agricultural and Resource Economics Society Conference (Adelaide: 2001).
- ² ABC Sci-Tech NewsOnline, 'GM Plant Detects Landmines' (26 January 2004), http://www.abc.net.au/science/news/scitech/SciTechRepublish_1031573.htm
- ³ Clive James, 'Global Status of Commercialized Transgenic Crops: 2002,' (Ithaca: International Service for the Acquisition of Agri-biotech Applications, 2003).
- ⁴ <http://www.abc.net.au/worldtoday/content/2003/s910338.htm>
- ⁵ Leighton Jones, 'Science, Medicine and the Future: Genetically Modified Foods,' *British Medical Journal* 318:2 (1999), pp.581-584.