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Should NZ grow GM crops?

What are the benefits, if any? And is it inevitable? Two views from opposite sides of the argument

Yes

Holding back science is robbing us of gains

Graeme Peters

There's no doubt that New Zealand will one day grow GM food. The only question is when.

It won't be any time soon because New Zealand has rules so tight that no one is allowed to plant a single GM seed in an open field. Of less concern, for now, is that this impassable regulatory hurdle has stopped GM food production here.

Far more damaging is that local scientists can't test new seeds developed using GM technology. Their innovative germplasm will benefit New Zealand Inc by raising crop yields, boosting milk and meat production, lowering greenhouse gas emissions, and helping plants combat drought, pests and diseases.

The fact that these researchers can't field test and therefore commercialise their contributions to New Zealand agriculture is a crime against science, and makes us all poorer.

But first let's correct the misperception that New Zealand is "GM-free".

Food Standards Australia and New Zealand's (FSANZ) website says it has approved 43 applications for genetically-modified foods, which means they can be legally imported and eaten in New Zealand.

FSANZ says it won't approve a GM food unless it's safe to eat. So far it's identified no safety concerns with any of the foods that it has assessed. Other credible national regulators which have independently reviewed the same products have reached the same endpoint.

Approvals include categories of soybean, canola, corn, potato, sugar beet, rice, lucerne, and wheat – staples of the world diet and grown in vast quantities globally. Indeed, the total amount of biotech crops grown worldwide last year was 160 million hectares, equivalent to six times the total land area of New Zealand.

The actual quantity of these 43 GM ingredients imported into New Zealand is anyone's guess, and could be quite small, but that's not the point. Of more salience is that a science-based regulator says they can be, because they're safe to eat.

Biotech foods have had the regulator's tick of approval since 2000. So if we've been allowed to eat them in our corn chips and breakfast cereals for over a decade, what's the problem with growing the raw materials here?

The answer should be: absolutely nothing. But none is grown because super-cautious rules established after a Royal Commission of Inquiry into Genetic Modification set the bar too high.

For example the Environmental Protection Authority, which considers applications to field test biotech crops, has to ask for a risk analysis and a benefits analysis for each application. A risk analysis is a common requirement internationally, but a benefits analysis is unusual and can't be done without completing a field trial under New Zealand conditions.

This has created a Catch 22. Researchers can't complete a benefits analysis without a field trial. But they can't get approval for a field trial without completing a benefits analysis. This is clearly madness. Any review of the flawed Hazardous Substance and New Organisms legislation must advise axing the need for a benefits analysis.

Those who oppose GM say that leading biotechnology companies, which are spending hundreds of millions on biotechnology research overseas, can't wait to plant GM crops in New Zealand.

This is incorrect. In reality these corporates, many of whom are Agcarm members, are only mildly interested in bringing their technology here because New Zealand doesn't grow the mainstream varieties for which biotechnology has been developed. These include insect-resistant cotton or soybean resistant to common and safe herbicides.

Undoubtedly the best opportunity for New Zealand lies with pasture, our largest crop. Pastoral Genomics, Plant and Food, and AgResearch are carrying out promising work to develop better pastures.

Pastoral Genomics is a farmer-funded research consortium which aims for forage improvement through biotechnology. It targets a range of desirable traits including drought tolerance and new grasses which have more energy, are more easily digested and reduce greenhouse gas emissions.

An economic analysis concluded that its work could add $1.5 billion to New Zealand's economy, lift household income by $500 million, and create up to 8000 jobs.

Now in its second decade, Pastoral Genomics has yet to field test its technology in New Zealand. Researchers are instead putting in small field trials in North America, but these aren't ideal because they don't replicate New Zealand conditions.

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In conclusion, we must continue to give people a choice. Consumers can avoid GM produce if they want. FSANZ specifies that food containing more than 1 per cent of GM ingredients must be labelled.

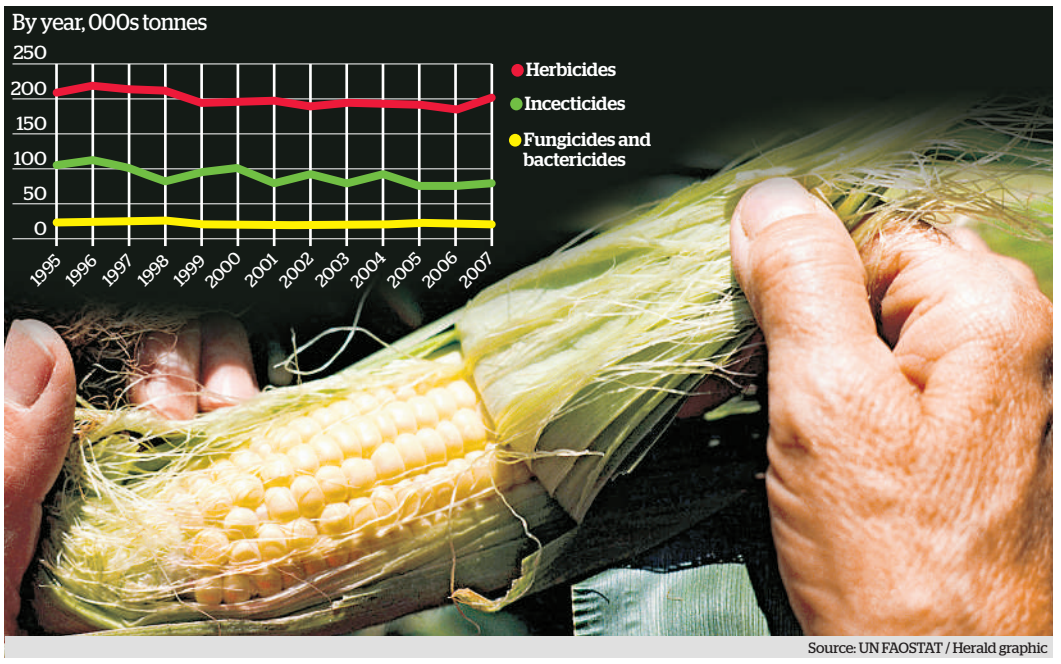
Growers should also have a choice – the right to plant biotech crops, or not. At present apple and kiwifruit growers exercise their choice and see no advantage to adopting GM, and good on them. But it would be unwise for any grower to say that the door is closed for eternity.

The group in most need of choice are researchers who want to test their products in field conditions. But they can't because of legislation written in the early and overly risk-averse days of biotech adoption.

An agricultural revolution is going on worldwide. New Zealand, an agricultural trading nation, needs to loosen the unacceptably tight shackles on biotechnology, or risk being left using yesterday's technology.

Graeme Peters is chief executive of Agcarm, the industry association for crop and animal science.

US pesticide use



Source: UN FAOSTAT / Herald graphic

No

'Go GM or fall behind', is a threat, not fate

Jack Heinemann

Science makes enormous contributions to agriculture. Marketing, politics and massive public subsidies for agriculture make enormous contributions to genetic engineering.

When overseas chief executives say "go GM or fall behind", it's a threat and marketing gambit, not fate.

Their companies don't just promote GM seed, they have monopoly control.

In the United States one firm owns 82 per cent of the corn and 93 per cent of the soybean seed supply. Just four companies control 29 per cent of the entire global seed supply in all crops.

GM is part of an industrial innovation model where intellectual property is the primary goal, rather than benefit to farmers or sustainable agriculture.

Innovations for production sustainability don't make as much licensing revenue for inventors and they give much more control to the farmer and the community. They improve soil health and reduce consumption of water and agrichemicals. That does not fit the ideology of big companies and certain governments, but it promotes small business,

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diversification and resilience in agriculture, and distributes wealth.

A UN analysis of 114 farming communities covering 2 million hectares across 24 African countries found just that. Non-GM, agroecological farming communities had more food, healthier children, gender equity and income to purchase education and invest out of poverty than those trapped in industrial farming systems.

Don't fret, we aren't alone. A tiny number of countries grow GM crops at significant scale, with 90 per cent in just 5 countries. Only Argentina and Paraguay devote more than 40 per cent of their production land to GM crops.

What's missing? Nothing, because as Monsanto says current GM crops provide no economic benefit to New Zealand. However, could future GM plants grow in less water, require less fertiliser, be healthier and make cows fart less?

In the 1970s and 1980s the promise was that GM would increase nitrogen fixation in plants but more than 30 years of research has failed to make a contribution to this goal.

From the 1990s onward GM was going to increase drought tolerance. More than one thousand field trials in the US alone have produced only a single commercial plant, a GM corn, which has not proven reliably better than non-GM varieties. Meanwhile, conventional breeding is producing non-GM drought tolerant varieties. All that remains are promises that GM will achieve these complex traits faster or better.

If we develop GM pasture grasses we will put the high-value markets of Europe and certain Asian nations in jeopardy as they place a premium on GM-free produce.

GM benefits have proven illusory, unsustainable and not unique.

Compare corn yields in the US and GM-free Western Europe, developed countries of comparable latitude. The US has more than 90 per cent GM corn and still the European countries on average equal or exceed US yields.

Canadian rapeseed yields before GM (1995) were 1970 kg/ha below European yields and after GM (2009) 2060 kg/ha less. GM hasn't increased yield; breeding and crop management have. Productive agriculture is more than just genes.

Figures from the UN Food and Agriculture Organisation (see graphic above) show US pesticide use is about the same as before GM. The US has 8 per cent of the world's agricultural land but uses 22 per cent of all pesticides (25 per cent of all herbicides alone).

Since adopting GM crops in 1999, South Africa's pesticide expenditures have increased 59 per cent. The way pesticides are applied to GM crops has created resistant weeds in the Americas, returning more toxic herbicide cocktails and tilling, to control them. US chemical insecticide use has decreased since GM, but it also decreased in similar proportions in GM-free countries, to 24 per cent of 1995 levels in France, 90 per cent in Germany, and 84 per cent in Switzerland.

Moreover, insects resistant to GM insecticidal (Bt) crops are emerging, potentially threatening the use of natural Bt in integrated pest management or agroecological farming.

GM cotton farmers in the southern US on average have smaller margins than those not using GM varieties. To cover this they and GM corn and soybean farmers collect a share of the US$1.7 trillion ($2 trillion) in agricultural subsidies.

Will GM feed the world? Before the adoption of GM crops in Argentina, food security – available dietary energy, protein and fat – was increasing by about 1 per cent per year. Since adoption, food security has decreased by 0.1 per cent to 1 per cent per year. GM Paraguay has similar statistics. Brazil doesn't fit these trends, but it was slower to scale up GM.

GM-free countries Chile, Columbia, Peru and Venezuela have increased food security. While it is an oversimplification to blame decreased food security on GM, it is simplistic and misleading to market GM as necessary to feed the world.

The case for GM crops is wanting. We could instead be building an alliance with the many other GM-free countries with which to trade in seed for the future, and investing in a changed way to farm for our own food and economic security.

Professor Jack Heinemann is the director of the Centre for Integrated Research in Biosafety at the University of Canterbury.