



GM Crops are still...

largely a story of the Americas

97% of all GM food is grown in the Americas – as it has been since GM cropping began 20 years ago.

85% of global GM crop production (including cotton) was in the US, Brazil, Argentina and Canada. (ISAAA 2017)

In the five Asian countries growing GM crops, just 4% is crops for direct human consumption. Non-food crops (cotton) account for 96% of acreage. (ISAAA 2017)

4 commodity crops

Four commodity crops – soy, maize, canola and cotton - account for around 99% of GM acreage. (ISAAA 2017) GM animal feed crops alfalfa and suga rbeet account for 0.8% while production of other GM crops (squash, papaya, apple and eggplant) ranges from small to miniscule (ISAAA 2017).

2 traits

Since 1996, two traits dominate commercial GM agriculture - **herbicide and insect resistance - or a combination of the two.** These account for virtually all GM crops grown - around 189 million of 189.8 million ha. (ISAAA 2017)

Other traits promised have proved difficult to deliver and most have yet to materialise. The first GM drought resistant crop on the market – a Monsanto maize - **performs no better than conventional corn** bred to cope with dry conditions. (USDA 2011)

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countries grow 85% of all GM crops
crops account for 99% of all GM acreage

Markets call the tune

No GM crops grown in New Zealand

It is widely agreed that the GMOs currently available are **not relevant to New Zealand conditions**.

The primary reason that no GM crops are grown in NZ, however, is **consumer resistance to GM foods**.

Markets avoid direct human foods

GM crops for direct human consumption - including wheat, potatoes, tomatoes and flaxseed - have foundered in the market. Most GM crops produced today end up as **animal feed, biofuel feedstock**, or in highly processed **food ingredients that do not need to be labeled**.

Europe still reluctant to grow GM crops

17 EU countries - more than 2/3 of Europe's arable land - have prohibited GM crops and some leading GM seed companies have closed down their European operations. (Nelson 2015; Michail 2015) GM cropping in the EU 28 is tiny, with just one GM crop (an insect-resistant corn) grown on 131,000 ha last year, less than 0.1% of global GM acreage. Spain accounts for around 95%, with Portugal growing the rest (7,069 ha). Czech Republic and Slovakia abandoned GM maize production "due to difficulty in marketing their biotech maize to feed millers who demand non-biotech maize." (ISAAA 2017)

Consumers still reject GM foods

Opposition to GM food is not confined to wealthy markets – it's global. A survey of 18 countries found that a majority of consumers do not want GMOs in food. Even when promised benefits, on average 57% of respondents disagreed with the statement that: "I don't mind GMOs in food if it helps farmers produce more and/or keeps prices down"; only 18% agreed. (Greendex 2014)

GM foods remain highly controversial in the EU. US government dispatches report "consumer attitudes to GE products are most negative" across the single market and that "many producers have changed the composition of their products to avoid losses in sales" (USDA 2017)

Even in the US – the home of GM food production - demand for non-GM food products is booming. Consumers overwhelmingly want labelling for GM content and the ability to choose GM Free products. The Non-GM Project now certifies a whopping \$26 billion in food products for the North American market per annum.

Increased labelling for GM animal feed

The trend is for **increased labelling of products for GM feed**. **France** and **Germany** have introduced GM free labelling schemes for animal products and major supermarket chains in **Italy, Switzerland** and **the UK**

either prohibit GM animal feed in their own brands or provide clear choice. Major international companies such as Danone, Lidl and Asda have also pledged to move to GM free feed products.

NZ meat exporters leveraging off GM Free status include: Harmony NZ, First Light Foods, NZ Natural Lamb Company, Ovation, Wakanui Beef, Lean Meats, Duncan New Zealand Venison and PAMU. Fonterra, Atkins Ranch and NZ Jerky are among those to gain Non-GMO Project certification to meet consumer demand in the US market.

“Grass-fed” – by definition non-GM – provides a huge opportunity for New Zealand meat and dairy exporters.

GMO development in NZ: the grasses

Lack of industry support for GM crop trials

After more than three decades of public investment, domestic R+D has **yet to produce a commercial product**.

Two field trials are underway in New Zealand: AgResearch’s GM livestock and Scion’s GM pine trees.

GM vegetable and fruit are unlikely to be grown here for the foreseeable future due to consumer resistance in key markets and because **Horticulture New Zealand has generally been cautious regarding GM horticulture crops**. (HortNZ 2009)

Industry concern about market backlash from local field trials

GM grasses are running **decades behind schedule** due to technical difficulties and pastoral industry worries. After 15 years of R+D, work on a GM drought resistant line has been put on ice indefinitely in favour of advanced non-GM methods (RNZ 2015). One strain – a so-called high-metabolisable energy grass - has progressed to field trials (the trait has been trialled in soybean in the US) but is still years from delivery.

Fears of market backlash is the primary reason that the GM grasses are being trialled in the US, rather than in New Zealand. Fonterra is concerned that even field trials could negatively impact on market perceptions and that they could not be properly contained. (Fonterra 2012; Farmers Weekly 2016)

GM grasses an all-or-nothing proposal

Government and industry agree that there is no way to contain GM grasses. As such, release (and some types of field trialling) of GM grasses is **an irreversible decision** that could ultimately affect all pastoral production – through market perceptions as well as in the supply chain.

And GM 2.0 (gene editing)?

New GM is still on the lab bench

Europe – the most influential jurisdiction for GMOs – has ruled

New genetic engineering techniques are GM ... and will not be “invisible” in the market

Just two new GMOs are on the market, and their production volumes are tiny:

- A herbicide resistant canola has been grown on 40,000 ha in North Dakota and a smaller scale in Canada.
- 16,000 acres of a high-oleic soybean has been grown the US.

Europe’s highest court – **the European Court of Justice** - has ruled that gene editing is GM under EU laws and that the techniques should be regulated to manage biosafety risks. That decision, which is binding on European member states, will have a huge influence on the commercial prospects of new GM in the near term.

New genetic engineering techniques – like gene editing - **raise significant economic risks due to uncertainty about consumer acceptance** and their regulatory status in export markets (Sustainability Council 2016).

Powerful gatekeepers have deemed the new techniques to be GM, separate to the courts, and products containing new GMOs will not qualify for certification. They include:

- the Non-GMO Project, which certifies \$26 billion US in products for the North American market (Non GMO Project 2017); and
- The German Retail Association for non-GM Food, whose membership has combined sales of 200 billion euro (VLOG 2016).

Recognising this, the Government decided to continue to regulate new GM techniques because “we do not want New Zealand getting ahead of market perceptions of these new biotechnologies.” (NZ Government 2015.)

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