

# section 3.14 |

appendix 2

## Outcomes of Consultation: Submissions from Interested Persons

### Section contents

3.	Analysis of submissions from Interested Persons	28
3.14	Opportunities from use or avoidance	228
	Introduction	228
	Issues raised by submitters: a summary	229
	‘Use pathway’ opportunities	230
	Human health benefits	230
	General economic benefits	230
	Increased productivity	232
	Increased range of products	232
	Environmental benefits	233
	Increased profitability	233
	Maintain or increase research capability	234
	New knowledge-based enterprises	235
	Increased competitiveness	235
	Enhanced animal welfare	236
	New global role	236
	‘Avoidance pathway’ opportunities	236
	Competitive advantage from organic production	236
	New Zealand as “GM free”	237
	Environmental benefits	237
	Human health benefits	238
	General economic benefits	238
	New global role	238
	‘Dual pathway’ possibilities	238
	‘Pathway’ for organic production systems	239
	Compatibility of genetic modification and organic production systems	239
	Incompatibility of genetic modification and “GM-free” production	240
	Uncertainty about coexistence of genetic modification and organic production systems	240

## 3.14 Opportunities from use or avoidance

### Introduction

Warrant item (i) invited representation on:

the opportunities that may be open to New Zealand from the use or avoidance of genetic modification, genetically modified organisms, and products

Issues raised in connection with the opportunities to be gained from the use or avoidance of genetic modification technology essentially hinged on submitters' overall philosophy towards genetic modification. Most submitters either favoured a strategic pathway that involved use of genetic modification or favoured a pathway that avoided its use. Some submitters indicated support for a dual pathway (ie, a pathway that involved use of certain types of genetic modification technology but avoidance of other types). This perspective was most clearly evident in submitters' views on whether New Zealand could combine genetic modification, genetic modification-free uses and organic agricultural systems.

Forty-three submitters made significant comment on this Warrant item. The main sectoral focus of most submitters (27) was economic or productive. In terms of submitter type, most came from industry networks or associations. Sixteen came from industry associations or networks, nine from research organisations and four from private companies. A further seven submitters came from consumer networks (three submitters), religious groups (one submitter), Maori organisations (one submitter) and organics organisations (two submitters). Most submitters favoured use of genetic modification. A majority of submitters (31) were regarded as being 'strongly for', or 'tending to be for' genetic modification. Twelve were regarded as being 'strongly against' or 'tending to be against' genetic modification.

Submitters' views are discussed in terms of a 'use pathway', an 'avoidance pathway' and a 'dual pathway'. The latter deals primarily with submitters' attitudes on organic farming and their views on whether organic production can be combined with use of genetic modification.

## Issues raised by submitters: a summary

A majority of submitters commenting on this Warrant item saw benefits in the use of genetic modification and favoured a ‘use pathway’. Most of these submitters came from biotechnology companies, farming concerns and research organisations. The most common issues raised were opportunities that would advance general economic benefits, together with specific business interests such as increased productivity and increased competitiveness. Specific opportunities identified included:

- human health benefits
- general economic benefits
- increased productivity
- increased range of products
- environmental benefits
- increased profitability
- increased research capability
- development of new knowledge-based enterprises
- increased competitiveness
- maintenance of research capability
- enhanced animal welfare
- a new global role.

Submitters who favoured the ‘avoidance pathway’ also noted economic benefits as advantages to be gained from avoiding use of genetic modification. Competitive advantages to be gained from organic production and the competitive advantage from genetic modification-free production were particularly noted. These submitters usually came from industries that supported organic farming or “GE-free” organisations, as well as environmental advocacy groups.

Submitters favouring avoidance of genetic modification identified several opportunities for New Zealand arising from avoidance. These included:

- competitive advantage from organic production
- competitive advantage from “GE-free” production
- environmental benefits
- general economic benefits
- a new global role
- human health benefits.

Over 40% of the total number of Interested Persons (43 submitters) commented on this Warrant item. However, most submitters referred to benefits from use or avoidance of genetic modification at some place in their submissions. These attitudes are captured in Table 3.6.

## ‘Use pathway’ opportunities

Most of those submitters who saw opportunities from the use of genetic modification technology cited various human health, environmental, business and economic reasons. Of the submitters mentioning specific benefits from use throughout their submissions (ie, not necessarily in response to Warrant item (i)), more than one-third of all Interested Persons saw benefits to human health (43 submitters) as well as general economic benefits (38 submitters). The next most frequently mentioned opportunities were for increased productivity (35 submitters), an increased range of products (34 submitters) and environmental benefits (33 submitters). Data for other categories of opportunity are presented in Table 3.6.

### Human health benefits

Benefits to human health were the most frequently raised benefit from using genetic modification. Forty-three submitters thought genetic modification offered opportunities for advances in human health. Significant comment came from patient advocacy groups.

Cystic Fibrosis Association of New Zealand [IP39] saw genetic modification technology as offering cystic fibrosis sufferers the “only possibility for a cure”.

In addition, submitters saw it important for New Zealand to have the capacity to develop and use new technologies. New Zealand Organisation for Rare Diseases [IP98] commented that if New Zealand accepted the use of genetic-based medicines it would give “increased research opportunities, greater business development and innovation, and more exports”.

### General economic benefits

General economic benefits (ie, benefits other than those specifically noted to increase productivity, profitability or competitiveness) ranked as the second most frequently mentioned opportunity to be gained from the use of genetic modification. Thirty-eight submitters noted general economic benefits.

General economic opportunities identified included:

- “increased export earnings” and internationally competitive companies (New Zealand Forest Industries Council [IP9])

**Table 3.6 Opportunities identified by submitters from the use or avoidance of genetic modification technology**

Opportunities identified	No. of submitters identifying opportunities from:	
	Use	Avoidance
Human health benefits	43	8
General economic benefits	38	6
Increased productivity	35	
Increased range of products	34	
Environmental benefits	33	15
Increased profitability	31	
Increased research capability	30	
Develop new knowledge-based enterprises	30	
Increased competitiveness	26	
Maintain research capability	21	
Enhance animal welfare	15	
New global role	4	6
Competitive advantage from organic production		22
Competitive advantage from "GE-free" production		15
Other	6	7

Note: this information is drawn from the complete submission, not just the response to Warrant item (i).

- “the potential to lift New Zealand’s economic performance and quality of life” with higher value exports (AgResearch [IP13])
- increased “contra-season” seed production and evaluation, with New Zealand growers contracted to trial new varieties of northern hemisphere genetically modified crops (Aventis CropScience [IP14])
- “the means to ... re-position the [game] industry and develop a platform for future revenue growth, resulting in innovative improvements, new products and more efficient production and processing systems” (New Zealand Game Industry Board (NZGIB) [IP33])
- “accelerated industry development” (New Zealand Arable-Food Industry Council [IP56]).

### Increased productivity

The opportunity for increased productivity, particularly in the farming sector, was advanced by 35 submitters. Most comments emphasised increased land productivity.

DuPont New Zealand [IP1] saw the potential for genetically modified crops to “increase the productivity of each acre of land”. NZGIB [IP33] noted:

The opportunities for improved productivity on farm are immense eg improved pasture species (cold tolerant, water efficient, improved nutrient balance, resistance to [increased salinity]), reduced incidence of disease (eg internal and external parasites) and improved selection of animals to enhance productive traits like reproduction, growth rate, muscling, velvet growth and quality.

New Zealand Dairy Board [IP67] foresaw “enormous opportunities” for dairying. It particularly mentioned benefits to farm productivity. New Zealand Cooperative Dairy Company [IP88] felt that genetic modification “could be used to lower the farm input costs and increase the value of dairy products”.

Wrightson [IP3] viewed biotechnology as contributing to “future growth in our primary industries”. It was seen to offer “significant advances in productivity, product quality and development of new products”.

### Increased range of products

Thirty-four submitters thought genetic modification would open opportunities in New Zealand for an increased range of products.

In an accompanying witness brief, DuPont [IP1] outlined various products and processes of genetic modification technology that were currently in development or anticipated further in the future:

- novel fibres, cosmetics and adhesives

- new building blocks for polymers
- corn with improved nutritional digestibility for farm animals
- corn with improved tolerance to heat and drought
- corn for human consumption that allowed increased absorption of iron (thus reducing need for iron supplements in developing countries)
- soybean oils with increased cooking stability and health value
- stress-resistant crops that could thrive in acid or saline soils.

## Environmental benefits

Opportunities for generating environmental benefits were highlighted by 33 submitters. The potential to control pests, especially possums, was the most frequently cited specific opportunity. Submitters noted other environmental benefits, including:

- reduced chemical use
- eradication of diseases posing a threat to New Zealand’s flora and fauna
- reduction in greenhouse gases.

Further discussion of environmental benefits can be found under Warrant item (j) (ii) (see section “Areas of public interest: environmental matters”).

## Increased profitability

Thirty-one submitters cited increased profitability as an economic benefit to be gained from using genetic modification technology. Submitters generally referenced specific industry applications in their comments such as the forestry and meat industries.

In the forestry sector, two submitters made specific mention of opportunities to improve profitability provided by use of genetic modification. Forest Industries Council [IP9] felt that “biotechnology can make an already sustainable industry even more sustainable — by improving profitability and environmental performance and enhancing international competitiveness”. Genesis Research and Development [IP11] argued a further benefit related to increased profitability through the use of genetic modification in that: “Increased profitability and quality of managed forestry will also reduce pressure on native timber, resulting in greater conservation of native habitat.”

In the meat industry, Meat New Zealand (MNZ) [IP31], NZGIB [IP33] and DuPont [IP1] saw benefits for increased profitability in the use of biotechnology.

NZGIB [IP33] maintained that:

Detailed analyses indicate that reliance on traditional technology alone, will not deliver the profitability necessary to compete in the international market. Competing producers of both red and white meat are likely to adopt genetic technologies placing the New Zealand pastoral sector at a disadvantage.

MINZ [IP31] felt that the “new technologies” would advance its interests in the key areas of improving food safety and the market acceptability of consumer products. In particular, it noted “potential for stepwise improvements in profitability and growth in the meat sector”.

DuPont [IP1] argued that the use of genetic modification techniques would “give farmers, regardless of the size of their operations, the potential to increase their productivity and profitability by growing crops with specialised value-added traits and resistance to pests”.

## Maintain or increase research capability

Throughout their entire submissions, 30 submitters noted that genetic modification technology would increase New Zealand’s science and research capability. Twenty-one thought it would maintain such capability. Most comments came from universities, Crown Research Institutes and other research facilities and reflected the need for New Zealand researchers to interact with the international community.

Representative of this perspective, New Zealand Forest Research Institute [IP2] stressed that using genetic modification technology enabled researchers to “maintain front-end capabilities compared to research organisations worldwide”.

Similarly, Crop and Food Research [IP4] noted that, in its experience, “New Zealand benefits immeasurably from its interaction with the international community”. It drew attention to an aspect of particular importance to researchers and the wider “knowledge” community in commenting:

New Zealand is estimated to contribute only 0.13% of the total global investment in research. However, we share access to the total pool of knowledge and use a far greater proportion of it than we produce.

Crop and Food Research argued further that:

Indeed in most cases the knowledge we produce ourselves could not be used without other information from overseas.

Institute of Molecular BioSciences, Massey University [IP15] said:

It is important that a cadre of New Zealand graduates is produced that not only have first-hand experience in the use of these technologies but are also qualified to understand, adopt and introduce such technologies from overseas jurisdictions into New Zealand.

Similarly, University of Auckland [IP16] stressed that for it to continue as “an internationally respected, research-led institution (and in order for New Zealand to remain part of the technologically advanced world)”, the University’s research programmes, research infrastructure, employees and teaching programmes “must reflect and play a role in advancing the best knowledge available internationally”. University of Otago [IP19] maintained that “to remain competitive, to be able to collaborate with international partners, and indeed to remain part of the global science community, New Zealand researchers must be able to access overseas GMO material rapidly as it is developed”.

## New knowledge-based enterprises

In a “knowledge-based” society, knowledge is the basis for creating new and innovative goods and services. Thirty submitters saw the opportunity for New Zealand to develop new knowledge-based industries as a major reason to accept the use of genetic modification technology. Several submitters saw such new enterprise as a prerequisite for New Zealand’s future economic wellbeing.

Submitters stressed the importance of maintaining a critical mass of experienced researchers engaging in dialogue and working on a collegial basis with other practitioners both in New Zealand and overseas. Several institutions considered their reputations to be at stake in decisions on genetic modification technology.

Lincoln University [IP8] commented:

Genetic modification ... brings the University into contact with international and national researchers. This contact contributes to the specific reputation of Lincoln University as a global research institute ... Denying access to this technique would, consequently, deny researchers access to a valuable research information and reduce significantly the ability of individuals to develop their research to a high intellectual standard and for industries to develop their products and markets.

The new knowledge-based economy would create a new range of industries and products. New Zealand Life Sciences Network [IP24] saw opportunities in “high value specialised products derived from second generation biotechnology, not in commodity crops”. AgResearch shared this opinion. It saw that the decline in commodity product prices required New Zealand “using innovation to add value and knowledge to create new industries” building on its existing assets in environmental and agricultural resources and research capability.

## Increased competitiveness

Thirty-six submitters highlighted increased competitiveness. With biotechnology revolutionising world agriculture, Wrightson [IP3] saw genetic modification as

significant for New Zealand, “a country that competes in the global economy”. Institute of Molecular BioSciences [IP15] also considered “maintenance and advancement of New Zealand’s competitive advantage in biologically based industries” as a key reason for using genetic modification. Association of Crown Research Institutes [IP22] argued that New Zealand’s future could only be assured “if it can develop new competitive products and services able to capture premium prices.”

### Enhanced animal welfare

The potential to advance animal welfare was noted by 15 submitters. Benefits cited included: maintenance of species integrity, improved disease prevention and control, and humane pest control.

### New global role

Four submitters saw a potential for New Zealand to have a new global role if genetic modification were adopted. Interchurch Commission on Genetic Engineering [IP49] thought that New Zealand could take a “leading position globally” with the opportunity to devise standards, regulations and testing of genetically modified foods.

## ‘Avoidance pathway’ opportunities

The most frequently cited reason for avoiding the use of genetic modification were the benefits in competitive advantage from organic production or genetic modification-free production. Taking into account submitters’ views throughout full submissions, 22 submitters noted benefits of organic production and 15 cited benefits of genetic modification-free production. Other opportunities from the avoidance of genetic modification technology included: environmental benefits (15 submitters), human health benefits (eight submitters), new global leadership (six submitters), and general economic benefits (six submitters).

### Competitive advantage from organic production

Twenty-two submitters identified the benefits of competitive advantage of organic production as an important opportunity arising from the avoidance of genetic modification. Submitters supporting organic production generally came from organic farming interests and environmental groups.

Submitter comments representative of those supporting organic production included:

- “Organic markets ... ‘New Zealand is in a unique position to capitalise on the world demand for clean food’” (AgResearch [IP13], quoting from another source).
- “[An] important driver of the global organic market is a widespread, and increasing, level of demand by wealthy consumers for organic foods and a corresponding rejection of GM foods” (Organic Product Exporters Group [IP53]).
- “The organic market world wide is growing in leaps and bounds based on popular consumer demand. Consumer resistance to GM is growing” (Canterbury Commercial Organics Group [IP65]).
- “New Zealand farmers overwhelmingly believe that the future of New Zealand farming lies with organics rather than with GM” (Green Party of Aotearoa/New Zealand [IP83]).

## New Zealand as “GM free”

Fifteen submitters cited the benefits of New Zealand being “GM free” as a major reason for supporting the avoidance of genetic modification technology. Submitters supporting this view generally came from environmental groups as well as religious organisations. Typical of submitters’ comments was the response from Interchurch Commission [IP49]:

We have the opportunity to be GM food free in New Zealand, which would respect the wishes and cultural values of many people.

## Environmental benefits

Fifteen submitters mentioned environmental benefits as a major reason for supporting the avoidance of genetic modification. Royal Forest and Bird Protection Society, Nelson/Tasman Branch [IP43] commented:

Isolation and the development of strong border controls means that we have the opportunity to protect ourselves and our environment from genetic engineering and GM organisms. ... Some species [in the Nelson Province] are endangered and some as yet have not been identified.

Nelson GE Free Awareness Group [IP100]) listed environmental benefits stemming from avoidance of genetic modification as including maintenance of biodiversity and preservation of fauna and flora for future generations. There were associated benefits of sustainable agriculture and continued primary production of quality agriculture products, timber and fish.

## Human health benefits

Eight submitters mentioned overall health benefits as being an advantage from not using genetic modification technology in New Zealand. These views are discussed more fully elsewhere in this report under Warrant items (m) and (j) (i) (see sections “Strategic outcomes” and “Areas of public interest: human health”).

## General economic benefits

Six submitters noted general economic benefits as a reason for avoiding genetic modification technology. Most submitters supporting this view noted such advantages as benefits to tourism and other export earnings from branding New Zealand as being “clean and green” and avoiding genetic modification. Representative of comments was the statement by Green Party [IP83]:

The avoidance of genetically modified crops and animals creates the opportunity to access higher priced markets for certified organic and GE free food.

## New global role

Six submitters saw the advantage of a new global role for New Zealand if genetic modification were avoided. Most views were linked to New Zealand’s “clean green” image. Typical of such views was the description by BIO-GRO New Zealand [IP58] of opportunities from the avoidance of genetic modification technologies in food production: “GE Free branding for all New Zealand food products similar to our Nuclear Free image” and enhancement of New Zealand’s image as “an exporter of top quality food and beverages to lucrative markets”.

## ‘Dual pathway’ possibilities

Submitters offered views on whether or not it would be possible for New Zealand to combine use of genetic modification with genetic modification-free uses and organic uses, thereby allowing a wide range of opportunities for beneficial developments. Of the 25 submitters who felt a ‘dual pathway’ was possible, 10 submitters were from research organisations, nine from industry networks or associations, four from private companies and two from other advocacy groups.

Several witnesses clearly envisaged the possibility of combining genetic modification technology in some areas but not in others. For example, several witnesses supported use of genetic modification techniques in human health together with avoidance of genetic modification in commercially grown crops. More controversial was the issue of organic farming where submitters had clearly different views on what was acceptable practice.

## ‘Pathway’ for organic production systems

In this Warrant item, and throughout the Interested Persons submissions generally, there was considerable discussion on whether organic farming and genetic modification were compatible. The attitude of those submitters who clearly indicated their opinion on whether New Zealand could combine genetic modification, genetic modification-free uses and organic uses was assessed. This assessment was possible for 55 submitters (approximately half of the total Interested Persons). On the proposition that New Zealand could combine genetic modification, genetic modification-free uses and organic uses: 25 submitters agreed and 26 submitters disagreed. Four submitters considered that New Zealand could “maybe” combine genetic modification, genetic modification-free uses and organic uses.

Opinion on this issue was strongly correlated with overall stance on genetic modification. Of the 25 submitters who felt that coexistence was possible, 24 were ‘strongly for’ and one ‘tended to be for’ genetic modification. Of the 26 not supporting coexistence, 20 were ‘strongly against’ and six ‘tended to be against’.

All 10 submitters from research organisations felt that genetic modification and organic farming could coexist, as did nine of the 13 submitters from industry networks or associations and four of the five private companies. Submitters who felt coexistence was not possible tended to be from advocacy networks or associations (seven submitters) and all six of the organic groups, as well as other religious, Maori and consumer networks.

On a sector basis, the opinion was divided: 17 of those in the economic/productive sector felt that the two types of farming could coexist and 10 felt not. Two were undecided.

## Compatibility of genetic modification and organic production systems

Several submitters who commented on this Warrant item explicitly stated that both organic production systems and genetic modification technologies could coexist. They included New Zealand Vice Chancellors Committee [IP18], Meat Industry Association of New Zealand (MIA) [IP32] and New Zealand Biotechnology Association (NZBA) [IP47].

NZBA felt that “organic production systems and those using genetically modified crops can readily coexist in New Zealand”. It further noted it suspected that “it would be economic suicide for New Zealand to reject modern science and technology in an attempt to become the ‘organic niche’ nation for world agriculture”. NZBA had not carried out a financial analysis

of the various options to support its view but strongly recommended that “this should be done if there is a widely held perception by the public that an ‘Organic’ nation is preferable to one based on our previous strengths in the biological sciences”.

Vice Chancellors Committee [IP18] felt that the two technologies could co-exist “with sound risk management practices” and added that, therefore, New Zealand could “benefit simultaneously from either method”. MIA [IP32] also referred to another form of compatibility, that between “the reduced use of chemicals and pharmaceuticals due to gene technology” and “the objectives of organics”.

### Incompatibility of genetic modification and “GM-free” production

Several submitters advanced reasons why organic production systems or “GM-free” products could not coexist with genetic modification. Canterbury Commercial Organics Group [IP65] said: “Isolating organic growing from GE contamination would be impossible given the acknowledged spread of pollen to outcross into the wild community.” The Group went on to say that birds, rodents, vehicles and water races could all add to such contamination.

Comvita New Zealand [IP74] noted its particular concern (as a bee products company) at the risk of honey bees collecting resources from genetically modified crops and the consequent difficulty of ensuring that the bee products were “GM free”. It made an assessment of “the risk of GMOs entering bee products from GM trial plots in New Zealand” and found that, although there was little likelihood of its own products containing genetically modified material, “10 out of 23 (43.5%) plots capable of producing bee product raw materials lacked adequate bee controls”.

### Uncertainty about coexistence of genetic modification and organic production systems

Four submitters were ambivalent about whether New Zealand could successfully combine organic production with genetic modification. Typical of this position was the view expressed by Hamilton City Council [IP20] that it was “unable to judge the merits” of the opposing viewpoints and it advocated “looking at all options”.