

# Border Control for Genetically Modified Seeds - Submission Summary

1 August 2002

This document accompanies the *Protocol for testing imported Zea mays seed for sowing* and the *Protocol for testing imported Brassica napus var. oleifera seed for sowing*. It summarises the submissions MAF received on the [MAF Discussion Paper 31 Border Control for Genetically Modified \(GM\) seeds](#)<sup>1</sup> and explains MAF's decisions.

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## [Border Control for Genetically Modified \(GM\) Seeds](#)

- [Public Submission on GM Seeds](#)

MAF received over 700 submissions: 657 identical one-page submissions; 34 submissions from seed importers, seed producers, and industry associations; 20 submissions from individuals and environmental groups; and one submission from another government. A list of the people and organisations that made submissions is attached at the end of this paper, together with an example of the form submissions. MAF will supply copies of any submissions on request.

Under section 22 of the *Biosecurity Act 1993*, when issuing or amending an import health standard, MAF is required to consider:

- the likelihood that goods of the kind or description to be specified in the import health standard may bring organisms into New Zealand;
- the nature and possible effect on people, the New Zealand environment, and the New Zealand economy of any organisms that goods of the kind or description specified in the import health standard may bring into New Zealand;
- New Zealand's international obligations; and
- such other matters as the chief technical officer considers relevant to the purpose of Part III (to provide for the effective management of risks associated with the importation of risk goods).

The following are some of the significant factors that guided MAF's decisions:

- the most important factor is the likelihood of releasing unapproved GM seeds into the New Zealand environment;
- the likelihood varies greatly depending on the type of seed and the source country;
- it is appropriate to have stricter controls where the likelihood is higher and less stringent controls where the likelihood is lower;
- there are limits to testing - even though it can provide a high level of assurance, testing will not reduce the likelihood to zero and there are some circumstances where testing cannot provide better assurance than existing systems;
- mandatory requirements are not the only way of avoiding unapproved GM seeds - seed for sowing is already highly regulated and managed to avoid the possibility of unwanted mixing and cross-pollination, many companies are already testing their seeds for commercial reasons; and
- MAF does not have all the answers or all the information that we would ideally like to have, we have to make the best decisions with what is available.

## **1. What has changed from the proposals in the discussion paper?**

- Clarified process for deciding whether countries will be granted area freedom from commercial

GM production.

- Testing required for all consignments rather than every third consignment from countries not granted area freedom.
- MAF reviewed the sample size after the discussion paper was released and has been increased to 3200 seeds ([Questions & Answers](#)<sup>2</sup> circulated 7 June 2002).
- Testing canola/oilseed rape (*Brassica napus* var. *oleifera*) will be brought forward to start on 1 October 2002, rather than on 1 January 2003.
- MAF will begin discussions with industry with the aim of introducing testing for soybeans (*Glycine max*) from 1 January 2003.
- An extra option for small quantities of seeds for cultivar trials and/or multiplication that is available under the sweet corn protocol will also be available under the new protocol.

## 2. How is the new protocol different from the one it replaces?

- MAF is extending its current testing regime to include a wider range of seeds. As well as extending the sweet corn (*Zea mays* var. *saccharata*) regime to maize (*Zea mays* var. *indentata*) seeds from 1 August 2002, testing of canola/oilseed rape (*Brassica napus* var. *oleifera*) seeds will start from 1 October 2002, in time for the planting season. MAF will begin discussions with industry with the aim of introducing testing for soybeans from 1 January 2003.
- MAF will consider "area freedom" from commercial GM production as an alternative to testing. Routine testing will not be required if MAF is satisfied that the source country has sufficient systems in place to provide a level of assurance equivalent to testing every consignment.
- Instead of accepting companies' use of accredited quality assurance systems, MAF will simply ask to see the test results.
- The sample size has increased from 1400 seeds to 3200 seeds.
- A test that is positive for nos3 but not for 35S will not be accepted without further testing.
- No import permit is required.

## 3. Why is MAF proposing not to routinely test seeds from countries that do not have commercial GM production?

There are some countries and regions that do not produce specific GM varieties. The concept of "area freedom" is well established in the context of diseases and plant pests. The likelihood of importing GM seeds from those countries is so low that testing will not provide better assurances. In this situation, mandatory testing is neither effective nor appropriate and it would be wrong to assume that it provides a higher level of assurance.

There are three main sources of possible GM contamination in seeds:

- GM contamination in the original seeds sown;
- cross-pollination from a nearby GM crop; and

- post-harvest mixing during storage, handling or transport.

The likelihood of GM contamination from all of these sources is far greater when there is commercial production of GM varieties, because of the scale and the greater opportunities for contamination to occur. It is possible, though extremely unlikely, that GM contamination could occur from GM field trials or through a breach of border controls in countries that do not commercially produce GM varieties of those crops. The likelihood would depend on the controls over the border and over GM field trials in those countries.

In practice, New Zealand imports seeds for the main agricultural crops (including sweet corn, maize and canola/oilseed rape) from very few sources: mainly Australia, Canada, Europe and the USA. This is partly because those countries are the major agricultural producers and are therefore the sources of the best seeds for New Zealand, but also because of New Zealand's biosecurity requirements. For example, *Zea mays* can only be imported from 14 countries (Australia, Austria, Canada, Chile, Finland, France, Germany, Hungary, the Netherlands, Norway, Sweden, Switzerland, the UK, and the USA). MAF's experience with sweet corn seed imports last year showed that sweet corn was only imported from Australia and the USA. Australia has not approved GM *Zea mays* for commercial release or for field trials<sup>3</sup>. All seven of the consignments from Australia tested negative for the presence of GM seeds and confirmed that *Zea mays* imported from Australia is very unlikely to contain GM seeds.

It is also important to recognise the assurances that seed companies already provide. Seeds for sowing are valuable and seed companies take great care to ensure the quality and purity of their seeds. This means that even if unauthorised GM seeds were present in another country, the systems used to ensure seed purity provide a high level of protection against cross-pollination and accidental mixing, and make it very unlikely that they would appear in seeds for sowing for export. Many companies are already doing their own testing, which provides an additional level of quality control.

The majority of submissions did not support our proposal to have a different approach for countries that do not produce GM varieties of the seeds. Submissions from those concerned about GM crops demanded testing for any seeds if there was a GM variety produced anywhere in the world. MAF rejected that approach because it does not differentiate sources of seed where the likelihood of GM contamination is so low that testing would simply be a waste of time and money. Other submissions (mainly from industry associations) pointed to the large number of GM crops in development but not yet commercialised in many countries and the likelihood of an increasing number of GM crops being adopted in the future. They argued that GM contamination was inevitable. MAF accepts that the testing regime will have to adapt as the number and type of GM crops changes but rejects the suggestion that not being able to guarantee 100% assurance at the border means that we have to accept a tolerance for GM contamination. The same argument applies to all biosecurity risks including foot and mouth disease. Border control can never be 100% perfect yet New Zealand has so far managed to prevent foot and mouth disease from entering. A few submissions (mainly importers) agreed that our proposal was a sensible approach.

Many submissions were concerned that seeds could be imported into New Zealand through a third country to avoid testing. As signatories to the International Plant Protection Convention, New Zealand and its trading partners must produce phytosanitary certificates, signed by a government agency, to accompany many exported plant products. This system is internationally recognised and even countries that are not signatories to the convention use it. MAF requires that a re-export phytosanitary certificate, together with a copy of the original phytosanitary certificate, must accompany the consignment if it is re-exported from a third country. MAF would also consider the level of border controls over re-packaging and re-export when considering whether to grant a country area freedom from commercial GM production. For these reasons, MAF considers it very unlikely that seed from a country that produces GM crops could be exported to a non-GM producing country and then be re-exported to New Zealand to circumvent the testing requirements.

Many submissions mentioned cases where unauthorised GM crops had been grown overseas, such as GM corn in Mexico and GM soybeans in Brazil. In Mexico, the GM corn appears to have come from corn imported for food from the USA. In New Zealand, post-harvest requirements for seed for processing (food) ensure that viable seeds are not released into the environment (see Question 8). New Zealand does not import corn from Mexico. In Brazil, farmers have illegally grown GM soybeans smuggled from Argentina. MAF will develop a testing regime for soybeans (Question 10) and would not grant area freedom to countries known to have GM contamination or illegal GM crops. MAF's information suggests that there may already be GM contamination in Europe for maize and canola/oilseed rape<sup>4</sup>, so any application for area freedom would be carefully scrutinised.

## 4. How will area (country) freedom work?

If requested, MAF will consider the option of area freedom from commercial GM production (on a crop: country basis). MAF will grant area freedom if the country can demonstrate that it has sufficient systems in place to provide a level of assurance equivalent to testing every consignment.

Currently there are no international standards or agreed methods for assessing area freedom from commercial GM production so to some extent MAF will have to make judgements based on available information. MAF will develop its own New Zealand standard but it would not be in place before the next import season (2003). Until then, MAF will consider evidence from appropriate regulatory authorities on a case-by-case basis and may grant interim area freedom status. MAF intends to be as open and transparent about this as possible, and will consult other relevant agencies, including the Environmental Risk Management Authority, and publish any decisions on MAF's web site. Until a standard is developed, it is not possible to specify the exact criteria but the following indicates what might be needed to grant area freedom from commercial GM production:

- a robust regulatory system for approving the environmental release of GM crops;
- no approval for commercial release of GM varieties of the crop in question;
- sufficient controls over any GM field trials of the crop in question to prevent cross-pollination or mixing with seed produced for sowing and export to New Zealand;

- appropriate systems in place at the border to confirm the source and identity of imported seeds and to allow the detection of illegal imports of unapproved GM seeds;
- no reliable evidence that unapproved GM varieties of the crop have been grown.

MAF may require some consignments to be tested over an interim period before granting area freedom. Once granted, MAF also reserves the right to revoke area freedom, or to introduce additional measures to monitor area freedom at any time, including testing of consignments.

## **5. Why is MAF requiring every consignment to be tested when the discussion paper proposed that it be required only for every third consignment?**

MAF felt that it was possible to recognise that many seed producers test their seeds for commercial reasons and that an audit inspection of every third consignment, together with commercial practice, would provide equivalent assurances to requiring every consignment to be tested. Most producers are likely to test their seeds rather than risk their commercial investments if there was any possibility that their consignments contained GM seeds and a 1 in 3 chance that they would be tested at the border. Testing at the border also takes time, which can result in missed commercial opportunities, so testing before shipping is the best way to ensure faster biosecurity clearance. For these reasons, MAF considers that even if only every third consignment were audited, it would result in nearly all consignments being tested by the companies.

There was a range of views among the industry submissions about the frequency of testing. Most argued that no testing was required and that the government should have a tolerance for GM seed (1% or more depending on the species). This reflects the industry's approach to varietal purity and they argue that zero tolerance is neither reasonable nor achievable. Some suggested random auditing at a low frequency (1 in 10 or 1 in 20) as a way of confirming that quality assurance processes were working. On the other hand, several of the largest users of imported seeds said that they already require every consignment to be tested either for their own or their customers' purposes and that they would prefer other importers to be forced to do the same. All of the organic farmers argued for every consignment to be tested, as did all of the submissions from people and organisations concerned about GM crops.

MAF also felt that an audit approach might lower compliance costs for a very few seed producers, such as organic producers, who were extremely confident that their separation practices would ensure that GM and non-GM seeds were not mixed. However, none of the submissions from industry suggested that this would reduce their compliance costs.

Given that there is little difference in compliance costs for importers, MAF's view is that there is a lower likelihood of delays and/or confusion at the border by testing every consignment than testing every third consignment.

## 6. Is there a tolerance, threshold or allowance for low levels of contamination?

No, the law does not permit unauthorised GM seeds to be knowingly imported or planted. If GM seeds are detected, the consignment will not be allowed into New Zealand. However, there is a chance that low concentrations of GM seeds may not be detected. The limit of reliable detection is about 0.1 percent (one seed in a thousand). This is not a barrier between what is detectable and what is not, but it indicates the level where we are very confident that we will find GM seeds. Lower concentrations of GM seeds may be detected, but with less confidence.

Many submitters discussed this issue even though there were no proposals to change the law. Most industry submissions argued for a 1% tolerance for GM varieties that had been approved in one OECD country but not necessarily in all. We reject this approach because it undermines the government's policy that GM organisms should be assessed and approved by the Environmental Risk Management Authority before being released into New Zealand. Many submissions supported MAF's position of rejecting all consignments where unapproved GM material is detected.

## 7. How did MAF choose a sample size of 3200 seeds?

The detection limit for GM seeds using the most sensitive method available (PCR) is around 0.1%. This is not a cut-off but it gives an estimate of what is reliably detectable, lower concentrations of GM seeds are also likely to be detected. MAF requires a sample size that provides a very high level of confidence (95%) of detecting GM seeds at a concentration of 0.1% or more. These numbers are not precise and do not describe rigid boundaries. Rather, they are an attempt to numerically describe the inherent uncertainties.

To determine an appropriate sample size the following assumptions have been made:

- Individual seeds are either GM or not GM (if seeds are present which are heterozygous for the GM trait, e.g. due to cross-pollination, the confidence of detection will be less).
- Any GM seeds present are randomly dispersed throughout the consignment. This is a normal assumption for sampling seeds and is only used for calculating statistics. Sampling must be done according to international standards that are designed to take seeds from different parts of a consignment to account for non-random distributions.
- The sample will be ground and analysed as a whole, seeds will not be analysed individually.
- The laboratory will correctly identify the presence or absence of GM material in 99% of samples.

If the consignment is contaminated with GM seed at a concentration of 0.1%, then the probability of randomly drawing a single GM seed is 0.001. The probability of not drawing a contaminated seed is 1 - 0.001. The probability of not drawing a contaminated seed in a sample of  $n$  seeds is  $(1-0.001)^n$ . Therefore, the probability of drawing at least one contaminated seed in  $n$  seeds is  $1 - (1-0.001)^n$ . The

probability that the lab correctly identifies the sample as contaminated is 99%, so the probability of a positive result from a sample of  $n$  seeds from a consignment having a contamination level of 0.1% is  $0.99 \times (1 - (1-0.001)^n)$ . This value must equal 0.95 in order for MAF to have 95% confidence that a consignment with a contamination level of 0.1% will be detected. Re-arranging the equation to solve for  $n$  gives  $n = \log(1-.95/.99) / \log(1-.001) = 3207$ .

If the contamination is from cross-pollination there will be less GM material in a contaminated seed and the probability that the contamination will be detected will be lower. The exact probability will depend on the proportion of the seed's DNA that is genetically modified and the effectiveness of the lab test at detecting very low concentrations of genetically modified DNA.

One submission said that the sample size should be increased to give 99% chance of detecting 0.1% contamination. Our technical/scientific advice is that 99% confidence is not realistic in practice, when all the uncertainties from sampling, handling, and analysis are taken into account. We require "a very high level of confidence", which is often expressed in statistics as 95% confidence. A larger sample size will increase the chances of detecting lower concentrations but aiming for anything higher than 95% confidence would simply give a false sense of security.

## 8. What about seeds imported for processing into human or animal food?

Seed for processing (including food) is imported into New Zealand under a different import health standard that includes post-entry controls<sup>5</sup>. Only three of the four main GM crops can be imported for processing under this standard (soybean, maize, and cotton). MAF has recently changed the grain import health standard so that these three products can only be imported as either:

- non-viable grain (heat treated or physically devitalised in some way before importation); or
- viable grain that is processed in a MAF approved transitional (quarantine) facility so that it is non-viable; or
- viable grain that is heat treated on arrival for 15 hours at 85°C (cooked) under MAF supervision.

MAF reserves the right to test any grain/seed consignment with a phytosanitary certificate stating that they are non-viable. If the seed is found to be viable, the importer's options are for the produce to be re-shipped or destroyed (in extenuating circumstances, devitalisation may be an option). This system prevents seed from being released into the environment. MAF will also investigate any instance where there is genuine suspicion of GM contamination, as in 2001 when MAF refused a consignment of cotton seed from Australia that had a high likelihood of containing GM seeds.

## 9. Why is testing for *Brassica napus* var. *oleifera* being brought forward to 1 October?

In its discussion paper, MAF indicated that testing for GM presence in canola/oilseed rape (*Brassica napus* var. *oleifera*) consignments would be required from 1 January 2003. However, at a meeting between government agencies in Wellington on 24 July 2002, there was strong concern that this would miss the current planting season. Hence it was agreed that the commencement date for testing should be brought forward to 1 October 2002.

There are many subspecies of *Brassica napus* including swede (var. *napobrassica*), forage rape (var. *biennis*), and canola/oilseed rape (*oleifera*). Only canola/oilseed rape (var. *oleifera*) has genetically modified varieties grown commercially overseas but the seeds look identical so it is impossible to differentiate the subspecies at the border. Currently, imported *Brassica napus* seeds do not require phytosanitary certificates but MAF intends to introduce new phytosanitary requirements to manage the risks from certain pathogens from 1 January 2003. MAF will require phytosanitary certificates for all imported *Brassica napus* seeds from 1 October 2002. The phytosanitary certificates must specify the subspecies. Testing for GM seeds will take effect only for canola/oil seed rape (var. *oleifera*) from 1 October 2002.

Some submissions from industry highlighted the possibility of cross-pollination between the subspecies. One submission suggested that we extend testing to all *Brassica* seeds. Although cross-pollination is possible, the quality assurance systems used to produce seed for sowing already have measures to prevent this. The likelihood that GM seeds would enter New Zealand through this route is so low that testing will not provide better assurances, but MAF will also investigate any instance where there is genuine suspicion of GM contamination.

## **10. Why is MAF proposing testing for *Glycine max* (soybeans)?**

New Zealand grows extremely small areas of soybeans (less than 20 hectares) and has not imported soybeans for sowing during the last year. However, to allow for soybeans to be imported in the future, MAF will develop a testing protocol for soybeans to come into force on 1 January 2003. MAF will consult importers and growers before introducing testing.

## **11. What is MAF doing about species other than maize, canola/oilseed rape, and soybeans?**

Maize, canola/oilseed rape, soybeans and cotton (*Gossypium hirsutum*) made up 99 percent of the world's area of GM crops last year. These crops are by far the most likely source of GM seeds.

Cotton is not grown commercially in New Zealand but cotton seed is occasionally imported from Australia for stock feed. Imported seed will not be permitted in viable form.

New Zealand imports zucchini (*Cucurbita pepo*) seeds from the USA, but GM zucchini varieties are

only grown in regions where two particular plant viruses are a problem. As a vegetable crop, it is not as intensively grown as grain crops and there are currently very strong commercial pressures in New Zealand to avoid GM crops. It is possible to identify cross-pollination from external sources during multiplication (before the seeds are harvested) because the fruit would have different shapes. Therefore the existing seed production and segregation systems provide a very high level of assurance that GM seeds would not be unintentionally imported into New Zealand.

Commercial carnations are produced from cuttings so carnation seeds for sowing are only imported for home gardens. GM carnations are easily identified (they have a distinctive blue/purple colour) and like GM zucchini, are grown in very small areas of one country (Australia). The greatest likelihood of importing GM material is from people deliberately importing packets of seeds for their gardens. MAF is reviewing the requirements for seeds imported by international passengers.

New Zealand does not import potato or papaya seeds. GM tomatoes are no longer grown commercially overseas but are the subject of many research projects, so MAF will continue to monitor the situation.

It is always possible that GM seeds could be smuggled or unintentionally brought into New Zealand through some other unauthorised source. New Zealand's existing biosecurity controls (e.g. x-ray machines) provide a high level of assurance against unauthorised plants and seeds.

## **12. Why has MAF rejected the idea of accrediting quality assurance systems for companies?**

Under the previous protocol, MAF allowed an alternative to testing for companies with a quality assurance system that had been accredited by MAF. However, accreditation is a time-consuming and costly process and only one seed company from the USA used it. Since testing was required to be part of any accredited quality assurance system, MAF considers that it is easier to accredit laboratories and simply require the test certificate to accompany the consignment.

In our discussion paper we specifically asked for feedback from the industry on this question of whether there were any cheaper alternatives to testing, such as documented audit/assurance systems. A few thought that the option of documented audit/assurance systems was useful, but most agreed that the only way to check a quality assurance system was through testing and therefore that it was no cheaper.

## **13. Why won't a test that is positive for nos3 but not for 35S be accepted without further testing?**

Under the previous protocol, a result that was positive for nos3 but negative for 35S was not considered to be conclusive because all GM sweet corn contains the 35S sequence. However, one GM maize variety contains nos3 but not 35S. MAF was also concerned about the chance of false positive results from the presence of *Agrobacterium tumefaciens* (a naturally occurring soil bacterium from which the nos3

sequence is derived). The testing protocols require both positive and negative controls to reduce the chances of false positives and false negatives. The testing techniques have also evolved considerably in the last 12 months so false positives are less likely.

Following a result that is positive for nos3 but negative for 35S, importers will have the option of further testing to prove the presence or absence of GM material. In practice, it is extremely unlikely that any importer would attempt to ship seeds to New Zealand if they had tested positive for one sequence offshore. Therefore this situation is only likely to occur with seeds sampled at the border.

Further testing may also be appropriate in the event of unclear or ambiguous results. In cases where uncertainty cannot be resolved by further testing, MAF will make a judgement in consultation with other relevant agencies, including the Environmental Risk Management Authority, and appropriately qualified experts outside MAF.

## **14. What are the requirements for small quantities of seeds for cultivar trials and/or multiplication?**

Importers of small quantities (defined as those weighing less than 5 kg per line) of seed for cultivar trials and/or multiplication will have three options:

- Test samples can be collected by either taking some seed from a number of randomly selected small packets of seed, or taking a random selection of whole packets of seed. If GM material is detected, the whole consignment will not be given biosecurity clearance.
- Untested seed may be imported into, and grown in a quarantine facility (for GMO testing this would be Level 1, albeit there may be a phytosanitary requirement that may require the seed to be grown in a Level 2 quarantine facility) registered and operated according to MAF Biosecurity Authority standard PBC-NZ-TRA-PQCON *Specification for the Registration of a Plant Quarantine or Containment Facility, and Operator*. During growth and before pollen is produced, MAF will test leaf disc samples for GM material. If GM plants are detected then the consignment will be destroyed.
- Untested seed may be imported into and grown in an appropriate quarantine facility registered and operated according to MAF Biosecurity Authority standard PBC-NZ-TRA-PQCON *Specification for the Registration of a Plant Quarantine or Containment Facility, and Operator* (if in a level 1 quarantine facility, the crop must be isolated by at least 200m from domestic *Zea mays* crops). The importer must sign a declaration that the seeds have been produced under a quality assurance system to avoid contamination by GM seeds and are not known to contain GM seeds. The plants will not be tested and will not receive biosecurity clearance. Once the trial is complete, all harvested seeds must be re-exported out of New Zealand and the remaining vegetative material destroyed, including any eventual emerging volunteer plants)

## **15. If a consignment is tested offshore will it be tested again at**

## the border?

No. A consignment that has been tested offshore in a MAF-accredited laboratory according to the method outlined in the protocol will not be tested again unless there genuine grounds to suspect that GM seeds are present.

## 16. Why not stop all seeds from countries that produce GM varieties? Why can't we import seeds from the rest of the world?

A large number of submissions argued for a ban on all seeds from countries that produce GM varieties of those seeds, citing international law and the precautionary principle. New Zealand takes a precautionary approach to all GM organisms by requiring that they be assessed before being approved for use in New Zealand. MAF's testing regime imposes an extra level of assurance over and above the fact that it is illegal to import unapproved GM seeds, and is also precautionary.

Many submissions argued that if GM seeds were imported that it would undermine New Zealand's agricultural exports. However, many of those agricultural industries also rely on imported seeds - the price and quality of seeds affects their competitiveness. For example, maize is grown for food and is also an important stock feed in the dairy, pig and poultry industries. Many of the best quality seeds come from countries that grow GM crops, because they are also the world's major seed producers. Banning seeds from those countries would seriously disrupt New Zealand's seed supply because there are few alternative sources. It would limit access to seeds with desirable characteristics (such as even ripening) and would raise the price of seeds, but could still not provide a 100% guarantee to stop all GM seeds. Such a ban would have serious negative effects in several agricultural industries, including dairying, and would seriously damage and possibly destroy those industries that rely on imported seeds.

Although the costs of a prohibition cannot be precisely determined, the value of these crops gives an indication of their importance. MAF estimates that the annual gross value of maize is about \$70 million and that it adds \$60 million in extra production to the dairy industry. The annual gross margin of the canola/oilseed rape crop is about \$1.8 million. New Zealand also has a seed multiplication industry worth about \$20-\$30 million. MAF believes that the mandatory testing regime will improve the already high level of assurance that GM seeds are unlikely to be released in New Zealand, while still allowing legitimate trade to proceed.

## 17. What consultation occurred? What involvement did industry have?

In February 2002, MAF published an article in *Biosecurity* magazine highlighting the issue of GM seeds and foreshadowing a consultation process to refine the existing testing protocol. MAF had identified

maize and canola as the most likely source of GM seeds. Several media articles carried the story at the time. Between February and May 2002 MAF prepared the public discussion paper. Before the discussion paper was released, we showed a draft to some industry contacts to check the facts and figures about seed imports and also corresponded with GE Free New Zealand

On 6 May 2002, MAF released Discussion Paper 31: "Border Control for Genetically Modified (GM) Seeds", with public submissions due by 28 June 2002. It was accompanied by a press release and published on MAF's web site. The story was widely reported in newspapers around the country. When the discussion paper was released we sent it directly to seed companies, industry associations, environmental groups, Maori groups, and individuals who had expressed an interest in this issue. Specifically, some of the groups we spoke to by telephone included the New Zealand Grain & Seed Trade Association, the New Zealand Plant Breeding & Research Association, the New Zealand Vegetable & Potato Growers Federation, Federated Farmers of New Zealand, Greenpeace, and the Green Party. MAF also directly informed officials in the Australian and USA governments, and member countries of the World Trade Organisation.

MAF received over 700 submissions: 657 identical one-page submissions; 34 submissions from seed importers, seed producers, and industry associations; 20 submissions from individuals and environmental groups; and one submission from another government. A summary of the submissions is attached at the end of this paper, together with an example of the form submissions. MAF will supply copies of any submissions on request.

## **18. What are the likely costs of these proposals?**

MAF cannot predict the full consequences of introducing this testing regime and asked for information from the industry about costs to supplement the information provided in the discussion paper. MAF's experience with sweet corn seeds last year was that trade continued, though there were some minor disruptions and delays at the border (particularly when the requirements first came into force).

In some cases, but not all, testing will increase the price of seeds. A few major New Zealand companies said that the testing regime would not impose extra costs or restrict the availability of seeds because they already required testing for their own commercial needs. One importer paid \$16,000 for testing sweet corn seeds from Australia, which increased the price of his seeds by 3%. Australia does not produce GM corn and all the tests were negative for GM material. Importers and growers of vegetable seeds were very concerned that the costs of testing and destructively sampling 3200 seeds would be prohibitive. One importer estimated that testing would increase the costs of their zucchini seeds by 10% and others suggested that certain lines of vegetables would become unavailable. Some said that extending testing to all seeds would drive them out of business.

There were very significant concerns from industry that New Zealand could become isolated from international seed trade and could lose the ability to trial new varieties of seeds because it is such a small market. If this happens, it is likely to cause a gradual decline in the competitiveness of New Zealand

companies. One company reported that trials of new varieties of sweet corn had been delayed by between 1-3 years due to the new requirements and that overseas companies were reluctant to meet New Zealand's requirements. One seed multiplication company reported that it had lost a client from the USA and another said that it had lost a \$2 million contract to Chile because the overseas company was not satisfied that it could meet New Zealand's requirements.

## **19. What effect would unapproved GM seeds have if they were released in New Zealand?**

The effects of unapproved GM organisms on the economy, environment and people of New Zealand are not certain. The most comprehensive examination in New Zealand of these issues and the general issues surrounding GM crops comes from the Royal Commission on Genetic Modification. The Royal Commission said, "The principal environmental risk in releasing genetically modified food and other crops into the environment is the physical contamination of other production systems." The government accepted the Royal Commission's recommendations that further work was needed on environmental impacts of GM crops and on the coexistence of GM and non-GM production. This work has begun and includes:

- conditional release of GM organisms (Recommendation 6.8);
- research on environmental impacts on soil and ecosystems (Recommendation 6.12);
- effective separation distances between GM and unmodified crops (Recommendation 7.7);
- a strategy for the use of the Bt toxin in sprays and GM plants (Recommendation 7.1);
- research on the economic impact of GM organisms (Recommendation 13.1)

The Royal Commission also noted the significance of the first release of a GM crop into New Zealand. MAF considers it important that the first release of a GM crop is approved under the HSNO Act 1996 rather than through an unintended release of GM seeds associated with the importation of conventional seeds.

## **20. What are other countries doing?**

Most countries do not specifically test imported seeds for the presence of GM seeds. Japan tests corn seeds from the USA for StarLink, a GM variety that is not approved for human consumption. For other seeds, Japan accepts that identity preservation in seed production effectively prevents GM contamination, but is considering stronger/mandatory measures. European Union law currently allows the unintended presence of up to 0.5% GM seeds if the seeds are approved for release but zero tolerance if they are not approved, but this is enforced differently in each country. Europe is currently debating new rules for the approval and labelling of GM organisms, including a proposal to allow a tolerance for GM seeds that are unapproved but have been cleared by the relevant scientific committee. The presence of such GM seeds must be technically unavoidable - the operators must be able to demonstrate that they have taken steps to avoid GM contamination. In the UK, seed companies have to satisfy the government

that due care has been taken to avoid unintended GM seeds, otherwise the government can take samples for testing.

Argentina, Canada, and the USA consider that anything lower than a 1% tolerance for GM seeds is unachievable. The International Seed Federation suggests that countries adopt a 1% tolerance for GM seeds that are approved in one OECD country but not in all. The International Seed Federation and the International Seed Trade Association have begun an experiment to validate seed testing methods.

## **21. Has GM contamination already occurred in New Zealand and is it inevitable?**

The New Zealand government has no evidence that GM seeds have been imported, though the possibility cannot be ruled out. MAF will investigate the suspected presence of any GM seeds as it would for any other case where there is evidence of a breach of the *Biosecurity Act 1993*.

It is difficult to predict whether contamination will be inevitable or not. With more and more GM crops being grown and traded around the world, there will be more opportunities for contamination of seed supplies. On the other hand, the systems to separate GM and non-GM crops are likely to improve, driven both by commercial pressures and demands from governments for assurances. It is probably inevitable that there will be some instances of contamination, but with appropriate actions and ongoing assurance systems, it should be possible to keep them isolated. There is always a chance that some low levels of contamination may not be detected, but most of the time any contamination will be detected by the assurance systems that are in place.

## **Names of people and/or organisations who made submissions on MAF Discussion Paper 31: Border Control for Genetically Modified (GM) Seeds**

- AB Annand & Co
- American Seed Trade Association (ASTA)
- Cedenco Foods Ltd
- Claire Bleakley
- Cropmark Seeds
- Dunbier & Associates
- Federated Farmers
- Foundation for Arable Research
- GE Free Northland (in Food & Environment)
- Global Industry Coalition
- Green Party
- Greenpeace Aotearoa New Zealand

- Groudswell Canterbury
- Heinz Wattie's
- Hybrid Seed Company
- John Davis
- Jossco NZ Ltd
- Kathy Bentham
- King Seeds
- Life Sciences Network
- Marjorie Zander
- Maungkarama Landcare Group
- Michelle McGregor
- Monsanto Thailand
- Mrs Julia Meek and family
- Nadine Driver
- New Zealand Agriseeds Ltd
- New Zealand Feed Manufacturers Association
- New Zealand Fruitgrowers/Vegetable & Potato Growers/Berryfruit Growers Federation
- New Zealand Grain & Seed Trade Association (Vegetable Seed Committee)
- New Zealand Plant Breeding & Research Association
- Northland Conservation Board
- Pacific Seeds
- PC Harbutt
- Penford New Zealand
- PGG Seeds
- Physicians and Scientists for Responsible Genetics
- Richard & Chise Dunwell
- Seed Solutions
- Seminis
- Snowy River Seeds
- South African National Seed Organization
- South Pacific Seeds
- Stephen Clark
- Sunrise Coast NZ Ltd
- Syngenta Seeds
- Tim Vallings
- Webling & Stewart Seeds
- Wendy McGuinness
- Wrightson Research
- Yates

plus: 657 identical form submissions  
(example next page)

# Public Submission on GM Seeds

to: **Ministry of Agriculture and Forestry**

Post to: PO Box 2526, Wellington DEADLINE: Friday 28 June 2002

Email : [gmseeds@maf.govt.nz](mailto:gmseeds@maf.govt.nz);

On-line at : [www.maf.govt.nz/gmseeds](http://www.maf.govt.nz/gmseeds);

fax to: (04) 473 0118 (to "GM seeds")

**Dear MAF, Feedback on MAF protocols for GE seed testing**

GM seed contamination is already occurring overseas, and must be stopped. There is a growing demand for guaranteed GE-free seed. Only maximum assurance is acceptable to protect New Zealand's bio-security, economy and to preserve consumer choice. There must be no compromise on bio-security to cut costs.

- **Testing must be done for all consignments of seeds** of commercial crops that have been genetically engineered irrespective of the country of origin. (GE seeds could be sent via a GE Free country to avoid testing). Reliance on importers complying with New Zealand law does NOT provide sufficient assurance against illegal GM imports.
- **Every consignment, NOT just every third consignment, should be audited** to confirm that it had been tested for GM seeds. MAF should require either: that a sample be taken at the border and tested, or evidence from tests performed offshore in a MAF-approved laboratory, provided the seeds are sampled and tested according to the protocol. There should also be testing of ALL incoming consignments of viable foodstuffs, stock feed eg. cotton seed, soy, etc for any purpose unless pre-processed.
- **There must be further protocols** on soyabean, cotton, potatoes, carnations, zucchini, and other seeds from the US or other countries where there is the possibility of genetic contamination. Ideally there should be a ban on seed imports from those countries growing a GE variant. International law and the precautionary principle contradict government claims that this is not feasible or beneficial.
- **I support MAF proposals for Zero tolerance** of shipments where GM seeds are present and for this to be advocated by New Zealand at international fora.
- **Timing for introducing new protocols must be brought forward** as a matter of urgency, with additional government funding as needed. The Government and Crown research Institutes should develop testing technologies for use in NZ and export overseas to meet the demand for GM tests

Please notify me in writing at the contact address below when the final protocol is decided.

Yours Sincerely

Name

Address/contact

Signature

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1. <http://www.biosecurity.govt.nz/imports/plants/papers/gm-seeds/border-control-gm-seeds.htm>
2. <http://www.biosecurity.govt.nz/imports/plants/papers/gm-seeds/gm-seeds-faq.htm>
3. Office of the Gene Technology Regulator, [www.ogtr.gov.au](http://www.ogtr.gov.au), information accessed 23 July 2002
4. A Meldolesi; European Union in disarray over GM seeds; Nature Biotechnology 20(4), pp324-325, April 2002