



Consultation on a draft Testing Protocol for GM
Medicago sativa (lucerne/alfalfa)

Review of Submissions

Biosecurity New Zealand
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Purpose

The purpose of this document is to summarise the submissions received during public consultation on a draft testing protocol for *Medicago sativa*, and to provide the Ministry of Agriculture and Forestry's (MAF) response to these submissions.

Background

- 1.1 MAF is the enforcement agency for both the Hazardous Substances and New Organisms Act (HSNO)1996, and the Biosecurity Act 1993. New organisms, including genetically modified (GM) organisms, must have HSNO approval before they can be lawfully released or grown in this country.
- 1.2 MAF concluded public consultation in July on a mandatory border testing protocol for *Medicago sativa* (lucerne/alfalfa) seed. Consultation was triggered by the commercial release in the United States (US) last year of two GM herbicide resistant varieties.
- 1.3 Fifteen submissions were received. Generally there is support for the implementation of a testing protocol for *Medicago sativa* seed for sowing and sprouting.
- 1.4 Border testing protocols are in place for *Zea mays* (maize and sweetcorn), *Glycine max* (soybean) and *Brassica napus* var. *oleifera* (oilseed rape) seeds for sowing in New Zealand. Commercially significant volumes of GM varieties of these three species are produced overseas.
- 1.5 *Medicago sativa* seed is imported into New Zealand for sprouting (alfalfa sprouts), for sowing (lucerne hay and seed production), and for animal and bird feed. Seed imported for animal and bird feed is devitalized, no longer contains viable new organisms, and therefore does not need to be tested for the presence of unapproved GM seeds. Imported seed for sprouting or sowing purposes is viable, and the testing protocol will be applied in these instances.
- 1.6 Two Import Health Standards - *Importation of Seed for Sowing*¹, and *Grains/Seeds for Consumption, Feed or Processing, Plant Health Requirements*² - will be amended to include the mandatory testing protocol requirement for *Medicago sativa* seed for sowing and sprouting.
- 1.7 MAF notified the World Trade Organisation (WTO) under the Technical Barriers to Trade (TBT) agreement on 15 June 2006, and received six requests

¹ Biosecurity New Zealand Standard "155.02.05 *Importation of Seed for Sowing*" <http://www.biosecurity.govt.nz/files/imports/plants/standards/155-02-05.pdf>

² Biosecurity New Zealand Standard "BNZ-GCFP-PHR *Grains/Seeds for Consumption, Feed or Processing – Plant Health Requirements*" <http://www.biosecurity.govt.nz/files/imports/plants/standards/bnz-gcfp-phr.pdf>

for further information on this issue. The notification period concluded on 8 August 2006, and no further submissions were received on this issue.

Benefits and costs of implementing a testing protocol

- 1.8 Implementing a GM testing protocol for *Medicago sativa* provides a practical and effective way to enforce the HSNO Act at the New Zealand border.
- 1.9 The testing protocol will increase compliance costs for importers for *Medicago sativa* seed for sowing and sprouting, and there may be further downstream effects on economic and trade issues related to these commodities.
- 1.10 This is the first time that the *Import Health Standard - Grains/Seeds for Consumption, Feed or Processing, Plant Health Requirements* - will be amended to include a GM testing protocol requirement. Compliance costs associated with GM testing and border clearance of GM documentation will thus be mandatory for specified food industry stakeholders.

MAF recommendations

- 1.11 That Biosecurity New Zealand implements a border testing protocol for *Medicago sativa* seed for sowing and sprouting from 30 November 2006.
- 1.12 That Biosecurity New Zealand implements the *Medicago sativa* protocol with no significant changes from the draft protocol, consulted with stakeholders in June-July 2006.
- 1.13 That Biosecurity New Zealand reconsiders the sampling requirements of the *Medicago sativa* testing protocol in a separate review. This may involve a further period of public consultation.

1. Introduction

The Ministry of Agriculture and Forestry (MAF) released the “Draft protocol for testing imports of *Medicago sativa* seed for sowing and sprouting for the presence of unapproved genetically modified seed” for public consultation on 9 June 2006. The protocol aims to prevent the importation of unapproved GM *Medicago sativa* seed which may be inadvertently present in consignments of conventional seed.

If implemented, the protocol will require amendments to the following two Import Health Standards:

Review of submissions received from consultation on a testing protocol for *Medicago sativa* (lucerne/alfalfa).

- *Importation of Seed for Sowing*
- *Importation of Grains/Seeds for Consumption, Feed or Processing – Plant Health Requirements*

The last date for submissions was 14 July 2006. Table 1 summarises the submitters and the organizations they represent.

Table 1 – Submissions received and organisations represented.

	Date received	Author	Organisation
1	13-06-2006	Vicky Thompson	Managing Director, Living Foods
2	14-06-2006	Gerard Martin	Kings Seeds (NZ) Ltd
3	30-06-2006	S.H. Manning	Managing Director, Agriseeds
4	9-07-2006	Noeline Gannaway	Public
5	12-07-2006	Margaret Aylward	public
6	12-07-2006	Clare Brown	public
7	13-07-2006	Colin MacGillivray	public
8	13-07-2006	Phillip Geertson	Geertson Seeds Farms, Oregon,USA
9	13-07-2006	Z. Grammer	GE Free Northland in food & environment
10	14-07-2006	Seager Mason	BioGro New Zealand
11	14-07-2006	Susie Lees	GE Aware Nelson/ GE Free New Zealand
12	14-07-2006	Steffan Browning	Soil & Health Association of New Zealand
13	14-07-2006	Jody Connor	Secretary, GM Policy & Advocacy, Federated Farmers of NZ (inc)
14	14-07-2006	David Penna	Regulatory Affairs Manager, Monsanto Australia Ltd
15	17-07-2006	Stephanie Howard	Sustainability Council of New Zealand

Each submission has been reviewed, focusing on technical suggestions.

Every effort has been taken to ensure transparency of the process. The consultation information and draft protocol have been reviewed by Biosecurity New Zealand, MAF Policy, and New Zealand Food Safety Authority. External consultation has been

provided by officials from the Ministry of Environment and Environmental Risk Management Authority New Zealand (ERMA New Zealand), and by the Ministry for Foreign Affairs and Trade and Standards New Zealand through their role in notifying the WTO secretariat.

2. Review of Submissions

2.1 Living Foods, Mangere, Auckland

“Living Foods would like to request that MAF considers the option of area freedom from the testing of lucerne from Australian grown seed for sprouting production in New Zealand.”

MAF Response:

This is an option in the testing protocols, and states that MAF will grant area freedom if the country can demonstrate sufficient systems are in place to provide a level of assurance equivalent to testing every seed line. Several other submitters have also requested assessment of country freedom for Australia (and Europe), and a detailed response to this suggestion is provided in section 3.2.

2.2 Kings Seeds (NZ) Ltd

“Testing certificates should be valid for an entire seed lot.”

MAF Response:

MAF agrees with this statement. Each testing certificate represents a seed lot as a whole. Importers who wish to bring in multiple consignments of the same seed lot over a period of time can do so by obtaining additional copies of the testing certificate from the laboratory, and supplying one with each consignment imported.

“The testing protocol should be implemented later than 1 August 2006 – as it is unlikely for GM seed to be available in the marketplace so soon.”

MAF Response:

Medicago sativa seed is “aged” for a period of four to six months following harvest, particularly in the United States where the percentage of hard seed can be as much as 50% at harvest³. Seed aging reduces hard seed to around 15%, which is preferred by seed buyers. Therefore *Medicago sativa* seed from the 2006 harvest is not expected to be available for import into New Zealand until late 2006 or early 2007. MAF considers that enforcing the testing protocol from 30 November 2006 onwards will ensure that border testing is effectively implemented.

“Request MAF considers the option of area freedom for Italian grown seed.”

³ Advice received during Industry Consultation meetings held on June 13th 2006 in Auckland and Christchurch.

MAF Response:

Several other submitters have also requested assessment for country area freedom for Australia and European countries. A detailed response to this suggestion is provided in section 3.2.

2.3 Agriseeds Limited

“Request MAF considers the option of area freedom for Australian and European grown seed.”

MAF Response:

Several other submitters have also requested assessment for country area freedom for Australia and European countries. A detailed response to this suggestion is provided in section 3.2.

2.4 Noeline Gannaway, public

*“I urge that health import standards be adapted for seed consignments of imported lucerne/alfalfa (*Medicago sativa*) to be rigorously tested by one of MAF’s testing laboratories to ensure that they can be certified as free of GM material.”*

MAF Response:

MAF intends to implement a testing protocol for *Medicago sativa* seed imports. It is not possible to certify seed consignments as GM free without testing every single seed, however, and certificates state that “no GM material was detected” at the limit of detection of the testing method.

2.5 Margaret Aylward, Clare Brown, and Colin MacGillivray, public

“Support for the implementation of a testing protocol.”

MAF Response:

Submission noted.

“Seed consignments should be certified GM free by at least two testing laboratories.”

MAF Response:

MAF does not consider it necessary for two laboratories to test the same seed material and report the same result. All three MAF approved laboratories routinely participate in proficiency testing programmes, measuring their testing performance against other international laboratories. Their ongoing successful participation in these programmes demonstrates the accuracy and reliability of their analytical testing, and enables MAF to have continued confidence in their testing services.

“MAF should develop a leaf test for detecting GM sprouts/plants.”

MAF Response:

MAF approved testing laboratories are able to detect the presence of genetically modified DNA in both leaf/plant material and seeds, as the testing methods are essentially the same. The main difference lies in the initial preparation of DNA. Seeds are ground into a fine powder, and various buffers and reagents are added to digest the cells and release the DNA. The tubes are then spun in centrifuge to separate the cellular components, and then the DNA is recovered. The method is similar for extracting DNA from green plant material, but leaves/plant material are first dried in silica gel (or liquid nitrogen) before grinding to a fine powder. Subsequent analytical steps, including the amplification of DNA and detection of specific GM constructs, are identical for DNA isolated from both seeds and plant material.

2.6 Geertson Seeds Farms, Oregon, USA

“Increase seed sample size, and possibly increase number of samples taken.”

MAF Response:

The current MAF protocols were used as the basis for drafting the *Medicago sativa* protocol, and they underpin the utility of the 3200 seed sample method. At this time, a re-evaluation of the seed sample size (and the number of samples taken) would require a further period of consultation, which would delay the implementation of the testing protocol. MAF believes it is prudent to implement the border testing protocol in advance of seed sales of the 2006 harvest, in order to reduce the likelihood of importation of unapproved GM seed. MAF will therefore consider the seed sampling requirements of the *Medicago sativa* protocol in a separate review. See further discussion in section 3.1.

“Retain the sample for an extended period in case of environmental contamination.”

MAF Response:

The current Standard⁴ requires laboratories to hold any remaining test sample for at least three months. There have been very few instances when MAF has required access to the remaining test sample beyond this period. As there are practical limits to the storage capacity of laboratory facilities, MAF considers the current requirement of “at least three months” to be adequate should further testing be required.

“Revise the standards for importation of Breeder or Foundation seed to make the requirements more extensive.”

MAF Response:

MAF does not anticipate a revision of the treatment of imported breeder or foundation seed in the Import Health Standard *Importation of Seeds for Sowing* in the near future. Most breeder seed is likely to be imported in limited quantities, and may not be able to meet the minimum testing sample size required by the protocol. There are a few alternative options outlined in the protocol for importers of small quantities of seed,

⁴ Biosecurity New Zealand Standard “Approval of Laboratories for Genetically Modified Organism Testing: 2005” - <http://www.biosecurity.govt.nz/files/imports/plants/papers/gm-seeds/labs-gmo-testing.pdf>

and MAF will continue to assist growers wishing to make use of these options for assessing novel cultivars and securing international seed growing contracts.

2.7 GE Free Northland in food & environment

“Supports the implementation of a testing protocol.”

MAF Response:

Submission noted.

“MAF testing laboratories should have a copy of NZ’s Zero Tolerance Policy in writing, reminding them to report all positive GM test results to NZ authorities.”

MAF Response:

All three MAF approved laboratories are fully aware of New Zealand’s zero tolerance policy toward GM organisms, however, MAF will remind laboratories by supplying a copy of the policy during implementation of the *Medicago sativa* protocol.

“MAF should develop model Quality Assurance programs to minimize GM contamination at all stages of seed breeding and transport.”

MAF Response:

Biosecurity New Zealand does not have the authority to insist that a specific Quality Assurance (QA) programme be adopted by overseas seed producers. It is important to understand that QA programmes are based on process assurance, and are not themselves a product guarantee. However, QA can be an important component of managing seed purity outcomes, and importers may choose seed suppliers on this basis to give greater assurances of the purity and GM status of their imports.

“Support the submission made by the Sustainability Council of NZ.”

MAF Response:

Submission noted.

2.8 BioGro New Zealand

“Supports GE Free Northland’s submission.”

MAF Response:

Submission noted.

2.9 GE Aware Nelson/ GE Free New Zealand

“Has observed wilding alfalfa on river gravels in Tasman district.”

MAF Response:

Submission noted.

“If seed cannot be certified GM free NZ should not import from countries where GM seed is produced.”

MAF Response:

As a testing method is available for detecting the presence of GM *Medicago sativa* seed, it is not necessary to ban imports from countries where GM seed is produced.

2.10 Soil & Health Association of New Zealand

“Supports the implementation of an effective testing protocol.”

MAF Response:

Submission noted.

2.11 Federated Farmers of NZ (inc), GM Policy & Advocacy

“Supports the implementation of a testing protocol.”

MAF Response:

Submission noted.

“Request MAF considers the option of area freedom for countries which do not grow GM lucerne/alfalfa.”

MAF Response:

Several other submitters have also requested assessment for country area freedom for Australia and European countries. A more detailed answer is provided in section 3.2.

2.12 Monsanto Australasia

“The test method [will only detect glyphosate tolerant alfalfa]. Recommend broadening the methods section to allow future GM trait detection strategies.”

MAF Response:

Glyphosate-tolerant *Medicago sativa* is the only commercialised GM trait in this crop species at the current time. It is not possible to determine exactly which traits will be commercialised in future, so MAF will adapt the protocol as and when this happens.

“Urge Biosecurity NZ to consider the use of [protein based methods] for seed testing purposes, coupled with a pooled seed sampling strategy.”

MAF Response:

MAF prefers the use of laboratory based tests rather than field-testing because laboratories can be approved to, and audited against, the MAF standard and protocols.

This gives MAF confidence in the reliability of the testing process, and the accuracy of the result. MAF considers that protein-based testing methods are usefully employed in seed breeding programmes, where tests can be routinely and cheaply used at all stages in the sowing, harvest, storage and transport of seed.

“Currently there are no validated PCR tests for GM alfalfa. Protein based methods are already publicly available.”

MAF Response:

The Eurofins laboratory in France have recently validated qualitative PCR tests for GM *Medicago sativa*, and these are available from September this year. The other laboratories are expected to be able to offer validated tests in the upcoming months. MAF understands your general point, however, that there is often a lag time between the commercialisation of a new GM crop and the validation of a PCR method to detect it.

“Support continued trade, as the seed production industry can successfully and responsibly implement a testing program.”

MAF Response:

Submission noted.

2.13 Sustainability Council of New Zealand

“Increase sample size to 10,000 seeds.”

MAF Response:

The current MAF protocols were used as the basis for drafting the *Medicago sativa* protocol, and they underpin the utility of the 3200 seed sample method. At this time, a re-evaluation of the seed sample size would require a further period of consultation, which would delay the implementation of the testing protocol. MAF believes it is prudent to implement the border testing protocol in advance of seed sales from the 2006 harvest, in order to reduce the likelihood of importation of unapproved GM seed. MAF will therefore consider the seed sampling requirements of the *Medicago sativa* protocol in a separate review. See further discussion in section 3.1.

“Adopt a Quality Assurance based-system along with border testing.”

MAF Response:

Biosecurity New Zealand does not have the authority to insist that a specific Quality Assurance (QA) programme be adopted by overseas seed producers. It is important to understand that QA programmes are based on process assurance, and are not themselves a product guarantee. However, QA can be an important component of managing seed purity outcomes, and importers may choose seed suppliers on this basis to give greater assurances of the purity and GM status of their imports.

3. Further Discussion

3.1 Modifying the Sampling Requirements

The current MAF protocols use a 3200 seed sample method, and this was consulted on for the *Medicago sativa* testing protocol. Several submitters recommended an increase in sampling requirements for the *Medicago sativa* testing protocol from 3200 seeds to 10,000 seeds. This would increase the sensitivity of the test. In determining whether or not to modify the sampling requirements it will also be necessary to consider other issues such as: New Zealand's competitive advantage, industry compliance costs, access to desirable seed varieties, and international best practice. MAF will address the seed sampling approach for *Medicago sativa* in a separate study. An additional period of public consultation may be necessary.

3.2 Country Area Freedom

Currently there are no international standards or agreed methods for assessing area freedom from commercial GM production. Biosecurity New Zealand considers that the following criteria must be met by a country in order to declare area freedom:

- 3.2.1 a robust regulatory system for approving the environmental release of GM crops;
- 3.2.2 no approval for commercial release of GM varieties of the crop in question;
- 3.2.3 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;
- 3.2.4 appropriate systems in place at the border (or crop monitoring regimes) to confirm the source and identity of imported seeds and to allow the detection of unapproved GM seeds;
- 3.2.5 reliable evidence that unapproved GM varieties of crops have not been grown.

Biosecurity New Zealand has conducted a preliminary consideration of the evidence from Australian regulatory authorities, and believes there is insufficient support for awarding area freedom at this time. While it is clear that most of the criteria are satisfied for awarding area freedom to Australia (and European countries, such as Italy), the primary difficulty is the lack of an equivalent border system which would allow the detection of unapproved GM seeds.

The incidences of unintentional presence of GM seed in conventional seed consignments are commonplace for most of the major crop seeds traded worldwide (see www.gmcontaminationregister.org). Therefore a strategy is required which allows the detection of unapproved GM seeds which may be *unintentionally present* in seed consignments. The New Zealand border testing protocol is one such strategy, but there may be alternatives which can provide similar assurances. The United Kingdom's GM Inspectorate, for example, implements a seed industry auditing program which is used to monitor the presence of unapproved GM seeds in conventional crops grown in the UK. Similarly, the Australian Government is

working with industry to develop compliance and crop monitoring programmes. It is possible that such government-led programmes could be used in future to support area freedom criteria. Further work is needed to determine whether these alternative compliance measures can provide the same assurances as testing every consignment, and until this work is realized, Biosecurity New Zealand does not anticipate being able to award “country area freedom” status to any country at this time.

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Appendix 1 Living Foods, Mangere, Auckland

Date: 13 June 2006

Submitter:

Vicky Thompson, Managing Director

Re: the protocol for testing imported medicago sativa (Lucerne/alfalfa) seed for the presence of unapproved genetically modified seed.

Re this document, Question 7 in Options for Importers of Lucerne Seed, Living Foods, would like to request that MAF considers the option of area freedom from the testing of Lucerne from Australian grown seed for sprouting production in New Zealand.

Appendix 2 Kings Seeds (NZ) Ltd, Katikati

Date: 14 June 2006

Submitter:

Gerard Martin, Manager

Hello Kathryn,

Nice to meet you yesterday and to put a face to a name. A shame that the other people invited to attend didn't make it, as I imagine a lot of effort went in to putting the meeting together. Hopefully your Christchurch meeting provided you with more information to work with.

Having spent a couple of hours driving back to Katikati afterwards and thinking on the subject, these are the points that would make pending Regulation change easier for me to adapt to.

1. A GMO Certificate from the testing laboratory that holds its validity over a whole seed lot allowing for several importations from it so as not to pay more than once for the same clearance.
2. Implementation of the Regulation later than August 1, 2006. Despite Monsanto/Seminis saying it will be available from this harvest, I think it is highly unlikely that you will see it in the marketplace for a further year. They will be publicising it for PR reasons and share price gain and the initial limited seed lots will be strictly controlled amongst their inner circle of growers to bulk it up further. No doubt they will be charging a premium for this product and will be keeping a tight rein on it for monetary reasons if nothing else.
3. Implementing an Area Freedom from commercial production option to recognise my only supplier, Italy, as being a suitable supplying nation.
4. Italy is renown in the EU for its staunch stand against GM crops with regulations to match and I understand this is well known and documented at Ministry level. I could possibly assist with information from my supplier if this would help.

If you feel I could offer any other input to your submission process, please get back to me.

Date: 30 June 2006

Submitter:

S.H. Manning, Managing Director

Re: Draft Seed Testing Protocol for *Medicago sativa* (Lucerne)

We note that in the draft protocol, Section 7 MAF has stated that it will consider the option for area freedom from commercial GM production.

We would like to request that Australia and the European Union be declared as acceptable countries for the importation of lucerne seed without GM testing.

Both regions have stringent requirements controlling the importation of GM seeds, and currently lucerne is not an authorized GM import to either region.

Additionally, Australia has extremely stringent requirements for the importation of lucerne seed (of any genetic status) which makes it highly unlikely that unintentional release of GM lucerne would occur.

With the majority of lucerne seed imported into New Zealand being produced in Australia we consider it would be a reasonable action to exempt seed from this source from any GM testing requirement with immediate effect.

Appendix 4 Public submission

Date: 9 July 2006

Submitter:
Noeline Gannaway

I am writing as an individual and a consumer of sprouted seeds such as alfalfa.

I strongly support New Zealand's policy of zero tolerance for GMO in imported seed, involving stringent protocols to keep GMOs out of New Zealand.

Given that lucerne/alfalfa has recently entered commercial production in the US, there is a risk that future consignments of seed imported from the US could contain low levels of GM seeds.

Therefore I urge that health import standards be adapted for seed consignments of imported lucerne/alfalfa (*Medicago sativa*) to be rigorously tested by one of MAF's testing laboratories to ensure that they can be certified as free of GM material.

Appendix 5 Public submission

Date: 12-13 July 2006

Fax copies sent by the following Submitters:

Margaret Aylward
Clare Brown
Colin MacGillivray

Submission RE: Amendments to two Import Health Standards (IHS) regulating amongst other seeds and grains, the importation of *Medicago sativa* (lucerne and alfalfa) seeds.

The two Import Health Standards (IHS) under consideration are:

MAF Standard 155.02.05 “Importation of Seed for Sowing” (2605 Kb), and

MAF Standard BNZ.GCFP.PHR “Importation of Grains/Seeds for Consumption, Feed or Processing – Plant Health Requirements” –
Option 2 in the Standard: Importation of Viable Seeds for Biosecurity Clearance at the New Zealand border
Option 3 in the Standard: Importation of Viable Seeds for Processing at MAF-Approved Transitional Facilities

I SUBMIT that in the interest of maintaining New Zealand’s agricultural and economic advantage of being GM Free and protecting our plants, soils and environment from genetic contamination we must amend the IHS’s mentioned above re alfalfa and Lucerne seed coming into New Zealand to make sure it is GM Free.

Two GM varieties of Lucerne namely J101 and J163 have been approved for commercial release by the US Department of Agriculture in July 2005 with first harvests expected in August 2006.

I SUBMIT that NZ’s zero tolerance policy for GMOs must be maintained for the unintended/accidental presence of GM in imported seed, plants or feed as this would be a risk to our economy.

New Zealand imports lucerne/alfalfa for sowing and sprouting which has been produced in the United States and other countries and this may inadvertently contain very low levels of GM seeds.

I SUBMIT that new requirements for the abovementioned IHS’s should be instituted to enable imported seeds, plants, feed consignments (for both animals and humans) to be certified free of GM material by AT LEAST TWO OF MAF’S APPROVED TESTING LABORATORIES AND THAT THE RESULTS OF THESE TWO TESTING LABORATORIES MUST CONCUR before the imports are allowed into New Zealand.

MAF Biosecurity New Zealand currently operates similar testing protocols for three commercial crops which have GM counterparts overseas. MAF already has seed testing protocols in place for maize and sweet corn, oilseed Brassica and soybeans which were implemented in 2001 and 2002. I SUBMIT that similar testing protocols should be extended to imported lucerne/alfalfa.

I understand the available laboratory test will test the seed using a DNA test called the polymerase chain reaction (PCR) which detects specific DNA sequences unique to the genetic modification. The GM lucerne varieties contain the herbicide tolerant gene (CP4 EPSPS) and a promoter gene (FMV) from the Figwort Mosaic Virus which conventional varieties do not have. A positive result for either of these genes indicates the presence of GM in a seed sample.

I also understand that Pacific Seeds of New Zealand have developed a leaf test for GM whereby seeds can be planted out in glasshouses and the leaves tested for GM.

Date: 13 July 2006

Submitter:
Phil Geertson

I am submitting the following suggestions for your consideration.

1. Increase the sample size and test a larger number of seeds, possibly divide the sample into 2 or 3 lots of 1000 seeds and test each lot.
2. Retain the sample for an extended time so that if some GM Lucerne shows up in a farmers field it would be possible to go back to the imported seed samples to determine who was the importer of the contaminated seed.
3. The standards for the importation of Breeder or Foundation Lucerne seed should be much more extensive.

The widespread use of Glyphosate herbicide on road right-of-ways, fence rows, ditch banks, pasture land, etc. creates a special problem with perennial plants that are pollinated by pollinators that travel long distances. When the glyphosate resistance gene is introduced into these plants that grow as feral weeds in these non crop land areas the GM glyphosate resistant plants will soon dominate those areas. The genes from these feral plants will then be transferred back into Lucerne fields that are grown for seed. Even with a very small amount of contamination in the seed farmers' plants there eventually will be widespread contamination of the entire Lucerne population.

Date: 13 July 2006

Submitter:

S Ajani, Secretary
Zelka Grammer

Who we are:

GE FREE NORTHLAND (in Food & Environment) is a non-political community organisation committed to the protection of food resources, the environment, truly sustainable primary production and the public health from adverse impacts of genetically engineered organisms. Many of our members are primary producers (agriculture, horticulture, forestry).

We share the concerns of many New Zealanders and independent scientists about potential adverse environmental, economic and public health effects of GMOs and the urgent need for improvements in Biosecurity NZ/ MAF's biosecurity protocols at our borders.

Our views are squarely in line with the needs of New Zealand exporters whose markets demand food free of GM content.

There is an urgent need for MAF to develop and implement a seed testing protocol to detect GM lucerne/alfalfa (which has been developed in the U.S.)

Any decision to permit GM food production in New Zealand would open up new sources of risks extending far beyond the company growing a GMO. It would raise costs and marketing risks for a much wider set of food producers.

Keeping GMOs out of NZ

New Zealand still has quite inadequate systems for border detection of GM contamination as shown by problems with stopping unwanted GE maize contamination in the past. There has only been limited reform of border detection systems since the breach involving GE maize in previous years.

Our community group and local primary producers would be affected by changes to the Import Health Standard's. We strongly support MAF amending the IHS's to include a GM testing protocol requirement, which should come into force as quickly as possible.

We strongly support new requirements in these IHS's that would necessitate seed consignments to be certified free of genetically modified (GM) material by one of MAF's approved testing laboratories. We understand that MAF Biosecurity NZ

currently operates similar testing protocols for three commercial crops which have GM counterparts overseas.

The purpose of a seed testing protocol should be to prevent the likelihood that GM seed will inadvertently be imported into New Zealand within consignments of conventional seed.

We are aware that New Zealand imports lucerne/alfalfa for sowing and sprouting each year from the United States and other countries, and that MAF has learned that two varieties of genetically modified (GM) lucerne/alfalfa recently entered commercial production in the United States.

We strongly support NZ's Zero Tolerance Policy (for GMOs..for unintended/adventitious presence of GMOs in imported seed) and urge Biosecurity NZ/MAF to put in place robust protocols to keep GMOs out of NZ.

In addition to the MAF-approved test (which requires a sample size of 3200 seeds, will detect GM if it is present in the sample 99.9% of the time), MAF must ensure that the independent seed testing lab (whoever they are) have in writing details of NZ's Zero Tolerance Policy for GE and how they must report/interpret any positive GM test result (no matter how small) to NZ authorities.

We do have serious concerns about mistakes made in the past by MAF/Biosecurity NZ regarding flawed protocols for checking seeds for importation for GE content (resulting in a number of instances in 2003/4 where GE contaminated maize was illegally planted in the North Island) Destruction of this unwanted maize (illegal incursion of a new organism) was costly and time consuming. We need to prevent this sort of incident from occurring again and make sure that NZ's biosecurity practice (to keep out new organisms) is watertight.

There are many benefits of maintaining NZ's Zero Tolerance Policy. The policy of zero tolerance to GM contaminated seed can be maintained at little or no cost to the economy.

This is a key conclusion from a report released last year by the Sustainability Council-
"Improving Practices to Avoid GM Contamination of Seed Imports"
<http://www.sustainabilitynz.org/docs/SeedingPurity.pdf>

Two low cost priorities for reform include:

- **Designing model quality assurance procedures** – that importers can use to track all stages of seed breeding and transport.

- **Improving incentives** – by ensuring the costs arising from contaminated seeds rest with the importing party in the first instance.

We strongly support the more substantive submission made by the Sustainability Council of NZ.

We would like to draw to the attention of Biosecurity NZ the official precautionary GE policies adopted by numerous Northland peninsula local authorities.

Various precautionary GMO policies adopted by local government in Adopted LTCCP's:

NRC Adopted Long Term Council Community Plan 2006-16

- content

* P. 41 LTCCP "The Regional Council is a member of a Northland inter-council working group to discuss a common approach to the management of genetically modified organisms in Northland. Until this group has completed it's work, the council has decided to adopt a precautionary approach. **This means that there should be no further development and field testing of transgenic organisms envisaged for agriculture, horticulture and forestry in Northland, nor any commercial release, until the risk potential has been adequately identified and evaluated and a strict liability regime put in place.**"

P42 LTCCP Priorities for Indigenous Biodiversity Supporting Agency to participate in a Northland inter-council working group to discuss a common approach to the management of GMOs in Northland and supporting agency to support a precautionary approach to GE by the Environmental Risk Management Authority (ERMA).

P43 LTCCP Measuring Progress

No GE applications approved by ERMA for Northland until the risk potential has been adequately identified and evaluated, and a strict liability regime put in place.
(ENDS)

\$10,000 budgeted for investigation/research in the event of an application to ERMA in the Northland region

WHANGAREI DISTRICT COUNCIL

"Council will adopt a precautionary approach to the management of biotechnology in general and to GMO land uses in particular. It will continue to investigate ways of maintaining the district's environment free of GMOs until outstanding issues such as liability, economic costs and benefits, environmental risks, and cultural effects are resolved." (p. 64, Whangarei District Council adopted LTCCP)

KAIPARA DISTRICT COUNCIL

"Support precautionary approach towards GE"

Community Priority under the Theme of "Kaipara District's special character and healthy environment" (p. 88, Kaipara District Council adopted LTCCP)

FAR NORTH DISTRICT COUNCIL

On page 17 in "Our Aspirations for the Future" Far North Future Plan 2006-2016

Review of submissions received from consultation on a testing protocol for *Medicago sativa* (lucerne/alfalfa).

Page 23 of 47

Summary for GE information it states:

'Far North District Council
Genetic Engineering/Genetically Modified Organisms

GE Free Northland proposed that council take a strong approach to control the outdoor use of Genetic Engineering/Genetically Modified Organisms.

This is an issue of high concern for GE FREE NORTHLAND and other Northland residents.

This matter was the subject of an appeal to the Revised Proposed District Plan. The appeal has since been withdrawn by the appellant and Council has entered into a Memorandum of Understanding (MOU) with GE Free Northland Inc to continue working with other councils to investigate options for controlling GMOs at a local level. Reports prepared for the Inter-Council Working Party on GMos are to be considered by Council in early 2006."

(summary, Far North Future Plan 2006-16) p. 17

We also note the GE content of the FNDC Annual Plan 2005/2006 including amendments to the 2004-2014 Long Term Council Community Plan.

This states under the Safety & Environment Group section (p. 33)

"GENETIC ENGINEERING/GENETICALLY MODIFIED ORGANISMS

Controlling the use or release of Genetic Engineering/Genetically Modified Organisms in the Far North District is an issue of high concerns for some members of our communities. This matter is the subject of an appeal to the Revised Proposed District Plan. Consequently, FNDC will await the outcome of those proceedings before considering the submissions for inclusion in the LTCCP. In the interim, FNDC remains committed to exploring the options for controlling GE/GMOs at a local level in collaboration with other local authorities north of Auckland."

RODNEY DISTRICT COUNCIL

"Rodney District Council becoming a Leader in Biodiversity Management

Council continuing to work during the next 4 years on developing and implementing policies on genetically modified organisms, biosecurity, biodiversity, climate change, energy and significant natural area protection incentives."

'Investigate options for community management of generically modified organisms and adopt a precautionary approach to the field trialing or use of genetically modified organisms'.

-Rodney District Council adopted Long Term Council Community Plan 2006-16

Waitakere City Council LTCCP 2006-16

wording in **Vol 1: Future Thinking: How the Eco City Will look Tomorrow:, ...**

"the city is promoted as GE free in field and food".

Review of submissions received from consultation on a testing protocol for *Medicago sativa* (lucerne/alfalfa).

AUCKLAND CITY COUNCIL

That Auckland City adopt a precautionary approach to the management of biotechnology in general and to Genetically Modified Organisms (GMO) land uses in particular. That Auckland City investigate ways to maintain the Isthmus and Hauraki Gulf Islands environment, free of GMO's until outstanding issues such as liability, economic costs and benefits, environmental risks, and cultural effects are resolved.

- ACC adopted LTCCP 2006-16

We wish to be heard. Please keep us informed.

http://www.sustainabilitynz.org/news_item.asp?sID=150

Wednesday, August 17, 2005

SUSTAINABILITY COUNCIL OF NZ Media Statement

STRONG PUBLIC SUPPORT FOR ZERO TOLERANCE TO GM CONTAMINATION

79% New Zealanders would support the current policy of zero tolerance to GM contamination of seed imports. Polling conducted for the Sustainability Council by DigiPoll also found 77% support for zero tolerance to GM contamination of crops in the field, once informed that this too is the current policy.

Public opinion is thus squarely in line with the needs of New Zealand exporters whose markets demand food free of GM content – however that contamination may arise. Though the current incident involved contamination of soy that was not grown in New Zealand, two points stand out from this experience.

The first is that this is a type of “supply chain” incident that is well documented overseas. While there are ways of minimising the chances of GM contamination occurring during transport and storage, the risk of such incidents was a key reason the Australian Wheat Board successfully opposed commercial production there of an entirely separate crop - GM canola.

This current incident shows how any decision to permit GM food production in New Zealand would open up new sources of risks extending far beyond the company growing a GMO. It would raise costs and marketing risks for a much wider set of food producers.

The second point is that New Zealand still has quite inadequate systems for border detection of GM contamination and the source of this incident could have been very different. MAF is admirably thorough in chasing down contamination once it is shown to be present. However, there has been very limited reform of border detection systems since the breach last year and the review this triggered.

MAF's current test for imported seed uses such a small sample size that around 5% of the time, the single test required will not show up GMOs at concentrations of 0.1% or

less. New Zealand food producers that are serious about detecting GM content use between two and fifteen times the sample size MAF requires. Trebling the number of seeds used would reduce from 5% to 1% the chances of the border test missing GM contamination at a level of 0.1%.

Other low cost priorities for reform include:

- **Designing model quality assurance procedures** – that importers can use to track all stages of seed breeding and transport.

- **Improving incentives** – by ensuring the costs arising from contaminated seeds rest with the importing party in the first instance.

MAF can best protect vulnerable food producers and align with public opinion by making far better use of low cost border protection options.

DigiPoll Survey Questions

Question 1: "New Zealand currently does not allow any GM contamination to be present in imported seeds. Should New Zealand continue this zero tolerance policy?"

Response: Yes: 78.8%; No: 15.3%; Don't know: 5.9%.

Question 2: "New Zealand currently does not allow any GM contamination to be present in crops grown in the field. Should New Zealand also continue this zero tolerance policy?"

Response: Yes: 77.2%; No: 16.1%; Don't know: 6.7%.

Both polls were conducted in early August 2005, have a sample size of 500 and a margin of error of +/- 4.4%.

Appendix 8 BioGro New Zealand

Date: 14 July 2006

Submitter:
Seager Mason

Dear Arun,

BioGro New Zealand wishes to submit on this issue.

We wish to support GE Free Northland's submission, attached. We agree with their submission, and it effectively covers BioGro's concerns on this matter.

Please refer:

- BioGro's website for information on BioGro.
- BioGro's submission and evidence as an Interested Party submitted to the Royal Commission on GM for BioGro's position on GE/GM/GMOs/LMOs.

We don't wish to be heard at this stage, but please keep us informed on progress.

Thanks,
Seager Mason

Date: 14 July 2006

Submitter:

Susie Lees

GMO - Current Issues - Lucerne/Alfalfa (*Medicago sativa*)

Background New Zealand imports lucerne/alfalfa for sowing and sprouting each year from the United States and other countries, and it has come to the notice of MAF that varieties of genetically modified (GM) lucerne/alfalfa have entered commercial production in the United States.

It is of concern that Lucerne/Alfalfa may enter the country contaminated for the following reasons:

1) There is no ERMA approval for GE variants of these plants to enter the country to be grown either as an animal feedstuff or human food. "Under the HSNO Act, GM lucerne/alfalfa is classed as a 'new organism' which can not legally be imported or grown in New Zealand."

Further there is no approval for GE alfalfa sprouts for human food by FSANZ.

2) As we have already found with corn any infringement of zero tolerance eventuates in low level contamination throughout the country (NZ).

3) Alfalfa/lucerne is a very important highly nutritious animal feed that is a valuable crop. Contamination of seed will also allow for soil contamination. In particular with this being a legume contamination of clovers may well occur through horizontal gene transfer via bacterial populations of *Rhizobium* sp. With root systems extending to 4.5 metres the contamination of soils could be extensive.

4) GE contaminants in these crops may well act as a barrier to future breeding of improved varieties. (see article 1 below)

5) The nutritional and health value of sprouted seeds may well be affected, it also poses the problem of GE sprouts being thrown in the compost heap/ rubbish and possibly becoming indigenous within our ecosystems thus threatening biodiversity.

6) GE Alfalfa could easily become a weed and could cross with other varieties of related plants. I have seen examples of wilding alfalfa on river gravels around the Tasman district. It obviously survives well in the wild and any outcrossing could well lead to resistant varieties of weeds becoming a problem as well as threatening biodiversity.

You state "Lucerne is a perennial species and feral plants grow along field edges and roadsides in the main seed production areas in the US.

Consequently, wild plants containing GM genes may persist in these environments.

Little is known about the potential for persistence of these GMOs in the New Zealand environment. "The precautionary principle should apply where the effect of wilding GE alfalfa on our precious NZ ecosystems is unknown.

7) Regimes of testing once the seed has been screened and entered New Zealand are lax in the case of maize, for instance I have been told that no testing of crops produced in New Zealand this year was carried out.

8) A tolerance level introduced after Corngate has resulted in various contamination incidents. Low level pollution will ultimately threaten New Zealand's clean green image and export advantages which will affect our agricultural economy in a negative manner.(See article 2 below).

9) The mixing of small amounts of GE seed can occur via harvesting equipment, seed cleaning plants, and seed storage facilities. This could occur after testing.

10) Has any examination been made of the effect of dispersal of the promoter Figwort Mosaic Virus (FMV) on our agricultural economy and environment?
This gene may remain in our soils or infect other plant by horizontal gene transfer.

You state ""If any GM seed is detected, the consignment will be denied entry into New Zealand," Mr Birnie said." and "Biosecurity New Zealand Director of Policy Douglas Birnie said there is a risk that future consignments of lucerne/alfalfa for sowing and sprouting produced in the United States could inadvertently contain very low levels of GM seeds."

This of course fails to allow for the fact that any testing will not give 100% positive proof of non contamination.

"The MAF-approved test, which requires a sample size of 3200 seeds, will detect GM if it is present in the sample 99.9% of the time. It provides a 95% confidence that GM seed will be sampled from a seed lot if it is present in concentrations of 0.1% or more (greater than or equal to 1 in 1000 seeds)."

I would suggest that 1000 seeds of alfalfa would weigh a miniscule amount therefore if one considers that 46,000 kg of alfalfa are being imported that could result in a considerable amount of seed being imported. With an average of 440,000 per kilo, a total number of 2024000000 seeds could be imported. .1% of this is 20240000 seeds could be genetically engineered which would very soon mean that it could severely impact our agriculture and environment.

It is therefore extremely important that we maintain a Zero Tolerance Policy for GMOs in New Zealand (for any unintended/adventitious presence of GMOs in imported seed) and that Biosecurity NZ develop extremely robust protocols to keep GMOs out of NZ.

Certainly if alfalfa seed cannot be certified free of genetically modified (GM) material by one of MAF's approved testing laboratories then it should not be imported from any country where GE seed is produced. It is only a question of time until contamination increases. We have our own lucerne and alfalfa seed production industry and can continue to import from Italy and Australia at present.

You state "lucerne is predominantly pollinated by bees in the field, and isolation distances for seed production are unlikely to guarantee that there will be no gene flow between these crops"

Your following statements "Implementation of a testing protocol can provide assurances that imports do not contain GM seeds, while still allowing trade to continue. Banning all imports of lucerne and alfalfa seed would not be justified, given that a GM test is available." And "However, seeds are traded world-wide. The lucerne and alfalfa breeding industry in the US is large,.." appear to imply that your decision has already been made and you are prepared to forgo NZ's biosecurity for the sake of trade.

We would appeal to you not to make the same mistakes with this crop as those which have resulted from the continued importation of contaminated maize. WE do now have the Cartagena Biosafety Protocol and are entitled to decide whether or not to import LMOs (living modified organisms.)

1) Beyond GM Food: New Cutting Edge MAS Technology Makes GM Food Obsolete by Jeremy Rifkin

For years, the life science companies—Monsanto, Syngenta, Bayer, Pioneer, etc.—have argued that genetically modified (GM) food is the next great scientific and technological revolution in agriculture, and the only efficient and cheap way to feed a growing population in a shrinking world.

Non-governmental organizations (NGOs), including my own, The Foundation on Economic Trends, have been cast as the villains in this unfolding agricultural drama, and often categorized as modern versions of the English Luddites, accused of continually blocking scientific and technological progress because of our opposition to GM food.

Now, in an ironic twist, new cutting edge technologies have made gene splicing and transgenic crops obsolete and a serious impediment to scientific progress.

The new frontier is called genomics and the new agricultural technology is called Marker Assisted Selection, or MAS. The new technology offers a sophisticated method to greatly accelerate classical breeding. A growing number of scientists believe that MAS— which is already being introduced into the market— will eventually replace GM food. Moreover, environmental organizations, like Greenpeace, that have long opposed GM crops, are guardedly supportive of MAS technology.

Rapidly accumulating information about crop genomes is allowing scientists to identify genes associated with traits like yield and then scan crop relatives for the presence of those genes. Instead of using molecular splicing techniques to transfer a gene from an unrelated species into the genome of a food crop to increase yield, resist pests, or improve nutrition, scientists are now using Marker Assisted Selection to locate desired traits in other varieties or, wild relatives of a particular food crop, then cross breeding those plants with the existing commercial varieties to improve the crop. With MAS, the breeding of new varieties always remain within a species, thus,

greatly reducing the risk of environmental harm and potential adverse health effects associated with GM crops. Using MAS, researchers can upgrade classical breeding and reduce by 50% or more the time needed to develop new plant varieties by pinpointing appropriate plant partners at the gamete or seedling stage.

While MAS is emerging as a promising new agricultural technology with broad application, the limits of transgenic technology are becoming increasingly apparent. Most of the transgenic crops introduced into the fields express only two traits, resistance to pests and compatibility with herbicides and rely on the expression of a single gene- hardly the sweeping agricultural revolution touted by the life science companies at the beginning of the GM era.

Of course, MAS researchers emphasize that there is still much work to be done in understanding the choreography, for example, between single genetic markers and complex genetic clusters and environmental factors, all of which interact to affect the development of the plant, and produce desirable outcomes, like improved yield and drought resistance.

Enthusiasm notwithstanding, a word of caution is in order. It should be noted that MAS is of value to the extent that it is used as part of broader, agroecological approach to farming, that integrates new crop introductions with a proper regard for all of the other environmental, economic, and social factors that together determine the sustainability of farming.

The wrinkle is that the continued introduction of GM crops could contaminate existing plant varieties, making the new MAS technology more difficult to use. A landmark 2004 survey conducted by the Union of Concerned Scientists, found that non-GM seeds from three of America's major agricultural crops—corn, soybeans, and canola—were already “pervasively contaminated with low levels of DNA sequences originating in genetically engineered varieties of these crops”. Cleaning up contaminated genetic programs could prove to be as troublesome and expensive in the future as cleaning up viruses that currently invade software programs.

As MAS technology becomes cheaper and easier to use, and as knowledge in genomics becomes more dispersed and easily available over the next decade, plant breeders around the world will be able to exchange information about “best practices” and democratize the technology. Already, plant breeders are talking about “open source” genomics, envisioning the sharing of genes just as Linux and other open source IT organizations currently share software.

The struggle between a younger generation of sustainable agriculture enthusiasts anxious to share genetic information and entrenched company scientists determined to maintain control over the world's seed stocks through patent protection, is likely to be hard fought, especially in the developing world.

If properly used as part of a much larger systemic and holistic approach to sustainable agricultural development, MAS technology could be the right technology at the right time in history.

Jeremy Rifkin is the author of "The Biotech Century" (Tarcher Putnam), and the President of The Foundation on Economic Trends in Washington, DC.

2)How the flood of GM goods was driven off the shelves. Geoffrey Lean
See <http://news.independent.co.uk/environment/article1168240.ece> for full article

Seven short years ago, when The Independent on Sunday began its campaign on GM foods and crops, 60 per cent of the products on our supermarket shelves contained modified ingredients.

Now only two GM products are left on sale: Schwartz's Bacon Flavour Bits Salad Topping, and Betty Crocker Bac-Os - neither exactly household names.

Then, too, widespread cultivation of GM crops throughout Britain was thought to be only a year away. No less than 53 of them were confidently awaiting approval. Now not a single GM plant is growing anywhere in any British field, and no one expects any to be sown any time in the foreseeable future.

At the time ours appeared a hopeless cause. The giant biotech companies seemed unstoppable, with full backing of the Government, fired by the messianistic determination of Tony Blair and backed by the US administration and British scientific establishment .

The Prime Minister privately dismissed public opposition but reckoned without the most powerful force of all, the superwomen (and supermen) of the shopping aisles who, informed of the presence of GM products in their foods and the arguments for and against, simply refused to buy them.: Michael Meacher, the then Environment minister, skilfully persuaded the biotech industry to agree to a three-year halt, pending official field trials.

Environmental campaigners repeatedly pulled up the GM crops, in an attempt to scupper the trails (at one protest Lord Melchett, then head of Greenpeace, was arrested with 20 supporters - only to be acquitted by a jury).

By the time the tests ended, 84% of Britain's had decided they would not touch the stuff. The supermarket chains fell over themselves to clear it from their shelves - and the big food manufacturers rushed to abjure its use.

Monsanto closed its seed cereal business in Britain and Europe, and the industry withdrew the last of the 53 applications it had once assumed would be granted. Anyone for Betty Crocker Bac-Os?

Date: 14 July 2006

Submitter:
Steffan Browning

Dear Arun

The Soil & Health Association of New Zealand Inc is 65 years old, and is the largest membership organisation supporting organic food and farming in New Zealand, and as such advocates for a GE Free environment and diet.

Soil & Health is concerned at the risks of GE contamination to organic production from seed imported into New Zealand and requests that Biosecurity NZ maintains a strong stance to negate that risk. Soil & Health supports the setting up of an effective protocol that will ensure New Zealand gardeners and primary producers do not have to deal with issues of GE contamination.

Organic producers operate with a consumer expectation of 0% GE contamination in their products, and so Soil & Health is in full support of the submission by GE Free in Food and Environment. Organic producers and consumers share many of the issues their conventional counterparts do concerning possible GE contamination, eg market access, liability in the event of contamination, ability to save seed, new weeds, possible health effects, loss of choice.

While supporting GE Free NZ's position, the Soil & Health Association of NZ also wishes to speak to its position and of the issues significant to organic producers.

Steffan Browning

Date: 14 July 2006

Submitter:

Jody Connor

Andrew Gillanders

RE: Comments on the draft import health standards for *Medicago sativa* (Lucerne/alfalfa) for Sowing and Consumption, Feed or Processing

Thank you for the opportunity to make comment on the Draft Seed Testing Protocol for *Medicago sativa* (Lucerne/ alfalfa) consultation document.

Federated Farmers would like to make the following key points in regard to these Import Health Standards:

- **Federated Farmers supports the implementation of the seed testing protocol.**
- **Federated Farmers recommends an exemption from the testing protocol for countries that are GM free.**

Discussion

The majority of Lucerne/ alfalfa seeds imported into New Zealand is used for the growing of pasture or hay for feeding livestock, with a smaller proportion being allotted to alfalfa sprouts for human consumption. This year the USA began the commercial production of two varieties of genetically modified (GM) Lucerne/alfalfa. With the majority of seed for sowing (65%, which equates to 25,000kg for 2004-2005) imported from the USA, there is a possibility that future imports of non-GM Lucerne seeds may inadvertently contain some GM Lucerne seed.

The current testing protocol does not have a provision for the testing for GM. **The proposed testing protocol will require importers to have consignments of *viable lucerne and alfalfa seed* tested for the presence of GM seed** at one of the three MAF approved testing laboratories located in Australia, France or the USA.

Federated Farmers supports the rights of farmers to use GM material, provided this use has passed through ERMA's processes and use has been considered on a case-by-case basis. At present, no GM seeds have been approved for field use in New Zealand.

As such the Federation considers it is important to manage the risk of inadvertent importation of viable GM material. However, the management of that risk should not be used to add an unnecessary barrier to the importation of *Medicago sativa* seed from countries that do not plant GM *Medicago sativa*. Federated Farmers strongly supports the policy that reflects the Sanitary and Phytosanitary rules of the WTO that allows for restrictions at the border provided those restrictions can be supported by science.

The Federation also notes that the protocol to be applied is similar to that used for testing imports of *Zea Mays* (Maize) seed for sowing for the presence of GM seed. The same 95% confidence level is required that the inadvertent presence of one GM seed in 1000 will be detected. The sample (weight basis) drawn from each seed line for testing must contain *at least 3200 seeds*. The Federation notes that no other importing country has granted an exemption from this testing.

As the USA is the only country in which the GM varieties of *Medicago sativa* are being sown, an exemption from the testing protocol for countries that are GM free is warranted. These countries not only state they are GM free, but they also have in place protocols to ensure there is the limited possibility of a GM contamination in their imports and exports.

The Federation supports this exemption for *Medicago sativa* from third countries while the production of GM Lucerne/alfalfa is limited to the USA and there is no worldwide movement of the product. This assumes a certain level of trust when importing from another country and in practice the testing protocols these countries have in place might not be as strict as New Zealand's. So while supporting this exemption in principle, the Federation remains cautious in practice.

Thank you for the opportunity to comment. We look forward to further feedback on this issue, and would welcome the opportunity to meet and discuss this further.

Yours sincerely

A handwritten signature in black ink that reads "A J Gillanders". The signature is written in a cursive, slightly slanted style.

Andrew Gillanders
Chairman, Grains Council
Federated Farmers of NZ (Inc)

Date: 14 July 2006

Submitter:
David Penna

Dear Sir/Madam,

Public Comment on “Draft Seed testing protocol for *Medicago sativa* (Lucerne/alfalfa)”

Monsanto appreciates the opportunity to provide a public comment on the draft seed testing protocol for *Medicago sativa* seed imported for sowing or sprouting purposes into New Zealand.

The stated objective of the draft seed testing protocol, “is to ensure that **genetically modified (GM) *Medicago sativa* (lucerne/alfalfa)** unapproved for import, development, field-testing or release under the Hazardous Substances and New Organisms Act (HSNO) 1996 Act is not released into the New Zealand environment through imported seed.” However, as written, the test method is prescribed very narrowly so that the protocol will detect only one type of GM product – glyphosate tolerant alfalfa. We recommend either a narrowing of the stated objective or broadening the methods section to allow incorporation of other, future GM trait detection strategies.

We do not support the proposal for testing methods based solely on the polymerase chain reaction (PCR). Currently there is no validated PCR method available for detection of the *epsps* gene or *fmv* promoter sequence in *Medicago sativa*. The use of *epsps* or *fmv* promoter sequences are not highly specific as noted by Biosecurity New Zealand because they are used in other genetically modified crops and are present in nature. Thus any testing method based solely on the use of either of these sequences will be prone to generating false positives and will therefore result in costly re-analysis or wrongful rejection of conventional seed lots. The high costs of PCR laboratory tests, the incidence of false positives, uncertain time of method availability and concerns about the reliability of PCR based methods will place undue burdens on lucerne/alfalfa seed producers and may unnecessarily limit New Zealand grower’s access to lucerne/alfalfa varieties.

Instead, we strongly urge Biosecurity New Zealand to consider the use of the lateral flow immunoassay method for seed testing purposes and a pooled seed sampling strategy (discussed below). Protein based methods are preferred by the global seed and grain industries due to their ease of use, reliability, sensitivity and lower cost. Such methods have been accepted for certification of corn grain destined for export to markets where the Starlink protein was/is not approved¹. Protein based methods have

¹ See reference <http://archive.gipsa.usda.gov/reference-library/directives/9181-1.pdf>

proved reliable, robust, accurate and are already publicly available. These methods were designed to facilitate trade of lucerne/alfalfa seed produced for export markets where regulatory approvals do not exist, such as New Zealand. Two such methods are currently available to assist the lucerne/alfalfa seed industry with the identification of Roundup Ready alfalfa:

1. Strategic Diagnostics Inc., product #7000011
<http://www.sdix.com/ProductSpecs.asp?nProductID=19>; and,
2. Envirologix, Inc., product #AS 045 BG
http://www.envirologix.com/artman/publish/cat_index_5.shtml

Monsanto encourages the implementation of a pooled sampling /testing strategy with a qualitative CP4 EPSPS protein test. The objectives stated by MAF in the Draft Seed testing protocol for *Medicago sativa* (lucerne/alfalfa), section 10, “MAF requires a 95% level of confidence that the inadvertent presence of 1 GM seed in 1000 seeds (0.1%) will be detected. In order to achieve this, a sample, measured by weight, drawn from each seed line must contain at least 3200 seeds....” We propose that this objective can be met by testing 12 pools of 600 seeds (by count or weight) using the lateral flow test to confirm the presence or absence of the CP4 EPSPS protein in each of the 12 pools. This test has been validated to detect one lucerne/alfalfa seed containing CP4 EPSPS in a pool of 600 seeds. By testing 12 pools of 600 seeds, even if 2 of the 12 pools are positive, it is possible to make the statistical statement: the seed lot contains a level of impurity (RR alfalfa) not greater than 0.1% with a 95% confidence level.

Given the limitations of testing methodology and that a claim of no GM seeds in a seed lot is not practical we recommend the certification language should state the following: “This variety was not developed using genetic engineering and was produced using quality assurance practices to maintain purity and prevent impurities from other lucerne varieties, including those that are genetically engineered. The lot was sampled and tested in accordance with the recommended protocol and no genetically engineered⁵ seed were detected.”

In closing, we support the intention of Biosecurity New Zealand to maintain the trade of conventional lucerne/alfalfa varieties. We believe that the lucerne/alfalfa seed production industry can successfully and responsibly implement a testing program within the country of origin or in New Zealand. In order to maintain profitable and efficient trade in lucerne/alfalfa varieties, it is important to consider the cost and time required to perform the testing, current availability of the test methods required, and likelihood of shipment delay due to retesting requirements. Protein detection methodologies are cost effective and simple to use thus facilitating testing without introducing burdensome costs on producers. There are two companies that currently have validated products commercially available for detection of CP4 EPSPS proteins in lucerne/alfalfa. We conclude that protein based methods will serve the intention of Biosecurity New Zealand thus assuring that lucerne/alfalfa imported for sowing or sprouting purposes contains non-detectable levels of GM seeds.

⁵ Alternatively, due to the narrow scope of the draft protocol (as discussed in the second paragraph of this submission), it may be more appropriate to claim “...and no Roundup Ready alfalfa seeds were detected.”

If you have any questions in relation to this submission, please do not hesitate to contact me.

Yours sincerely,

David Penna
Regulatory Affairs Manager – Australia/ New Zealand

Date: 17 July 2006

Submitter:
Stephanie Howard

Dear Arun

Attached is the Sustainability Council submission on the draft testing protocol for Lucerne/alfalfa seed imports. Also attached is a 2004 report, Seeding Purity, which provides background and greater depth analysis to the substance of our submission.

Many thanks for providing us for further time to submit.

Best regards
Stephanie Howard

Sustainability Council of New Zealand
P.O. Box 24304
Wellington
Tel: 04-9133655
Fax: 04-9133760
www.sustainabilitynz.org

Submission in respect of
Draft Seed Testing Protocol for *Medicago sativa*
(Lucerne/Alfalfa)

14 July 2006

Introduction

The Sustainability Council of New Zealand is an incorporated charitable trust whose overall objective is to assist the evolution of a sustainable New Zealand. It was launched in July 2002.

The Council is pro-science and recognises the importance of biological research to New Zealand. It sees considerable potential in the application of gene technology, especially in medicine, but seeks to ensure that the research and development are consistent with the highest standards of care and with a sustainable New Zealand.

The Council has undertaken significant research into biosecurity policy with respect to seed imports and the presence of unintended GMO content. In 2004, the Council released a report *Seeding Purity* that identified deficiencies in the current biosecurity regime as it relates to GM contamination and identified a series of upgrades in border practices that would address these shortfalls. A copy of that report is attached, and is otherwise available at <http://www.sustainabilitynz.org/docs/SeedingPurity.pdf>.

We welcome the opportunity to contribute to the development of an import standard for Lucerne-alfalfa.

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1. Background and Context

The question that should drive the design of an import standard for alfalfa-lucerne seed imports is: “Which approach can best deliver on the zero tolerance to GMO contamination in seed imports that is required by New Zealand law?” The regulatory response will need to:

- provide sufficient flexibility for industry in determining how to respond to those standards;
- ensure that the standard is high enough to protect the interests of members of the sector who must produce or supply to GM intolerant markets;
- ensure that compliance costs do not create an unnecessary burden on the industry or consumers;
- target detection of any contamination before seed stock arrives in New Zealand ports, rather than at the time of arrival, or after it has received border clearance and has been planted out. (We understand that this approach is increasingly seen as delivering the best biosecurity protection).

A robust biosecurity regime is necessary to maintain the integrity of New Zealand’s food production and supply chains. Contamination incidents can trigger media attention, and food producers are understandably concerned about consumer reactions to such incidents. While the ideal is to avoid contamination altogether, detection of the presence of GMOs in trace or so-called ‘adventitious form’, can work to demonstrate the effectiveness of the regime, particularly where detection occurs prior to entry into the country and especially, before the GM elements have entered the food production chain.

The following factors set the political and commercial context that the standard needs to take account of:

a) Market sensitivity to GM and spillover effects

Market sensitivity to the presence of GM foods or GM food ingredients is well documented in key New Zealand export markets, and surveys suggest similar patterns domestically. This sensitivity has led to what are known as spillover effects. Forms of spillover effects that are notable in the case of alfalfa-lucerne include:

- Contamination of a particular crop managed by one company or in one region may affect perceptions well beyond;
- Contamination of a particular crop may affect market perceptions of the integrity of all products into which that particular crop is incorporated.
- Contamination incidents may also cause negative perceptions of product integrity beyond that particular crop or ingredient, causing market unease more widely across the food production sector.

While the products of imported lucerne and alfalfa seed appear to be almost exclusively domestically consumed, a domestic contamination incident is still

considered to be of importance to exporters because of the extreme sensitivity of foreign clients and the ability for associations to be made even where there is no conceivable ability for cross-contamination to result. Domestic producers of alfalfa are also operating in a sensitive segment of the market and are more exposed to such effects.

b) The risks posed by freeriders or those with less stringent requirements

A related issue is the risk posed to producers that must meet GM Free market demands by those with less stringent market requirements for seed or product purity.

Medicago sativa are imported for animal feed (Lucerne) and direct human consumption (Alfalfa). Across the market for lucerne-alfalfa import, cultivation and processing there is likely to be some variation in the degree of market sensitivity to the presence of GMOs in Lucerne/alfalfa products. As alfalfa is a direct human food, there is likely to be more sensitivity to the presence of GM varieties, independent of whether these receive regulatory approval from FSANZ. Where mandatory national standards do not set sufficiently high standards, companies producing for highly sensitive markets may be vulnerable to the risks posed by players that do not need to take such care to ensure seed stock purity. Such national standards can facilitate ‘free rider’ or ‘cowboy’ behaviour.

Heinz Watties identified the threat from ‘cowboys’ in its submission to MAF in 2002:

“Our greatest concern with border control is about unauthorised GM seed imports by parties who don’t have such strict controls as ourselves, and/or don’t have as much business to lose if the integrity of NZ food products was undermined”.

Wrightsons voiced similar concerns in its submission to the draft protocol on testing imports of *Brassica napus* var. *oleifera*:

“The Seed industry in New Zealand is largely very disciplined with some strong industry associations. These organisations take a responsible and firm stance on quality issues to support the long term vision of the industry. In reality, however, it is very easy in New Zealand to start up a new seed company and the protocols must protect those who have a long-term commitment to the industry”.

Any standard must fairly provide for and protect the interests of those producers with more stringent market requirements.

Costs of contamination incidents

Past experience with contamination incidents in New Zealand indicates that the costs in terms of lost sales and brand damage far outstrip the costs of routine testing and quality assurance.

Further, once contamination is in the field, the costs of clean-up are borne not just by the importers and/or food processors, but also by taxpayers. Amendments to HSNO in 2003 require the Crown to administer such incidents under the Biosecurity Act and compensation thus becomes payable where the contaminant was unknowingly imported. This is a further factor supporting the design guideline for any import standard should be to ensure that no contaminated seed crosses the border, but is detected prior to entry.

2. The current proposal

The current proposal – representative sampling of shipments through a single border test of 3,200 seeds – follows the protocols adopted to test for the presence of GM contamination in seed imports of *brassica napus* var *oleifera*; *zea mays* and *glycine max*.

We understand that food producers have raised concerns with MAF in respect of *zea mays* that a single border test of 3,200 seeds is not sufficient to protect the interests of the industry. These companies have noted that they are supplying to markets that will not accept even traces of GM corn or maize. For this reason, they have adopted rigorous quality assurance programmes involving testing at multiple points along the production chain.

The Sustainability Council is also of the view that the proposed regime is not sufficiently demanding to provide the appropriate level of capacity to detect contamination prior to entry into the country. Detectability for the presence of trace levels of GM contamination is unnecessarily low due to (1) the sample size, and (2) the single test.

A single test of 3,200 seeds achieves a 95% level of confidence of detecting GM seeds at a concentration of 0.1% or more. The error rate is 1 in 1,000 for samples of 3,200 seeds.

This margin of error is significant given that HSNO effectively sets a zero tolerance requirement, and that taxpayers will be required to meet significant cleanup in the event that any contamination is not detected by at the border, but is picked up further down the line.

3. Proposed Import Standard: Quality Assurance Based Protocol with Border Test

The Council believes that a Quality Assurance Based system along with a single border test of 10,000 seeds at a MAF-accredited facility would be best suited to achieve the standards required from a legal and national economic perspective.

Such an approach would address the shortcomings discussed above.

3.1 Quality Assurance Systems Accreditation

Augmenting the border test with a requirement for a qualifying programme for quality assurance reduces the risks of unintended GMO imports for minimal additional cost. The virtue of a quality assurance-based import standard is that checks are made at multiple points during the seed breeding, multiplication and shipping phases, which is likely to increase the ability to detect GM contamination.

While a number of importers seek out seed from suppliers that use quality assurance programmes of some form, we recommend that MAF assess existing and potential new ones to determine which would meet an acceptable minimum. Any accreditation system should accommodate for different approaches and promote innovation, while not compromising on the desired standard.

By way of illustration of the kind of system that should, in our view, qualify for accreditation is Pacific Seed's *Gateway* programme. Pacific Seeds is an Australian-based company that supplies corn seed to the New Zealand market and has developed a QA system designed to meet New Zealand's zero tolerance requirement for seed imports. The system involves testing of seeds at multiple points along the multiplication process. The most critical, however, occurs before multiplication. This is because the company favours US corn seed for its breeding stock, but recognises that this is one of the highest-risk countries to source corn seed from. To address this, Pacific Seeds imports just a handful of parent lines, breeds them up in quarantine, and leaf-tests every one to verify that they are non-GM. Once this has been established, the resulting seeds can then be multiplied, at which point representative testing is adopted.

The Gateway system therefore combines 100% testing with representative sampling, the first being conducted at the point in the seed production chain where the risk of contamination is highest. Gateway merits special attention as it was specifically developed by Pacific Seeds to ensure it could maintain and indeed increase its presence in the New Zealand maize seed market.⁶

We note that in the past there has been some (limited) discussion about the feasibility of adopting a quality-assurance based biosecurity system to prevent GM contamination of seed imports.

MAF's 2002 Discussion Paper, "Border Control for Genetically Modified (GM) Seeds", considered the desirability of basing the border measures on "Paper Trails and Identity Preservation". At the time, MAF did not favour this option and advocated moving to a border testing regime alone. The basis for MAF's decision was the lack of international guidelines:

The main difficulty with this approach is checking compliance and/or auditing. There are no international guidelines or standards for what identity

⁶ Nick Gardner, International Division Manager, Pacific Seeds Australia, Personal Communications, 24 June and 14 July, 2004.

preservation should involve, what sort of documents would be required, or how they would be audited.⁷

Since the time of that 2002 review, quality assurance programmes have evolved significantly, as the Gateway example illustrates. Indeed, the programme was developed following the discovery of GM corn in New Zealand fields supplied by seed from Pacific Seeds. If there was indeed an absence of international guidelines at that time, today there are a number of programmes that MAF can draw upon to evaluate what should constitute 'best practice' standards.

By introducing the concept of 'area freedom status', MAF has accepted that a quality assurance system is, in principle, feasible. The current concept for area freedom is that a country does not produce GM varieties of the seed that is to be imported.

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 seed line.⁸

As countries that do not grow GM varieties of a particular crop may nevertheless import seed stock from GM producing countries (thereby creating entry points for GM seed at low levels) rigorous area freedom would require appraisal of border control as that will form part of the means by which area freedom is maintained. Although, to our knowledge, MAF has yet to establish area freedom with respect a GMO, making it operational would seem to require MAF to accredit quality assurance systems similar to those the Council is proposing for use in respect of alfalfa and lucerne.

We note that in the above-cited discussion document from 2002, MAF concluded a paper-trail or identity-preservation approach (i.e., quality assurance approach) has no distinct advantages to testing at the border:

If compliance was audited using tests at the border, then this option may not have any benefits over simply testing at the border.⁹

Such a view places a great deal of weight on the single test when an error can readily result in costs to the Crown of \$500,000 to \$1 million. A requirement to adhere to a quality assurance programme is a tiny cost to impose on industry in comparison to the very real fiscal risk the Crown runs in the event of sampling not being carried out properly, or the lab making an error, as occurred in March 2004.

Testimony to the greater confidence in preventing GM contamination that the quality assurance approach offers is the extent to which food producers have voluntarily adopted such systems - Heinz Watties and Penfords provide examples of this.

⁷ MAF (2002) *Border Control for Genetically Modified (GM) Seeds*. Discussion Paper No: 31, p. 5.

⁸ MAF (2006) Draft Seed testing protocol for *Medicago sativa* (Lucerne/Alfalfa).

⁹ MAF (2002) *Border Control for Genetically Modified (GM) Seeds*. Discussion Paper No: 31, p. 5.

Members of the Lucerne-alfalfa sector that are supplying consumers at the less sensitive end of the market may argue that such a regime would entail new compliance costs that they should not have to meet, and that those supplying to more sensitive markets should instead internalise those costs themselves. This argument would have merit in the absence of the spillover effects noted above. However, given that these spillover costs are real and demonstrable, a regime that does not require all importers and processors of Lucerne and alfalfa seed to work to a high standard will instead mean that some companies may pass on the costs of less rigorous attention to GM contamination to other producers and to the taxpayer.

3.2 Border Test of 10,000 Seeds

Sample testing still has a central role to play. Here a single border test of 10,000 seeds imported for commercial planting is recommended. A sample size of 10,000 seeds yields 99% confidence that presence of GMOs to a level of 0.1% will be detected. In our view, the sample size increase is warranted because:

- The accompanying increase in confidence would be beneficial, particularly as contamination incidents both in New Zealand and internationally thus far tend to be traces of GMO presence at the limits of detection. Higher confidence in the sample results will be of benefit given this demonstrated sensitivity.
- Major food producers are tending to use such sample sizes anyway.
- The costs of increasing the seed sample size from that proposed are minor.