

**A Review of the Handling of the GM
Maize Incident at Gisborne and
Pukekohe.**

August – October 2002

A report prepared for ERMA New
Zealand and MAF.

by

Don McGregor
October 2002

Table of Contents

Recommendations	3
Legislative.....	3
Operational.....	3
1. Introduction.....	5
2. The Initial Phase	5
3. Roles and Responsibilities	6
Legislative responsibility.....	7
Accountability	9
4. The Follow-up Phase	10
Testing of Seeds.....	10
Site Clean-up.....	11
5. Enforcement.....	12
6. Contingency Planning	13
7. Communications and Public Relations.....	14
8. Capabilities and Resources.	15
Appendix 1: MAF/ERMA New Zealand Report, released at the press conference held on 3 October 2002	17
Appendix 2: Terms of Reference	21
Appendix 3: MAF press release, 8 August 2002	23

Recommendations

Legislative

1. MAF and ERMA New Zealand make submissions to the review of the new organisms provisions of the HSNO Act on their experiences and difficulties in interpreting and operating the Act during the handling of this incident. (Section 3.6)¹.
2. ERMA New Zealand and MAF consider whether and how the HSNO Act might be amended to clarify the roles, responsibilities and powers of the Authority, the Chief Executive of the MAF, and persons appointed as enforcement officers by the Chief Executive of MAF, in enforcing the provisions of the HSNO Act; and to clarify and give better guidance on operational relationships between the Authority, ERMA New Zealand and enforcement agencies and enforcement officers. (Sections 5.2 and 5.6).
3. A review of relevant provisions of the Biosecurity Act takes place in parallel with the review of the new organisms provisions of the HSNO Act so that the two Acts are better aligned, and 'seamless' in their operation. (Section 3.9).
4. MAF (in consultation with other departments and agencies, including MfE, ERMA New Zealand, and the Ministry of Health), consider whether and how the Biosecurity Act might be amended so that unintentional release into the uncontrolled New Zealand environment of any new organism (including a GMO), that has not been approved under the HSNO Act and which is not an unwanted organism, falls within the purview of the Biosecurity Act. (Section 3.8).
5. MAF and MfE, investigate whether and how the HSNO Act might be amended to align it with the Biosecurity Act with respect to cost recovery. (Section 8.4).

Operational

6. MAF and ERMA New Zealand make appropriate preparations for handling similar or more serious incidents involving less cooperative companies or individuals. (Section 2.8).
7. ERMA New Zealand and MAF review and revise their MoU on their inter-relationships, and their operational agreements, in the light of their experiences from this incident; (Section 3.13) work continuously to improve their operational relationships for handling breaches of the new organisms provisions of the HSNO Act (Section 3.14); and develop a generic framework for management of future incidents, based on the experiences from this incident. (Section 6.4)

¹ Section in this report in which the recommendation is discussed.

8. MAF prepare an operational protocol, and performance standards, for collection, despatch and monitoring of seed (and other biological material) for testing for GM contamination where there is urgency in obtaining results; and give staff training in the operation of the protocol. (Section 4.2).
9. MAF and ERMA New Zealand confer on the training of enforcement officers; draw up a protocol outlining their respective roles and responsibilities for guiding and directing enforcement officers in the discharge of their duties (Section 5.6); and take steps to ensure that persons appointed to enforce the provisions of the HSNO Act satisfy the requirements of the HSNO (Personnel Qualifications) Regulations 2001. (Section 5.4).
10. MAF review every two years the effectiveness of its import health standards and border detection and testing protocols for preventing the entry to New Zealand of unapproved GMOs (Section 6.2).
11. MAF and ERMA New Zealand, as part of their contingency planning for handling future incidents, formulate a communications strategy that is open, transparent and fair to all parties, and which recognises the interests of the government, and also the interests of commercial organisations and other parties or individuals directly involved. (Section 7.2).
12. MAF and ERMA New Zealand assess the resources deployed (in both monetary and human capital terms) in the handling of this incident, identify any significant gaps or weaknesses, estimate the resources needed to handle larger and more serious incidents in the future, and develop a strategy for securing those resources at short notice. (Section 8.3).
13. The Authority reviews its guidelines for ERMA New Zealand's operations, and its delegations, in the light of experience from this incident. (Section 3.16).

1. Introduction

- 1.1 Pacific Seeds Ltd informed the Director of Plant Biosecurity, Ministry of Agriculture and Forestry (MAF) on the afternoon of Wednesday 7 August 2002 that their quality assurance tests had shown the presence of genetically modified (GM) maize seeds in crops harvested in Gisborne and Pukekohe earlier in the year. A detailed account of what followed was prepared and released by MAF and the Environmental Risk Management Authority (ERMA New Zealand) at a press conference held in Wellington on 3 October 2002. That account is appended to this report as **Appendix 1**.
- 1.2 This present report was commissioned by the Chief Executive of ERMA New Zealand and the Group Director of the MAF Biosecurity Authority at the end of September 2002. The terms of reference for the review are appended to this report as **Appendix 2**. MAF and ERMA New Zealand made relevant papers available to the reviewer. In preparing this report, the reviewer interviewed 26 people with a connection with the incident, from ERMA New Zealand, MAF, the Ministry for the Environment (MfE), Ministry of Research, Science and Technology (MoRST), the Department of the Prime Minister and Cabinet (DPMC), Crop & Food, and the companies which supplied and grew the maize seed.
- 1.3 Incidents similar to or more serious than his one are very likely to occur in the future. The purpose of this review is to learn from the handling of this incident so that any future incident may be managed more effectively.

2. The Initial Phase

- 2.1 Following Pacific Seeds notification of MAF on the afternoon of 7 August 2002 of their detection of GM of the contamination, a meeting of senior officials and other advisers was held at MAF the following morning, 8 August. Two senior managers of the company which supplied the maize seed, Pacific Seeds, flew from Australia to attend, as well as a representative of the firm contracted by Pacific Seeds to grow the maize in Gisborne. Government officials present at the meeting were seven MAF officials (including the Assistant Director General - Policy, and the Group Director of the Biosecurity Authority), ERMA New Zealand's Chief Executive and his legal adviser, the Chief Executive and two other officials from the Ministry for the Environment (MfE), one official from the Department of the Prime Minister and Cabinet (DPMC), two from the Parliamentary Office of the Minister for the Environment, and one from the Parliamentary Office of the Minister for Biosecurity. The meeting was chaired by MAF's Assistant Director General - Policy.
- 2.2 Pacific Seeds provided the meeting with information on their test results, and on the maize grown at Pukekohe and Gisborne. The government officials (meeting separately) discussed the implications, the legal situation and actions to be taken. Pacific Seeds was asked to provide more information on their seeds and their growing of maize in New Zealand.

- 2.3 In making their decision to voluntarily to destroy the GM-contaminated seeds, Pacific Seeds accepted a loss that they put at approximately \$500 000. Smaller firms would not have been able to sustain such a loss.
- 2.4 Government officials decided to secure the seeds, to take samples for re-testing, and to oversee the destruction of the seeds. A press release, made late in the afternoon of 8 August, is appended to this report as **Annex 3**.
- 2.6 Enforcement officers, appointed on 9 August under the Hazardous Substances and New Organisms Act 1996 (HSNO Act), secured the seeds in Gisborne and Pukekohe, as well as seeds from these sites held in Edgumbe for stock-food manufacture. The enforcement officers also supervised the taking of samples for MAF's re-testing, transport of seeds to Auckland Airport, and their subsequent destruction there by incineration.
- 2.7 The Minister for Biosecurity was briefed on 13 August; this briefing appeared on MAF's website on 15 August.
- 2.8 The initial phase of the Government's response was expeditious and well managed overall. Senior government officials and company representatives met within 18 hours of Pacific Seeds contacting MAF with news of the GM contamination. Pacific Seeds decision to destroy the contaminated seeds, following hard on the heels of their notification of MAF of their discovery of the GM contamination, enhanced respect for the openness and ethical standards of Pacific Seeds, who took a long-term view throughout of their future in the New Zealand market. The press release on 8 August commended Pacific Seeds for their total cooperation; this cooperation made MAF's and ERMA New Zealand's management of the incident much easier. A less cooperative, let alone a hostile company, would have made handling of the incident much more difficult. This is one of the many 'what if' issues that were brought up during interviews. Pacific Seeds were, of course, fully aware of the penalties that they might face under the HSNO Act, and were reminded of that by the chair at the 8 August meeting. It is **recommended** that MAF and ERMA New Zealand make appropriate preparations for handling similar or more serious incidents involving less cooperative companies or individuals. These preparations would include consideration of responsibility and accountability for implementing the actions, and their timing.
- 2.9 Through MAF's press release, the Government was seen to be open, on the front foot, and in control within 24 hours of MAF being notified by Pacific Seeds of the GM contamination.

3. Roles and Responsibilities

- 3.1 The minutes of the meeting of 8 August 2002 note that after the industry representatives left, "the remaining officials discussed the implications, the legal situation, and action to be taken". Although the minutes do not say, it is a fair guess that the roles and responsibilities of different agencies, in particular MAF, ERMA New Zealand and MfE were discussed at some length. They still are. This is arguably the most significant issue arising from the incident. Who should take the lead? What are the accountability pathways? There was, and still is, some confusion about the answers to these questions.

Legislative responsibility

3.3 The confusion arises, to a significant degree, from complexities in the drafting of the HSNO Act, from difficulties in interpreting the HSNO Act, and from a lack of alignment of the HSNO and Biosecurity Acts.

3.4 The flavour of some these difficulties is illustrated by comments from interviews:

“HSNO Act creates confusion”.

“HSNO Act is written for deliberate introductions; need to be clear about legislation covering unintended presence of new organisms”.

“There are gaps in the linkages between the two Acts [Biosecurity and HSNO]”.

3.5 One person interviewed pointed to sections(s)13(1) and 25(1) of the HSNO Act to show that the incident was a HSNO matter:

S13(1). “Every person who imports, possesses, or uses a hazardous substance or new organism shall ensure that-

(a) Any adverse effect caused by an act or omission of that person in relation to that substance or organism on any other person or the environment is avoided, remedied or mitigated; and

(b) No action or omission by that person will contravene any requirement or control on that substance or organism imposed by this Act”.

S25(1)(b). “No new organism shall be imported, developed, field tested or released otherwise than in accordance with an approval issued under this Act”.

3.6 Recently MfE released a public discussion paper on *Improving the Operation of the HSNO Act for New Organisms*. Submissions close on 15 November 2002. It is **recommended** that, as a matter of urgency, MAF and ERMA New Zealand make submissions to the review of the new organisms provisions of the HSNO Act on their experiences and difficulties in interpreting and operating the Act during the handling of this incident.

3.7 The majority of those interviewed believed that the GM maize incident was primarily a HNSO matter. A minority thought it to be primarily a biosecurity matter which did (or should have) come under the purview of the Biosecurity Act. Any new organisms (including GMOs) crossing the border without HSNO approval are unwanted organisms under the Biosecurity Act. The argument went that the contaminated seeds were risk goods that should have been stopped at border under the Biosecurity Act, but were not. A similar ‘Biosecurity Act’ argument was that the seeds were risk goods which did not comply with the appropriate import health standard (because of their GM contamination), specifically s25(5) (a) and (b) of the Biosecurity Act. The Biosecurity Act does not cover new organisms beyond the border that do not meet the Biosecurity Act’s definition of ‘unwanted organisms’. Officials examined whether or not provisions of the Biosecurity Act applied. Most of those asked agreed that it would have been much easier to handle

the incident if had it fallen unambiguously within the ambit of the Biosecurity Act. However there was a view, strongly argued by officials from DPMC, that this and similar incidents could be handled adequately under the HSNO Act as it presently exists, i.e. no legislative change would be required.

- 3.8 There was some advocacy for amending the Biosecurity Act so that the unintentional introduction of GMOs was clearly a matter that came within the ambit of the that Act. This merits serious consideration. It is **recommended**, as a matter of urgency, that MAF (in consultation with other departments and agencies, including MfE, ERMA New Zealand, and the Ministry of Health), consider whether and how the Biosecurity Act might be amended so that unintentional release into the uncontrolled New Zealand environment of any new organism (including a GMO), that has not been approved under HSNO and which is not an unwanted organism, falls within the purview of the Biosecurity Act.
- 3.9 It is important that incidents of the kind under review, clearly fall unambiguously within the ambit of one Act, and not under (or worse, between) two, or more separate pieces of legislation. One of the initial difficulties thrown up by this incident was whether it should be dealt with under the HSNO Act, the Biosecurity Act, or both. There is an argument that all legislation concerning genetically modified organisms should be in one place. For many, the obvious place is HSNO Act. It is crucial therefore, that a review of the Biosecurity Act provisions takes place in parallel with the review of the new organisms provisions of the HSNO Act. The broader purpose of parallel reviews of the new organisms provisions of both the Biosecurity and the HSNO Acts would be to ensure that both Acts are ‘aligned’ and ‘seamless in their operation’, to quote phrases used by persons interviewed. It is **recommended** that a review of relevant provisions of the Biosecurity Act takes place in parallel with the review of the new organisms provisions of the HSNO Act.

Accountability

- 3.10 Stemming from the lack of legislative clarity were questions of accountability for handling the incident. Although the HSNO Act [s99(1)] confers on the Authority responsibility for ensuring that the provisions of the HSNO Act are enforced, the HSNO Act gives others responsibility for enforcing the provisions of the Act. Several enforcement agencies (but not MAF) are named on s97 of the HSNO Act
- 3.11 As part of ensuring that the provisions of the Act were enforced, on 8 August 2002 the Chief Executive of ERMA New Zealand authorised the Chief Executive of MAF to appoint enforcement officers under s99(3)(b)(i) of the HSNO Act.
- 3.12 This separation of responsibility of ensuring that the HSNO Act is enforced and responsibility for enforcing the Act (i.e. doing the enforcing) resulted in officials being uncertain about who they were accountable to, and what they were accountable for. At interviews, lines of accountability were variously described as ‘messy’, ‘fuzzy’, or ‘confused’. The HSNO Act itself, rather than the officials involved, received most of the blame for this. Whatever the reason, lack of clarity about accountability erodes efficient and effective management of incidents. It is highly desirable, if not essential, that all people involved in an incident like this share a common view of lines of accountability.
- 3.13 More is needed than simply saying it was ERMA New Zealand’s job to see that the enforcing was done, and MAF job to do it. A key is the operational relationship between ERMA New Zealand (seeing that the enforcing is done) and MAF (doing the enforcing). Although there is a *Memorandum of Understanding Concerning the Inter-relationship between ERMA New Zealand and MAF (MoU)*, and operational agreements under the MoU, neither the MOU nor the operational agreements anticipate incidents of the sort being reviewed. This can be rectified, and it is **recommended** that ERMA New Zealand and MAF review and revise their MoU on their inter-relationships, and their operational agreements, in the light of their experiences from this incident.
- 3.14 While it is to be hoped that eventually there may be more legislative clarity for frameworks for operational relationships between ERMA New Zealand and enforcement agencies, it would be a mistake to wait for that to happen. It is **recommended** ERMA New Zealand and MAF work continuously to improve their operational relationships for handling breaches of the new organisms provisions of the HSNO Act.
- 3.15 The powers and functions conferred on the Authority by HSNO Act are primarily quasi-judicial – the Authority is constituted to make considered decisions in response to formal applications submitted according to clearly defined processes. A quasi-judicial decision-making board is ill-suited for directly handling operational matters, more especially in a crisis. Those involved in managing a crisis are usually immersed full-time in fast-moving, interactive, iterative decision-making. The political and public relations aspects, as well as the technical aspects need to be actively managed. Not only is the Authority ill-suited for such operational functions, many would consider it inappropriate for a quasi-judicial board, like the Authority, to be sucked into ‘hands on’ management of an incident such as this one, and particularly the political and public relations aspects.
- 3.16 ERMA New Zealand, headed by the Chief Executive, is the operational agent of the Authority. An important role for the Authority is setting guidelines that allow ERMA

New Zealand to operate efficiently and effectively in the handling of an incident such as this one, and to ensure that the appropriate delegations are in place to allow this to happen. It is **recommended** that, at an appropriate time, the Authority review its guidelines and delegations in the light of experience from this incident.

4. The Follow-up Phase

4.1 The follow-up phase started with the appointment of enforcement officers on Friday 9 August. The two main and parallel components of this phase were (i) (re-)testing by MAF of seed samples for GM contamination, and (ii) preparation and implementation of site clean-up plans. In general, while the initial phase was almost unanimously considered to have been handled well, there was an equally strong consensus that the follow-up took too long. The reasons for this were several and varied. One reason was there was no blue print to follow. Secondly, there were lapses in communications. Thirdly, the time needed for the (re)testing of seed samples was under-estimated, and not all concerned were aware the urgency for getting the results. Fourthly, it took longer than it should have to agree on management plans for the fields in which the maize had been grown. The purpose of this review is to highlight what can be learnt, rather than to apportion blame. It needs to be emphasised that, despite hiccups along the way, there was general satisfaction with the final outcome.

Testing of Seeds

4.2 It took too long to collect and despatch the seed samples from New Zealand; there were delays in getting the seed across the Australian border; there were some technical hitches in the Australian laboratory; the United States laboratory was in the midst of its busiest time of the year, and the New Zealand samples had to be fitted in where they could. Some of these hiccups were due to lapses in communications or feedback; some were due to inexperience; others may have been unavoidable. It was reported that steps have been taken to remedy deficiencies. That's good. It is **recommended** that MAF prepare an operational protocol, and performance standards, for collection, despatch and monitoring of seed (and other biological material) for testing for GM contamination where there is urgency in obtaining results; and that staff be given training in the operation of the protocol.

4.3 Some people believed that some of the delays might have been avoided had there been a MAF-accredited GM testing laboratory in New Zealand. There are New Zealand laboratories that would like accreditation, and there are some in the seed industry who would use an accredited laboratory in New Zealand. Others are not sure, pointing out that most testing is best done off-shore, in the country of origin of seed to be imported; New Zealand is a significant but nevertheless relatively small exporter of seed. A judgement on this issue could not be made within the scope of this review, but it is an issue that may be worth looking at again in a year or two's time. Many people expect the frequency of GM contamination of goods coming into New Zealand to increase, and some are concerned about GM contamination from handling, storage and transport of seed, after samples have been taken for testing by overseas laboratories.

4.4 The interpretation of MAF's results was agreed by officials from several agencies, before the results were released publicly. The technical interpretation of results can be potentially contentious, especially when levels of GM contamination are very low. It is

important that, in incidents such as this, results are submitted for independent expert review before publication. Not doing so exposes the government to political risk.

Site Clean-up

4.5 It took over a month for the parties involved in the incident to reach agreement on what to do to clean up the sites where the maize had been grown. That was far too long. There was general agreement though, that while there were delays and wobbles along the way, the final outcome was satisfactory.

4.6 There was an extensive web of people and agencies involved in deciding and implementing the future management and clean up of the sites where the maize had been grown in Pukekohe and Gisborne. Apart from the Authority (eight members), six ERMA New Zealand staff members were involved (not all at the same time or on the same issues), seven MAF head office staff members (again, not necessarily all at the same time or on the same issues), three external advisers, four MAF Quarantine Service officers (including three who were appointed as enforcement officers), six officials from other departments, and seven or eight industry people. What is important is not the precise number of people involved, but the complex matrix of interactions required between people and agencies involved in handling an incident like this. As one might expect, different facets of the incident were handled, almost without exception ably and competently, by different people at different times according to their particular skills and their standing in the hierarchy of their organisations. But there was no one person acknowledged by all as responsible for overall coordination and management of the handling of the incident throughout its entire time course. The absence of visible continuity of leadership contributed to the drawn out nature of the follow up. It is **recommended** that ERMA New Zealand and MAF develop a generic framework for management of future incidents, based on the experiences from this incident. The framework should address, among other things, leadership and coordination.

4.7 It is important to recognise that these comments are made with the benefit of hindsight. It should be recorded that many positive comments were made about the follow up. For example:

“----- very good on process to handle follow up”;

“actual follow up regime developed as a very workable solution”;

“response from ----- was excellent”.

There was widely-shared satisfaction with the final outcome of the follow-up.

5. Enforcement

- 5.1 A basic reason for the drawn out nature of the decision-making on the site clean-up and management was the lack of legislative and administrative clarity as to the roles and relationships of the Authority, ERMA New Zealand, and MAF in managing an incident like this. This has been discussed already (refer to Section 3 of this report). Although the HSNO Act is clear that the Authority is responsible for seeing that the HSNO Act is enforced [s99(1)], the Act gives little guidance as to how that oversight is to be carried out.
- 5.2 The Act [s100] clearly states that the person who appoints an enforcement officer is responsible “in every respect for the actions of that officer”. For this incident, the Chief Executive of MAF appointed the enforcement officers, and he was responsible for their actions. There is a yawning gap between the Authority’s responsibility for seeing that the Act is enforced, and the responsibility of the Chief Executive of MAF (in this incident) for the actions of the enforcement officers. What happens, for example, if the Authority, ERMA New Zealand and MAF disagree on enforcement? The basic difficulty in the handling of the incident was that there were few ground rules, legislative or otherwise, covering the relationships between the Authority, ERMA New Zealand and MAF. It is **recommended**, as a matter of urgency, that ERMA New Zealand, MAF and MfE consider amendments to the HSNO Act to clarify and give better guidance on operational relationships between the Authority, ERMA New Zealand and enforcement agencies and enforcement officers (refer also to section 3 of this report).
- 5.3 The three enforcement officers appointed to handle this incident on the ground were from MAF’s Quarantine Service (MQS). MQS has nearly 500 field officers spread throughout the country. These officers enforce provisions of the Biosecurity Act, MAF/ERMA New Zealand containment standards and containment controls imposed by the Authority in its HSNO decisions. Appointment of MQS field officers to enforce the new organisms provisions of the HSNO Act seems entirely logical; it would be a waste of resources to duplicate their service.
- 5.4 The HSNO (Personnel Qualifications) Regulations 2001 set out the knowledge and qualifications required of enforcement officers. They are required to be fully conversant with relevant provisions of the HSNO Act, of the relationships between the HSNO Act and the Biosecurity Act, and to know the procedures for determining an organism’s nature and whether or not it is a new organism. If, as seems appropriate, a more formal agreement is reached between ERMA New Zealand and MAF for securing the services of MQS officers as enforcement officers over the longer term, arrangements will have to be agreed for the training of the MQS officers. It is **recommended** that MAF and ERMA New Zealand confer on the training of enforcement officers, and take steps to ensure that persons appointed to enforce the provisions of the HSNO Act satisfy the requirements of the HSNO (Personnel Qualifications) Regulations 2001.

5.5 Section 104 of the HSNO Act, which covers the issuing of compliance orders by enforcement officers, gives considerable independence and discretion to enforcement officers, who are empowered to issue compliance orders, “if in the opinion of the enforcement officer” there has been a breach of the Act. This raises a number of issues: (i) appropriate training for people appointed as enforcement officers [s100(1)]; (ii) how s104, which confers enforcement officers with significant independence, relates to s100(2) which makes the person who appoints an enforcement officer “liable in every respect for the actions of that officer”; and (iii) what are the relationships between the Authority, which is responsible for seeing that the provisions of the Act are enforced; the persons who appoint enforcement officers, who are responsible for the actions of the enforcement officers; and the enforcement officers themselves who empowered by the Act to exercise judgement on whether or not a breach of the Act has occurred, and if so, what should be done.

5.6 Many of these difficulties are likely to disappear if, as has been mooted, the Chief Executive of MAF was named as a person responsible for enforcing the HSNO Act under s97 of the Act. Even so, a formal protocol may be required between ERMA New Zealand and MAF covering the roles, responsibilities and channels of communication between ERMA New Zealand and MAF for guiding and directing the enforcement officers in the discharge of their duties. It has already been **recommended** that, as a matter of urgency, ERMA New Zealand and MAF jointly consider whether and how the HSNO Act might be amended to clarify the roles, responsibilities and powers of the Authority, the Chief Executive of the MAF, and persons appointed as enforcement officers by the Chief Executive of MAF, in enforcing the provisions of the HSNO Act. In addition, it is **recommended** ERMA New Zealand and MAF draw up a protocol outlining their respective roles and responsibilities for guiding and directing the enforcement officers in the discharge of their duties.

6. Contingency Planning

6.1 This event had not been anticipated, so there were no specific plans to deal with it. Both organisations are now acutely aware of the need to plan for future incidents like this one. As more than one person interviewed said, it was lucky that this incident was relatively benign: future incidents are likely to be more serious, and occur with increasing frequency. This incident provides a base from which to plan management of future incidents. Some of those interviewed suggested that ERMA New Zealand and MAF develop scenarios involving, say, GM tomatoes, potatoes, sweet corn, maize or canola. One sobering comment was “Imagine if this was canola, 5000 hectares, 100 growers”.

6.2 Steps have been taken since the Jubilee sweet corn incident in 2000 to tighten border protocols for GM testing of seed. MAF should continue to focus energetically on prevention of entry of GM contaminated goods. It is **recommended** that MAF review every two years the effectiveness of its import health standards and border detection and testing protocols for preventing the entry to New Zealand of unapproved GMOs.

6.3 But despite controls at the border, there was almost unanimous agreement from those interviewed that there are likely to be more incidents of unapproved and unintended releases into the New Zealand uncontrolled environment of GM organisms, and that they are likely to occur with increasing frequency.

6.4 What sort of planning should be done? The answers given at interviews ranged from drawing up detailed protocols and running mock exercises, along the lines for a fruit-fly incursion, to developing basic principles that will apply, a framework. Several people contended that specific plans risk being overly prescriptive and inflexible. One thing is certain: the next incident will be different from the last. Another repeated comment, was that planning needs to take account of the commercial interests of contractors and landowners, who want a rapid and unambiguous response from enforcement agencies on the future management of the land on which the crops have been grown. It is **recommended** that ERMA New Zealand and MAF develop a framework for handling future GM incidents, building on the experiences from this incident.

7. Communications and Public Relations

7.1 It was agreed by officials right at the outset, that the incident should be handled openly and transparently. A press release was made late on 8 August, little more than 24 hours after Pacific Seeds had notified MAF of their results showing GM contamination. This proactiveness put the government on the front foot and pre-empted negative public responses. An editorial in *The Press* on 12 August said “Unlike its handling of ‘corngate’, [the Government] has this time been open about the issue, and that seems to have released the steam the incident had. Because all political parties, and the public have been brought into the loop they have no reason to suspect a cover up or fear something nasty is growing in the paddock and lurking in the corn or chicken soup. Everyone has been invited to see the husk stripped and the underlying corn exposed for inspection”.

7.2 The seed industry came out well too. The readiness of Pacific Seeds and their contracted growers to provide information, and Pacific Seeds’ decision to destroy their stocks of seed enhanced their reputation and goodwill. Pacific Seeds were informed that the information they supplied would be publicly available under the Official Information Act, but they were caught unawares and unprepared by the publication on MAF’s website on 15 August of the material they had supplied and MAF’s briefing paper to the Minister. As a consequence, Pacific Seeds and their contracted growers were ‘ambushed’ by journalists hunting for more information; this put a lot of stress on them and on their relationship with MAF and ERMA New Zealand. This highlights the tricky balance between running a no surprises policy for the firms directly involved, and maintaining public confidence that the government is not being improperly influenced by industry interests. Pacific Seeds and their contract growers were concerned about the patchy information flow to them from officials. They heard little about what was going on for quite long periods. Maintaining open communication with the firms most directly affected and with other stakeholders (e.g. Federated Framers) is difficult in a fast-moving crisis, and also when there is prolonged uncertainty within government agencies about the steps to take to deal with an incident. It is also important to treat all parties as equals; one of the contract growers was invited to the 8 August meeting in Wellington, but the other was not.

It is **recommended** that MAF and ERMA New Zealand, as part of their contingency planning for handling future incidents, formulate a communications strategy that is open, transparent and fair to all parties, and which recognises the interests of the government, and also the interests of commercial organisations and other parties or individuals directly involved.

- 7.3 There was considerable public interest and concern about the incident in Gisborne. Officials from MAF and ERMA responded by participating in a public meeting in Gisborne on 8 October. The officials were open and direct in their presentations and responses to questions. Although they did not satisfy all their critics, they deserve credit for their readiness to engage in and listen to open public debate. Although this might not be appropriate in all situations, it is an example to be considered in the handling of future incidents.
- 7.4 The firm contracted to grow the maize in Gisborne had to deal with a heavy load of questions and enquiries after the firm was publicly named on television on the night of 8 August. The firm felt the need to employ security guards at its premises. By contrast there was almost no public expression of interest in Pukekohe. The firm contracted to grow the maize in Pukekohe received only one email enquiry and not even one phone call despite considerable local and national media exposure. One can only speculate on the reasons for these differences in public responses, but they do point to regional differences in public attitudes.

8. Capabilities and Resources.

- 8.1 Although both MAF and ERMA New Zealand have in-house technical expertise in plant GM, this expertise is thin in both institutions. Advice was sought and obtained from an independent expert on the technical issues concerned with the management and clean-up of the sites where the maize was grown. This was useful for both ERMA New Zealand and MAF. Independent advice should be sought by government agencies when needed. However this is no substitute for maintaining adequate capability in-house. Government departments and agencies need to make decisions quickly when handling incidents like this one. Competent, appropriately-trained people are needed in-house to interact with colleagues handling other aspects of the incident. Equally important, especially in a crisis, they need to be readily available to brief Ministers if required. The expertise required for dealing with an incident such as this is a combination of scientific and technical knowledge with knowledge of appropriate legislation and of the enforcement of that legislation. These skills can be referred to as 'operational' technical skills.
- 8.2 These combinations of skills are not readily bought off the peg; they have to be developed and nurtured. The skills, or more precisely, the human capital that has been built up over the years in one or two key people, are usually critical to the successful handling of incidents. The absence (even temporarily) or loss of one or two key people can make a significant difference to the successful handling of an incident like this. Organisations, like ERMA New Zealand and MAF, need to have readily available back-up for the key capabilities required for the efficient handling of incidents like this.

- 8.3 One concern of both MAF and ERMA New Zealand is that responding to incidents like this diverts people from their normal duties. Other work does not get done; this could have downstream consequences for both MAF and ERMA New Zealand, for example in maintaining New Zealand's biosecurity. The handling of this incident stretched the resources of the relevant sections of both MAF and ERMA New Zealand; yet this incident was relatively restricted with low-level GM contamination. It is **recommended** that both MAF and ERMA New Zealand assess the resources deployed (in both monetary and human capital terms) in the handling of this incident, identify any significant gaps or weaknesses, estimate the resources needed to handle larger and more serious incidents in the future, and develop a strategy for securing those resources at short notice.
- 8.4 The Biosecurity Act [s135] provides for the recovery of costs of administering that Act, in particular those costs that are not provided for by money appropriated by Parliament.. MAF is concerned that there is no such provision in the HSNO Act, so that MAF is unable to recover the costs incurred in enforcing the Act. This is another example of incongruence of the Biosecurity and HSNO Acts. It is **recommended** that MAF and MfE, as a matter of urgency, investigate whether and how the HSNO Act might be amended to align it with the Biosecurity Act with respect to cost recovery.

Appendices

Appendix 1: MAF/ERMA New Zealand Report, released at the press conference held on 3 October 2002

An investigation into the suspected growth of genetically modified maize in Gisborne and Pukekohe, August-September 2002²

On 7 August 2002, the Ministry of Agriculture and Forestry (MAF) was informed by Pacific Seeds that maize seeds from two crops grown in New Zealand had tested positive for genetically modified (GM) seed. A meeting was held on 8 August so that the company could provide further details about the incident to both MAF and other government agencies, including the Ministry of the Environment (MfE) and the Environmental Risk Management Authority (ERMA). The meeting was held in three parts and the minutes are set out in Appendix 1 and were published on MAF's web site on 15 August. During the first part, Pacific Seeds and associated companies provided information about the affected crops. Industry representatives then left the meeting and government officials discussed the appropriate actions. These actions were then discussed with the industry representatives.

Pacific Seeds explained their surprise at the positive test results and provided assurances that the seeds were contained, physically separated from other seeds, and had not been distributed to farmers. The company then described the history of the affected crops in Gisborne and Pukekohe. The following descriptions are derived from this information and from the information presented at the subsequent meeting on 28 August (Appendix 3), and verified by MAF where this was possible by field inspections during August.

The crops in Gisborne were grown from two parent lines (821082 and 821093 x 821094) imported from the USA (Garst Company) during April and September 2001. A composite sample (approximately 700 seeds of each parent) of the seed was tested by GeneScan, Australia and no GM seed was detected. This testing was done on the company's own initiative as part of their quality control system. There was no regulatory requirement to test imported maize seed for sowing for the presence of GM seeds at this time (this requirement was introduced on 1 August 2002). The parent lines were planted on three fields in Gisborne, one (11.8 ha) was planted with both parent lines to produce hybrid seed and the other two (0.5 ha) were planted with one of the parent lines to produce inbred seed for future hybrid seed production.

The Pukekohe crops were grown from two parent lines (3IIH6 and 3DHA9) imported from the USA (Monsanto) during September 2001. Prior to export, a sample (1100 seeds) of each parent line was tested by Monsanto, St Louis and no GM seed was detected. As before, this testing was done on the company's own initiative. The parent lines were planted on thirteen fields, eleven (12.5 ha) were planted with both parent lines to produce hybrid seed, the remaining two (0.7 ha) were planted with one of the parent lines to produce inbred seed.

The fields in both Gisborne and Pukekohe were temporally and/or spatially separated from surrounding crops of the same species (Appendices 1, 5 and 7). Approximately 33.5 tonnes of seed was produced from the crops and this was stored in warehouses in Gisborne and Pukekohe. Seed of three of the four original imported parent lines remained. Crop residue from processing in Gisborne, including some viable seeds, had been sent to Edgcombe where it was waiting to be processed into stock feed.

A representative sample of the hybrid seed (1400 seeds) from the two sites was sent to GeneScan for testing in late August 2002 as part of the company's usual quality control system. The results, received on 6 August, were positive for the 35S sequence indicating that GM seed was present. Further testing by GeneScan, requested by Pacific Seeds, reported that GM seed was present as a concentration of less than 0.05% (fewer than 1 in 2000 seeds) and identified the GM variety present as Bt176 in the hybrid Gisborne crop and YieldGard in the hybrid Pukekohe crop. The Bt176 and YieldGard varieties both contain a gene which produces an insecticide active against the European corn borer.

² The full report, with appendices, is available from MAF.

Following their description of the sites in Gisborne and Pukekohe on 8 August, the industry representatives left the meeting and government officials discussed the implications, legal situation and the actions required. It was decided that the appropriate response was to:

- secure the seeds
- have samples of the parent and hybrid seeds tested
- decide the fate of the seeds after their test results were available
- require information from the company including: test results for parent and hybrid seeds, and confirmation of sampling and testing techniques used; locations of the farms where the parent lines were grown; separation mechanisms (isolation distances, timing) used; status of plant material remaining at the farms where the seed were grown; a chronology of the handling and movements of the parent lines and hybrid crop; and the location of all the parent and hybrid seeds.

These decisions and requests were conveyed to Pacific Seeds. The company indicated their willingness to cooperate with these requests and also indicated that in the interim they had decided to destroy the seeds once the necessary samples had been taken. Government officials made it clear that this was the company's decision and stated that this must be done under MAF supervision. This condition was accepted by the industry representatives. According to the law, there may have been other acceptable ways to treat the seed such as exporting it but these were not considered after the company decided to destroy the seed.

Since it would be some time before the results of the government's tests on the seed samples were available, MAF and ERMA agreed that it was necessary to proceed on the assumption that some GM plants had been grown in Gisborne and Pukekohe.

On 9 August, three staff of MAF Quarantine Service were appointed as enforcement officers under the Hazardous Substances and New Organisms Act 1996. The appointments were made by MAF's Director General acting under delegated authority from ERMA. They secured the seeds in Gisborne and Pukekohe and the crop residue in Edgecumbe. The officers also took 5 kilogramme samples from each of the lines of seed available, i.e. three of the four inbred parent lines, the four inbred parent lines multiplied in New Zealand and the two hybrid crops that resulted from crossing the imported parent lines. Following Pacific Seeds's decision to destroy the seeds, all the remaining seeds and the crop residue were transported to Auckland and incinerated by Waste Resources Ltd. under MAF supervision.

The Minister for Biosecurity, the Hon Jim Sutton, was briefed on the situation on 13 August (Brief No: 02/50, Appendix 2). The brief included details of the affected crops, the actions taken and planned, and differences between the current incident and the Jubilee sweetcorn variety in late 2000, and was published on MAF's web site on 15 August.

The enforcement officers in Gisborne and Pukekohe were instructed to take sub-samples of 3200 seeds from each of the 5 kilogramme samples (as per MAF's *Protocol for testing imports of Zea mays seed for sowing for the presence of genetically modified seed*). The officers then sent the sub-samples to each of MAF's accredited laboratories (Biogenetic Services, USA and GeneScan, Australia) between 16 and 21 August. There were small delays because the staff involved were not familiar with the process required to send such samples. However, more significant delays occurred at the Australian and American borders, for example the samples from Pukekohe took 7 days to receive clearance at the Australian border. The samples arrived at Biogenetic Services on 22 and 23 August and GeneScan on 28 and 29 August. The laboratories were instructed to test the samples for the 35S promoter and nos 3' terminator, two sequences commonly present in GM maize. GeneScan were subsequently asked to identify and quantify the type and amount of GM seed present in positive samples. Both laboratories prioritized these tests but the samples arrived during one of the busiest periods of the year.

MAF officials visited the 13 affected fields in Pukekohe on 22 August 2002 and the 3 fields in Gisborne on 27 August 2002. The purpose of these visits was to verify the information provided by Pacific Seeds on the status of the affected blocks and the land use in the surrounding area. Both of these aspects were found to accord with the information supplied by the company. Photographs were taken recording the general situation of the sites and their condition (Appendix 3). Eleven of the fields in Pukekohe had not been cultivated since harvest and some crop residues remained including viable seeds. Some of the viable seeds had begun to germinate. The two remaining fields had been cultivated soon after harvest and put into pasture. These two fields and one uncultivated field had been grazed but the animals were removed at the request of Pacific Seeds after it had obtained its initial positive test results. All three fields in Gisborne had been cultivated after harvest and had remained fallow since.

Little crop residue was seen on any of the five cultivated fields in Gisborne and Pukekohe nor were viable seed or volunteer plants (plants germinating from seeds produced in the previous season's crop) observed. In Pukekohe, volunteer plants were observed on the sites where crop waste had been partially burnt and crop residues (e.g. cobs, seeds) were also observed in the seed processing facility. On 23 August, MAF and ERMA requested that Pacific Seeds clean the shed of all remaining crop residues, these were then collected by an enforcement officer and transported to Auckland for incineration.

As soon as the seed had been secured, MAF and ERMA began to formulate appropriate strategies to deal with the affected fields, contingent upon the results of testing. However, final decisions were not made until after MAF had visited the affected sites and the requested information had been obtained by Pacific Seeds. The company presented detailed information about the Gisborne and Pukekohe crops to government officials on 28 August. Most of the information was contained in a briefing folder provided by the company (Appendix 4) so the minutes from the meeting (Appendix 5) record only comments and questions, and additional information provided by the company.

Following the presentation by Pacific Seeds, officials from MAF and ERMA met to discuss what immediate action was required to destroy crop residues and to ensure that no viable material was spread from these fields. There was also a discussion about what longer term action was required to ensure that any volunteer plants subsequently emerging were destroyed and what monitoring was required to ensure that this happened. The minutes of this meeting are recorded in Appendix 6. After the meeting there was consultation within MAF and ERMA on the immediate actions agreed at the meeting. On 30 August 2002, MAF and ERMA requested Pacific Seeds to stubble mulch the eleven fields which had received no cultivation since harvest. The fields were then to be cultivated, preferably by ploughing, to incorporate the mulched material, and to recultivate (or herbicide spray if this was not possible) once any volunteer plants had germinated. Pacific Seeds and associated companies confirmed that they would undertake this work and the initial cultivations are now complete.

Over the next two weeks MAF and ERMA collected the information that was required to make decisions over the longer term future of the affected sites in Gisborne and Pukekohe. This included commissioning a report from Dr Allan Hardacre (Crop & Food, Palmerston North) concerning the effectiveness of spatial and temporal isolation to prevent cross-pollination between *Zea mays* crops, the viability of *Zea mays* seed, and the possibility of controlling volunteer plants when crops of different species were grown on the sites (Appendix 7). There was also a period of consultation within and between MAF, MfE and ERMA (including both ERMA NZ and the Authority) to agree a management plan for the 16 affected fields in Gisborne and Pukekohe. Pacific Seeds was sent the management plan (*Proposed site management for Pacific Seeds maize sites, September 2002 – March 2003*) on 13 September for consultation and responded on 17 September that they were largely agreeable and had begun to take the commenced the required actions. However, the company remarked that it did not necessarily have the legal rights necessary to access the relevant neighbouring land. Therefore the document was amended by the addition of point 4, section 3 ("MAF/ERMA recognise as necessary") and the final version is included in Appendix 8. Nothing else was changed during consultation with Pacific Seeds. The document describes in detail what is required of the company, including cultivation and monitoring requirements and how this must be verified by MAF at key intervals.

As described above, the governments tests were conducted on the residual imported seed from three of the four inbred parent lines, the four inbred parent lines multiplied in New Zealand and the two hybrid crops that resulted from crossing the imported parent lines. MAF received the results from Biogenetic Services on 10 September 2002 and from GeneScan on 5-18 September 2002. These are summarised in Appendix 9. The tests in the USA cost \$4,500, those in Australia cost \$8,300.

Officials from MAF, MfE, ERMA and the Ministry of Research, Science and Technology met on 18 September 2002 to discuss the government's and Pacific Seeds's test results. As described in Appendix 10, it was concluded that:

- conventional hybrid maize containing a very small concentration of GM varieties has been grown in Gisborne and Pukekohe
- it is very likely that the source of this seed is due solely to the presence of very small concentrations of GM seed in the imported parent lines
- it is very unlikely that any GM seed in the hybrid maize was the result of cross-pollination from adjoining crops during growth in New Zealand

The concentration of GM seed in the crops in Gisborne and Pukekohe was very small, certainly less than 0.05% (i.e. fewer than 1 in 2000 seeds) in both instances and appreciably less than this in Pukekohe. In Gisborne, no

GM seed was detected in the male parent and therefore there was no possibility for cross-pollination from fields on which the hybrid variety was produced. However, the imported female parent contained the GM variety YieldGard and most probably also Bt176. In Pukekohe, GM seed was detected in both the imported male and female parents. The GM variety in the female line was identified as LibertyLink. LibertyLink varieties contain a gene which provides tolerance to herbicides containing glufosinate ammonium such as Buster, which is registered for use in New Zealand, and Liberty. The variety in the male line was not identified but may well be a YieldGard variety such as MON802 or MON809. Although both imported female and male parents contained a tiny concentration of GM seed, the fields in which they were grown were spatially and temporally isolated from the two maize crops in the vicinity. These crops were more than 110 metres distant, were separated by large hedges and their outside rows were destroyed prior to harvest. There was also little or no overlap between the times the affected crops and the neighbouring maize crops produced pollen and when they were receptive to pollination. Dr Allan Hardacre reviewed this isolation (Appendix 7) and concluded that the chance of cross-pollination between the crops was negligible.

The seed maize crops in Gisborne and Pukekohe were planted at a density of 70,000 plants hectare. Only one seed line was grown to produce inbred seed, whereas hybrid seed was produced from “female” (75% of the plants) and “male” (25% of the plants) parents. From the test results and the areas grown, it can be calculated that up to 319 GM plants grew in Gisborne (310 on the hybrid field and 9 on the inbred field) and up to 463 in Pukekohe (438 on the hybrid field and 25 on the inbred field). That is a maximum of 782 plants out of the approximately 1.8 million plants which were grown on the affected fields. However, the actual figure is likely to be even smaller than this since the concentration of GM plants was less than 0.05%.

It is most likely that GM seeds were not detected when the parent lines were imported because there was such a tiny concentration of GM seed present. The concentration of GM seed in the parent and the hybrid seed is less than 0.05%. Although the testing methods are very sensitive, the limit of reliable detection is around 0.1 %. More importantly when a sample is taken there is a chance that it will not contain GM seeds even if some are present in the seed batch. This sampling error exists whenever a sample is taken and is larger when the concentration of GM seeds is small. The likelihood of detecting GM seed in a line using a sample of 3200 seeds at a GM seed concentration of 0.04% is 71%, at a concentration of 0.02% it is 47% and at a concentration of 0.01% it is 27% (assuming the GM seed is homozygous, randomly distributed and is correctly identified in 99% of samples). For example, GM seeds were detected in samples of the Pukekohe hybrid maize crop taken by Pacific Seeds but not in those taken by the government. Smaller samples of seed were tested by Pacific Seeds when the seed was imported but their testing exceeded what was required for regulatory purposes.

This incident highlights the problem that no matter what testing regime is applied to imported seeds there is always a possibility that GM seeds will go undetected if they are present at a very small concentration.

Appendix 2: Terms of Reference

PREAMBLE

On 7 August, Pacific Seeds reported possible GM contamination of hybrid maize seed, which had been grown at Pukekohe and Gisborne from imported “inbred” lines. GM contamination was confirmed, although not until some time after the first report. In the interim however, the seed was destroyed and the sites where it was grown secured.

Site clean up action was then agreed between MAF and ERMA New Zealand and a request on clean up sent out to affected landowners. With some modifications this was accepted. Clean up was thus able to proceed on a voluntary basis.

REVIEW

A joint review will be concluded by ERMA New Zealand and MAF into the incident described above. For ERMA New Zealand this will be a limited review, i.e. no public submissions, carried out under section 11(e) of the HSNO Act.

MATTERS TO BE INQUIRED INTO

1. The overall purpose of the review is to establish what lessons can be learnt from our (joint) handling of the incident, so the similar future incidents can be handled more efficiently and effectively.
2. Particular matters to be investigated into will be:
 - handling of the initial response, including both treatment of the seed and sites and confirmation of contamination;
 - handling of the follow up action, particularly clean up of the sites;
 - issues surrounding testing, including arrangements for testing, adequacy of testing and the interpretation and implications of test results;
 - the appointment and actions of enforcement officers;
 - roles undertaken by and relationships between the parties directly or indirectly involved, including the industry, MAF, the Environmental Risk Management Authority and ERMA New Zealand, officials of other agencies, and Ministers;
 - handling of industry relations;
 - handling of public and community relations;

3. Issues that should also be explored (in addition to the above) are:
- contingency and other planning for future events of the same general type;
 - whether roles, responsibilities and powers need to be clarified, and if so, how;
 - resourcing and capability implications for the future.

MODUS OPERANDI

All relevant background documents will be made available to the reviewer, and this will include the initial report on the incident from MAF (this report will give a factual account of what happened, and will not include any analysis of what happened). The reviewer will also be able to talk to any MAF or ERMA New Zealand staff member without restraint, and will also be free to interview other people.

The review report will be a public document.

The work will be carried out by Don McGregor.

The review will be completed, i.e. completion of final report, no later than Friday 18 October.

The review report will be handled as follows:

- Submitted in draft form jointly to the Chief Executive of ERMA New Zealand and the Group Director Biosecurity Authority, for comment, especially on the accuracy of matters of fact.
- Submitted finally to the same positions, after taking account of comments.

Appendix 3: MAF press release, 8 August 2002



Media Release

Ministry of Agriculture and Forestry
Te Manatu Ahuwhenua, Ngaherehere

Thursday 8 August 2002

GM contamination risk investigation

The Ministry of Agriculture and Forestry (MAF) was notified yesterday (7 August 2002) about the possible risk of GM contamination of maize seed grown and harvested in New Zealand.

The notification to MAF followed routine post-harvest testing of maize seeds on 6 August 2002 by Pacific Seeds of Australia who had contracted for the maize to be grown in New Zealand on their behalf by contract growers at Gisborne and Pukekohe. None of this maize seed was grown for consumption and none of it has entered the food chain.

All seed from the maize crops in question, and left-over seeds imported for the purpose of growing these crops, is currently being held in secure storage supervised by MAF. All of these seeds will be destroyed by Pacific Seeds under MAF supervision.

MAF and the Environmental Risk Management Authority (ERMA) will investigate whether any further action needs to be taken at the sites where the maize crops were grown.

The possibility that the tests conducted by Pacific Seeds were false positives cannot be ruled out at this time. Pacific Seeds is currently conducting additional tests to validate the 6 August results and also examine in closer detail the seed DNA. MAF has also arranged for parallel testing in accredited international laboratories of seed material from the maize crops harvested in New Zealand and also from the imported parent lines of these crops.

The parent lines were tested prior to their import into New Zealand and no GM material was found. MAF is also arranging for samples from the original parent seed lines to be tested to validate this.

MAF Group Director Policy Larry Fergusson said that MAF and ERMA were impressed by the speed with which Pacific Seeds notified them of this possible contamination risk.

“Pacific Seeds is to be commended for notifying us so quickly of this issue, offering full access to all of their records and total co-operation in our investigations. They have done this in full knowledge of the fact that they could face legal action should it be proved that an offence has been committed under the provisions of the HSNO Act. Their offer to destroy all of the seeds in question without being instructed to also reflects well on their credibility.”

Media contact: Brett Sangster, MAF Director Corporate Communications, 0-4-498 9882 or 0-27-247 8777