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**Brief No: 03/73**

**Minister for Biosecurity  
Minister of Agriculture**

Cc: Prime Minister  
Minister for the Environment  
Associate Minister for Biosecurity  
Minister for Food Safety  
Associate Minister of Agriculture  
Minister for Trade Negotiations

## **INVESTIGATION INTO GENETICALLY MODIFIED SWEET CORN**

- 1. The Ministry of Agriculture and Forestry (MAF) has almost completed its investigation into the occurrence of genetically modified (GM) sweet corn in Gisborne associated with export of product to Japan by [REDACTED]. The detection involved a consignment of processed corn kernels grown in New Zealand and exported to Japan. This briefing follows on from briefings 03/17 and 03/23 dated 4 July 2003 and dated 8 July 2003 respectively (copies are attached for ease of reference). The briefing reports on the outcome of MAF's investigation since the previous briefings, including test results from product and seed sampled from suspect varieties of sweet corn, and informs you on the actions that MAF plans to take to manage any residual risks around last year's plantings.*

### **MAF Site Investigation**

2. Six fields under investigation were visually inspected between 5-10 July 2003 by MAF Quarantine Service and AgriQuality staff. Visual inspections consisted of systematic walking 'sweeps' of the fields using four person teams, which entirely covered each field. Inspectors were looking for evidence of corn seed, remaining corn vegetation (stubble) or growth of volunteer corn plants. No evidence of corn seed or volunteer plant growth was seen either within the fields or within 3 metres around the perimeter of the fields. The field teams reported a high level of confidence that nothing was missed due to good visibility of the ground. A field investigation report has been prepared.

3. Field staff have also been involved in tracing land use in a 300-metre radius around the four fields identified by [REDACTED] as having grown the [REDACTED] variety of sweet corn under investigation. The 300-metre inspection specification was based on United States and Australian scientific data for dispersal distances of sweet corn pollen and therefore allowed MAF to assess the probability of cross-pollination with other crops.
4. A leading New Zealand scientist at Crop and Food Research, specialising in maize and sweet corn breeding and processing, has provided MAF with recommendations that specifically relate to the control of volunteers in sweet corn fields. Based on this advice MAF considers that the four [REDACTED] fields have been subjected to post-harvest cultivation treatments that would prevent any viable material remaining in the fields and is sufficient to meet the recommendations of the Crop and Food expert. Harvesting also occurs when the kernels are physiologically immature and therefore non-viable.

### **MAF Company Review**

5. A summary report of the [REDACTED] review conducted on 7 and 8 July 2003 has been prepared. The following conclusions were made:
  - [REDACTED] has traceability of their product back to seed purchased;
  - There is no evidence that GM material was introduced at the point of processing. The only material that is added to the whole kernel product is salt and water, in the form of brine;
  - The company has taken steps to ensure [REDACTED] product identified from suspect batches has been contained pending further information arising from MAF's investigations.
6. The review of the company also suggested that the last of the four fields planted with [REDACTED] also included a second variety ([REDACTED]) as there was insufficient [REDACTED] to plant the whole field.

### **Testing of Corn Product and Seed Used to Produce it**

7. A series of product and seed samples were sent to AgriQuality GMO Services in Melbourne for testing. These included seed (where available) and product of [REDACTED] and [REDACTED] plus two other varieties that were grown adjacent to the [REDACTED] field originally linked to the positive GMO test in Japan. The results are discussed below.
8. During the 2002/03 season, [REDACTED] grew two sweet corn varieties produced by [REDACTED] (lot number [REDACTED]) and [REDACTED] (lot number [REDACTED]). Both are non-GM hybrid varieties produced by conventional means in the United States of America and exported as seed to New Zealand.
9. From the results of the GMO testing commissioned by MAF on these sweet corn varieties, it was determined that three of four fields sown with the variety [REDACTED] produced a processed product containing a very small concentration (less than 0.1%) of the GM variety Bt11. Bt11 is a type of GM maize and sweet corn that has been modified to be insect resistant and herbicide tolerant. Food Standards Australia New Zealand has approved the variety for food use.

10. No pure sample of the imported [REDACTED] seed remained from the planting however the fourth field had been planted with a mix of both varieties and 4.5 kg (containing approximately 6,000 seeds per kg) of this mixed seed remained. Visual inspection of this residual sample suggested that it comprised both [REDACTED] seed and [REDACTED] seed. MAF tested three samples of this seed (approximately 4 kg in total) for the presence of GM material and these tests all gave negative results. Similarly, [REDACTED] tested three 10,000 seed samples of this [REDACTED] lot prior to import, in part for quality assurance purposes but also to meet MAF's import requirements, and these tests were negative. Subsequently [REDACTED] have tested three further 10,000 seed samples and the results were again negative.
11. MAF has investigated other possible sources of the GM material (cross-pollination from other sweet corn and maize crops surrounding the fields under investigation, and cross-contamination during harvesting, processing and laboratory testing). This investigation has included assessments of the possibility of cross-pollination from surrounding fields, testing of the harvested product and planted seed (where available) of adjacent sweet corn fields, review of the harvesting and processing procedures and a review of the testing facility's procedures. This has not identified any possible source of the GM material. The only known link between the three fields is the seed sown and therefore the possibility remains that the imported seed was the source of the GM material despite the absence of supporting test results.

#### **Further testing of [REDACTED] seeds**

12. Since the variety [REDACTED] had been planted on one of the four fields under investigation. MAF took two 1 kg samples of the remaining imported seed and tested it for the presence of GM material. One of the two samples tested positive for the regulatory sequence 35S indicating the presence of a GMO. Subsequent tests demonstrated that this was present at a minuscule concentration (less than 0.05%). Despite intensive testing using gene/variety-specific tests it has not been possible to identify the GM variety present.
13. The positive result almost certainly does not result from the presence of *Cauliflower mosaic virus*-infected material (from which 35S is derived). Specific tests for the virus were negative, moreover corn is not a host of the virus and the testing facility has processes in place to remove any extraneous plant material that might be infected. The testing laboratory also has a number of controls to detect cross-contamination during sample extraction and testing and MAF does not believe that this is a likely reason for the positive test result. It is also unlikely that the GM variety present is not one of those tested for; in total 10 gene/variety-specific tests were done which detect 19 GM varieties including all the GM sweet corn and maize varieties commonly grown abroad.
14. The most likely explanation for not being able to identify the GM variety present is simply that its concentration is below the detection limit for the gene/variety-specific tests. Although 35S was detected, a number of GM varieties have more copies of the regulatory sequences than of specific genes, e.g. Bt11 contains two copies of 35S and nos 3' but one each of the Cry1Ab and pat genes (which confer insect resistance and herbicide tolerance respectively). Furthermore, the quantitative tests on this sample indicated that the quantity of GM material present was extremely small.

## **Importation Requirements**

15. MAF, in consultation with other government departments, is reviewing the testing protocols used for imported sweet corn, maize, oilseed rape and soya bean seeds imported for sowing and will brief ministers on their conclusions shortly.

## **Dealing with Fields Which Grew the Corn**

16. MAF has inspected the sites, reviewed cultivation histories and identified the risk profiles of the four Gisborne sites that grew [REDACTED] variety, and a small amount of [REDACTED], sweet corn. MAF has concluded that there is no risk of mature seed having been produced on these four fields and that they are of low risk.
17. MAF has consulted with the Environmental Risk Management Authority (ERMA) on the status of compliance orders on the four fields that restricts the removal of organisms and material from the fields. ERMA concurred with MAF that the compliance orders could be lifted on the four fields.
18. MAF has obtained information from [REDACTED], [REDACTED], [REDACTED] and [REDACTED] regarding field management, pre- and post harvest, of [REDACTED] ([REDACTED]) and [REDACTED] ([REDACTED]) varieties of sweet corn in the last growing season (2002-2003). The four companies planted an estimated total of 333 hectares in [REDACTED] and 442 hectares in [REDACTED]. The majority of post-harvest field management practises involved either cultivation shortly after harvest or one to three days of stock grazing, followed by multiple heavy discing/mulching and planting in either winter pasture or fodder crops. MAF considers that these methods effectively prevent any plants developing to a point where viable seed can be set. Consequently fields managed in this way are considered to be low risk. Many growers have rotational polices and will therefore replant in alternate crops this coming season. A few other growers are considering replanting sweet corn or maize while others are undecided. MAF has requested additional information and clarification of management practices where information provided was deficient.
19. A plan is in preparation to cover validation of field management and risk status. MAF proposes to take no further action on fields that have been identified as low risk and where absence of volunteer plants has been confirmed. MAF anticipates that only a small number of fields (estimated to be less than 5% of the total) could potentially contain viable seed because of absence of prompt stubble management. A management regime is being prepared for this situation and will be confirmed with ERMA New Zealand.

## **Media management**

20. A press release and press conference will be held on Tuesday 5 August 2003 reporting the results of MAF's investigation.

## Recommendations

21. It is recommended that you:

a) **note** the contents of this briefing paper;

**noted**

b) **note** that MAF proposes to:

- i) Communicate the results of the investigation and the action being taken as a result, to the public on Tuesday 5 August 2003, and
- ii) Review the adequacy of the testing protocols used for imported sweet corn, maize, oilseed rape and soya bean seeds imported for sowing, in consultation with other government departments, and will brief Ministers on their conclusions shortly; and

**noted**

c) **note** the contents of the attached draft press release.

**noted**

Veronica Herrera  
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