

**Ministry of Agriculture and Forestry**  
**Project FMA 128**  
**Levels of *Escherichia coli* O157 in lettuces**  
**and *Salmonella* in apples**

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by

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## SUMMARY

This report is an output from Objective 2 of the MAF Policy project FMA 128. The scope of the project was to carry out the qualitative and, if present, quantitative measurement of pathogens on fresh lettuces and apples, as identified by the risk ranking assessment in Objective 1. In this first objective, ESR presented a report on “Risks associated with bacterial pathogens in exported fruit and vegetables” (Hudson and Turner, 2002) in which the food/hazard combinations of *Escherichia coli* O157:H7 on lettuce and *Salmonella* on apple were recommended for sampling.

Export trade of lettuces is minimal, so it was necessary to sample the produce available in the local market to obtain a sufficient number of samples. Apples are exported in large volumes so sampling was carried out at export packhouses. The aim of the sampling plan was to obtain as many varieties of produce from as many growers as possible. The project recognised the need to sample as close to the point of packing as possible to avoid downstream recontamination problems.

Between the months of February and May 2003, 240 conventionally grown lettuce and 234 organically grown lettuce samples were tested for *E. coli* O157:H7; and between the months of March and May 2003, 239 samples of apples grown under the Integrated Fruit Production programme (IFP) and 230 organically grown apples were tested for *Salmonella*.

Conventional lettuces (48 lots of 5 samples) were obtained from 22 growers from around New Zealand. Seven varieties were included, with Iceberg being the variety most available in the market. All samples tested negative for pathogenic *E. coli* O157:H7 per 25 g of sample.

Organic lettuces were purchased from 9 growers from around New Zealand. Forty-six lots of 5 samples and one lot of 4 samples were purchased, representing 13 varieties with Iceberg, Fancy green, Green oak and Cos being the most popular. All samples were negative for *E. coli* O157:H7. However an atypical *E. coli* O157:H16 was isolated from one Fancy green lettuce with a count of 23 MPN per g. This isolate harboured the *eaeA* adhesin gene, one of four recognised in pathogenic *E. coli* O157:H7. The *stx1*, *stx2* and *hlyA* genes were absent. Verocytotoxin was not produced by this isolate. It was concluded that this isolate was of dubious, and most probably, no public health significance. The fact that verocytotoxin was not produced made this isolate a curiosity of no concern.

239 IFP and 230 organic apples were sampled from export packhouses in both North and South Islands. Eight varieties of IFP apples and five varieties of organic apples were sampled. Braeburn, Royal Gala and Fuji apples were the most popular. No *Salmonella* was isolated from any IFP apple samples. However one batch of 5 samples of organic Braeburn apples from the same orchard tested positive for *Salmonella* Typhimurium DT12a. Due to the nature of the test procedure, where the 200 ml volume of rinse was divided into 35 ml and 165 ml portions, initial individual large portion testing was negative for *Salmonella*. It was only when these five smaller 35 ml portions from the batch were pooled and tested that *Salmonella* was isolated.

From the results, we do not know how many samples out of five were contaminated or if only one sample was contaminated whether only one apple out of three in the sample was contaminated. It was likely that the level of contamination was very low since the larger individual rinse portion tested negative and only the pooled test of five smaller 35 ml portions was positive. It may be possible to deduce from this that perhaps only one apple in the sample was likely to have been contaminated with only one or a few *Salmonella* cells to return a positive pooled test. If this was the case, then the prevalence would be as low as 0.4% positive out of 230 organic samples.

This study demonstrated the benefit of introduction and effective implementation of HACCP based food control programmes in the edible fruit and plant product industries. Vigilance over approved programmes needed to be reinforced as these pathogens are present in New Zealand. Establishing critical control points or adopting control measures would minimise the potential of having hazardous pathogens in edible plant products.



# 1 INTRODUCTION

Internationally there is growing interest and concern over the microbiological safety of edible plant products. This concern, both at the consumer and regulatory level, has been fueled by some high profile (albeit quite product-specific) foodborne illness outbreaks, involving a number of deaths, which were traced back to edible produce.

While New Zealand's exports of edible plant products have no history of causing outbreaks such as these, a number of internationally-significant food safety pathogens are present in New Zealand, and could potentially be present on fresh produce. In addition, countries (most notably the European Union) have signaled an intention to look at introducing regulatory requirements for the safety and hygiene of imported edible plant products.

New Zealand needs to be proactive and target its research so that the introduction of any regulatory market access requirements by our trading partners can be quickly and effectively responded to. The establishment and implementation of scientifically valid guidelines for food safety in relation to the production, packing and storage of edible plant products will help ensure New Zealand maintains its current access to markets and protect its reputation as a supplier.

In year 2000/2001, the Ministry of Agriculture and Forestry (MAF) funded research for the development of generic HACCP models for MAF Food to provide a basis for a food safety-official assurance programme for fresh produce as and when importing countries require one. This project highlighted the lack of data available to identify food safety hazards in fresh produce exported from New Zealand (Faulkner *et al.*, 2001). Although several potential food/hazard combinations were suggested in the 2001 report, the cost involved in producing meaningful scientific data covering all of the fresh produce and hazards would be very large indeed.

In the year 2002/2003 funding round, the New Zealand Food Safety Authority proposed the project entitled "Identification and establishment of levels of food safety pathogens on fresh produce produced in New Zealand and intended for export (EOI-18, 2002/03)".

It was suggested by the Environmental Science and Research Institution (ESR) in the proposal to MAF Policy that a qualitative risk assessment process should be applied to determine which food/hazard combinations appear to pose the greatest risk for the health of overseas consumers. There was recognition of a need for research to provide information on identification and levels of food safety pathogens on fresh produce, encompassing both organic and conventional production methods.

In December 2002, ESR presented a report entitled "Risks associated with bacterial pathogens in exported fruit and vegetables" to MAF (Hudson and Turner, 2002). This report was an output from Objective 1 of this MAF Policy project FMA128. It used a risk assessment to identify food/hazard combinations among the range of bacterial pathogens and produce foods that are the most likely to result in human disease.

The report recommended two produce/hazard combinations (organic vs conventional). One such recommendation was *Escherichia coli* O157:H7 on lettuces, and the other was *Salmonella* on apples.

## 1.1 *Escherichia coli* O157 on Lettuces

Lettuces are commonly eaten raw and may or may not be adequately washed before consumption. Though the volume exported from New Zealand is relatively small, the association with outbreaks of foodborne disease in many countries, particularly of *E. coli* O157:H7 infection, suggests this vegetable is a subject for further research. Both conventional and organic methods expose lettuces to pathogens present in soil and, potentially, in agricultural applications such as compost. Lettuces will be similar to other leafy ground-grown vegetables such as cabbages and witloof in terms of risk of contamination, and may in some ways be representative of these latter products when they are also consumed raw.

Contaminants can be acquired at any stage in the production process, from growing, through distribution to handling prior to use. Foodborne disease outbreaks associated with vegetables usually occur because the vegetable was exposed to faecal material during growth or handling. Some vegetables may be fertilised with manure or compost that may not have been correctly produced. Irrigation water may be contaminated, and people handling produce who practice poor personal hygiene following defecation may also contaminate vegetables.

Vegetables may be subjected to decontamination or washing after harvest but this does not guarantee the removal of pathogens despite the fact that their numbers could be reduced 10-100 fold.

Fresh ready-to-eat vegetables are usually stored for relatively short periods and under refrigeration to maintain quality. Although growth of most organisms under these conditions will be minimal if it grows at all, cool, moist conditions are likely to favour the survival of some organisms such as *E. coli* O157.

*Escherichia coli* O157:H7 is present in New Zealand. However it is less likely to be found on produce due to its low environmental prevalence (as far as is known). Overseas, *E. coli* O157:H7 has rarely been found in microbiological surveys of fresh produce, but it has caused outbreaks associated with fruit and vegetable consumption, and lettuces, particularly, have been implicated.

It is now recognised that when lettuces grow in contaminated soils, *E. coli* O157:H7 can be found colonising stomatal pores and can migrate into the internal surfaces of lettuce leaf tissue (Solomon *et al.*, 2002). In hydroponic systems, the pathogen has been observed adhering to roots, the seed coats and moving within the vasculature of a hypocotyl infiltrating the xylem (Wachtel *et al.*, 2002). These observations have changed the view that contamination of produce by bacteria was a surface phenomenon. The likelihood of internalisation of pathogens in lettuces if they are grown in contaminated soil has influenced the way lettuces were tested in this project.

## 1.2 *Salmonella* on Apples

Fruits have an associated microflora, and initial contamination comes from the field and during harvesting and transport operations. A source of contamination of fruits is the use of contaminated water for their irrigation or washing prior to consumption.

Pathogens which may have been introduced to raw fruits during growth or harvest will not grow on most fruits, but they may survive for some time depending on the pathogen and the fruit. This is important with some organisms, such as *Salmonella*, that survive well in the environment. There is the potential for *Salmonella* to be introduced via the irrigation system, but there has been no documented case of this occurring.

In the USA where melons from Mexico have been associated with *S. Poona* outbreaks, it was suspected that the melons may have been contaminated by reptiles, such as iguanas, that feed on melons in the field (CDC, 2002). In New Zealand, apples are grown outdoors where they are exposed to environmental sources of contamination such as dust, insects and birds, all of which may carry pathogens onto the fruit. Birds, especially sparrows, are likely to be of greater importance since they are affected by salmonellosis and could be carriers of *Salmonella* Typhimurium DT 160 (Alley *et al.* 2002). This *Salmonella* serotype is still a very common isolate in the New Zealand environment and domestic cats were affected last year (Carolyn Nicols, pers comm.), possibly infected from eating infected sparrows. Faecal material from birds is likely to reach the fruit on the trees, and there is opportunity for cross-contamination to other apples while being handled in water flumes in packhouses. Apples are mostly eaten raw without peeling and with or without washing.

Outbreaks of bacterial infections where fruit and vegetables have been implicated as the vehicle show *Salmonella* as the dominant aetiological agent. In outbreak data, *Salmonella* has been mainly associated with cantaloupe melons and tomatoes. In survey data *Salmonella* has been detected on a wider variety of fruits and vegetables, indicating its potential to be present on such foods.

As with lettuces, it has also been recognised that internalisation of pathogens into apples is a food safety issue. We can no longer assume that contamination of apples occurs only on the surface. Contamination of the core of apples with *E. coli* O157:H7 (Buchanan *et al.*, 1999) and tomatoes with *Salmonella* Montevideo (Zhuang *et al.*, 1995) has been proven. Although internalisation of *Salmonella* in apples has not been the subject of specific research, high rates of internalisation of coliforms, yeasts and moulds and aerobic bacteria in apples and pears has been reported (Riordan *et al.*, 2001). These observations have also influenced the way apples were tested in this project.

## 1.3 Scope of Project

Objective 2 of project FMA 128 was to carry out the qualitative and, if present, quantitative measurement of pathogens on fresh lettuces and apples, as identified from the risk assessment. It was recognised that the export trade of lettuces is minimal, and so it was necessary to sample local produce. Apples are exported in larger volumes so sampling was carried out at export packhouses.

As this objective required conventionally grown (hereon referred to as conventional) and organically grown (hereon referred to as organic) produce to be sampled, the name “conventional” does not exist in the pipfruit industry anymore. Instead, an Integrated Fruit Production (IFP) system has been introduced to replace it. Integrated Fruit Production is defined as “...the economical production of high quality fruit, giving priority to ecologically safer methods, minimising the undesirable side effects and use of agrochemicals, to enhance the safeguards to the environment and human health” (Vickery 2003). In New Zealand, the IFP programme was introduced in the 1995/96 season and by the 2000/01 season 90% of growers followed the programme. It is a dynamic system which is reviewed annually, and the system is fine tuned for each growing season (Mike Butcher, pers. comm., New Zealand Pipfruit Limited)

To achieve a high probability of detecting a small fraction of produce containing a pathogen, 230 samples each of conventional, IFP or organic produce were purchased from suppliers/retailers from throughout New Zealand and analysed for the pathogens.

## **2 MATERIALS AND METHODS**

### **2.1 Sampling of Produce**

At the project planning stage, it was recognised that samples taken as close to the point of packing were preferred. Produce supplied direct from growers was the first choice but packhouses were also recommended as these were closest to the farm. However, other supply avenues such as wholesalers and distributors were considered if the two recommended supply points could not meet the requirements of the sampling plan.

The aim of the sampling plan was:

- To obtain produce from as many growers as possible;
- To purchase 5 samples per batch of produce from each grower at any one time;
- To sample as many varieties of produce as possible.

#### **2.1.1 Lettuces**

The Ministry of Agriculture and Forestry provided ESR with a contact person from Vegfed (Ron Gall). This contact then suggested two distributors, MG Marketing and Leader Brand Produce, as the lettuce supply chain does not have packhouses. Further assistance from The AgriChain Centre Ltd (Anne-Marie Arts) led to contacts with Fresh Max, Turners & Growers and Fresh Direct. From these initial contacts and information gained from them, ESR explored other suppliers and distributors in the lettuce supplier chain.

### *2.1.1.1 Conventional Lettuces*

Conventional lettuces are grown on a larger scale with many growers supplying the market for mainstream public consumption. Because of this, their supply is continuous and available throughout the year. Some growers send produce across regions while others only supply locally. The growers cut the produce the day before shipping and pack them into industry- regulated crates, colour coded according to group and company alignment.

There is also a slight variation between Auckland and Christchurch markets. In the South Island, the crates of fresh lettuces are trucked by growers to a franchise distributing company (i.e. Fresh Max or MG Marketing) representing the supermarket chains, to retail shops via the wholesaler Turners & Growers (T&G) or they sell direct to retail outlets. Some sell directly to the public from roadside stalls at the farm gate. In Auckland, T&G is a big player, on-selling produce to the supermarket chains. One particular distributor, Auckland Fruit and Produce Supplies Ltd, bulk buys crates of lettuce from T&G and on-sells them to retailers. Turners & Growers (Auckland) recommended that ESR purchase lettuces from this distributor.

Fresh Max did not participate in this project as their management felt that their growers needed to be contacted first and this would require too much effort and cause time delays. MG Marketing and Turners & Growers assisted with this project by agreeing to sell crates of lettuces to ESR from different growers on days of availability. The sampling criterion was to obtain produce as close as possible to harvest date and the farm. The ideal situation would have been to obtain produce directly from the growers. However it was not possible to contact individual growers to supply lettuces for this project as the cost in project management and freight would have been prohibitive. Furthermore, most growers, with the exception of the Leader Brand from Gisborne, would not have the time to oblige to requests of supplying a few lettuces at a time to ESR. The samples purchased by ESR were supplied by distributors and therefore potential contamination from further handling was unlikely.

Leader Brand is a large nation-wide supplier of individually wrapped lettuces in contrast to most growers who supply loose lettuces locally to a few markets. Leader Brand supplies to the Progressive Enterprise group of supermarkets through Fresh Max. As this distributor did not participate in the project, the grower in Gisborne was approached to supply directly to ESR. Otherwise samples would have to be purchased indirectly third hand from the Countdown supermarkets.

Most distributors operate a produce safety programme where each case of lettuces is tagged with a ticketing system. Each ticket is supposed to carry a coded number and the name of the grower appears on the ticket. However on most occasions, only the name of the grower appeared on the cards. Because lettuces are highly perishable, they are usually sold on the first day at market and little remains on the next day.

Conventional lettuces were purchased on a weekly basis from the suppliers. In most cases, whole crates of lettuces from each grower were purchased. Each crate could contain from 10 to 18 lettuces depending on the size of the plant. In some situations, it was possible to purchase five lettuces per batch and these were sampled from the bottom of the crate.

Frequent contact between the produce managers and ESR was important in the procurement of samples.

A total of 240 conventional lettuces were analysed for *E. coli* O157:H7. Sampling commenced on 3 February 2003 and finished on 28 March 2003.

#### *2.1.1.2 Organic Lettuces*

In contrast to the conventional lettuce market, a lot of effort in the management of this project was spent on tracking growers in rural areas with reference to the Bio-Gro register, finding out whether they were supplying the market and, if possible, arranging direct sales to ESR. Some growers would only supply to their contract retail stall so some samples were purchased through these outlets. Growers supplying to supermarkets or distributors of organic produce have usually been screened for their Bio-Gro status. Two growers were “Demeter” registered and this equivalent standard is recognised by Bio-Gro as a biodynamic form of organic growing system.

The organic lettuce market is very small and fragmented. Most growers have direct contacts with retail shops or organic produce distributors, or contracts to supply direct to supermarkets. While all supermarkets sell conventional lettuces, only a small number stock organic lettuces. Growers who supply on contract to produce distributors tended to come from farms outside the city or from another region. Small growers with farms near or within city boundaries normally supply directly to local speciality shops that only retail organic produce. However there have been situations where supermarkets also obtain supply from local growers if their main supplier from outside the region is not producing.

Growers tend to grow lettuces of multiple varieties in small plots and the timing of harvest usually overlaps with supply from other growers rather than directly competing in the market. There are not many players in the distribution chain. Fresh Direct is a main organic produce distributor represented in the North Island (Auckland) and the South Island (Christchurch). Supermarkets like New World purchase from Fresh Direct. Both branches have their own grower base supplying at different times of the year. A second major player in the organic produce market in Auckland is iEProduce in Takapuna. This company also sells produce via the internet and their grower base is similar to Fresh Direct. Many attempts were made to contact an organic produce retailer in Hamilton to supply lettuces from the Waikato region but nothing materialised when it was mentioned that the samples were for a MAF project. It is also possible that this outlet also buys from growers in Hastings or Waiuku in the Auckland region.

The supply of organic lettuces for this project was also limited by the fact that some organic growers do not grow lettuces over summer as prices are regarded as slightly depressed since home gardeners can grow their own, and the potential for aphid infestation. The Christchurch Polytechnic teaches growers to grow lettuces later in the season (towards autumn) for a better return on produce. Due to this practice, the number of growers supplying the organic lettuce market at the time of this survey was not fully representative during the survey.

Organic lettuces were purchased in batches of 5 samples from the distributor, supermarket or directly from the growers. The biggest challenge in this part of the project was to find enough growers or distributors of this class of produce to secure the number of samples necessary for this survey. A total of 234 organic lettuces were purchased and analysed for *E. coli* O157:H7. The sampling period for organic lettuces was longer due to the uncertain nature of supply in the market. Sampling of this sub-set commenced on 14 February 2003 and finished on 14 May 2003.

### 2.1.2 Apples

At the start of the project, MAF facilitated initial introduction between ESR and the general manager of the Pipfruit Growers New Zealand Incorporated/N.Z. Pipfruit Ltd (Paul Browne). As co-operation from industry was of key importance to the sampling programme, this initial contact was critical to the success of the project. The contact provided ESR with the names of four packhouses situated in the main commercial apple growing regions in New Zealand, namely, Hawkes Bay, Marlborough and Central Otago. ESR contacted the managers of the packhouses by email outlining the research project and asking for their participation.

Of the four packhouses, one (Greenplanet Packhouse in Hastings) declined due to lack of resources. The three packhouses that supported the project were Molyneux Packhouse in Cromwell, Centrewood Packhouse in Blenheim and Mr Apple Packhouse in Whakatu, Hastings in the North Island. All the packhouses pack IFP and organic apples.

Each plant manager assigned a sampling officer to oversee the sampling. ESR provided a sampling schedule (Table 1), sampling forms (Appendix 1), zip-lock storage bags (Glad, 250 X 350 mm), gloves, address labels and instructions on sampling to the sampling person.

The apple packhouses were asked to take 5 samples from each grower at any one time. Sampling was scheduled according to a timetable. Each sample consisted of 3 apples to be taken wearing the same pair of gloves and deposited into a zip-lock bag. Each bag was identified to match the information recorded on the form.

Apples from Molyneux and Centrewood packhouses were sent to the ESR Public Health Laboratory in Christchurch and those from Mr Apple were sent to the ESR Public Health Laboratory in Auckland by overnight courier. Sampling was scheduled to start on the 17 March 2003 and finished on the week before Easter.

#### 2.1.2.1 *IFP apples*

The IFP apples provided by the packhouses were from certified orchards in the growing regions. Each packhouse has its own group of contract growers supplying fruit during the season. On occasions, other packhouses may sub-contract packing of apples from other growers to them. The packhouse operates a system where packing of apples alternates between IFP and organic. Thorough cleaning of the packing system separates packing of both types of apples in the same plant.

In the South Island, Molyneux has 12 IFP growers, Centrewood has 6 IFP growers and in the North Island, Mr Apple in Hastings has 40 IFP growers. A total of 239 IFP apples were supplied by the apple packhouses and analysed for *Salmonella*.

#### *2.1.2.2 Organic Apples*

Only organic orchards certified by Bio-Gro were included in this project. The orchards were either fully certified organic or organic in-conversions from IFP systems. These two groups make up the 10% of certified apple orchards in New Zealand (Mike Butcher, pers. comm.). Each orchard is allocated a registered Bio-Gro Operator identification number that is listed on the Bio-Gro register.

The number of organic growers is not as many as IFP ones. Molyneux has 4 growers, Centrewood has 7 growers and Mr Apple has 10 growers.

A total of 230 organic apples were supplied by the apple packhouses and analysed for *Salmonella*. Sampling commenced on 19 March 2003 and finished on 22 May 2003.



**Table 1: Year 2003 season: Apple sampling plan submitted to packhouses at start of project**

Sampling period and dates		Molyneux (Cromwell – Earnscy Weaver)		Centerwood Orchard (Blenheim - Lachy Hynd)		Mr Apple (Hastings - Tony Knight)	
		IFP apples (12 growers)	Organic apples (4 Growers)	IFP apples (6 growers)	Organic apples (7 growers)	IFP apples (40 growers)	Organic apples (10 growers)
Week	Date of sampling						
One	17 –19 March 2003	3 X 5 = 15	2 X 5 = 10	3 X 5 = 15	3 X 5 = 15	5 X 5 = 25	3 X 5 = 15
Two	24 - 26 March 2003	2 X 5 = 10	2 X 5 = 10	2 X 5 = 10	3 X 5 = 15	5 X 5 = 25	3 X 5 = 15
Three	31 Mar – 2 Apr 2003	3 X 5 = 15	2 X 5 = 10	3 X 5 = 15	3 X 5 = 15	5 X 5 = 25	3 X 5 = 15
Four	7 – 9 April 2003	2 X 5 = 10	2 X 5 = 10	2 X 5 = 10	3 X 5 = 15	5 X 5 = 25	3 X 5 = 15
Five	14 – 16 April, 2003	5 X 5 = 25			3 X 5 = 15	3 X 5 = 15	3 X 5 = 15
	Total	75 samples	40 samples	50 samples	75 samples	115 samples	75 samples

## 2.2 Testing

### 2.2.1 Lettuces

Lettuces were tested in their natural state without washing. Only lettuces taken from the middle of the crate were selected for testing. The outer few leaves that made up the unwanted part of each lettuce were first removed and discarded as would be practised by consumers. About 200 grams of leaves from the next few outer layers were removed and stored in a sterile bag. Twenty-five grams were sub-sampled by taking representative portions off the leaves with sterile tongs and placed into a whirlpak bag. Leftovers of this sub-sample were held in a 4 °C cold room until required for enumeration. These were discarded if enumeration was not necessary.

Each 25 g sample was crushed on a flat surface to homogenise, in order to allow contact and mixing between the internal matrix and enrichment media. Samples were prepared, incubated and screened for *E. coli* O157:H7 by using TECRA visual immunoassay.

When a sample tested positive by TECRA, an homogenate was prepared promptly from the leftover sample that was kept at 4 °C. An MPN series of tubes was set up for enumeration. Following incubation, each tube was screened by TECRA and any positive tube was subjected to further confirmation.

The methodology used for this research project is appended in Appendix 2.

### 2.2.2 Apples

Each sample consisted of three apples. The apples were washed in 200 ml of buffered peptone water (BPW) with addition of two drops of Triton-X. This was added as a non-ionic surfactant to counter the waxy coating on the apples so that bacteria adhering to the skin were released during the washing. The apples were given a two minute rinse with intermittent massaging, especially around the fruit stalk region. After washing, the rinse water was transferred into a sterile 24oz whirlpak bag. A sterile apple corer was used to remove the core from each of the apples. The core-less fruit was discarded. The apple cores were broken open with the butt of a bottle through the bag taking care not to puncture the bag with the apple pips. The broken cores (to detect internalised pathogen by exposing them to media enrichment) were transferred into the 24 oz whirlpak bag containing the rinse water. These were agitated for a further 2 minutes before testing.

The apple rinse was then separated into 2 portions (35 ml and 165 ml). The 35ml volume was stored in a sterile container at 4 °C for MPN enumeration later if required. The 165 ml portion was screened for *Salmonella* by the ELISA method. For a positive immunoassay result, the 35 ml aliquot was used to set up the multi-tube MPN enumeration series. When a negative immunoassay was obtained, the stored 35 ml sample was pooled with the other negative samples from the same batch and tested by the ELISA method.

The methodology used for this research is appended in Appendix 3.

### 3 RESULTS

#### 3.1 Conventional Lettuces

Conventional lettuces were purchased from 22 growers originating from Auckland, Christchurch, Nelson, Oamaru and Gisborne (Table 2). Samples were purchased on a weekly basis from each distributor. Five samples per batch at a time from each grower were tested for *E. coli* O157 upon arrival in the laboratory.

Out of 240 samples of lettuces analysed (48 lots of 5 samples), 175 were of the iceberg variety. The rest of the numbers were made up by Rollo rosso, Lollo biondi, Butterhead, Cos, Red oak and Green oak varieties.

The appearance of aphids from late March 2003 caused a slight decline in supply of lettuces to the market and a slight price increase. The Leader Brand in Hastings was badly affected and at one stage, even suspended harvesting for a few weeks. The project was only slightly affected by this interruption in supply.

All samples tested negative for *E. coli* O157:H7 per 25 grams of sample (see Appendix 4).

#### 3.2 Organic Lettuces

Organic lettuces were purchased from 9 growers from Oamaru, Timaru, Waimate, Lincoln, Motukarara, Christchurch, Hastings, and Waiuku (Table 3). Growers from Hastings and Waiuku supplied many varieties to the Auckland market. The Biological Husbandry Unit in Lincoln, Canterbury, and Opihi gardens in Timaru supplied to Fresh Direct, Christchurch who then distribute to their customers. They also sold some to other organic produce retailers. The grower, John Guthrie from Waimate, only sold lettuces at the farm gate and to local shops. One grower, Brydone Growers from Totara, Oamaru, sent produce to Fresh Direct in Christchurch as well as selling locally while the Rileys sell them directly to New World supermarkets. Growers from Oamaru used the MG Marketing transport delivery system to freight produce to Christchurch.

Two hundred and thirty four lettuces were purchased (46 lots of 5 lettuces and one lot of 4 lettuces, Table 3). Most batches of five were of the same variety and only in one batch was a mixture of varieties received (Appendix 4). There were 13 varieties of organic lettuce tested. The popularity of Iceberg was rivalled by the availability of Fancy green, Green oak and Cos varieties.

Out of 234 lettuces, one sample from a batch of 5 lettuces showed strongly positive reaction by the TECRA screening method. The positive sample was from a batch of 5 Fancy greens harvested on the 26 March 2003 and supplied by Rileys from Kakanui, Oamaru directly to New World Supermarkets in Christchurch. Confirmation of the immunoassay screen using the procedure described in Appendix 2 showed that despite the multi-tier approach to confirmation of results, the identification was still of equivocal value.

The following step-wise testing showed the process undertaken before the identity of the isolate could be ascertained:

- TECRA VIA produced a strong positive (Grade 5) result.
- Did not grow on CTSMac agar (selective agar for *E. coli* O157). Grew on EHEC agar (a washed sheep-blood based agar) but did not exhibit delayed haemolysis, which is typical of *E. coli* O157:H7.
- Culture from EHEC plates agglutinated strongly with Oxoid *E. coli* O157 Latex test reagent
- PCR screening showed that *stx1*, *stx2* and *hlyA* genes were absent but *eaeA* was present.
- Verotoxin was not produced in cell culture
- Biochemical test confirmed that the isolate was an *E. coli*. However the isolate is sorbitol positive (most *E. coli* O157:H7 are sorbitol negative).
- Specific serotyping with O- and H- antisera showed that the isolate was an *E. coli* O157:H16 strain
- Further PCR showed that the *bfpA* gene was absent suggesting that this strain is not an EPEC (enteropathogenic *E. coli*).

The isolate was confirmed as an atypical *E. coli* O157:H16, and is of dubious, and most probably, no public health significance because of the absence of toxin genes. It was present at a count of 23 MPN/g. Owing to the fact that the flagella serology was not H7, this isolate was not regarded as an *E. coli* O157:H7 isolation. Therefore all samples (234) were negative for *E. coli* O157:H7 per 25g.

Since the organism did not carry the toxin gene, and did not elaborate verocytotoxins it is, by definition, not a shiga toxin producing *E. coli*. In essence the isolation is a curiosity of no concern.

**Table 2: Supply of varieties of conventional lettuces by growers from around New Zealand between 3 February to 28 March 2003**

Name of Growers	Growing area	No of samples of each variety of lettuce purchased from each grower							Total per grower
		Icebergs	Lollo Rosso	Butterhead	Lollo Biondi	Cos	Red Oak	Green Oak	
Brian Gosney	Christchurch	5							5
GF Case & Son	Christchurch	10							10
Gill Grower	Auckland		5						5
Immanuel	Auckland		5	5	5		5		20
J Chong	Christchurch	10							10
JA Barrow	Christchurch	10							10
JA Kieranowski	Christchurch	5							5
JS Ewers	Nelson	15							15
JS Watson	Christchurch	5							5
KP Lim Ltd	Oamaru	20							20
Leader Brand	Gisborne	10				10			20
PA&HA Kieranowski	Christchurch	5							5
Paul Prendergast	Christchurch	15							15
RE&CL Conning	Nelson	10							10
RH Scott	Christchurch	5							5
Scott	Christchurch	5							5
Simon Zhu	Oamaru	15							15
Singh Brothers	Auckland		5	5			5	10	25
Sun Oaks Holdings	Auckland				5				5
The Vegepot	Christchurch	10							10
Trott	Christchurch	10							10
YL Wong	Christchurch	10							10
Total		175	15	10	10	10	10	10	240

**Table 3: Supply of varieties of organic lettuces by growers from around New Zealand between 14 February to 14 May 2003**

Variety of lettuce purchased from each grower	Organic Lettuce Growers and Growing areas in New Zealand									
	Anisa & Jason Clarke	Biological Husbandry Unit	Brydone Growers	Geoff Barnett	Hohepa Canterbury	John Guthrie	Lawsons True Earth	Opihi	Peter & Julie Riley	Total
	Waiuku, Auckland	Lincoln, Canterbury	Totara, Oamaru	Motukarara, Canterbury.	Halswell, Christchurch	Waimate	Hastings	Timaru	Kakanui, Oamaru	
Cos Single	5	15		5		5	15			45
Fancy Brown						10			5	15
Fancy Green		10			5	10	5		7 #	37
Fancy Red							10		2	12
Frilly Long	10									10
Frilly Short	5								5	10
Green Ice	5									5
Green Oak	5		5				10		5	25
Iceberg			5		5		14	25		49
Red Oak	5									5
Red Sails		5					10			15
Red Speckled	5									5
Red/Green									1	1
Total	40	30	10	5	10	25	64	25	25	234

# The *E. coli* O157:H16 was isolated from 1/5 lettuces from this farm in Kakanui, Oamaru. The lettuce was harvested on the 26 March 2003.

### 3.3 IFP and Organic Apples

During the sampling period, the original plans given to the packhouses were changed many times depending on supply of apples from growers and when IFP or organic apple packing was scheduled in the packhouses. The first lot of apples arrived in the laboratories at ESR on the 19 March 2003. Due to re-scheduling of sampling by the packhouses, the period of sampling was prolonged until the 21 May 2003 when Mr Apple provided the last lot of the organic apples.

The rescheduling prolonged the sampling period from a planned five weeks to nine weeks (Table 4). In week eight, a pre-arranged two by two lots of IFP and organic apples were received in the laboratory as four lots of IFP apples. At the same time, there were only four samples in one batch instead of five. The slight delay in achieving milestone 4 was due to this mix-up in sampling as well as the re-scheduling of sampling depending on availability of apples.

Results showed that no *Salmonella* was isolated from 239 samples of IFP apples. These were made up of 47 batches of 5 samples and one batch of 4 samples, comprising of 109 Braeburn, 5 Brookfield, 15 Fuji, 15 Gala, 5 Orin, 10 Pacific Queen, 10 Pink Lady and 70 Royal Gala apple varieties (Table 5). The apples came from 11 orchards in the South Island and 22 orchards in the North Island.

For organic apples, 230 samples were submitted by thirty orchards contributing to this project, fifteen from each Island. Five varieties of organic apples were submitted (Table 5). These were made up of 46 batches of 5 samples comprising 65 Braeburn, 5 Brookfield, 40 Fuji, 5 Pacific Queen and 115 Royal Gala apple varieties.

One batch of 5 samples of Braeburn apples from Mr Apple Packhouse that originated from Bostock-Downs orchard (307 Ngatawara Rd, Bridge Pa, Hastings, harvested on 7/04/2003 and packed on 14/04/2003) tested positive for *Salmonella* Typhimurium DT12a. All other samples tested negative for *Salmonella*.

When these samples were initially tested individually using the larger portion of rinse, *Salmonella* was not detected. It was only when the five smaller 35 ml portions from the batch were pooled and tested that *Salmonella* was isolated. From this result, it is likely that the *Salmonella* count in this batch of apples was low, possibly one cell in 200 ml of rinse since the larger portion did not test positive in the first instance. This would be equivalent to one cell on one of three apples in the sample, assuming that only one sample out of five was positive.

Due to the negative result of the initial individual test, an MPN enumeration was not done as all of the sample rinse had been used). The *Salmonella* contaminant had to come from at least one sample in the batch. It was possible, but unlikely, that two small portions would contain the *Salmonella* contaminant. Following enrichment, the TECRA method is sensitive enough to detect at least 1 - 5 cfu of *Salmonella* in each portion contributing to the pooled test.

The overall contribution of samples from each packhouse is shown in Table 5 and the full results of tests on organic and IFP apples from each orchard are appended in Appendix 5.





**Table 4: Year 2003 season: Apple sampling schedule followed by the packhouses with sample numbers provided**

Sampling period and dates		Molyneux (Cromwell – Earnscy Weaver)		Centerwood Orchard (Blenheim - Lachy Hynd)		Mr Apple (Hastings - Tony Knight)	
		IFP (12 growers)	Organic (4 Growers)	IFP (6 growers)	Organic (7 growers)	IFP (40 growers)	Organic (10 growers)
Week	Date						
One	17 - 19 March 2003	2 X 5 = 10	2 X 5 = 10		1 X 5 = 5	3 X 5 = 15	5 X 5 = 25
Two	24 - 28 March 2003	3 X 5 = 15	3 X 5 = 15		2 X 5 = 10	5 X 5 = 25	4 X 5 = 20
Three	31 Mar – 4 Apr 2003			2 X 5 = 10	2 X 5 = 10	6 X 5 = 30	4 X 5 = 20
Four	7 – 11 April 2003	2 X 5 = 10	2 X 5 = 10	3 X 5 = 15	1 X 5 = 5	5 X 5 = 25	5 X 5 = 25
Five	14 – 17 April 2003	3 X 5 = 15	1 X 5 = 5		3 X 5 = 15	5 X 5 = 25	4 X 5 = 20 #
Six	22 - 24 April 2003				2 X 5 = 10		
Seven	28 Apr - 2 May 2003			2 X 5 = 10		3 X 5 = 15	3 X 5 = 15
Eight	5 - 9 May 2003	3 X 5 = 15 1 X 4 = 4					
Nine	19 - 23 May 2003						2 X 5 = 10
	Total	69 samples	40 samples	35 samples	55 samples	135 samples	135 samples

# A batch of 5 apple samples was positive for *Salmonella* Typhimurium DT12a in a pooled test.

**Table 5: Contribution of numbers of samples of IFP and organic apples and varieties from the packhouses**

Packhouse that serviced the orchards	Location in New Zealand	Type of Orchard	Number. of Orchards	Apple variety and number sampled								Total
				Braeburn	Brookfield	Fuji	Gala	Orin	Pacific Queen	Pink Lady	Royal Gala	
Centrewood	Blenheim, Marlborough	IFP	5	15					10		10	35
		Organic	10	10	5	20					20	55
Molyneux	Cromwell, Central Otago	IFP	6	29		15					25	69
		Organic	4	5		10					25	40
Mr Apple	Whakatu, Hastings	IFP	22	65	5		15	5		10	35	135
		Organic	15	50 #		10			5		70	135

# The only batch of 5 organic Braeburn apple samples tested positive in a pooled test for *Salmonella* Typhimurium DT12a came from Mr Apple Packhouse.

## 4 CONCLUSIONS

Disease caused by *E. coli* O157:H7 can be serious and is fatal in a small percentage of cases, especially when children become infected. A number of long-term illnesses can be caused by this organism, with kidney dialysis being required for some cases. The presence of even a few organisms (levels of 0.3-0.4 cells per gram) has caused outbreaks in the past.

In this project, *E. coli* O157:H7 was not detected in any of the conventional or organic lettuces. Lettuces sampled were grown in different growing areas of both Islands. However due to the timing of this project, samples were taken only during peak summer growing conditions (February to May 2003) and therefore were not representative of a production year. There is some indication that this sampling period coincided with that time of the year when a slight seasonal increase of human cases has been noted, i.e. in the months of February to May each year (Anonymous, 2003). The fact that no *E. coli* O157:H7 was isolated from retail lettuces sampled during this peak period was significant for the produce market.

However, to increase our understanding of the effect of *E. coli* O157:H7 prevalence in the New Zealand foods, it may be prudent to continue further studies to include the winter/spring seasons. In relation to farming activity, this would help gauge whether calving and lambing have an impact on potential contamination of edible plant products while under cultivation in the environment. It remains to be seen whether such activity in animal husbandry would have any impact at all on environmental contamination of waterways that could affect microbiological safety of vegetable crops growing in areas of such farming activity.

Unlike *Salmonella*, where the disease affects the health of ewes and reduces lambing rates and results in a higher prevalence in the environment during lambing (Anonymous, 2002), *E. coli* O157:H7 does not affect cattle and the shedding of *E. coli* O157:H7 appears to be transient (Sargeant *et al.*, 2000). Such a ubiquitous existence, if it occurs in New Zealand, in the gut of cattle would likely result in intermittent or continuous presence of this hazard in the environment once excreted onto paddocks. However overseas data cannot readily be transferred to New Zealand where animal husbandry is unique. Data suggests that *E. coli* O157:H7 is not frequently carried by adult bovines in New Zealand.

The number of human cases of *E. coli* O157:H7 has been increasing yearly since 1998 (Anonymous, 2003). This trend reflects mainly the occurrence of sporadic cases. There has been no link to the consumption of lettuce or other edible plant products.

The isolation of *E. coli* O157:H16 which carried one of the four virulence genes, i.e. *eaeA*, was interesting, and demonstrated the skills required of such hazard testing. It showed the importance of molecular DNA techniques in helping us understand the phenotype of such an isolate, and guided us in our evaluation of its public health significance. The count of this *E. coli* O157:H16 in the lettuce sample was 23 MPN per g. If it had been a toxigenic *E. coli* O157:H7, then the exposure at such a level could be significant since the presence of <1 cell per g can cause an outbreak.

Realistically, not much can be done by a regulatory authority in regard to produce that is on sale for a short period and found to be contaminated by a hazardous pathogen later. The only effective approach is to ensure pathogens are minimised by the introduction and effective implementation of generic HACCP models for Food Assurance Programmes. Nevertheless, in the event of pathogen discovery at retail sales, it would still be helpful, after the event, to trace back along the supply chain to the grower. Any critical control point or control measures adopted by the grower would have to be re-visited.

The discovery of *Salmonella* Typhimurium DT12a in a batch of five organic Braeburn apple samples signifies that there is potential for *Salmonella* contamination to occur in apples. The incidence of this *S. Typhimurium* phage type in the human population is not the most common, ranking below eight other phage types (Thornley *et al.*, 2002), and incidence has been stable since 1995. Also, this *Salmonella* is not common in the Hawkes Bay region from which the apple was sourced (indeed just one human case since January 2001). One batch out of 46 batches equates to a 2.2% batch contamination rate.

Because of the nature of the test, we do not know how many samples out of five were contaminated or if only one sample was contaminated whether only one apple out of three in the sample was contaminated. It was likely that the level of contamination was very low since the larger individual rinse portion (165 ml portion) tested negative and only the pooled test of five smaller 35 ml portions was positive. It may be possible to deduce from this that perhaps only one apple in the sample was likely to have been contaminated with only one or a few *Salmonella* cells to return a positive pooled test. If this was the case, then the prevalence would be as low as 0.4% positive out of 230 organic samples.

The risk deduced from this positive isolation of *Salmonella* from an organic apple can be regarded as very low. For *Salmonella* to cause illness, the probability of disease at a dose of 100 cells is  $6.87 \times 10^{-10}$  (Teunis *et al.*, 1999). Such a low probability makes this isolation insignificant as a public health concern. Further washing would reduce the level of the pathogen even more. However once in the hands of the public, there is always a slight concern as to whether the person who consumes a lightly contaminated fruit would wash it first and eat it straight away after cutting it up. Some overseas outbreaks of salmonellosis were due to contamination of pre-cut fruit from the skin (Anonymous, 2001).

This *Salmonella* could have originated from bird droppings on the apples, water used by the packhouse in the packing process or poor hygiene of a packer during handling. It is not possible to comment further on these possibilities without further information and investigation. Although *Salmonella* was found in a batch of organic apples, a similar finding could equally well have surfaced on IFP apples since all apples are grown above ground and packed in packhouses, and are not influenced by contaminants in the soil.

This report confirms that pathogens can be detected on raw fruit produced in New Zealand. Whilst the significance of this finding in terms of a human health risk can not be determined given the limited nature of this survey and the low numbers of pathogen detected, it serves as a signal to the industry that individual food safety plans and/or industry wide Codes of Practice need to be reviewed to ensure:

- (i) that pathogens have been identified as a possible food safety risk;
- (ii) that the significance of the pathogens is adequately considered; and
- (iii) current procedures are sufficient to manage the presence of pathogens on produce.

In addition, industry education programmes need to be reviewed to ensure they adequately address the risk of, and means to control, pathogen contamination.

## REFERENCES

- Alley, M.R., Conolly, J.H., Fenwick, S.G., Mackereth, G.F., Leyland, M.J., Rogers, L.E., Haycock, M., Nicol, C. and Reed, C.E.M. (2002) An epidemic of salmonellosis caused by *Salmonella* Typhimurium DT160 in wild birds and humans in New Zealand. *New Zealand Veterinary Journal* 50(5) 170-176.
- Anonymous (2001) Analysis and evaluation of preventative control measures for the control and reduction/elimination of microbial hazards on fresh and fresh-cut produce. In Chapter 4, Outbreaks associated with fresh and fresh-cut produce, incidence, growth and survival of pathogens in fresh and fresh-cut produce. IFT/FDA contract No 223-98-2333, Track Order No. 3, 30 September 2001. <http://www.cfsan.fda.gov/~comm/ift3-toc.html>
- Anonymous (2002) Project Report on Quantitative risk assessment of *Salmonella* in sheep meat produced in New Zealand, MAF Food, May 2002.
- Anonymous (2003) VTEC/STEC infection, page14. ESR Monthly Surveillance Report, February 2003
- Buchanan, R.L., Edelson, S.G., Miller, R.L. and Sapers, G.M. (1999) Contamination of intact apples after immersion in an aqueous environment containing *Escherichia coli* O157:H7. *Journal of Food Protection* 62(5), 444-50.
- CDC (2002) Multistate outbreaks of *Salmonella* serotype Poona infections associated with eating canteloupe from Mexico-United States and Canada, 2000-2002. *Morbidity and Mortality Weekly Report* 51, 1044-1047.
- Faulkner, L., Bunting, S., Walker, S., *et al.* (2001) Generic HACCP models for food assurance programmes. Operational research contract FMA169. Prepared for MAF Policy by Agriquality New Zealand Ltd.
- Hudson, J.A. and Turner, N. (2002) Risks associated with bacterial pathogens in exported fruit and vegetables. Operational research contract FMA128 (Objective 1). ESR Client Report FW 0280.
- Riordan, D.C.R., Sapers, G.M., Hankinson, T.R., Magee, M., Mattrazzo, A.M. and Annous, B.A. (2001) A study of U.S. orchards to identify potential sources of *Escherichia coli* O157:H7. *Journal of Food Protection* 64, 1320-1327.
- Sargeant, J.M., Gillespie, J.R., Oberst, R.D., Phebus, R.K., Hyatt, D.R., Bohra, L.K. and Galland, J.C. (2000). Results of a longitudinal study of the prevalence of *Escherichia coli* O157:H7 on cow-calf farms. *American Journal of Veterinary Research* 61(11), 1375-9.
- Solomon, E.B., Yaron, S. and Matthews, K.R. (2002) Transmission of *Escherichia coli* O157:H7 from contaminated manure and irrigation water to lettuce plant tissue and

its subsequent internalization. *Applied and Environmental Microbiology* 68, 397-400.

TECRA *Salmonella* Visual Immunoassay Technical Sheet  
[http://www.tecra.net/admin/media\\_files/SALVIASSETB.pdf](http://www.tecra.net/admin/media_files/SALVIASSETB.pdf)

Teunis, P.F.M., Nagelkerke, N.J.D., and Haas, C.N. (1999) Dose response models for infectious gastroenteritis. *Risk Analysis* 19, 1251-60.

Thornley, C., Baker, M. and Nicol, C. (2002) The rising incidence of *Salmonella* infection in New Zealand, 1995-2001. *New Zealand Public Health Report* 9(4), October-December, 25-28.

Vickery, J. (2003) Integrated Fruit Production (IFP): an overview of programs. Page 1-5.  
<http://www.pmac.net/intefrt.htm>

Wachtel, M.R., Whitehand, L.C. and Mandrell, R.E. (2002) Association of *Escherichia coli* O157:H7 with preharvest leaf lettuce upon exposure to contaminated irrigation water. *Journal of Food Protection* 65, 18-25.

Zhuang, R-Y., Beuchat, L.R. and Angulo, F.J. (1995) Fate of *Salmonella* Montevideo on and in raw tomatoes as affected by temperature and treatment with chlorine. *Applied and Environmental Microbiology* 61, 2127-2131.

## APPENDIX 1: Apple procurement form for MAF project FMA 128

Name of Packhouse:..... Date of Packing:.....

Name of Sampler:.....

Name of Apple Orchard	Address of Orchard	Numbers assigned to the five units in this lot (As marked on sample bag)	Apple variety	Harvest date	Tick box if IFP	Tick box if Organic	Type of Organic certification (Bio Gro, AgriQual etc)



## **APPENDIX 2: Method for isolation of *E. coli* O157:H7 from lettuces**

### **Media:**

Buffered Tryptic Soy Broth (Merck) With Novobiocin (BTSB + N)

Tryptic Soy Broth	30 g
Dipotassium phosphate (K <sub>2</sub> HPO <sub>4</sub> )	1.5 g
Distilled water	1 litre

Check that pH is to 7.2-7.6. Adjust, if necessary, using 1M HCl or 1M NaOH before autoclaving at 121°C for 15 min. Cool to room temperature before adding 1 vial of Novobiocin to 1 litre of broth. This brings the final concentration of Novobiocin to 20 mg/L. (If bulk Novobiocin is being used add enough to give 20 mg/L).

### **Sampling procedure:**

Lettuce were sampled and kept in individual plastic bags. These were transported chilled to the laboratory and then kept chilled at 4 °C until required for testing. All lettuces were tested within 24 hours of arrival. Most were tested within two hours on receipt.

### **Sample preparation:**

- Outer older leaves were removed (ones which you would normally throw away) and discarded.
- The lettuces were not washed prior to testing.
- The next four to five outer leaves were removed and transferred to a sterile bag.
- 25 grams were sub-sampled using sterile tongs into a 24 oz whirlpak bag. Left-overs were kept in the bag at 4 °C for MPN in the event that the 25g sample turned up positive by TECRA.
- Crispy lettuce bits in the whirlpak bag were mashed with the base of a bottle. Pummelling sample in the stomacher was not helpful due to the flat structure of the leaves. The idea was to make the sample squashy and bruised before adding mTSB+N so as to allow contact with the lumen of the leaves.
- After adding 225 ml of MTSB+N, the sample was incubated at 41-43°C for 18-24 h
- A positive control using *E. coli* O157:H7 (NCTC 12900) and negative control using *Staphylococcus aureus* (ATCC 25923) were also set up.
- The TECRA protocol (for Dairy products and other foods) as supplied by the kit (Version MS2281 03.01) was followed for screening of Presence/Absence of *E. coli* O157.
- A positive TECRA result was followed by a Public Health Laboratory procedure that employed immunomagnetic separation and identification of *E. coli* O157:H7. A further MPN enumeration was also set up for counting level of pathogen present in the sample.

### **Presence/Absence Test (TECRA protocol for Dairy products and other foods)**

- The enrichment was incubated at 41-43°C for 18-24 h.

- 1 ml of the enriched culture was transferred into a boiling tube containing 50µl of sample additive.
- The sample was steamed for 15 minutes.
- The steamed sample was tested by ELISA (The procedure as supplied by the kit was followed).

### **MPN enumeration following a positive TECRA**

- 40 g of lettuce leaves was weighed in a blender.
- 40 g of 0.1% Peptone was added and blended into a slurry. This was the 1 in 2 homogenate (ratio 1:1).
- A set of MPN tubes (4 X 3 tubes in 10 ml m-TSB + N broth) was set up in rows.
- The first set of 3 tubes was inoculated with 2 ml of neat homogenate to each tube.
- The second set of 3 tubes was inoculated with 1 ml of a 1/10 dilution prepared by adding 2 ml of homogenate to 8 ml of 0.1% peptone.
- The third set of 3 tubes was inoculated with 1 ml of a 1/100 dilution prepared by adding 1 ml of 1/10 to 9 ml of 0.1% peptone.
- The fourth set of 3 tubes was inoculated with 1 ml of a 1/1000 dilution prepared by adding 1 ml of 1/100 to 9 ml of 0.1% peptone.
- The whole set of tubes was incubated at 41-43°C for 18-24 h

Summary:

1 in 2 homogenate	2 ml	3 X 10 ml m-TSB+N broth	Equivalent to 1 g inoculum
1/10 dilution	1 ml	3 X 10 ml m-TSB+N broth	Equivalent to 0.1 g inoculum
1/100 dilution	1 ml	3 X 10 ml m-TSB+N broth	Equivalent to 0.01 g inoculum
1/1000 dilution	1 ml	3 X 10 ml m-TSB+N broth	Equivalent to 0.001 g inoculum

- Following incubation each individual tube was immunoassayed by TECRA and positive tubes were further evaluated by IMS and plating.

### **Immunomagnetic Separation**

- The magnetic plate was removed and the necessary number of 1.5 ml microcentrifuge tubes loaded into the Dynal MPC-M.
- Dynabeads anti-*E. coli* O157 were resuspended until the pellet in the bottom disappeared by using a vortex mixer. 20 µl of Dynabeads was pipetted and dispensed into each tube.
- 1 ml of the pre-enriched sample was added and the lid on the tube was closed. A new pipette tip was used for each new sample.
- The Dynal MPC-M rack was inverted a few times. The tubes were incubated at room temperature for 10 min with gentle continuous agitation to prevent the beads from settling.
- The magnetic plate was inserted into the Dynal MPC-M. The rack was inverted several times over 3 minutes to concentrate the beads into a pellet on the side of the tube. The 3 minutes period was for proper recovery.

- The tube's cap was opened using the tube opener provided and the sample supernatant was carefully aspirated and discarded as well as the remaining liquid in the tube's cap.
- The magnetic plate was removed from the Dynal MPC-M.
- 1 ml of wash buffer (PBS-Tween; 0.15M NaCl, 0.01M Sodium phosphate buffer, pH 7.4, with 0.05% Tween-20, autoclave at 121 °C for 15 min) was added. It was important to note here that the tube should not be touched with the pipette since this can cross-contaminate the samples as well as the wash buffer. The cap from each tube was closed and again the Dynal MPC-M was inverted a few times to resuspend the beads.
- The above steps were repeated.
- The above steps repeated once more but this time 1 ml of wash buffer was added at the last step where 100 µl of wash buffer was added to resuspend the Dynabeads-bacteria complex. This was mixed gently until well suspended.

### **Isolation of *E. coli* O157 from Dynabeads**

- After magnetic separation, 50 µl Dynabeads-bacteria complex was transferred to a CTSMAC agar plate and EHEC agar plate. The inoculum was streaked to obtain isolated colonies.
- The CTSMAC plate was incubated at 35 °C and EHEC plate at 37°C for 18 to 24 hours.
- CTSMAC plate was examined for typical sorbitol negative (colourless/buff) circular colonies, approximately 2 mm in diameter with slightly darkened centres. (NB: Some *E. coli* O157:H7 strains are sorbitol positive and in situations where the TECRA test is positive, sorbitol positive colonies must be picked and investigated).
- The EHEC plate was examined for haemolytic colonies. Colonies that were haemolytic at 24 hours and not at 4 hours were presumptive EHECs and were sub-cultured and submitted to the Enteric Reference Laboratory at ESR for virulence gene testing by PCR.
- Presumptive colonies on CTSMAC agar were also subcultured onto nutrient agar slopes and submitted to the Enteric Reference Laboratory at ESR for phenotypic typing.
- Suspect colonies were preliminary confirmed by using the Oxoid Latex Agglutination test kit (refer to instructions supplied by the kit)

## **APPENDIX 3: Method for isolation of *Salmonella* from apples**

### **Sample preparation**

- Each sample consisted of 3 apples.
- The 3 apples were washed in 200 ml of buffered peptone water (BPW) with addition of 2 drops of Triton-X100. These were given a two-minute rinse with intermittent massaging especially around the fruit stalk region.
- After washing, the rinse water was transferred into a sterile 24oz whirlpak bag.
- A sterile apple corer was used to remove the core from each of the apples. The core-less fruit was discarded. The apple cores were broken open with the butt of a media bottle through the bag taking care not to puncture the bag with the apple pips.
- The broken cores (to detect internalised pathogen by exposing them to media enrichment) were transferred into the 24 oz whirlpak bag containing the rinse water. These were agitated for a further 2 minutes.
- A 35ml volume was transferred into a 50 ml sterile pottle and stored at 4°C for MPN enumeration later if Presence/Absence (P/A) test was positive.
- The 165 ml portion was tested for P/A of *Salmonella* by ELISA, using the *Salmonella* TECRA Visual Immunoassay supplied by the kit (follow TECRA Protocol 5 – Other Products, Version MS2296 3/00).
- A positive control using *Salmonella* Menston (Col Sal 226) and negative control using *E. coli* (ATCC 25922) were also set up.

### **Presence/Absence Test (TECRA protocol 5 – Other Products)**

- The pre-enrichment was incubated at 35°C for 18-22 hours
- Two selective enrichments were performed:
  - One ml was transferred from the pre-enrichment broth into 10 ml of Mannitol Selenite Cystine (MSC) broth and incubated at 35°C for 6-8 hours.
  - 0.1 ml was transferred from pre-enrichment into 10 ml of RV broth and incubated at 42°C for 6-8 hours.
- Two post-enrichments were performed by transferring 1 ml from MSC broth into 9 ml of M-broth and 1 ml of RV broth into another 9 ml of M-broth.
- Both M-broths were incubated at 35°C for 16-20 hours.
- 0.5 ml from each M-broth was transferred into a boiling tube and sample was steamed for 15 minutes.
- The steamed sample was tested by ELISA (The procedure as supplied by the kit was followed).

### **For Positive TECRA P/A test**

The following steps were used to confirm a positive result:

- Culture from the M-Broth was streaked onto XLD and Brilliant Green agars;
- Presumptive colonies on agar were screened using biochemical tests;
- Colonies displaying characteristic biochemical tests were confirmed by serology;
- Submission of isolate to ESR Enteric Reference Laboratory for serotyping and, if necessary, phage typing.

### **For Negative TECRA P/A test**

- When all samples from the same batch tested negative by TECRA, the five remaining 35 ml portions that were kept at 4 °C from each batch were pooled and further screened by TECRA. The pooled samples was incubated at 35°C for 18-22 hours and the TECRA *Salmonella* VIA repeated

### **Enumeration using MPN**

When a sample was confirmed positive by TECRA, the 35 ml homogenate that was kept at 4 °C was used to set up a 3 row MPN series using a 3 x 10 ml, 3 x 1 ml and 3 x 0.1 ml combination of the BPW rinse. Following incubation, each tube was screened by TECRA and any positive tube was further subjected to confirmation as described above.

- The MPN (3 x 10ml, 3 x 1ml, 1 x 0.1ml) series was set up in vials. These were incubated at 35°C for 18-22 hours as initial pre-enrichment.
- For enrichment, the MSC/RV combination was also used. The MSC was incubated at 35°C for 16-20 hours and the RV at 42°C for 18-22 hours.
- Each enrichment broth was streaked onto XLD/BGA plates.
- Presumptive colonies on agar were screened using biochemical tests;
- Colonies displaying characteristic biochemical tests were confirmed by serology;
- Presumptive isolates were submitted to ESR Enteric Reference Laboratory for serotyping and, if necessary, phage typing.

#### APPENDIX 4: Conventional and Organic Lettuces: Sample and Laboratory Data

MAF Project Code: FMA 128. Examination of Conventional Lettuces for <i>Escherichia coli</i> O157:H7								
Date	PHL Job No	Sample No	Name of Grower	Location of Farm	Date Harvested	Lettuce Variety	<i>E. coli</i> O157:H7 per 25g	Supplier
3/02/2003	CPH0390091	1	Trott	432 Preston Rd CHCH	2/02/2003	Iceberg	Not detected	MG Marketing
3/02/2003	CPH0390091	2	Trott	432 Preston Rd CHCH	2/02/2003	Iceberg	Not detected	MG Marketing
3/02/2003	CPH0390091	3	Trott	432 Preston Rd CHCH	2/02/2003	Iceberg	Not detected	MG Marketing
3/02/2003	CPH0390091	4	Trott	432 Preston Rd CHCH	2/02/2003	Iceberg	Not detected	MG Marketing
3/02/2003	CPH0390091	5	Trott	432 Preston Rd CHCH	2/02/2003	Iceberg	Not detected	MG Marketing
3/02/2003	CPH0390091	1	Paul Prendergast	Marshlands Rd, CHCH	2/02/2003	Iceberg	Not detected	MG Marketing
3/02/2003	CPH0390091	2	Paul Prendergast	Marshlands Rd, CHCH	2/02/2003	Iceberg	Not detected	MG Marketing
3/02/2003	CPH0390091	3	Paul Prendergast	Marshlands Rd, CHCH	2/02/2003	Iceberg	Not detected	MG Marketing
3/02/2003	CPH0390091	4	Paul Prendergast	Marshlands Rd, CHCH	2/02/2003	Iceberg	Not detected	MG Marketing
3/02/2003	CPH0390091	5	Paul Prendergast	Marshlands Rd, CHCH	2/02/2003	Iceberg	Not detected	MG Marketing
3/02/2003	CPH0390091	1	JS Watson	Marshlands Rd, CHCH	2/02/2003	Iceberg	Not detected	MG Marketing
3/02/2003	CPH0390091	2	JS Watson	Marshlands Rd, CHCH	2/02/2003	Iceberg	Not detected	MG Marketing
3/02/2003	CPH0390091	3	JS Watson	Marshlands Rd, CHCH	2/02/2003	Iceberg	Not detected	MG Marketing
3/02/2003	CPH0390091	4	JS Watson	Marshlands Rd, CHCH	2/02/2003	Iceberg	Not detected	MG Marketing
3/02/2003	CPH0390091	5	JS Watson	Marshlands Rd, CHCH	2/02/2003	Iceberg	Not detected	MG Marketing
3/02/2003	CPH0390091	1	JS Ewers	Blackbyre Rd, Appleby, Nelson	2/02/2003	Iceberg	Not detected	MG Marketing
3/02/2003	CPH0390091	2	JS Ewers	Blackbyre Rd, Appleby, Nelson	2/02/2003	Iceberg	Not detected	MG Marketing
3/02/2003	CPH0390091	3	JS Ewers	Blackbyre Rd, Appleby, Nelson	2/02/2003	Iceberg	Not detected	MG Marketing
3/02/2003	CPH0390091	4	JS Ewers	Blackbyre Rd, Appleby, Nelson	2/02/2003	Iceberg	Not detected	MG Marketing
3/02/2003	CPH0390091	5	JS Ewers	Blackbyre Rd, Appleby, Nelson	2/02/2003	Iceberg	Not detected	MG Marketing
10/02/2002	CPH0390116	1	KP Lim & Co	15-0 RD, Oamaru	9/02/2003	Iceberg	Not detected	MG Marketing
10/02/2002	CPH0390116	2	KP Lim & Co	15-0 RD, Oamaru	9/02/2003	Iceberg	Not detected	MG Marketing
10/02/2002	CPH0390116	3	KP Lim & Co	15-0 RD, Oamaru	9/02/2003	Iceberg	Not detected	MG Marketing
10/02/2002	CPH0390116	4	KP Lim & Co	15-0 RD, Oamaru	9/02/2003	Iceberg	Not detected	MG Marketing
10/02/2002	CPH0390116	5	KP Lim & Co	15-0 RD, Oamaru	9/02/2003	Iceberg	Not detected	MG Marketing
10/02/2002	CPH0390116	1	RH Scott	Marshlands Rd, CHCH	9/02/2003	Iceberg	Not detected	MG Marketing

10/02/2002	CPH0390116	2	RH Scott	Marshlands Rd, CHCH	9/02/2003	Iceberg	Not detected	MG Marketing
10/02/2002	CPH0390116	3	RH Scott	Marshlands Rd, CHCH	9/02/2003	Iceberg	Not detected	MG Marketing
10/02/2002	CPH0390116	4	RH Scott	Marshlands Rd, CHCH	9/02/2003	Iceberg	Not detected	MG Marketing
10/02/2002	CPH0390116	5	RH Scott	Marshlands Rd, CHCH	9/02/2003	Iceberg	Not detected	MG Marketing
10/02/2002	CPH0390116	1	Simon Zhu	Beach Rd, RD, Oamaru	9/02/2003	Iceberg	Not detected	MG Marketing
10/02/2002	CPH0390116	2	Simon Zhu	Beach Rd, RD, Oamaru	9/02/2003	Iceberg	Not detected	MG Marketing
10/02/2002	CPH0390116	3	Simon Zhu	Beach Rd, RD, Oamaru	9/02/2003	Iceberg	Not detected	MG Marketing
10/02/2002	CPH0390116	4	Simon Zhu	Beach Rd, RD, Oamaru	9/02/2003	Iceberg	Not detected	MG Marketing
10/02/2002	CPH0390116	5	Simon Zhu	Beach Rd, RD, Oamaru	9/02/2003	Iceberg	Not detected	MG Marketing
10/02/2002	CPH0390116	1	Paul Prendergast	Marshlands Rd, CHCH	9/02/2003	Iceberg	Not detected	MG Marketing
10/02/2002	CPH0390116	2	Paul Prendergast	Marshlands Rd, CHCH	9/02/2003	Iceberg	Not detected	MG Marketing
10/02/2002	CPH0390116	3	Paul Prendergast	Marshlands Rd, CHCH	9/02/2003	Iceberg	Not detected	MG Marketing
10/02/2002	CPH0390116	4	Paul Prendergast	Marshlands Rd, CHCH	9/02/2003	Iceberg	Not detected	MG Marketing
10/02/2002	CPH0390116	5	Paul Prendergast	Marshlands Rd, CHCH	9/02/2003	Iceberg	Not detected	MG Marketing
10/02/2002	CPH0390116	1	GF Case & Son	340 Cranford St, CHCH	9/02/2003	Iceberg	Not detected	MG Marketing
10/02/2002	CPH0390116	2	GF Case & Son	340 Cranford St, CHCH	9/02/2003	Iceberg	Not detected	MG Marketing
10/02/2002	CPH0390116	3	GF Case & Son	340 Cranford St, CHCH	9/02/2003	Iceberg	Not detected	MG Marketing
10/02/2002	CPH0390116	4	GF Case & Son	340 Cranford St, CHCH	9/02/2003	Iceberg	Not detected	MG Marketing
10/02/2002	CPH0390116	5	GF Case & Son	340 Cranford St, CHCH	9/02/2003	Iceberg	Not detected	MG Marketing
10/02/2002	CPH0390116	1	PA&HA Kieranowski	21 Mairehau Rd, CHCH	9/02/2003	Iceberg	Not detected	Turners&Growers
10/02/2002	CPH0390116	2	PA&HA Kieranowski	21 Mairehau Rd, CHCH	9/02/2003	Iceberg	Not detected	Turners&Growers
10/02/2002	CPH0390116	3	PA&HA Kieranowski	21 Mairehau Rd, CHCH	9/02/2003	Iceberg	Not detected	Turners&Growers
10/02/2002	CPH0390116	4	PA&HA Kieranowski	21 Mairehau Rd, CHCH	9/02/2003	Iceberg	Not detected	Turners&Growers
10/02/2002	CPH0390116	5	PA&HA Kieranowski	21 Mairehau Rd, CHCH	9/02/2003	Iceberg	Not detected	Turners&Growers
10/02/2002	CPH0390116	1	YL Wong Holdings	329 Marshlands Rd, CHCH	9/02/2003	Iceberg	Not detected	Turners&Growers
10/02/2002	CPH0390116	2	YL Wong Holdings	329 Marshlands Rd, CHCH	9/02/2003	Iceberg	Not detected	Turners&Growers
10/02/2002	CPH0390116	3	YL Wong Holdings	329 Marshlands Rd, CHCH	9/02/2003	Iceberg	Not detected	Turners&Growers
10/02/2002	CPH0390116	4	YL Wong Holdings	329 Marshlands Rd, CHCH	9/02/2003	Iceberg	Not detected	Turners&Growers
10/02/2002	CPH0390116	5	YL Wong Holdings	329 Marshlands Rd, CHCH	9/02/2003	Iceberg	Not detected	Turners&Growers
10/02/2002	CPH0390116	1	JA Barrow	39 Woodlands Pl, CHCH	9/02/2003	Iceberg	Not detected	Turners&Growers
10/02/2002	CPH0390116	2	JA Barrow	39 Woodlands Pl, CHCH	9/02/2003	Iceberg	Not detected	Turners&Growers
10/02/2002	CPH0390116	3	JA Barrow	39 Woodlands Pl, CHCH	9/02/2003	Iceberg	Not detected	Turners&Growers

10/02/2002	CPH0390116	4	JA Barrow	39 Woodlands Pl, CHCH	9/02/2003	Iceberg	Not detected	Turners&Growers
10/02/2002	CPH0390116	5	JA Barrow	39 Woodlands Pl, CHCH	9/02/2003	Iceberg	Not detected	Turners&Growers
12/02/2003	CPH0390129	1	KP Lim & Co	15-0 RD Oamaru	11/02/2003	Iceberg	Not detected	MG Marketing
12/02/2003	CPH0390129	2	KP Lim & Co	15-0 RD Oamaru	11/02/2003	Iceberg	Not detected	MG Marketing
12/02/2003	CPH0390129	3	KP Lim & Co	15-0 RD Oamaru	11/02/2003	Iceberg	Not detected	MG Marketing
12/02/2003	CPH0390129	4	KP Lim & Co	15-0 RD Oamaru	11/02/2003	Iceberg	Not detected	MG Marketing
12/02/2003	CPH0390129	5	KP Lim & Co	15-0 RD Oamaru	11/02/2003	Iceberg	Not detected	MG Marketing
12/02/2003	CPH0390129	1	Simon Zhu	Beach Rd, RD, Oamaru	11/02/2003	Iceberg	Not detected	MG Marketing
12/02/2003	CPH0390129	2	Simon Zhu	Beach Rd, RD, Oamaru	11/02/2003	Iceberg	Not detected	MG Marketing
12/02/2003	CPH0390129	3	Simon Zhu	Beach Rd, RD, Oamaru	11/02/2003	Iceberg	Not detected	MG Marketing
12/02/2003	CPH0390129	4	Simon Zhu	Beach Rd, RD, Oamaru	11/02/2003	Iceberg	Not detected	MG Marketing
12/02/2003	CPH0390129	5	Simon Zhu	Beach Rd, RD, Oamaru	11/02/2003	Iceberg	Not detected	MG Marketing
17/02/2003	CPH0390144	1	GF Case & Son	340 Cranford St, CHCH	16/02/2003	Iceberg	Not detected	Turners&Growers
17/02/2003	CPH0390144	2	GF Case & Son	340 Cranford St, CHCH	16/02/2003	Iceberg	Not detected	Turners&Growers
17/02/2003	CPH0390144	3	GF Case & Son	340 Cranford St, CHCH	16/02/2003	Iceberg	Not detected	Turners&Growers
17/02/2003	CPH0390144	4	GF Case & Son	340 Cranford St, CHCH	16/02/2003	Iceberg	Not detected	Turners&Growers
17/02/2003	CPH0390144	5	GF Case & Son	340 Cranford St, CHCH	16/02/2003	Iceberg	Not detected	Turners&Growers
17/02/2003	CPH0390144	1	JA Barrow	39 Woodlands Pl, CHCH	16/02/2003	Iceberg	Not detected	Turners&Growers
17/02/2003	CPH0390144	2	JA Barrow	39 Woodlands Pl, CHCH	16/02/2003	Iceberg	Not detected	Turners&Growers
17/02/2003	CPH0390144	3	JA Barrow	39 Woodlands Pl, CHCH	16/02/2003	Iceberg	Not detected	Turners&Growers
17/02/2003	CPH0390144	4	JA Barrow	39 Woodlands Pl, CHCH	16/02/2003	Iceberg	Not detected	Turners&Growers
17/02/2003	CPH0390144	5	JA Barrow	39 Woodlands Pl, CHCH	16/02/2003	Iceberg	Not detected	Turners&Growers
17/02/2003	CPH0390144	1	YL Wong Holdings	329 Marshlands Rd, CHCH	16/02/2003	Iceberg	Not detected	Turners&Growers
17/02/2003	CPH0390144	2	YL Wong Holdings	329 Marshlands Rd, CHCH	16/02/2003	Iceberg	Not detected	Turners&Growers
17/02/2003	CPH0390144	3	YL Wong Holdings	329 Marshlands Rd, CHCH	16/02/2003	Iceberg	Not detected	Turners&Growers
17/02/2003	CPH0390144	4	YL Wong Holdings	329 Marshlands Rd, CHCH	16/02/2003	Iceberg	Not detected	Turners&Growers
17/02/2003	CPH0390144	5	YL Wong Holdings	329 Marshlands Rd, CHCH	16/02/2003	Iceberg	Not detected	Turners&Growers
17/02/2003	CPH0390144	1	The Vegepot	Marshlands Rd, CHCH	16/02/2003	Iceberg	Not detected	Turners&Growers
17/02/2003	CPH0390144	2	The Vegepot	Marshlands Rd, CHCH	16/02/2003	Iceberg	Not detected	Turners&Growers
17/02/2003	CPH0390144	3	The Vegepot	Marshlands Rd, CHCH	16/02/2003	Iceberg	Not detected	Turners&Growers
17/02/2003	CPH0390144	4	The Vegepot	Marshlands Rd, CHCH	16/02/2003	Iceberg	Not detected	Turners&Growers
17/02/2003	CPH0390144	5	The Vegepot	Marshlands Rd, CHCH	16/02/2003	Iceberg	Not detected	Turners&Growers



18/02/2003	CPH0390155	1	Scott	Walter Rd, CHCH	17/02/2003	Iceberg	Not detected	MG Marketing
18/02/2003	CPH0390155	2	Scott	Walter Rd, CHCH	17/02/2003	Iceberg	Not detected	MG Marketing
18/02/2003	CPH0390155	3	Scott	Walter Rd, CHCH	17/02/2003	Iceberg	Not detected	MG Marketing
18/02/2003	CPH0390155	4	Scott	Walter Rd, CHCH	17/02/2003	Iceberg	Not detected	MG Marketing
18/02/2003	CPH0390155	5	Scott	Walter Rd, CHCH	17/02/2003	Iceberg	Not detected	MG Marketing
18/02/2003	CPH0390155	1	KP Lim & Co	15-0 RD Oamaru	17/02/2003	Iceberg	Not detected	MG Marketing
18/02/2003	CPH0390155	2	KP Lim & Co	15-0 RD Oamaru	17/02/2003	Iceberg	Not detected	MG Marketing
18/02/2003	CPH0390155	3	KP Lim & Co	15-0 RD Oamaru	17/02/2003	Iceberg	Not detected	MG Marketing
18/02/2003	CPH0390155	4	KP Lim & Co	15-0 RD Oamaru	17/02/2003	Iceberg	Not detected	MG Marketing
18/02/2003	CPH0390155	5	KP Lim & Co	15-0 RD Oamaru	17/02/2003	Iceberg	Not detected	MG Marketing
18/02/2003	CPH0390155	1	Simon Zhu	Beach Rd, RD, Oamaru	17/02/2003	Iceberg	Not detected	MG Marketing
18/02/2003	CPH0390155	2	Simon Zhu	Beach Rd, RD, Oamaru	17/02/2003	Iceberg	Not detected	MG Marketing
18/02/2003	CPH0390155	3	Simon Zhu	Beach Rd, RD, Oamaru	17/02/2003	Iceberg	Not detected	MG Marketing
18/02/2003	CPH0390155	4	Simon Zhu	Beach Rd, RD, Oamaru	17/02/2003	Iceberg	Not detected	MG Marketing
18/02/2003	CPH0390155	5	Simon Zhu	Beach Rd, RD, Oamaru	17/02/2003	Iceberg	Not detected	MG Marketing
18/02/2003	CPH0390155	1	Trott	432 Preston Rd CHCH	17/02/2003	Iceberg	Not detected	MG Marketing
18/02/2003	CPH0390155	2	Trott	432 Preston Rd CHCH	17/02/2003	Iceberg	Not detected	MG Marketing
18/02/2003	CPH0390155	3	Trott	432 Preston Rd CHCH	17/02/2003	Iceberg	Not detected	MG Marketing
18/02/2003	CPH0390155	4	Trott	432 Preston Rd CHCH	17/02/2003	Iceberg	Not detected	MG Marketing
18/02/2003	CPH0390155	5	Trott	432 Preston Rd CHCH	17/02/2003	Iceberg	Not detected	MG Marketing
24/02/2003	CPH0390179	1	JA Kieranowski	326 Marshlands Rd, CHCH	23/02/2003	Iceberg	Not detected	Turners&Growers
24/02/2003	CPH0390179	2	JA Kieranowski	326 Marshlands Rd, CHCH	23/02/2003	Iceberg	Not detected	Turners&Growers
24/02/2003	CPH0390179	3	JA Kieranowski	326 Marshlands Rd, CHCH	23/02/2003	Iceberg	Not detected	Turners&Growers
24/02/2003	CPH0390179	4	JA Kieranowski	326 Marshlands Rd, CHCH	23/02/2003	Iceberg	Not detected	Turners&Growers
24/02/2003	CPH0390179	5	JA Kieranowski	326 Marshlands Rd, CHCH	23/02/2003	Iceberg	Not detected	Turners&Growers
24/02/2003	CPH0390179	1	RE&CL Conning	Edens Rd, RD, Richmond, Nelson	23/02/2003	Iceberg	Not detected	Turners&Growers
24/02/2003	CPH0390179	2	RE&CL Conning	Edens Rd, RD, Richmond, Nelson	23/02/2003	Iceberg	Not detected	Turners&Growers
24/02/2003	CPH0390179	3	RE&CL Conning	Edens Rd, RD, Richmond, Nelson	23/02/2003	Iceberg	Not detected	Turners&Growers
24/02/2003	CPH0390179	4	RE&CL Conning	Edens Rd, RD, Richmond, Nelson	23/02/2003	Iceberg	Not detected	Turners&Growers
24/02/2003	CPH0390179	5	RE&CL Conning	Edens Rd, RD, Richmond, Nelson	23/02/2003	Iceberg	Not detected	Turners&Growers
24/02/2003	CPH0390179	1	JS Ewers	Blackbyre Rd, Appleby, Nelson	23/02/2003	Iceberg	Not detected	Turners&Growers
24/02/2003	CPH0390179	2	JS Ewers	Blackbyre Rd, Appleby, Nelson	23/02/2003	Iceberg	Not detected	Turners&Growers

24/02/2003	CPH0390179	3	JS Ewers	Blackbyre Rd, Appleby, Nelson	23/02/2003	Iceberg	Not detected	Turners&Growers
24/02/2003	CPH0390179	4	JS Ewers	Blackbyre Rd, Appleby, Nelson	23/02/2003	Iceberg	Not detected	Turners&Growers
24/02/2003	CPH0390179	5	JS Ewers	Blackbyre Rd, Appleby, Nelson	23/02/2003	Iceberg	Not detected	Turners&Growers
24/02/2003	CPH0390179	1	J Chong	Harewood, CHCH	23/02/2003	Iceberg	Not detected	Turners&Growers
24/02/2003	CPH0390179	2	J Chong	Harewood, CHCH	23/02/2003	Iceberg	Not detected	Turners&Growers
24/02/2003	CPH0390179	3	J Chong	Harewood, CHCH	23/02/2003	Iceberg	Not detected	Turners&Growers
24/02/2003	CPH0390179	4	J Chong	Harewood, CHCH	23/02/2003	Iceberg	Not detected	Turners&Growers
24/02/2003	CPH0390179	5	J Chong	Harewood, CHCH	23/02/2003	Iceberg	Not detected	Turners&Growers
26/02/2003	CPH0390192	1	Paul Prendergast	Marshlands Rd, CHCH	25/02/2003	Iceberg	Not detected	MG Marketing
26/02/2003	CPH0390192	2	Paul Prendergast	Marshlands Rd, CHCH	25/02/2003	Iceberg	Not detected	MG Marketing
26/02/2003	CPH0390192	3	Paul Prendergast	Marshlands Rd, CHCH	25/02/2003	Iceberg	Not detected	MG Marketing
26/02/2003	CPH0390192	4	Paul Prendergast	Marshlands Rd, CHCH	25/02/2003	Iceberg	Not detected	MG Marketing
26/02/2003	CPH0390192	5	Paul Prendergast	Marshlands Rd, CHCH	25/02/2003	Iceberg	Not detected	MG Marketing
26/02/2003	CPH0390192	1	KP Lim & Co	15-0 RD Oamaru	25/02/2003	Iceberg	Not detected	MG Marketing
26/02/2003	CPH0390192	2	KP Lim & Co	15-0 RD Oamaru	25/02/2003	Iceberg	Not detected	MG Marketing
26/02/2003	CPH0390192	3	KP Lim & Co	15-0 RD Oamaru	25/02/2003	Iceberg	Not detected	MG Marketing
26/02/2003	CPH0390192	4	KP Lim & Co	15-0 RD Oamaru	25/02/2003	Iceberg	Not detected	MG Marketing
26/02/2003	CPH0390192	5	KP Lim & Co	15-0 RD Oamaru	25/02/2003	Iceberg	Not detected	MG Marketing
26/02/2003	CPH0390192	1	Brian Gosney	Marshlands Rd, Christchurch	25/02/2003	Iceberg	Not detected	MG Marketing
26/02/2003	CPH0390192	2	Brian Gosney	Marshlands Rd, Christchurch	25/02/2003	Iceberg	Not detected	MG Marketing
26/02/2003	CPH0390192	3	Brian Gosney	Marshlands Rd, Christchurch	25/02/2003	Iceberg	Not detected	MG Marketing
26/02/2003	CPH0390192	4	Brian Gosney	Marshlands Rd, Christchurch	25/02/2003	Iceberg	Not detected	MG Marketing
26/02/2003	CPH0390192	5	Brian Gosney	Marshlands Rd, Christchurch	25/02/2003	Iceberg	Not detected	MG Marketing
26/02/2003	CPH0390192	1	JS Ewers	Blackbyre Rd, Appleby, Nelson	25/02/2003	Iceberg	Not detected	MG Marketing
26/02/2003	CPH0390192	2	JS Ewers	Blackbyre Rd, Appleby, Nelson	25/02/2003	Iceberg	Not detected	MG Marketing
26/02/2003	CPH0390192	3	JS Ewers	Blackbyre Rd, Appleby, Nelson	25/02/2003	Iceberg	Not detected	MG Marketing
26/02/2003	CPH0390192	4	JS Ewers	Blackbyre Rd, Appleby, Nelson	25/02/2003	Iceberg	Not detected	MG Marketing
26/02/2003	CPH0390192	5	JS Ewers	Blackbyre Rd, Appleby, Nelson	25/02/2003	Iceberg	Not detected	MG Marketing
26/02/2003	CPH0390192	1	The Vegepot	Marshlands Rd, CHCH	25/02/2003	Iceberg	Not detected	Turners&Growers
26/02/2003	CPH0390192	2	The Vegepot	Marshlands Rd, CHCH	25/02/2003	Iceberg	Not detected	Turners&Growers
26/02/2003	CPH0390192	3	The Vegepot	Marshlands Rd, CHCH	25/02/2003	Iceberg	Not detected	Turners&Growers
26/02/2003	CPH0390192	4	The Vegepot	Marshlands Rd, CHCH	25/02/2003	Iceberg	Not detected	Turners&Growers

26/02/2003	CPH0390192	5	The Vegepot	Marshlands Rd, CHCH	25/02/2003	Iceberg	Not detected	Turners&Growers
26/02/2003	CPH0390192	1	J Chong	Harewood, CHCH	25/02/2003	Iceberg	Not detected	Turners&Growers
26/02/2003	CPH0390192	2	J Chong	Harewood, CHCH	25/02/2003	Iceberg	Not detected	Turners&Growers
26/02/2003	CPH0390192	3	J Chong	Harewood, CHCH	25/02/2003	Iceberg	Not detected	Turners&Growers
26/02/2003	CPH0390192	4	J Chong	Harewood, CHCH	25/02/2003	Iceberg	Not detected	Turners&Growers
26/02/2003	CPH0390192	5	J Chong	Harewood, CHCH	25/02/2003	Iceberg	Not detected	Turners&Growers
26/02/2003	CPH0390192	1	RE&CL Conning	Edens Rd, RD, Richmond, Nelson	25/02/2003	Iceberg	Not detected	Turners&Growers
26/02/2003	CPH0390192	2	RE&CL Conning	Edens Rd, RD, Richmond, Nelson	25/02/2003	Iceberg	Not detected	Turners&Growers
26/02/2003	CPH0390192	3	RE&CL Conning	Edens Rd, RD, Richmond, Nelson	25/02/2003	Iceberg	Not detected	Turners&Growers
26/02/2003	CPH0390192	4	RE&CL Conning	Edens Rd, RD, Richmond, Nelson	25/02/2003	Iceberg	Not detected	Turners&Growers
26/02/2003	CPH0390192	5	RE&CL Conning	Edens Rd, RD, Richmond, Nelson	25/02/2003	Iceberg	Not detected	Turners&Growers
5/03/2003	AMC0390678	1	Leader Brand	352 Lytton Rd, Gisborne	4/03/2003	Iceberg	Not detected	Leaderbrand grower
5/03/2003	AMC0390678	2	Leader Brand	352 Lytton Rd, Gisborne	4/03/2003	Iceberg	Not detected	Leaderbrand grower
5/03/2003	AMC0390678	3	Leader Brand	352 Lytton Rd, Gisborne	4/03/2003	Iceberg	Not detected	Leaderbrand grower
5/03/2003	AMC0390678	4	Leader Brand	352 Lytton Rd, Gisborne	4/03/2003	Iceberg	Not detected	Leaderbrand grower
5/03/2003	AMC0390678	5	Leader Brand	352 Lytton Rd, Gisborne	4/03/2003	Iceberg	Not detected	Leaderbrand grower
5/03/2003	AMC0390679	1	Leader Brand	352 Lytton Rd, Gisborne	4/03/2003	RomaineCos	Not detected	Leaderbrand grower
5/03/2003	AMC0390679	2	Leader Brand	352 Lytton Rd, Gisborne	4/03/2003	RomaineCos	Not detected	Leaderbrand grower
5/03/2003	AMC0390679	3	Leader Brand	352 Lytton Rd, Gisborne	4/03/2003	RomaineCos	Not detected	Leaderbrand grower
5/03/2003	AMC0390679	4	Leader Brand	352 Lytton Rd, Gisborne	4/03/2003	RomaineCos	Not detected	Leaderbrand grower
5/03/2003	AMC0390679	5	Leader Brand	352 Lytton Rd, Gisborne	4/03/2003	RomaineCos	Not detected	Leaderbrand grower
6/03/2003	AMC0390682	1	Immanuel	Pokeno, Auckland	5/03/2003	Lollo Biondi	Not detected	Ak Fruit&Produce
6/03/2003	AMC0390682	2	Immanuel	Pokeno, Auckland	5/03/2003	Lollo Biondi	Not detected	Ak Fruit&Produce
6/03/2003	AMC0390682	3	Immanuel	Pokeno, Auckland	5/03/2003	Lollo Biondi	Not detected	Ak Fruit&Produce
6/03/2003	AMC0390682	4	Immanuel	Pokeno, Auckland	5/03/2003	Lollo Biondi	Not detected	Ak Fruit&Produce
6/03/2003	AMC0390682	5	Immanuel	Pokeno, Auckland	5/03/2003	Lollo Biondi	Not detected	Ak Fruit&Produce
6/03/2003	AMC0390683	1	Singh Brothers	Pokekohe, Auckland	5/03/2003	Red Oak	Not detected	Ak Fruit&Produce
6/03/2003	AMC0390683	2	Singh Brothers	Pokekohe, Auckland	5/03/2003	Red Oak	Not detected	Ak Fruit&Produce
6/03/2003	AMC0390683	3	Singh Brothers	Pokekohe, Auckland	5/03/2003	Red Oak	Not detected	Ak Fruit&Produce
6/03/2003	AMC0390683	4	Singh Brothers	Pokekohe, Auckland	5/03/2003	Red Oak	Not detected	Ak Fruit&Produce
6/03/2003	AMC0390683	5	Singh Brothers	Pokekohe, Auckland	5/03/2003	Red Oak	Not detected	Ak Fruit&Produce
6/03/2003	AMC0390684	1	Singh Brothers	Pokekohe, Auckland	5/03/2003	Lollo Rosso	Not detected	Ak Fruit&Produce

6/03/2003	AMC0390684	2	Singh Brothers	Pokekohe, Auckland	5/03/2003	Lollo Rosso	Not detected	Ak Fruit&Produce
6/03/2003	AMC0390684	3	Singh Brothers	Pokekohe, Auckland	5/03/2003	Lollo Rosso	Not detected	Ak Fruit&Produce
6/03/2003	AMC0390684	4	Singh Brothers	Pokekohe, Auckland	5/03/2003	Lollo Rosso	Not detected	Ak Fruit&Produce
6/03/2003	AMC0390684	5	Singh Brothers	Pokekohe, Auckland	5/03/2003	Lollo Rosso	Not detected	Ak Fruit&Produce
6/03/2003	AMC0390685	1	Singh Brothers	Pokekohe, Auckland	5/03/2003	Green Oak	Not detected	Ak Fruit&Produce
6/03/2003	AMC0390685	2	Singh Brothers	Pokekohe, Auckland	5/03/2003	Green Oak	Not detected	Ak Fruit&Produce
6/03/2003	AMC0390685	3	Singh Brothers	Pokekohe, Auckland	5/03/2003	Green Oak	Not detected	Ak Fruit&Produce
6/03/2003	AMC0390685	4	Singh Brothers	Pokekohe, Auckland	5/03/2003	Green Oak	Not detected	Ak Fruit&Produce
6/03/2003	AMC0390685	5	Singh Brothers	Pokekohe, Auckland	5/03/2003	Green Oak	Not detected	Ak Fruit&Produce
6/03/2003	AMC0390686	1	Singh Brothers	Pokekohe, Auckland	5/03/2003	Butterhead	Not detected	Ak Fruit&Produce
6/03/2003	AMC0390686	2	Singh Brothers	Pokekohe, Auckland	5/03/2003	Butterhead	Not detected	Ak Fruit&Produce
6/03/2003	AMC0390686	3	Singh Brothers	Pokekohe, Auckland	5/03/2003	Butterhead	Not detected	Ak Fruit&Produce
6/03/2003	AMC0390686	4	Singh Brothers	Pokekohe, Auckland	5/03/2003	Butterhead	Not detected	Ak Fruit&Produce
6/03/2003	AMC0390686	5	Singh Brothers	Pokekohe, Auckland	5/03/2003	Butterhead	Not detected	Ak Fruit&Produce
10/03/2003	AMC0390713	1	Immanuel	Pokeno, Auckland	9/03/2003	Lollo Rosso	Not detected	Ak Fruit&Produce
10/03/2003	AMC0390713	2	Immanuel	Pokeno, Auckland	9/03/2003	Lollo Rosso	Not detected	Ak Fruit&Produce
10/03/2003	AMC0390713	3	Immanuel	Pokeno, Auckland	9/03/2003	Lollo Rosso	Not detected	Ak Fruit&Produce
10/03/2003	AMC0390713	4	Immanuel	Pokeno, Auckland	9/03/2003	Lollo Rosso	Not detected	Ak Fruit&Produce
10/03/2003	AMC0390713	5	Immanuel	Pokeno, Auckland	9/03/2003	Lollo Rosso	Not detected	Ak Fruit&Produce
11/03/2003	AMC0390722	1	Gill Grower	Kumeu, Auckland	10/03/2003	Lollo Rosso	Not detected	Ak Fruit&Produce
11/03/2003	AMC0390722	2	Gill Grower	Kumeu, Auckland	10/03/2003	Lollo Rosso	Not detected	Ak Fruit&Produce
11/03/2003	AMC0390722	3	Gill Grower	Kumeu, Auckland	10/03/2003	Lollo Rosso	Not detected	Ak Fruit&Produce
11/03/2003	AMC0390722	4	Gill Grower	Kumeu, Auckland	10/03/2003	Lollo Rosso	Not detected	Ak Fruit&Produce
11/03/2003	AMC0390722	5	Gill Grower	Kumeu, Auckland	10/03/2003	Lollo Rosso	Not detected	Ak Fruit&Produce
11/03/2003	AMC0390723	1	Singh Brothers	Pukekohe, Auckland	10/03/2003	Green Oak	Not detected	Ak Fruit&Produce
11/03/2003	AMC0390723	2	Singh Brothers	Pukekohe, Auckland	10/03/2003	Green Oak	Not detected	Ak Fruit&Produce
11/03/2003	AMC0390723	3	Singh Brothers	Pukekohe, Auckland	10/03/2003	Green Oak	Not detected	Ak Fruit&Produce
11/03/2003	AMC0390723	4	Singh Brothers	Pukekohe, Auckland	10/03/2003	Green Oak	Not detected	Ak Fruit&Produce
11/03/2003	AMC0390723	5	Singh Brothers	Pukekohe, Auckland	10/03/2003	Green Oak	Not detected	Ak Fruit&Produce
11/03/2003	AMC0390724	1	Immanuel	Pokeno, Auckland	10/03/2003	Red Oak	Not detected	Ak Fruit&Produce
11/03/2003	AMC0390724	2	Immanuel	Pokeno, Auckland	10/03/2003	Red Oak	Not detected	Ak Fruit&Produce
11/03/2003	AMC0390724	3	Immanuel	Pokeno, Auckland	10/03/2003	Red Oak	Not detected	Ak Fruit&Produce

11/03/2003	AMC0390724	4	Immanuel	Pokeno, Auckland	10/03/2003	Red Oak	Not detected	Ak Fruit&Produce
11/03/2003	AMC0390724	5	Immanuel	Pokeno, Auckland	10/03/2003	Red Oak	Not detected	Ak Fruit&Produce
11/03/2003	AMC0390725	1	Immanuel	Pokeno, Auckland	10/03/2003	Butterhead	Not detected	Ak Fruit&Produce
11/03/2003	AMC0390725	2	Immanuel	Pokeno, Auckland	10/03/2003	Butterhead	Not detected	Ak Fruit&Produce
11/03/2003	AMC0390725	3	Immanuel	Pokeno, Auckland	10/03/2003	Butterhead	Not detected	Ak Fruit&Produce
11/03/2003	AMC0390725	4	Immanuel	Pokeno, Auckland	10/03/2003	Butterhead	Not detected	Ak Fruit&Produce
11/03/2003	AMC0390725	5	Immanuel	Pokeno, Auckland	10/03/2003	Butterhead	Not detected	Ak Fruit&Produce
11/03/2003	AMC0390726	1	Sunoaks Holdings	Kumeu, Auckland	10/03/2003	Lollo Biondi	Not detected	Ak Fruit&Produce
11/03/2003	AMC0390726	2	Sunoaks Holdings	Kumeu, Auckland	10/03/2003	Lollo Biondi	Not detected	Ak Fruit&Produce
11/03/2003	AMC0390726	3	Sunoaks Holdings	Kumeu, Auckland	10/03/2003	Lollo Biondi	Not detected	Ak Fruit&Produce
11/03/2003	AMC0390726	4	Sunoaks Holdings	Kumeu, Auckland	10/03/2003	Lollo Biondi	Not detected	Ak Fruit&Produce
11/03/2003	AMC0390726	5	Sunoaks Holdings	Kumeu, Auckland	10/03/2003	Lollo Biondi	Not detected	Ak Fruit&Produce
28/03/2003	AMC0390972	1	Leader Brand	352 Lytton Rd, Gisborne	27/03/2003	Cos	Not detected	Leaderbrand grower
28/03/2003	AMC0390972	2	Leader Brand	353 Lytton Rd, Gisborne	27/03/2003	Cos	Not detected	Leaderbrand grower
28/03/2003	AMC0390972	3	Leader Brand	354 Lytton Rd, Gisborne	27/03/2003	Cos	Not detected	Leaderbrand grower
28/03/2003	AMC0390972	4	Leader Brand	355 Lytton Rd, Gisborne	27/03/2003	Cos	Not detected	Leaderbrand grower
28/03/2003	AMC0390972	5	Leader Brand	356 Lytton Rd, Gisborne	27/03/2003	Cos	Not detected	Leaderbrand grower
28/03/2003	AMC0390973	1	Leader Brand	357 Lytton Rd, Gisborne	27/03/2003	Iceberg	Not detected	Leaderbrand grower
28/03/2003	AMC0390973	2	Leader Brand	358 Lytton Rd, Gisborne	27/03/2003	Iceberg	Not detected	Leaderbrand grower
28/03/2003	AMC0390973	3	Leader Brand	359 Lytton Rd, Gisborne	27/03/2003	Iceberg	Not detected	Leaderbrand grower
28/03/2003	AMC0390973	4	Leader Brand	360 Lytton Rd, Gisborne	27/03/2003	Iceberg	Not detected	Leaderbrand grower
28/03/2003	AMC0390973	5	Leader Brand	361 Lytton Rd, Gisborne	27/03/2003	Iceberg	Not detected	Leaderbrand grower

## Appendix 4 continued

MAF Project Code: FMA 128. Examination of Organic Lettuces for <i>Escherichia coli</i> O157:H7								
Date received	PHL Job No	Sample No	Name of Grower	Location of Farm	Date Harvested	Lettuce Variety	<i>E. coli</i> O157:H7 per 25g	Supplier
14/02/2003	AMC0390411	O1	Lawsons True Earth	Ngatarawa Rd, RD5 Hastings	13/02/2003	Green Oak	Not Detected	Fresh Direct
14/02/2003	AMC0390411	O2	Lawsons True Earth	Ngatarawa Rd, RD5 Hastings	13/02/2003	Green Oak	Not Detected	Fresh Direct
14/02/2003	AMC0390411	O3	Lawsons True Earth	Ngatarawa Rd, RD5 Hastings	13/02/2003	Green Oak	Not Detected	Fresh Direct
14/02/2003	AMC0390411	O4	Lawsons True Earth	Ngatarawa Rd, RD5 Hastings	13/02/2003	Green Oak	Not Detected	Fresh Direct
14/02/2003	AMC0390411	O5	Lawsons True Earth	Ngatarawa Rd, RD5 Hastings	13/02/2003	Green Oak	Not Detected	Fresh Direct
14/02/2003	AMC0390412	O1	Lawsons True Earth	Ngatarawa Rd, RD5 Hastings	13/02/2003	Red Sails	Not Detected	Fresh Direct
14/02/2003	AMC0390412	O2	Lawsons True Earth	Ngatarawa Rd, RD5 Hastings	13/02/2003	Red Sails	Not Detected	Fresh Direct
14/02/2003	AMC0390412	O3	Lawsons True Earth	Ngatarawa Rd, RD5 Hastings	13/02/2003	Red Sails	Not Detected	Fresh Direct
14/02/2003	AMC0390412	O4	Lawsons True Earth	Ngatarawa Rd, RD5 Hastings	13/02/2003	Red Sails	Not Detected	Fresh Direct
14/02/2003	AMC0390412	O5	Lawsons True Earth	Ngatarawa Rd, RD5 Hastings	13/02/2003	Red Sails	Not Detected	Fresh Direct
14/02/2003	AMC0390413	O1	Lawsons True Earth	Ngatarawa Rd, RD5 Hastings	13/02/2003	Iceberg	Not Detected	Fresh Direct
14/02/2003	AMC0390413	O2	Lawsons True Earth	Ngatarawa Rd, RD5 Hastings	13/02/2003	Iceberg	Not Detected	Fresh Direct
14/02/2003	AMC0390413	O3	Lawsons True Earth	Ngatarawa Rd, RD5 Hastings	13/02/2003	Iceberg	Not Detected	Fresh Direct
14/02/2003	AMC0390413	O4	Lawsons True Earth	Ngatarawa Rd, RD5 Hastings	13/02/2003	Iceberg	Not Detected	Fresh Direct
14/02/2003	AMC0390413	O5	Lawsons True Earth	Ngatarawa Rd, RD5 Hastings	13/02/2003	Iceberg	Not Detected	Fresh Direct
20/02/2003	AMC0390499	O1	Lawsons True Earth	Ngatarawa Rd, RD5 Hastings	19/02/2003	Green Oak	Not Detected	Fresh Direct
20/02/2003	AMC0390499	O2	Lawsons True Earth	Ngatarawa Rd, RD5 Hastings	19/02/2003	Green Oak	Not Detected	Fresh Direct
20/02/2003	AMC0390499	O3	Lawsons True Earth	Ngatarawa Rd, RD5 Hastings	19/02/2003	Green Oak	Not Detected	Fresh Direct
20/02/2003	AMC0390499	O4	Lawsons True Earth	Ngatarawa Rd, RD5 Hastings	19/02/2003	Green Oak	Not Detected	Fresh Direct
20/02/2003	AMC0390499	O5	Lawsons True Earth	Ngatarawa Rd, RD5 Hastings	19/02/2003	Green Oak	Not Detected	Fresh Direct
20/02/2003	AMC0390500	O1	Lawsons True Earth	Ngatarawa Rd, RD5 Hastings	19/02/2003	Cos Single	Not Detected	Fresh Direct
20/02/2003	AMC0390500	O2	Lawsons True Earth	Ngatarawa Rd, RD5 Hastings	19/02/2003	Cos Single	Not Detected	Fresh Direct
20/02/2003	AMC0390500	O3	Lawsons True Earth	Ngatarawa Rd, RD5 Hastings	19/02/2003	Cos Single	Not Detected	Fresh Direct
20/02/2003	AMC0390500	O4	Lawsons True Earth	Ngatarawa Rd, RD5 Hastings	19/02/2003	Cos Single	Not Detected	Fresh Direct
20/02/2003	AMC0390500	O5	Lawsons True Earth	Ngatarawa Rd, RD5 Hastings	19/02/2003	Cos Single	Not Detected	Fresh Direct
20/02/2003	AMC0390501	O1	Lawsons True Earth	Ngatarawa Rd, RD5 Hastings	19/02/2003	Iceberg	Not Detected	Fresh Direct
20/02/2003	AMC0390501	O2	Lawsons True Earth	Ngatarawa Rd, RD5 Hastings	19/02/2003	Iceberg	Not Detected	Fresh Direct

20/02/2003	AMC0390501	O3	Lawsons True Earth	Ngatarawa Rd, RD5 Hastings	19/02/2003	Iceberg	Not Detected	Fresh Direct
20/02/2003	AMC0390501	O4	Lawsons True Earth	Ngatarawa Rd, RD5 Hastings	19/02/2003	Iceberg	Not Detected	Fresh Direct
20/02/2003	AMC0390501	O5	Lawsons True Earth	Ngatarawa Rd, RD5 Hastings	19/02/2003	Iceberg	Not Detected	Fresh Direct
20/02/2003	AMC0390502	O1	Lawsons True Earth	Ngatarawa Rd, RD5 Hastings	19/02/2003	Red Sails	Not Detected	Fresh Direct
20/02/2003	AMC0390502	O2	Lawsons True Earth	Ngatarawa Rd, RD5 Hastings	19/02/2003	Red Sails	Not Detected	Fresh Direct
20/02/2003	AMC0390502	O3	Lawsons True Earth	Ngatarawa Rd, RD5 Hastings	19/02/2003	Red Sails	Not Detected	Fresh Direct
20/02/2003	AMC0390502	O4	Lawsons True Earth	Ngatarawa Rd, RD5 Hastings	19/02/2003	Red Sails	Not Detected	Fresh Direct
20/02/2003	AMC0390502	O5	Lawsons True Earth	Ngatarawa Rd, RD5 Hastings	19/02/2003	Red Sails	Not Detected	Fresh Direct
25/02/2003	CPH0390189	O1	Biological Husbandry Unit	Lincoln University, Lincoln, Canterbury	24/02/2003	Cos Single	Not Detected	Fresh Direct
25/02/2003	CPH0390189	O2	Biological Husbandry Unit	Lincoln University, Lincoln, Canterbury	24/02/2003	Cos Single	Not Detected	Fresh Direct
25/02/2003	CPH0390189	O3	Biological Husbandry Unit	Lincoln University, Lincoln, Canterbury	24/02/2003	Cos Single	Not Detected	Fresh Direct
25/02/2003	CPH0390189	O4	Biological Husbandry Unit	Lincoln University, Lincoln, Canterbury	24/02/2003	Cos Single	Not Detected	Fresh Direct
25/02/2003	CPH0390189	O5	Biological Husbandry Unit	Lincoln University, Lincoln, Canterbury	24/02/2003	Cos Single	Not Detected	Fresh Direct
26/02/2003	CPH0390192	O1	Opihi	Timaru	25/02/2003	Iceberg	Not Detected	Fresh Direct
26/02/2003	CPH0390192	O2	Opihi	Timaru	25/02/2003	Iceberg	Not Detected	Fresh Direct
26/02/2003	CPH0390192	O3	Opihi	Timaru	25/02/2003	Iceberg	Not Detected	Fresh Direct
26/02/2003	CPH0390192	O4	Opihi	Timaru	25/02/2003	Iceberg	Not Detected	Fresh Direct
26/02/2003	CPH0390192	O5	Opihi	Timaru	25/02/2003	Iceberg	Not Detected	Fresh Direct
4/03/2003	CPH0390222	O1	Opihi	Timaru	3/03/2003	Iceberg	Not Detected	Fresh Direct
4/03/2003	CPH0390222	O2	Opihi	Timaru	3/03/2003	Iceberg	Not Detected	Fresh Direct
4/03/2003	CPH0390222	O3	Opihi	Timaru	3/03/2003	Iceberg	Not Detected	Fresh Direct
4/03/2003	CPH0390222	O4	Opihi	Timaru	3/03/2003	Iceberg	Not Detected	Fresh Direct
4/03/2003	CPH0390222	O5	Opihi	Timaru	3/03/2003	Iceberg	Not Detected	Fresh Direct
5/03/2003	CPH0390236	O1	Geoff Barnett	90 Seabridge Rd, Motukarara, Canterbury	4/03/2003	Cos	Not Detected	Piko Organics
5/03/2003	CPH0390236	O2	Geoff Barnett	91 Seabridge Rd, Motukarara, Canterbury	4/03/2003	Cos	Not Detected	Piko Organics
5/03/2003	CPH0390236	O3	Geoff Barnett	92 Seabridge Rd, Motukarara, Canterbury	4/03/2003	Cos	Not Detected	Piko Organics
5/03/2003	CPH0390236	O4	Geoff Barnett	93 Seabridge Rd, Motukarara, Canterbury	4/03/2003	Cos	Not Detected	Piko Organics
5/03/2003	CPH0390236	O5	Geoff Barnett	94 Seabridge Rd, Motukarara, Canterbury	4/03/2003	Cos	Not Detected	Piko Organics
5/03/2003	CPH0390236	O1	Biological Husbandry Unit	Lincoln University, Lincoln, Canterbury	4/03/2003	Cos Single	Not Detected	Piko Organics
5/03/2003	CPH0390236	O2	Biological Husbandry Unit	Lincoln University, Lincoln, Canterbury	4/03/2003	Cos Single	Not Detected	Piko Organics
5/03/2003	CPH0390236	O3	Biological Husbandry Unit	Lincoln University, Lincoln, Canterbury	4/03/2003	Cos Single	Not Detected	Piko Organics
5/03/2003	CPH0390236	O4	Biological Husbandry Unit	Lincoln University, Lincoln, Canterbury	4/03/2003	Cos Single	Not Detected	Piko Organics

5/03/2003	CPH0390236	O5	Biological Husbandry Unit	Lincoln University, Lincoln, Canterbury	4/03/2003	Cos Single	Not Detected	Piko Organics
5/03/2003	CPH0390236	O1	Opihi	Timaru	4/03/2003	Iceberg	Not Detected	Fresh Direct
5/03/2003	CPH0390236	O2	Opihi	Timaru	4/03/2003	Iceberg	Not Detected	Fresh Direct
5/03/2003	CPH0390236	O3	Opihi	Timaru	4/03/2003	Iceberg	Not Detected	Fresh Direct
5/03/2003	CPH0390236	O4	Opihi	Timaru	4/03/2003	Iceberg	Not Detected	Fresh Direct
5/03/2003	CPH0390236	O5	Opihi	Timaru	4/03/2003	Iceberg	Not Detected	Fresh Direct
7/03/2003	CPH0390251	O1	Opihi	Timaru	6/03/2003	Iceberg	Not Detected	Fresh Direct
7/03/2003	CPH0390251	O2	Opihi	Timaru	6/03/2003	Iceberg	Not Detected	Fresh Direct
7/03/2003	CPH0390251	O3	Opihi	Timaru	6/03/2003	Iceberg	Not Detected	Fresh Direct
7/03/2003	CPH0390251	O4	Opihi	Timaru	6/03/2003	Iceberg	Not Detected	Fresh Direct
7/03/2003	CPH0390251	O5	Opihi	Timaru	6/03/2003	Iceberg	Not Detected	Fresh Direct
11/03/2003	CPH0390256	O1	Brydone Growers	469 Main St, Totara, Oamaru	10/03/2003	Green Oak	Not Detected	Fresh Direct
11/03/2003	CPH0390256	O2	Brydone Growers	469 Main St, Totara, Oamaru	10/03/2003	Green Oak	Not Detected	Fresh Direct
11/03/2003	CPH0390256	O3	Brydone Growers	469 Main St, Totara, Oamaru	10/03/2003	Green Oak	Not Detected	Fresh Direct
11/03/2003	CPH0390256	O4	Brydone Growers	469 Main St, Totara, Oamaru	10/03/2003	Green Oak	Not Detected	Fresh Direct
11/03/2003	CPH0390256	O5	Brydone Growers	469 Main St, Totara, Oamaru	10/03/2003	Green Oak	Not Detected	Fresh Direct
11/03/2003	CPH0390256	O1	Opihi	Timaru	10/03/2003	Iceberg	Not Detected	Fresh Direct
11/03/2003	CPH0390256	O2	Opihi	Timaru	10/03/2003	Iceberg	Not Detected	Fresh Direct
11/03/2003	CPH0390256	O3	Opihi	Timaru	10/03/2003	Iceberg	Not Detected	Fresh Direct
11/03/2003	CPH0390256	O4	Opihi	Timaru	10/03/2003	Iceberg	Not Detected	Fresh Direct
11/03/2003	CPH0390256	O5	Opihi	Timaru	10/03/2003	Iceberg	Not Detected	Fresh Direct
12/03/2003	AMC0390757	O1	Lawsons True Earth	Ngatarawa Rd, RD5 Hastings	11/03/2003	Iceberg	Not Detected	Fresh Direct
12/03/2003	AMC0390757	O2	Lawsons True Earth	Ngatarawa Rd, RD5 Hastings	11/03/2003	Iceberg	Not Detected	Fresh Direct
12/03/2003	AMC0390757	O3	Lawsons True Earth	Ngatarawa Rd, RD5 Hastings	11/03/2003	Iceberg	Not Detected	Fresh Direct
12/03/2003	AMC0390757	O4	Lawsons True Earth	Ngatarawa Rd, RD5 Hastings	11/03/2003	Iceberg	Not Detected	Fresh Direct
12/03/2003	AMC0390756	O1	Lawsons True Earth	Ngatarawa Rd, RD5 Hastings	11/03/2003	Cos Single	Not Detected	Fresh Direct
12/03/2003	AMC0390756	O2	Lawsons True Earth	Ngatarawa Rd, RD5 Hastings	11/03/2003	Cos Single	Not Detected	Fresh Direct
12/03/2003	AMC0390756	O3	Lawsons True Earth	Ngatarawa Rd, RD5 Hastings	11/03/2003	Cos Single	Not Detected	Fresh Direct
12/03/2003	AMC0390756	O4	Lawsons True Earth	Ngatarawa Rd, RD5 Hastings	11/03/2003	Cos Single	Not Detected	Fresh Direct
12/03/2003	AMC0390756	O5	Lawsons True Earth	Ngatarawa Rd, RD5 Hastings	11/03/2003	Cos Single	Not Detected	Fresh Direct
12/03/2003	AMC0390755	O1	Lawsons True Earth	Ngatarawa Rd, RD5 Hastings	11/03/2003	Fancy Green	Not Detected	Fresh Direct
12/03/2003	AMC0390755	O2	Lawsons True Earth	Ngatarawa Rd, RD5 Hastings	11/03/2003	Fancy Green	Not Detected	Fresh Direct



12/03/2003	AMC0390755	O3	Lawsons True Earth	Ngatarawa Rd, RD5 Hastings	11/03/2003	Fancy Green	Not Detected	Fresh Direct
12/03/2003	AMC0390755	O4	Lawsons True Earth	Ngatarawa Rd, RD5 Hastings	11/03/2003	Fancy Green	Not Detected	Fresh Direct
12/03/2003	AMC0390755	O5	Lawsons True Earth	Ngatarawa Rd, RD5 Hastings	11/03/2003	Fancy Green	Not Detected	Fresh Direct
12/03/2003	AMC0390754	O1	Lawsons True Earth	Ngatarawa Rd, RD5 Hastings	11/03/2003	Fancy Red	Not Detected	Fresh Direct
12/03/2003	AMC0390754	O2	Lawsons True Earth	Ngatarawa Rd, RD5 Hastings	11/03/2003	Fancy Red	Not Detected	Fresh Direct
12/03/2003	AMC0390754	O3	Lawsons True Earth	Ngatarawa Rd, RD5 Hastings	11/03/2003	Fancy Red	Not Detected	Fresh Direct
12/03/2003	AMC0390754	O4	Lawsons True Earth	Ngatarawa Rd, RD5 Hastings	11/03/2003	Fancy Red	Not Detected	Fresh Direct
12/03/2003	AMC0390754	O5	Lawsons True Earth	Ngatarawa Rd, RD5 Hastings	11/03/2003	Fancy Red	Not Detected	Fresh Direct
12/03/2003	CPH0390267	O1	Biological Husbandry Unit	Lincoln University, Lincoln, Canterbury	11/03/2003	Red Sails	Not Detected	Fresh Direct
12/03/2003	CPH0390267	O2	Biological Husbandry Unit	Lincoln University, Lincoln, Canterbury	11/03/2003	Red Sails	Not Detected	Fresh Direct
12/03/2003	CPH0390267	O3	Biological Husbandry Unit	Lincoln University, Lincoln, Canterbury	11/03/2003	Red Sails	Not Detected	Fresh Direct
12/03/2003	CPH0390267	O4	Biological Husbandry Unit	Lincoln University, Lincoln, Canterbury	11/03/2003	Red Sails	Not Detected	Fresh Direct
12/03/2003	CPH0390267	O5	Biological Husbandry Unit	Lincoln University, Lincoln, Canterbury	11/03/2003	Red Sails	Not Detected	Fresh Direct
12/03/2003	CPH0390267	O1	Hohepa Canterbury	Cnr Sabys and Trises Rd, Halswell, Christchurch	11/03/2003	Iceberg	Not Detected	Grower
12/03/2003	CPH0390267	O2	Hohepa Canterbury	Cnr Sabys and Trises Rd, Halswell, Christchurch	11/03/2003	Iceberg	Not Detected	Grower
12/03/2003	CPH0390267	O3	Hohepa Canterbury	Cnr Sabys and Trises Rd, Halswell, Christchurch	11/03/2003	Iceberg	Not Detected	Grower
12/03/2003	CPH0390267	O4	Hohepa Canterbury	Cnr Sabys and Trises Rd, Halswell, Christchurch	11/03/2003	Iceberg	Not Detected	Grower
12/03/2003	CPH0390267	O5	Hohepa Canterbury	Cnr Sabys and Trises Rd, Halswell, Christchurch	11/03/2003	Iceberg	Not Detected	Grower
13/03/2003	CPH0390272	O1	Peter & Julie Riley	14 ORD, Kakanui, Oamaru	12/03/2003	Green Oak	Not Detected	NW Fendalton
13/03/2003	CPH0390272	O2	Peter & Julie Riley	14 ORD, Kakanui, Oamaru	12/03/2003	Green Oak	Not Detected	NW Fendalton
13/03/2003	CPH0390272	O3	Peter & Julie Riley	14 ORD, Kakanui, Oamaru	12/03/2003	Green Oak	Not Detected	NW Fendalton
13/03/2003	CPH0390272	O4	Peter & Julie Riley	14 ORD, Kakanui, Oamaru	12/03/2003	Green Oak	Not Detected	NW Fendalton
13/03/2003	CPH0390272	O5	Peter & Julie Riley	14 ORD, Kakanui, Oamaru	12/03/2003	Green Oak	Not Detected	NW Fendalton
18/03/2003	CPH0390291	O1	Biological Husbandry Unit	Lincoln University, Lincoln	17/03/2003	Fancy Green	Not Detected	Fresh Direct
18/03/2003	CPH0390291	O2	Biological Husbandry Unit	Lincoln University, Lincoln	17/03/2003	Fancy Green	Not Detected	Fresh Direct
18/03/2003	CPH0390291	O3	Biological Husbandry Unit	Lincoln University, Lincoln	17/03/2003	Fancy Green	Not Detected	Fresh Direct
18/03/2003	CPH0390291	O4	Biological Husbandry Unit	Lincoln University, Lincoln	17/03/2003	Fancy Green	Not Detected	Fresh Direct
18/03/2003	CPH0390291	O5	Biological Husbandry Unit	Lincoln University, Lincoln	17/03/2003	Fancy Green	Not Detected	Fresh Direct
25/03/2003	CPH0390317	O1	John Guthrie	Karuna Gardens, Morven Rd, Waimate	24/03/2003	Fancy Brown	Not Detected	Grower
25/03/2003	CPH0390317	O2	John Guthrie	Karuna Gardens, Morven Rd, Waimate	24/03/2003	Fancy Brown	Not Detected	Grower
25/03/2003	CPH0390317	O3	John Guthrie	Karuna Gardens, Morven Rd, Waimate	24/03/2003	Fancy Brown	Not Detected	Grower
25/03/2003	CPH0390317	O4	John Guthrie	Karuna Gardens, Morven Rd, Waimate	24/03/2003	Fancy Brown	Not Detected	Grower

25/03/2003	CPH0390317	O5	John Guthrie	Karuna Gardens, Morven Rd, Waimate	24/03/2003	Fancy Brown	Not Detected	Grower
25/03/2003	CPH0390317	O1	John Guthrie	Karuna Gardens, Morven Rd, Waimate	24/03/2003	Fancy Green	Not Detected	Grower
25/03/2003	CPH0390317	O2	John Guthrie	Karuna Gardens, Morven Rd, Waimate	24/03/2003	Fancy Green	Not Detected	Grower
25/03/2003	CPH0390317	O3	John Guthrie	Karuna Gardens, Morven Rd, Waimate	24/03/2003	Fancy Green	Not Detected	Grower
25/03/2003	CPH0390317	O4	John Guthrie	Karuna Gardens, Morven Rd, Waimate	24/03/2003	Fancy Green	Not Detected	Grower
25/03/2003	CPH0390317	O5	John Guthrie	Karuna Gardens, Morven Rd, Waimate	24/03/2003	Fancy Green	Not Detected	Grower
20/03/2003	CPH0390307	O1	Peter & Julie Riley	14 ORD, Kakanui, Oamaru	19/03/2003	Fancy Green	Not Detected	NW Fendalton
20/03/2003	CPH0390307	O2	Peter & Julie Riley	15 ORD, Kakanui, Oamaru	19/03/2003	Fancy Green	Not Detected	NW Fendalton
20/03/2003	CPH0390307	O3	Peter & Julie Riley	16 ORD, Kakanui, Oamaru	19/03/2003	Fancy Green	Not Detected	NW Fendalton
20/03/2003	CPH0390307	O4	Peter & Julie Riley	17 ORD, Kakanui, Oamaru	19/03/2003	Fancy Green	Not Detected	NW Fendalton
20/03/2003	CPH0390307	O5	Peter & Julie Riley	18 ORD, Kakanui, Oamaru	19/03/2003	Fancy Green	Not Detected	NW Fendalton
20/03/2003	CPH0390308	O1	Biological Husbandry Unit	Lincoln University, Lincoln	19/03/2003	Fancy Green	Not Detected	Fresh Direct
20/03/2003	CPH0390308	O2	Biological Husbandry Unit	Lincoln University, Lincoln	19/03/2003	Fancy Green	Not Detected	Fresh Direct
20/03/2003	CPH0390308	O3	Biological Husbandry Unit	Lincoln University, Lincoln	19/03/2003	Fancy Green	Not Detected	Fresh Direct
20/03/2003	CPH0390308	O4	Biological Husbandry Unit	Lincoln University, Lincoln	19/03/2003	Fancy Green	Not Detected	Fresh Direct
20/03/2003	CPH0390308	O5	Biological Husbandry Unit	Lincoln University, Lincoln	19/03/2003	Fancy Green	Not Detected	Fresh Direct
26/03/2003	AMC0390942	O1	Anisa & Jason Clarke	Sunset Coast Organics, Waiuku	24/03/2003	Green Oak	Not Detected	iEProduce
26/03/2003	AMC0390942	O2	Anisa & Jason Clarke	Sunset Coast Organics, Waiuku	24/03/2003	Green Oak	Not Detected	iEProduce
26/03/2003	AMC0390942	O3	Anisa & Jason Clarke	Sunset Coast Organics, Waiuku	24/03/2003	Green Oak	Not Detected	iEProduce
26/03/2003	AMC0390942	O4	Anisa & Jason Clarke	Sunset Coast Organics, Waiuku	24/03/2003	Green Oak	Not Detected	iEProduce
26/03/2003	AMC0390942	O5	Anisa & Jason Clarke	Sunset Coast Organics, Waiuku	24/03/2003	Green Oak	Not Detected	iEProduce
26/03/2003	AMC0390943	O1	Anisa & Jason Clarke	Sunset Coast Organics, Waiuku	24/03/2003	Green Ice	Not Detected	iEProduce
26/03/2003	AMC0390943	O2	Anisa & Jason Clarke	Sunset Coast Organics, Waiuku	24/03/2003	Green Ice	Not Detected	iEProduce
26/03/2003	AMC0390943	O3	Anisa & Jason Clarke	Sunset Coast Organics, Waiuku	24/03/2003	Green Ice	Not Detected	iEProduce
26/03/2003	AMC0390943	O4	Anisa & Jason Clarke	Sunset Coast Organics, Waiuku	24/03/2003	Green Ice	Not Detected	iEProduce
26/03/2003	AMC0390943	O5	Anisa & Jason Clarke	Sunset Coast Organics, Waiuku	24/03/2003	Green Ice	Not Detected	iEProduce
26/03/2003	AMC0390941	O1	Anisa & Jason Clarke	Sunset Coast Organics, Waiuku	24/03/2003	Red Oak	Not Detected	iEProduce
26/03/2003	AMC0390941	O2	Anisa & Jason Clarke	Sunset Coast Organics, Waiuku	24/03/2003	Red Oak	Not Detected	iEProduce
26/03/2003	AMC0390941	O3	Anisa & Jason Clarke	Sunset Coast Organics, Waiuku	24/03/2003	Red Oak	Not Detected	iEProduce
26/03/2003	AMC0390941	O4	Anisa & Jason Clarke	Sunset Coast Organics, Waiuku	24/03/2003	Red Oak	Not Detected	iEProduce
26/03/2003	AMC0390941	O5	Anisa & Jason Clarke	Sunset Coast Organics, Waiuku	24/03/2003	Red Oak	Not Detected	iEProduce
27/03/2003	CPH0390334	O1	Biological Husbandry Unit	Lincoln University, Lincoln	26/03/2003	Cos Single	Not Detected	Fresh Direct

27/03/2003	CPH0390334	O2	Biological Husbandry Unit	Lincoln University, Lincoln	26/03/2003	Cos Single	Not Detected	Fresh Direct
27/03/2003	CPH0390334	O3	Biological Husbandry Unit	Lincoln University, Lincoln	26/03/2003	Cos Single	Not Detected	Fresh Direct
27/03/2003	CPH0390334	O4	Biological Husbandry Unit	Lincoln University, Lincoln	26/03/2003	Cos Single	Not Detected	Fresh Direct
27/03/2003	CPH0390334	O5	Biological Husbandry Unit	Lincoln University, Lincoln	26/03/2003	Cos Single	Not Detected	Fresh Direct
27/03/2003	CPH0390334	O1	Peter & Julie Riley	14 ORD, Kakanui, Oamaru	26/03/2003	Fancy Green	Not Detected #	NW Fendalton
27/03/2003	CPH0390334	O2	Peter & Julie Riley	14 ORD, Kakanui, Oamaru	26/03/2003	Fancy Green	Not Detected	NW Fendalton
27/03/2003	CPH0390334	O3	Peter & Julie Riley	14 ORD, Kakanui, Oamaru	26/03/2003	Fancy Green	Not Detected	NW Fendalton
27/03/2003	CPH0390334	O4	Peter & Julie Riley	14 ORD, Kakanui, Oamaru	26/03/2003	Fancy Green	Not Detected	NW Fendalton
27/03/2003	CPH0390334	O5	Peter & Julie Riley	14 ORD, Kakanui, Oamaru	26/03/2003	Fancy Green	Not Detected	NW Fendalton
1/04/2003	AMC0391016	O1	Lawsons True Earth	Ngatarawa Rd, RD5 Hastings	31/03/2003	Fancy Red	Not Detected	iEProduce
1/04/2003	AMC0391016	O2	Lawsons True Earth	Ngatarawa Rd, RD5 Hastings	31/03/2003	Fancy Red	Not Detected	iEProduce
1/04/2003	AMC0391016	O3	Lawsons True Earth	Ngatarawa Rd, RD5 Hastings	31/03/2003	Fancy Red	Not Detected	iEProduce
1/04/2003	AMC0391016	O4	Lawsons True Earth	Ngatarawa Rd, RD5 Hastings	31/03/2003	Fancy Red	Not Detected	iEProduce
1/04/2003	AMC0391016	O5	Lawsons True Earth	Ngatarawa Rd, RD5 Hastings	31/03/2003	Fancy Red	Not Detected	iEProduce
1/04/2003	AMC0391017	O1	Lawsons True Earth	Ngatarawa Rd, RD5 Hastings	31/03/2003	Cos Single	Not Detected	iEProduce
1/04/2003	AMC0391017	O2	Lawsons True Earth	Ngatarawa Rd, RD5 Hastings	31/03/2003	Cos Single	Not Detected	iEProduce
1/04/2003	AMC0391017	O3	Lawsons True Earth	Ngatarawa Rd, RD5 Hastings	31/03/2003	Cos Single	Not Detected	iEProduce
1/04/2003	AMC0391017	O4	Lawsons True Earth	Ngatarawa Rd, RD5 Hastings	31/03/2003	Cos Single	Not Detected	iEProduce
1/04/2003	AMC0391017	O5	Lawsons True Earth	Ngatarawa Rd, RD5 Hastings	31/03/2003	Cos Single	Not Detected	iEProduce
3/04/2003	CPH0390361	O1	Peter & Julie Riley	14 ORD, Kakanui, Oamaru	2/04/2003	Fancy Green	Not Detected	NW Fendalton
3/04/2003	CPH0390361	O2	Peter & Julie Riley	14 ORD, Kakanui, Oamaru	2/04/2003	Fancy Green	Not Detected	NW Fendalton
3/04/2003	CPH0390361	O3	Peter & Julie Riley	14 ORD, Kakanui, Oamaru	2/04/2003	Red/Green	Not Detected	NW Fendalton
3/04/2003	CPH0390361	O4	Peter & Julie Riley	14 ORD, Kakanui, Oamaru	2/04/2003	Fancy Red	Not Detected	NW Fendalton
3/04/2003	CPH0390361	O5	Peter & Julie Riley	14 ORD, Kakanui, Oamaru	2/04/2003	Fancy Red	Not Detected	NW Fendalton
8/04/2003	CPH0390378	O1	Brydone Growers	469, Main Road, Totara, Oamaru	7/04/2003	Iceberg	Not Detected	Fresh Direct
8/04/2003	CPH0390378	O2	Brydone Growers	469, Main Road, Totara, Oamaru	7/04/2003	Iceberg	Not Detected	Fresh Direct
8/04/2003	CPH0390378	O3	Brydone Growers	469, Main Road, Totara, Oamaru	7/04/2003	Iceberg	Not Detected	Fresh Direct
8/04/2003	CPH0390378	O4	Brydone Growers	469, Main Road, Totara, Oamaru	7/04/2003	Iceberg	Not Detected	Fresh Direct
8/04/2003	CPH0390378	O5	Brydone Growers	469, Main Road, Totara, Oamaru	7/04/2003	Iceberg	Not Detected	Fresh Direct
9/04/2003	CPH0390389	O1	Peter & Julie Riley	14 ORD, Kakanui, Oamaru	8/04/2003	Fancy Brown	Not Detected	NW Fendalton
9/04/2003	CPH0390389	O2	Peter & Julie Riley	14 ORD, Kakanui, Oamaru	8/04/2003	Fancy Brown	Not Detected	NW Fendalton
9/04/2003	CPH0390389	O3	Peter & Julie Riley	14 ORD, Kakanui, Oamaru	8/04/2003	Fancy Brown	Not Detected	NW Fendalton

9/04/2003	CPH0390389	O4	Peter & Julie Riley	14 ORD, Kakanui, Oamaru	8/04/2003	Fancy Brown	Not Detected	NW Fendalton
9/04/2003	CPH0390389	O5	Peter & Julie Riley	14 ORD, Kakanui, Oamaru	8/04/2003	Fancy Brown	Not Detected	NW Fendalton
15/04/2003	CPH0390424	O1	Hohepa Canterbury	Cnr Sabys and Trises Rd, Halswell	14/04/2003	Fancy Green	Not Detected	Grower
15/04/2003	CPH0390424	O2	Hohepa Canterbury	Cnr Sabys and Trises Rd, Halswell	14/04/2003	Fancy Green	Not Detected	Grower
15/04/2003	CPH0390424	O3	Hohepa Canterbury	Cnr Sabys and Trises Rd, Halswell	14/04/2003	Fancy Green	Not Detected	Grower
15/04/2003	CPH0390424	O4	Hohepa Canterbury	Cnr Sabys and Trises Rd, Halswell	14/04/2003	Fancy Green	Not Detected	Grower
15/04/2003	CPH0390424	O5	Hohepa Canterbury	Cnr Sabys and Trises Rd, Halswell	14/04/2003	Fancy Green	Not Detected	Grower
15/04/2003	CPH0390424	O1	John Guthrie	Karuna Gardens, Morven Rd, Waimate	14/04/2003	Fancy Brown	Not Detected	Grower
15/04/2003	CPH0390424	O2	John Guthrie	Karuna Gardens, Morven Rd, Waimate	14/04/2003	Fancy Brown	Not Detected	Grower
15/04/2003	CPH0390424	O3	John Guthrie	Karuna Gardens, Morven Rd, Waimate	14/04/2003	Fancy Brown	Not Detected	Grower
15/04/2003	CPH0390424	O4	John Guthrie	Karuna Gardens, Morven Rd, Waimate	14/04/2003	Fancy Brown	Not Detected	Grower
15/04/2003	CPH0390424	O5	John Guthrie	Karuna Gardens, Morven Rd, Waimate	14/04/2003	Fancy Brown	Not Detected	Grower
15/04/2003	CPH0390424	O1	John Guthrie	Karuna Gardens, Morven Rd, Waimate	14/04/2003	Cos Single	Not Detected	Grower
15/04/2003	CPH0390424	O2	John Guthrie	Karuna Gardens, Morven Rd, Waimate	14/04/2003	Cos Single	Not Detected	Grower
15/04/2003	CPH0390424	O3	John Guthrie	Karuna Gardens, Morven Rd, Waimate	14/04/2003	Cos Single	Not Detected	Grower
15/04/2003	CPH0390424	O4	John Guthrie	Karuna Gardens, Morven Rd, Waimate	14/04/2003	Cos Single	Not Detected	Grower
15/04/2003	CPH0390424	O5	John Guthrie	Karuna Gardens, Morven Rd, Waimate	14/04/2003	Cos Single	Not Detected	Grower
15/04/2003	CPH0390424	O1	John Guthrie	Karuna Gardens, Morven Rd, Waimate	14/04/2003	Fancy Green	Not Detected	Grower
15/04/2003	CPH0390424	O2	John Guthrie	Karuna Gardens, Morven Rd, Waimate	14/04/2003	Fancy Green	Not Detected	Grower
15/04/2003	CPH0390424	O3	John Guthrie	Karuna Gardens, Morven Rd, Waimate	14/04/2003	Fancy Green	Not Detected	Grower
15/04/2003	CPH0390424	O4	John Guthrie	Karuna Gardens, Morven Rd, Waimate	14/04/2003	Fancy Green	Not Detected	Grower
15/04/2003	CPH0390424	O5	John Guthrie	Karuna Gardens, Morven Rd, Waimate	14/04/2003	Fancy Green	Not Detected	Grower
29/04/2003	AMC0391350	O1	Anisa & Jason Clarke	Sunset Coast Organics, Waiuku	28/04/2003	Filly Short	Not Detected	iEProduce
29/04/2003	AMC0391350	O2	Anisa & Jason Clarke	Sunset Coast Organics, Waiuku	28/04/2003	Filly Short	Not Detected	iEProduce
29/04/2003	AMC0391350	O3	Anisa & Jason Clarke	Sunset Coast Organics, Waiuku	28/04/2003	Filly Short	Not Detected	iEProduce
29/04/2003	AMC0391350	O4	Anisa & Jason Clarke	Sunset Coast Organics, Waiuku	28/04/2003	Filly Short	Not Detected	iEProduce
29/04/2003	AMC0391350	O5	Anisa & Jason Clarke	Sunset Coast Organics, Waiuku	28/04/2003	Filly Short	Not Detected	iEProduce
29/04/2003	AMC0391351	O1	Anisa & Jason Clarke	Sunset Coast Organics, Waiuku	28/04/2003	Cos Single	Not Detected	iEProduce
29/04/2003	AMC0391351	O2	Anisa & Jason Clarke	Sunset Coast Organics, Waiuku	28/04/2003	Cos Single	Not Detected	iEProduce
29/04/2003	AMC0391351	O3	Anisa & Jason Clarke	Sunset Coast Organics, Waiuku	28/04/2003	Cos Single	Not Detected	iEProduce
29/04/2003	AMC0391351	O4	Anisa & Jason Clarke	Sunset Coast Organics, Waiuku	28/04/2003	Cos Single	Not Detected	iEProduce
29/04/2003	AMC0391351	O5	Anisa & Jason Clarke	Sunset Coast Organics, Waiuku	28/04/2003	Cos Single	Not Detected	iEProduce

29/04/2003	AMC0391352	O1	Anisa & Jason Clarke	Sunset Coast Organics, Waiuku	28/04/2003	Friilly Long	Not Detected	iEProduce
29/04/2003	AMC0391352	O2	Anisa & Jason Clarke	Sunset Coast Organics, Waiuku	28/04/2003	Friilly Long	Not Detected	iEProduce
29/04/2003	AMC0391352	O3	Anisa & Jason Clarke	Sunset Coast Organics, Waiuku	28/04/2003	Friilly Long	Not Detected	iEProduce
29/04/2003	AMC0391352	O4	Anisa & Jason Clarke	Sunset Coast Organics, Waiuku	28/04/2003	Friilly Long	Not Detected	iEProduce
29/04/2003	AMC0391352	O5	Anisa & Jason Clarke	Sunset Coast Organics, Waiuku	28/04/2003	Friilly Long	Not Detected	iEProduce
29/04/2003	AMC0391353	O1	Anisa & Jason Clarke	Sunset Coast Organics, Waiuku	28/04/2003	Red Speckled	Not Detected	iEProduce
29/04/2003	AMC0391353	O2	Anisa & Jason Clarke	Sunset Coast Organics, Waiuku	28/04/2003	Red Speckled	Not Detected	iEProduce
29/04/2003	AMC0391353	O3	Anisa & Jason Clarke	Sunset Coast Organics, Waiuku	28/04/2003	Red Speckled	Not Detected	iEProduce
29/04/2003	AMC0391353	O4	Anisa & Jason Clarke	Sunset Coast Organics, Waiuku	28/04/2003	Red Speckled	Not Detected	iEProduce
29/04/2003	AMC0391353	O5	Anisa & Jason Clarke	Sunset Coast Organics, Waiuku	28/04/2003	Red Speckled	Not Detected	iEProduce
15/05/2003	AMC0391587	O1	Anisa & Jason Clarke	Sunset Coast Organics, Waiuku	14/05/2003	Friilly Short	Not Detected	iEProduce
15/05/2003	AMC0391587	O2	Anisa & Jason Clarke	Sunset Coast Organics, Waiuku	14/05/2003	Friilly Short	Not Detected	iEProduce
15/05/2003	AMC0391587	O3	Anisa & Jason Clarke	Sunset Coast Organics, Waiuku	14/05/2003	Friilly Short	Not Detected	iEProduce
15/05/2003	AMC0391587	O4	Anisa & Jason Clarke	Sunset Coast Organics, Waiuku	14/05/2003	Friilly Short	Not Detected	iEProduce
15/05/2003	AMC0391587	O5	Anisa & Jason Clarke	Sunset Coast Organics, Waiuku	14/05/2003	Friilly Short	Not Detected	iEProduce

#*E. coli* O157:H16 isolated, atypical, 23MPN/g, *eaeA* positive, *stx1*, *stx2*, *hlyA* and *bfpA* negative. Sorbitol fermenting, does not grow on CTSMac. Regarded as non-pathogenic strain. Although this strain possessed O157 somatic antigen, the flagella antigen was not -H7 and as such the strain was not regarded as an *E. coli* O157:H7.

## APPENDIX 5: Organic and IFP Apples: Sample and Laboratory Data

MAF Project Code: FMA 128. Examination of Organic Apples for <i>Salmonella</i>											
Date received	PH Job No	Packhouse	Name of Orchard & R Pin No	Physical Location	BioGro No	Date harvested	Date packed	Run Number	Sample No.	Apple Variety	<i>Salmonella</i> result per sample
19/03/2003	CPH0390296	Molyneux, Cromwell	Summerfruit Orchards	Conroy Rd, Earnscliffe	4256 CO1	6/03/2003	17/03/2003		O1	Royal Gala	Not isolated
19/03/2003	CPH0390296	Molyneux, Cromwell	Summerfruit Orchards	Conroy Rd, Earnscliffe	4256 CO1	6/03/2003	17/03/2003		O2	Royal Gala	Not isolated
19/03/2003	CPH0390296	Molyneux, Cromwell	Summerfruit Orchards	Conroy Rd, Earnscliffe	4256 CO1	6/03/2003	17/03/2003		O3	Royal Gala	Not isolated
19/03/2003	CPH0390296	Molyneux, Cromwell	Summerfruit Orchards	Conroy Rd, Earnscliffe	4256 CO1	6/03/2003	17/03/2003		O4	Royal Gala	Not isolated
19/03/2003	CPH0390296	Molyneux, Cromwell	Summerfruit Orchards	Conroy Rd, Earnscliffe	4256 CO1	6/03/2003	17/03/2003		O5	Royal Gala	Not isolated
19/03/2003	CPH0390296	Molyneux, Cromwell	Springvale Orchard	Rockview Rd, Alexandra	3902 CO1	7/03/2003	17/03/2003		O1	Royal Gala	Not isolated
19/03/2003	CPH0390296	Molyneux, Cromwell	Springvale Orchard	Rockview Rd, Alexandra	3902 CO1	7/03/2003	17/03/2003		O2	Royal Gala	Not isolated
19/03/2003	CPH0390296	Molyneux, Cromwell	Springvale Orchard	Rockview Rd, Alexandra	3902 CO1	7/03/2003	17/03/2003		O3	Royal Gala	Not isolated
19/03/2003	CPH0390296	Molyneux, Cromwell	Springvale Orchard	Rockview Rd, Alexandra	3902 CO1	7/03/2003	17/03/2003		O4	Royal Gala	Not isolated
19/03/2003	CPH0390296	Molyneux, Cromwell	Springvale Orchard	Rockview Rd, Alexandra	3902 CO1	7/03/2003	17/03/2003		O5	Royal Gala	Not isolated
20/03/2003	CPH0390304	Centerwood, Blenheim	Park Orchard	Dillons Point Rd, Blenheim	3919	13-14/03/03	18/03/2003		O1	Royal Gala	Not isolated
20/03/2003	CPH0390304	Centerwood, Blenheim	Park Orchard	Dillons Point Rd, Blenheim	3919	13-14/03/03	18/03/2003		O2	Royal Gala	Not isolated
20/03/2003	CPH0390304	Centerwood, Blenheim	Park Orchard	Dillons Point Rd, Blenheim	3919	13-14/03/03	18/03/2003		O3	Royal Gala	Not isolated
20/03/2003	CPH0390304	Centerwood, Blenheim	Park Orchard	Dillons Point Rd, Blenheim	3919	13-14/03/03	18/03/2003		O4	Royal Gala	Not isolated
20/03/2003	CPH0390304	Centerwood, Blenheim	Park Orchard	Dillons Point Rd, Blenheim	3919	13-14/03/03	18/03/2003		O5	Royal Gala	Not isolated

		Blenheim								Gala	isolated
18/03/2003	AMC0390846	Mr Apple, Whakatu	R1460 Kinross Orchard	297 Omaranui Rd, Napier	4041 CO1	15/03/2003	18/03/2003	79	O1	Royal Gala	Not isolated
18/03/2003	AMC0390846	Mr Apple, Whakatu	R1460 Kinross Orchard	297 Omaranui Rd, Napier	4041 CO1	15/03/2003	18/03/2003	79	O2	Royal Gala	Not isolated
18/03/2003	AMC0390846	Mr Apple, Whakatu	R1460 Kinross Orchard	297 Omaranui Rd, Napier	4041 CO1	15/03/2003	18/03/2003	79	O3	Royal Gala	Not isolated
18/03/2003	AMC0390846	Mr Apple, Whakatu	R1460 Kinross Orchard	297 Omaranui Rd, Napier	4041 CO1	15/03/2003	18/03/2003	79	O4	Royal Gala	Not isolated
18/03/2003	AMC0390846	Mr Apple, Whakatu	R1460 Kinross Orchard	297 Omaranui Rd, Napier	4041 CO1	15/03/2003	18/03/2003	79	O5	Royal Gala	Not isolated
18/03/2003	AMC0390846	Mr Apple, Whakatu	R1911 Ladybird Farm	188 Thompson Rd, Havelock Nth	2588 CO1	2/03/2003	18/03/2003	19	O1	Royal Gala	Not isolated
18/03/2003	AMC0390846	Mr Apple, Whakatu	R1911 Ladybird Farm	188 Thompson Rd, Havelock Nth	2588 CO1	2/03/2003	18/03/2003	19	O2	Royal Gala	Not isolated
18/03/2003	AMC0390846	Mr Apple, Whakatu	R1911 Ladybird Farm	188 Thompson Rd, Havelock Nth	2588 CO1	2/03/2003	18/03/2003	19	O3	Royal Gala	Not isolated
18/03/2003	AMC0390846	Mr Apple, Whakatu	R1911 Ladybird Farm	188 Thompson Rd, Havelock Nth	2588 CO1	2/03/2003	18/03/2003	19	O4	Royal Gala	Not isolated
18/03/2003	AMC0390846	Mr Apple, Whakatu	R1911 Ladybird Farm	188 Thompson Rd, Havelock Nth	2588 CO1	2/03/2003	18/03/2003	19	O5	Royal Gala	Not isolated
18/03/2003	AMC0390846	Mr Apple, Whakatu	R2405 Te Awatea	251 Omaranui Rd, Napier	2836 CO1	6/03/2003	18/03/2003	65	O1	Royal Gala	Not isolated
18/03/2003	AMC0390846	Mr Apple, Whakatu	R2405 Te Awatea	251 Omaranui Rd, Napier	2836 CO1	6/03/2003	18/03/2003	65	O2	Royal Gala	Not isolated
18/03/2003	AMC0390846	Mr Apple, Whakatu	R2405 Te Awatea	251 Omaranui Rd, Napier	2836 CO1	6/03/2003	18/03/2003	65	O3	Royal Gala	Not isolated
18/03/2003	AMC0390846	Mr Apple, Whakatu	R2405 Te Awatea	251 Omaranui Rd, Napier	2836 CO1	6/03/2003	18/03/2003	65	O4	Royal Gala	Not isolated
18/03/2003	AMC0390846	Mr Apple, Whakatu	R2405 Te Awatea	251 Omaranui Rd, Napier	2836 CO1	6/03/2003	18/03/2003	65	O5	Royal Gala	Not isolated
18/03/2003	AMC0390846	Mr Apple, Whakatu	R2403 Notchwood	339 Omaranui Rd, Napier	2836 CO2	5/03/2003	18/03/2003	40	O1	Royal Gala	Not isolated
18/03/2003	AMC0390846	Mr Apple, Whakatu	R2403 Notchwood	339 Omaranui Rd, Napier	2836 CO2	5/03/2003	18/03/2003	40	O2	Royal Gala	Not isolated
18/03/2003	AMC0390846	Mr Apple,	R2403 Notchwood	339 Omaranui Rd, Napier	2836 CO2	5/03/2003	18/03/2003	40	O3	Royal	Not

		Whakatu								Gala	isolated
18/03/2003	AMC0390846	Mr Apple, Whakatu	R2403 Notchwood	339 Omaranui Rd, Napier	2836 CO2	5/03/2003	18/03/2003	40	O4	Royal Gala	Not isolated
18/03/2003	AMC0390846	Mr Apple, Whakatu	R2403 Notchwood	339 Omaranui Rd, Napier	2836 CO2	5/03/2003	18/03/2003	40	O5	Royal Gala	Not isolated
18/03/2003	AMC0390846	Mr Apple, Whakatu	R1889 Donnelly	1139 Omaha Rd, Hastings	583 CO2	8/03/2003	18/03/2003	38	O1	Royal Gala	Not isolated
18/03/2003	AMC0390846	Mr Apple, Whakatu	R1889 Donnelly	1139 Omaha Rd, Hastings	583 CO2	8/03/2003	18/03/2003	38	O2	Royal Gala	Not isolated
18/03/2003	AMC0390846	Mr Apple, Whakatu	R1889 Donnelly	1139 Omaha Rd, Hastings	583 CO2	8/03/2003	18/03/2003	38	O3	Royal Gala	Not isolated
18/03/2003	AMC0390846	Mr Apple, Whakatu	R1889 Donnelly	1139 Omaha Rd, Hastings	583 CO2	8/03/2003	18/03/2003	38	O4	Royal Gala	Not isolated
18/03/2003	AMC0390846	Mr Apple, Whakatu	R1889 Donnelly	1139 Omaha Rd, Hastings	583 CO2	8/03/2003	18/03/2003	38	O5	Royal Gala	Not isolated
27/03/2003	CPH0390330	Centrewood, Blenheim	Hammersfield	Hamerichs Rd, RD2 Blenheim	4028	21/03/2003	24/03/2003		O1	Brookfield	Not isolated
27/03/2003	CPH0390330	Centrewood, Blenheim	Hammersfield	Hamerichs Rd, RD2 Blenheim	4028	21/03/2003	24/03/2003		O2	Brookfield	Not isolated
27/03/2003	CPH0390330	Centrewood, Blenheim	Hammersfield	Hamerichs Rd, RD2 Blenheim	4028	21/03/2003	24/03/2003		O3	Brookfield	Not isolated
27/03/2003	CPH0390330	Centrewood, Blenheim	Hammersfield	Hamerichs Rd, RD2 Blenheim	4028	21/03/2003	24/03/2003		O4	Brookfield	Not isolated
27/03/2003	CPH0390330	Centrewood, Blenheim	Hammersfield	Hamerichs Rd, RD2 Blenheim	4028	21/03/2003	24/03/2003		O5	Brookfield	Not isolated
27/03/2003	CPH0390330	Centrewood, Blenheim	K&N Bright, Radford Block	Murrays Rd, RD3, Blenheim	3921	19-20/3/03	26/03/2003		O1	Royal Gala	Not isolated
27/03/2003	CPH0390330	Centrewood, Blenheim	K&N Bright, Radford Block	Murrays Rd, RD3, Blenheim	3921	19-20/3/03	26/03/2003		O2	Royal Gala	Not isolated
27/03/2003	CPH0390330	Centrewood, Blenheim	K&N Bright, Radford Block	Murrays Rd, RD3, Blenheim	3921	19-20/3/03	26/03/2003		O3	Royal Gala	Not isolated
27/03/2003	CPH0390330	Centrewood, Blenheim	K&N Bright, Radford Block	Murrays Rd, RD3, Blenheim	3921	19-20/3/03	26/03/2003		O4	Royal Gala	Not isolated
27/03/2003	CPH0390330	Centrewood, Blenheim	K&N Bright, Radford Block	Murrays Rd, RD3, Blenheim	3921	19-20/3/03	26/03/2003		O5	Royal Gala	Not isolated
27/03/2003	CPH0390331	Molyneux,	JD Campbell & Co	3 Conroy Rd, Earnsclough	3761 CO1	17/03/2003	24/03/2003		O1	Royal	Not



		Cromwell								Gala	isolated
27/03/2003	CPH0390331	Molyneux, Cromwell	JD Campbell & Co	3 Conroy Rd, Earnsclough	3761 CO1	17/03/2003	24/03/2003		O2	Royal Gala	Not isolated
27/03/2003	CPH0390331	Molyneux, Cromwell	JD Campbell & Co	3 Conroy Rd, Earnsclough	3761 CO1	17/03/2003	24/03/2003		O3	Royal Gala	Not isolated
27/03/2003	CPH0390331	Molyneux, Cromwell	JD Campbell & Co	3 Conroy Rd, Earnsclough	3761 CO1	17/03/2003	24/03/2003		O4	Royal Gala	Not isolated
27/03/2003	CPH0390331	Molyneux, Cromwell	JD Campbell & Co	3 Conroy Rd, Earnsclough	3761 CO1	17/03/2003	24/03/2003		O5	Royal Gala	Not isolated
27/03/2003	CPH0390331	Molyneux, Cromwell	Summerfruit Orchards	Conroy Rd, RD1, Earnsclough	4256 CO1	17/03/2003	24/03/2003		O1	Royal Gala	Not isolated
27/03/2003	CPH0390331	Molyneux, Cromwell	Summerfruit Orchards	Conroy Rd, RD1, Earnsclough	4256 CO1	17/03/2003	24/03/2003		O2	Royal Gala	Not isolated
27/03/2003	CPH0390331	Molyneux, Cromwell	Summerfruit Orchards	Conroy Rd, RD1, Earnsclough	4256 CO1	17/03/2003	24/03/2003		O3	Royal Gala	Not isolated
27/03/2003	CPH0390331	Molyneux, Cromwell	Summerfruit Orchards	Conroy Rd, RD1, Earnsclough	4256 CO1	17/03/2003	24/03/2003		O4	Royal Gala	Not isolated
27/03/2003	CPH0390331	Molyneux, Cromwell	Summerfruit Orchards	Conroy Rd, RD1, Earnsclough	4256 CO1	17/03/2003	24/03/2003		O5	Royal Gala	Not isolated
27/03/2003	CPH0390331	Molyneux, Cromwell	Hort Research	160 Earnsclough Rd, Alexandra	0608 CO1	19/03/2003	24/03/2003		O1	Royal Gala	Not isolated
27/03/2003	CPH0390331	Molyneux, Cromwell	Hort Research	160 Earnsclough Rd, Alexandra	0608 CO1	19/03/2003	24/03/2003		O2	Royal Gala	Not isolated
27/03/2003	CPH0390331	Molyneux, Cromwell	Hort Research	160 Earnsclough Rd, Alexandra	0608 CO1	19/03/2003	24/03/2003		O3	Royal Gala	Not isolated
27/03/2003	CPH0390331	Molyneux, Cromwell	Hort Research	160 Earnsclough Rd, Alexandra	0608 CO1	19/03/2003	24/03/2003		O4	Royal Gala	Not isolated
27/03/2003	CPH0390331	Molyneux, Cromwell	Hort Research	160 Earnsclough Rd, Alexandra	0608 CO1	19/03/2003	24/03/2003		O5	Royal Gala	Not isolated
28/03/2003	AMC0390979	Mr Apple, Whakatu	R1897 Bostock-Downs	307 Ngatawara Rd, Bridge Pa	583 CO1	15/03/2003	25/03/2003		O1	Royal Gala	Not isolated
28/03/2003	AMC0390979	Mr Apple, Whakatu	R1897 Bostock-Downs	307 Ngatawara Rd, Bridge Pa	583 CO1	15/03/2003	25/03/2003		O2	Royal Gala	Not isolated
28/03/2003	AMC0390979	Mr Apple, Whakatu	R1897 Bostock-Downs	307 Ngatawara Rd, Bridge Pa	583 CO1	15/03/2003	25/03/2003		O3	Royal Gala	Not isolated
28/03/2003	AMC0390979	Mr Apple, Whakatu	R1897 Bostock-Downs	307 Ngatawara Rd, Bridge Pa	583 CO1	15/03/2003	25/03/2003		O4	Royal Gala	Not isolated

		Whakatu	Downs							Gala	isolated
28/03/2003	AMC0390979	Mr Apple, Whakatu	R1897 Bostock-Downs	307 Ngatawara Rd, Bridge Pa	583 CO1	15/03/2003	25/03/2003		O5	Royal Gala	Not isolated
28/03/2003	AMC0390974	Mr Apple, Whakatu	R1894 Bostock-Danellen	340 Swamp Rd, Waipawa	583 CO4	21/03/2003	25/03/2003		O1	Royal Gala	Not isolated
28/03/2003	AMC0390974	Mr Apple, Whakatu	R1894 Bostock-Danellen	340 Swamp Rd, Waipawa	583 CO4	21/03/2003	25/03/2003		O2	Royal Gala	Not isolated
28/03/2003	AMC0390974	Mr Apple, Whakatu	R1894 Bostock-Danellen	340 Swamp Rd, Waipawa	583 CO4	21/03/2003	25/03/2003		O3	Royal Gala	Not isolated
28/03/2003	AMC0390974	Mr Apple, Whakatu	R1894 Bostock-Danellen	340 Swamp Rd, Waipawa	583 CO4	21/03/2003	25/03/2003		O4	Royal Gala	Not isolated
28/03/2003	AMC0390974	Mr Apple, Whakatu	R1894 Bostock-Danellen	340 Swamp Rd, Waipawa	583 CO4	21/03/2003	25/03/2003		5	Royal Gala	Not isolated
28/03/2003	AMC0390975	Mr Apple, Whakatu	R1891 Bostock - Goldwater	447 Swamp Rd, Waipawa	583 CO5	20/03/2003	25/03/2003		O1	Royal Gala	Not isolated
28/03/2003	AMC0390975	Mr Apple, Whakatu	R1891 Bostock - Goldwater	447 Swamp Rd, Waipawa	583 CO5	20/03/2003	25/03/2003		O2	Royal Gala	Not isolated
28/03/2003	AMC0390975	Mr Apple, Whakatu	R1891 Bostock - Goldwater	447 Swamp Rd, Waipawa	583 CO5	20/03/2003	25/03/2003		O3	Royal Gala	Not isolated
28/03/2003	AMC0390975	Mr Apple, Whakatu	R1891 Bostock - Goldwater	447 Swamp Rd, Waipawa	583 CO5	20/03/2003	25/03/2003		O4	Royal Gala	Not isolated
28/03/2003	AMC0390975	Mr Apple, Whakatu	R1891 Bostock - Goldwater	447 Swamp Rd, Waipawa	583 CO5	20/03/2003	25/03/2003		O5	Royal Gala	Not isolated
28/03/2003	AMC0390976	Mr Apple, Whakatu	R1475 Tikokino Orchard	405 SH 50, Tikokino	4041 CO2	17/03/2003	25/03/2003		O1	Royal Gala	Not isolated
28/03/2003	AMC0390976	Mr Apple, Whakatu	R1475 Tikokino Orchard	405 SH 50, Tikokino	4041 CO2	17/03/2003	25/03/2003		O2	Royal Gala	Not isolated
28/03/2003	AMC0390976	Mr Apple, Whakatu	R1475 Tikokino Orchard	405 SH 50, Tikokino	4041 CO2	17/03/2003	25/03/2003		O3	Royal Gala	Not isolated
28/03/2003	AMC0390976	Mr Apple, Whakatu	R1475 Tikokino Orchard	405 SH 50, Tikokino	4041 CO2	17/03/2003	25/03/2003		O4	Royal Gala	Not isolated
28/03/2003	AMC0390976	Mr Apple, Whakatu	R1475 Tikokino Orchard	405 SH 50, Tikokino	4041 CO2	17/03/2003	25/03/2003		O5	Royal Gala	Not isolated
3/04/2003	AMC0391053	Mr Apple, Whakatu	R1461 Ngapuka Orchard	23 Longlands Rd, Hastings	4041 CO2	15/03/2003	25/03/2003		O1	Royal Gala	Not isolated
3/04/2003	AMC0391053	Mr Apple,	R1461 Ngapuka	23 Longlands Rd, Hastings	4041 CO2	15/03/2003	25/03/2003		O2	Royal	Not

		Whakatu	Orchard							Gala	isolated
3/04/2003	AMC0391053	Mr Apple, Whakatu	R1461 Ngapuka Orchard	23 Longlands Rd, Hastings	4041 CO2	15/03/2003	25/03/2003		O3	Royal Gala	Not isolated
3/04/2003	AMC0391053	Mr Apple, Whakatu	R1461 Ngapuka Orchard	23 Longlands Rd, Hastings	4041 CO2	15/03/2003	25/03/2003		O4	Royal Gala	Not isolated
3/04/2003	AMC0391053	Mr Apple, Whakatu	R1461 Ngapuka Orchard	23 Longlands Rd, Hastings	4041 CO2	15/03/2003	25/03/2003		5	Royal Gala	Not isolated
3/04/2003	AMC0391054	Mr Apple, Whakatu	R2377 Bays Orchard-Elmwood	467 Twyford Rd, Hastings	2502 CO3	4/03/2003	25/03/2003		O1	Royal Gala	Not isolated
3/04/2003	AMC0391054	Mr Apple, Whakatu	R2377 Bays Orchard-Elmwood	467 Twyford Rd, Hastings	2502 CO3	4/03/2003	25/03/2003		O2	Royal Gala	Not isolated
3/04/2003	AMC0391054	Mr Apple, Whakatu	R2377 Bays Orchard-Elmwood	467 Twyford Rd, Hastings	2502 CO3	4/03/2003	25/03/2003		O3	Royal Gala	Not isolated
3/04/2003	AMC0391054	Mr Apple, Whakatu	R2377 Bays Orchard-Elmwood	467 Twyford Rd, Hastings	2502 CO3	4/03/2003	25/03/2003		O4	Royal Gala	Not isolated
3/04/2003	AMC0391054	Mr Apple, Whakatu	R2377 Bays Orchard-Elmwood	467 Twyford Rd, Hastings	2502 CO3	4/03/2003	25/03/2003		O5	Royal Gala	Not isolated
3/04/2003	AMC0391055	Mr Apple, Whakatu	R1891 Bostock - Goldwater	447 Swamp Rd, Waipawa	583 CO5	28/03/2003	25/03/2003		O1	Royal Gala	Not isolated
3/04/2003	AMC0391055	Mr Apple, Whakatu	R1891 Bostock - Goldwater	447 Swamp Rd, Waipawa	583 CO5	28/03/2003	25/03/2003		O2	Royal Gala	Not isolated
3/04/2003	AMC0391055	Mr Apple, Whakatu	R1891 Bostock - Goldwater	447 Swamp Rd, Waipawa	583 CO5	28/03/2003	25/03/2003		O3	Royal Gala	Not isolated
3/04/2003	AMC0391055	Mr Apple, Whakatu	R1891 Bostock - Goldwater	447 Swamp Rd, Waipawa	583 CO5	28/03/2003	25/03/2003		O4	Royal Gala	Not isolated
3/04/2003	AMC0391055	Mr Apple, Whakatu	R1891 Bostock - Goldwater	447 Swamp Rd, Waipawa	583 CO5	28/03/2003	25/03/2003		O5	Royal Gala	Not isolated
3/04/2003	AMC0391056	Mr Apple, Whakatu	R1578 Bellingham Orchard	45 Longlands Rd West, Hastings	4297 CO1	8/03/2003	25/03/2003		O1	Royal Gala	Not isolated
3/04/2003	AMC0391056	Mr Apple, Whakatu	R1578 Bellingham Orchard	45 Longlands Rd West, Hastings	4297 CO1	8/03/2003	25/03/2003		O2	Royal Gala	Not isolated
3/04/2003	AMC0391056	Mr Apple, Whakatu	R1578 Bellingham Orchard	45 Longlands Rd West, Hastings	4297 CO1	8/03/2003	25/03/2003		O3	Royal Gala	Not isolated
3/04/2003	AMC0391056	Mr Apple, Whakatu	R1578 Bellingham Orchard	45 Longlands Rd West, Hastings	4297 CO1	8/03/2003	25/03/2003		O4	Royal Gala	Not isolated
3/04/2003	AMC0391056	Mr Apple, Whakatu	R1578 Bellingham Orchard	45 Longlands Rd West, Hastings	4297 CO1	8/03/2003	25/03/2003		O5	Royal Gala	Not isolated

		Whakatu	Orchard	Hastings						Gala	isolated
2/04/2003	CPH0390349	Centrewood, Blenheim	Bishells Orchard	162 Battys Road, Blenheim	4563	17/03/2003	29/03/2003		O1	Royal Gala	Not isolated
2/04/2003	CPH0390349	Centrewood, Blenheim	Bishells Orchard	162 Battys Road, Blenheim	4563	17/03/2003	29/03/2003		O2	Royal Gala	Not isolated
2/04/2003	CPH0390349	Centrewood, Blenheim	Bishells Orchard	162 Battys Road, Blenheim	4563	17/03/2003	29/03/2003		O3	Royal Gala	Not isolated
2/04/2003	CPH0390349	Centrewood, Blenheim	Bishells Orchard	162 Battys Road, Blenheim	4563	17/03/2003	29/03/2003		O4	Royal Gala	Not isolated
2/04/2003	CPH0390349	Centrewood, Blenheim	Bishells Orchard	162 Battys Road, Blenheim	4563	17/03/2003	29/03/2003		O5	Royal Gala	Not isolated
2/04/2003	CPH0390349	Centrewood, Blenheim	Jenny Greer	West Bank Rd, Pokororo, RD1, Motueka	4279	13-20/03/03	29/03/2003		O1	Royal Gala	Not isolated
2/04/2003	CPH0390349	Centrewood, Blenheim	Jenny Greer	West Bank Rd, Pokororo, RD1, Motueka	4279	13-20/03/03	29/03/2003		O2	Royal Gala	Not isolated
2/04/2003	CPH0390349	Centrewood, Blenheim	Jenny Greer	West Bank Rd, Pokororo, RD1, Motueka	4279	13-20/03/03	29/03/2003		O3	Royal Gala	Not isolated
2/04/2003	CPH0390349	Centrewood, Blenheim	Jenny Greer	West Bank Rd, Pokororo, RD1, Motueka	4279	13-20/03/03	29/03/2003		O4	Royal Gala	Not isolated
2/04/2003	CPH0390349	Centrewood, Blenheim	Jenny Greer	West Bank Rd, Pokororo, RD1, Motueka	4279	13-20/03/03	29/03/2003		O5	Royal Gala	Not isolated
9/04/2003	CPH0390387	Centrewood, Blenheim	Dashwood Grove	Redwood Pass Rd, Lower Dashwood, RD4	4389CO1	24/03/2003	7/04/2003		O1	Fuji	Not isolated
9/04/2003	CPH0390387	Centrewood, Blenheim	Dashwood Grove	Redwood Pass Rd, Lower Dashwood, RD4	4389CO1	24/03/2003	7/04/2003		O2	Fuji	Not isolated
9/04/2003	CPH0390387	Centrewood, Blenheim	Dashwood Grove	Redwood Pass Rd, Lower Dashwood, RD4	4389CO1	24/03/2003	7/04/2003		O3	Fuji	Not isolated
9/04/2003	CPH0390387	Centrewood, Blenheim	Dashwood Grove	Redwood Pass Rd, Lower Dashwood, RD4	4389CO1	24/03/2003	7/04/2003		O4	Fuji	Not isolated
9/04/2003	CPH0390387	Centrewood, Blenheim	Dashwood Grove	Redwood Pass Rd, Lower Dashwood, RD4	4389CO1	24/03/2003	7/04/2003		O5	Fuji	Not isolated
10/04/2003	CPH0390400	Molyneux, Cromwell	John Campbell	Conroy Rd, RD1, Earnscliffe	3761 CO1	2/04/2003	7/04/2003		O1	Fuji	Not isolated
10/04/2003	CPH0390400	Molyneux, Cromwell	John Campbell	Conroy Rd, RD1, Earnscliffe	3761 CO1	2/04/2003	7/04/2003		O2	Fuji	Not isolated
10/04/2003	CPH0390400	Molyneux,	John Campbell	Conroy Rd, RD1,	3761 CO1	2/04/2003	7/04/2003		O3	Fuji	Not

		Cromwell		Earnsleugh							isolated
10/04/2003	CPH0390400	Molyneux, Cromwell	John Campbell	Conroy Rd, RD1, Earnsleugh	3761 CO1	2/04/2003	7/04/2003		O4	Fuji	Not isolated
10/04/2003	CPH0390400	Molyneux, Cromwell	John Campbell	Conroy Rd, RD1, Earnsleugh	3761 CO1	2/04/2003	7/04/2003		O5	Fuji	Not isolated
10/04/2003	CPH0390400	Molyneux, Cromwell	Summerfruit Orchards	Conroy Rd, RD1, Earnsleugh	4256 CO1	2/04/2003	7/04/2003		O1	Fuji	Not isolated
10/04/2003	CPH0390400	Molyneux, Cromwell	Summerfruit Orchards	Conroy Rd, RD1, Earnsleugh	4256 CO1	2/04/2003	7/04/2003		O2	Fuji	Not isolated
10/04/2003	CPH0390400	Molyneux, Cromwell	Summerfruit Orchards	Conroy Rd, RD1, Earnsleugh	4256 CO1	2/04/2003	7/04/2003		O3	Fuji	Not isolated
10/04/2003	CPH0390400	Molyneux, Cromwell	Summerfruit Orchards	Conroy Rd, RD1, Earnsleugh	4256 CO1	2/04/2003	7/04/2003		O4	Fuji	Not isolated
10/04/2003	CPH0390400	Molyneux, Cromwell	Summerfruit Orchards	Conroy Rd, RD1, Earnsleugh	4256 CO1	2/04/2003	7/04/2003		O5	Fuji	Not isolated
10/04/2003	AMC0391156	Mr Apple, Whakatu	R1419 Bays Orchards, Home	142 Thompsons Rd, Hastings	2502 CO1	3/03/2003	31/03/2003	137	O1	Braeburn	Not isolated
10/04/2003	AMC0391156	Mr Apple, Whakatu	R1419 Bays Orchards, Home	142 Thompsons Rd, Hastings	2502 CO1	3/03/2003	31/03/2003	137	O2	Braeburn	Not isolated
10/04/2003	AMC0391156	Mr Apple, Whakatu	R1419 Bays Orchards, Home	142 Thompsons Rd, Hastings	2502 CO1	3/03/2003	31/03/2003	137	O3	Braeburn	Not isolated
10/04/2003	AMC0391156	Mr Apple, Whakatu	R1419 Bays Orchards, Home	142 Thompsons Rd, Hastings	2502 CO1	3/03/2003	31/03/2003	137	O4	Braeburn	Not isolated
10/04/2003	AMC0391156	Mr Apple, Whakatu	R1419 Bays Orchards, Home	142 Thompsons Rd, Hastings	2502 CO1	3/03/2003	31/03/2003	137	O5	Braeburn	Not isolated
10/04/2003	AMC0391157	Mr Apple, Whakatu	R1419 Bays Orchards, Home	142 Thompsons Rd, Hastings	2502 CO1	2/03/2003	31/03/2003	131	O1	Braeburn	Not isolated
10/04/2003	AMC0391157	Mr Apple, Whakatu	R1419 Bays Orchards, Home	142 Thompsons Rd, Hastings	2502 CO1	2/03/2003	31/03/2003	131	O2	Braeburn	Not isolated
10/04/2003	AMC0391157	Mr Apple, Whakatu	R1419 Bays Orchards, Home	142 Thompsons Rd, Hastings	2502 CO1	2/03/2003	31/03/2003	131	O3	Braeburn	Not isolated
10/04/2003	AMC0391157	Mr Apple, Whakatu	R1419 Bays Orchards, Home	142 Thompsons Rd, Hastings	2502 CO1	2/03/2003	31/03/2003	131	O4	Braeburn	Not isolated
10/04/2003	AMC0391157	Mr Apple, Whakatu	R1419 Bays Orchards, Home	142 Thompsons Rd, Hastings	2502 CO1	2/03/2003	31/03/2003	131	O5	Braeburn	Not isolated
10/04/2003	AMC0391158	Mr Apple,	R1897 Bostock-	307 Ngatawara Rd, Bridge Pa	583 CO1	3/04/2003	3/04/2003	130	O1	Braeburn	Not

		Whakatu	Downs								isolated
10/04/2003	AMC0391158	Mr Apple, Whakatu	R1897 Bostock-Downs	307 Ngatawara Rd, Bridge Pa	583 CO1	3/04/2003	3/04/2003	130	O2	Braeburn	Not isolated
10/04/2003	AMC0391158	Mr Apple, Whakatu	R1897 Bostock-Downs	307 Ngatawara Rd, Bridge Pa	583 CO1	3/04/2003	3/04/2003	130	O3	Braeburn	Not isolated
10/04/2003	AMC0391158	Mr Apple, Whakatu	R1897 Bostock-Downs	307 Ngatawara Rd, Bridge Pa	583 CO1	3/04/2003	3/04/2003	130	O4	Braeburn	Not isolated
10/04/2003	AMC0391158	Mr Apple, Whakatu	R1897 Bostock-Downs	307 Ngatawara Rd, Bridge Pa	583 CO1	3/04/2003	3/04/2003	130	O5	Braeburn	Not isolated
10/04/2003	AMC0391158	Mr Apple, Whakatu	R1460 Kinross Orchard	297 Omaranui Rd, Napier	4041 CO1	6/04/2003	3/04/2003		O1	Braeburn	Not isolated
10/04/2003	AMC0391158	Mr Apple, Whakatu	R1460 Kinross Orchard	297 Omaranui Rd, Napier	4041 CO1	6/04/2003	3/04/2003		O2	Braeburn	Not isolated
10/04/2003	AMC0391158	Mr Apple, Whakatu	R1460 Kinross Orchard	297 Omaranui Rd, Napier	4041 CO1	6/04/2003	3/04/2003		O3	Braeburn	Not isolated
10/04/2003	AMC0391158	Mr Apple, Whakatu	R1460 Kinross Orchard	297 Omaranui Rd, Napier	4041 CO1	6/04/2003	3/04/2003		O4	Braeburn	Not isolated
10/04/2003	AMC0391158	Mr Apple, Whakatu	R1460 Kinross Orchard	297 Omaranui Rd, Napier	4041 CO1	6/04/2003	3/04/2003		O5	Braeburn	Not isolated
10/04/2003	AMC0391160	Mr Apple, Whakatu	R2404 Omaranui Orchard	309 Omaranui Rd, Napier	2836 CO3	1/04/2003	3/04/2003	138	O1	Braeburn	Not isolated
10/04/2003	AMC0391160	Mr Apple, Whakatu	R2404 Omaranui Orchard	309 Omaranui Rd, Napier	2836 CO3	1/04/2003	3/04/2003	138	O2	Braeburn	Not isolated
10/04/2003	AMC0391160	Mr Apple, Whakatu	R2404 Omaranui Orchard	309 Omaranui Rd, Napier	2836 CO3	1/04/2003	3/04/2003	138	O3	Braeburn	Not isolated
10/04/2003	AMC0391160	Mr Apple, Whakatu	R2404 Omaranui Orchard	309 Omaranui Rd, Napier	2836 CO3	1/04/2003	3/04/2003	138	O4	Braeburn	Not isolated
10/04/2003	AMC0391160	Mr Apple, Whakatu	R2404 Omaranui Orchard	309 Omaranui Rd, Napier	2836 CO3	1/04/2003	3/04/2003	138	O5	Braeburn	Not isolated
16/04/2003	CPH0390429	Centrewood, Blenheim	Park Orchard (replant block)	Dillons Point Rd, Blenheim	3919	12/04/2003	14/04/2003		O1	Braeburn	Not isolated
16/04/2003	CPH0390429	Centrewood, Blenheim	Park Orchard (replant block)	Dillons Point Rd, Blenheim	3919	12/04/2003	14/04/2003		O2	Braeburn	Not isolated
16/04/2003	CPH0390429	Centrewood, Blenheim	Park Orchard (replant block)	Dillons Point Rd, Blenheim	3919	12/04/2003	14/04/2003		O3	Braeburn	Not isolated
16/04/2003	CPH0390429	Centrewood, Blenheim	Park Orchard (replant block)	Dillons Point Rd, Blenheim	3919	12/04/2003	14/04/2003		O4	Braeburn	Not

		Blenheim	block)								isolated
16/04/2003	CPH0390429	Centrewood, Blenheim	Park Orchard (replant block)	Dillons Point Rd, Blenheim	3919	12/04/2003	14/04/2003		O5	Braeburn	Not isolated
16/04/2003	CPH0390429	Centrewood, Blenheim	K & N Bright	146 Murrays Rd, RD3 Blenheim	3921	11/04/2003	14/04/2003		O1	Braeburn	Not isolated
16/04/2003	CPH0390429	Centrewood, Blenheim	K & N Bright	146 Murrays Rd, RD3 Blenheim	3921	11/04/2003	14/04/2003		O2	Braeburn	Not isolated
16/04/2003	CPH0390429	Centrewood, Blenheim	K & N Bright	146 Murrays Rd, RD3 Blenheim	3921	11/04/2003	14/04/2003		O3	Braeburn	Not isolated
16/04/2003	CPH0390429	Centrewood, Blenheim	K & N Bright	146 Murrays Rd, RD3 Blenheim	3921	11/04/2003	14/04/2003		O4	Braeburn	Not isolated
16/04/2003	CPH0390429	Centrewood, Blenheim	K & N Bright	146 Murrays Rd, RD3 Blenheim	3921	11/04/2003	14/04/2003		O5	Braeburn	Not isolated
16/04/2003	CPH0390429	Centrewood, Blenheim	Park Orchard	Dillons Point Rd, Blenheim	3919	14/04/2003	14/04/2003		O1	Fuji	Not isolated
16/04/2003	CPH0390429	Centrewood, Blenheim	Park Orchard	Dillons Point Rd, Blenheim	3919	14/04/2003	14/04/2003		O2	Fuji	Not isolated
16/04/2003	CPH0390429	Centrewood, Blenheim	Park Orchard	Dillons Point Rd, Blenheim	3919	14/04/2003	14/04/2003		O3	Fuji	Not isolated
16/04/2003	CPH0390429	Centrewood, Blenheim	Park Orchard	Dillons Point Rd, Blenheim	3919	14/04/2003	14/04/2003		O4	Fuji	Not isolated
16/04/2003	CPH0390429	Centrewood, Blenheim	Park Orchard	Dillons Point Rd, Blenheim	3919	14/04/2003	14/04/2003		O5	Fuji	Not isolated
16/04/2003	CPH0390431	Molyneux, Cromwell	JD & CO Campbell	3 Conroys Rd, Earnsclough, Alexandra	3761 CO1	9/04/2003	14/04/2003		O1	Braeburn	Not isolated
16/04/2003	CPH0390431	Molyneux, Cromwell	JD & CO Campbell	3 Conroys Rd, Earnsclough, Alexandra	3761 CO1	9/04/2003	14/04/2003		O2	Braeburn	Not isolated
16/04/2003	CPH0390431	Molyneux, Cromwell	JD & CO Campbell	3 Conroys Rd, Earnsclough, Alexandra	3761 CO1	9/04/2003	14/04/2003		O3	Braeburn	Not isolated
16/04/2003	CPH0390431	Molyneux, Cromwell	JD & CO Campbell	3 Conroys Rd, Earnsclough, Alexandra	3761 CO1	9/04/2003	14/04/2003		O4	Braeburn	Not isolated
16/04/2003	CPH0390431	Molyneux, Cromwell	JD & CO Campbell	3 Conroys Rd, Earnsclough, Alexandra	3761 CO1	9/04/2003	14/04/2003		O5	Braeburn	Not isolated
16/04/2003	AMC0391227	Mr Apple, Whakatu	R1460 Kinross Orchard	297 Omaranui Rd, Napier	4041 CO1	12/04/2003	14/04/2003	157	O1	Braeburn	Not isolated
16/04/2003	AMC0391227	Mr Apple,	R1460 Kinross	297 Omaranui Rd, Napier	4041 CO1	12/04/2003	14/04/2003	157	O2	Braeburn	Not

		Whakatu	Orchard								isolated
16/04/2003	AMC0391227	Mr Apple, Whakatu	R1460 Kinross Orchard	297 Omaranui Rd, Napier	4041 CO1	12/04/2003	14/04/2003	157	O3	Braeburn	Not isolated
16/04/2003	AMC0391227	Mr Apple, Whakatu	R1460 Kinross Orchard	297 Omaranui Rd, Napier	4041 CO1	12/04/2003	14/04/2003	157	O4	Braeburn	Not isolated
16/04/2003	AMC0391227	Mr Apple, Whakatu	R1460 Kinross Orchard	297 Omaranui Rd, Napier	4041 CO1	12/04/2003	14/04/2003	157	O5	Braeburn	Not isolated
16/04/2003	AMC0391228	Mr Apple, Whakatu	R1460 Kinross Orchard	297 Omaranui Rd, Napier	4041 CO1	14/04/2003	14/04/2003	161	O1	Braeburn	Not isolated
16/04/2003	AMC0391228	Mr Apple, Whakatu	R1460 Kinross Orchard	297 Omaranui Rd, Napier	4041 CO1	14/04/2003	14/04/2003	161	O2	Braeburn	Not isolated
16/04/2003	AMC0391228	Mr Apple, Whakatu	R1460 Kinross Orchard	297 Omaranui Rd, Napier	4041 CO1	14/04/2003	14/04/2003	161	O3	Braeburn	Not isolated
16/04/2003	AMC0391228	Mr Apple, Whakatu	R1460 Kinross Orchard	297 Omaranui Rd, Napier	4041 CO1	14/04/2003	14/04/2003	161	O4	Braeburn	Not isolated
16/04/2003	AMC0391228	Mr Apple, Whakatu	R1460 Kinross Orchard	297 Omaranui Rd, Napier	4041 CO1	14/04/2003	14/04/2003	161	O5	Braeburn	Not isolated
16/04/2003	AMC0391229	Mr Apple, Whakatu	R1893 Bostok - Kalapana	Wilson Rd, Flaxmere	583 CO3	9/04/2003	14/04/2003		O1	Braeburn	Not isolated
16/04/2003	AMC0391229	Mr Apple, Whakatu	R1893 Bostok - Kalapana	Wilson Rd, Flaxmere	583 CO3	9/04/2003	14/04/2003		O2	Braeburn	Not isolated
16/04/2003	AMC0391229	Mr Apple, Whakatu	R1893 Bostok - Kalapana	Wilson Rd, Flaxmere	583 CO3	9/04/2003	14/04/2003		O3	Braeburn	Not isolated
16/04/2003	AMC0391229	Mr Apple, Whakatu	R1893 Bostok - Kalapana	Wilson Rd, Flaxmere	583 CO3	9/04/2003	14/04/2003		O4	Braeburn	Not isolated
16/04/2003	AMC0391229	Mr Apple, Whakatu	R1893 Bostok - Kalapana	Wilson Rd, Flaxmere	583 CO3	9/04/2003	14/04/2003		O5	Braeburn	Not isolated
16/04/2003	AMC0391230	Mr Apple, Whakatu	R1897 Bostock-Downs	307 Ngatawara Rd, Bridge Pa	583 CO1	7/04/2003	14/04/2003		O1	Braeburn	Not isolated #
16/04/2003	AMC0391230	Mr Apple, Whakatu	R1897 Bostock-Downs	307 Ngatawara Rd, Bridge Pa	583 CO1	7/04/2003	14/04/2003		O2	Braeburn	Not isolated #
16/04/2003	AMC0391230	Mr Apple, Whakatu	R1897 Bostock-Downs	307 Ngatawara Rd, Bridge Pa	583 CO1	7/04/2003	14/04/2003		O3	Braeburn	Not isolated #
16/04/2003	AMC0391230	Mr Apple, Whakatu	R1897 Bostock-Downs	307 Ngatawara Rd, Bridge Pa	583 CO1	7/04/2003	14/04/2003		O4	Braeburn	Not isolated #
16/04/2003	AMC0391230	Mr Apple,	R1897 Bostock-	307 Ngatawara Rd, Bridge Pa	583 CO1	7/04/2003	14/04/2003		O5	Braeburn	Not



		Whakatu	Downs								isolated #
23/04/2003	CPH0390443	Centrewood, Blenheim	Five Oaks Orchard	Murrays Rd, RD3, Blenheim	3921	15/04/2003	22/04/2003		O1	Fuji	Not isolated
23/04/2003	CPH0390443	Centrewood, Blenheim	Five Oaks Orchard	Murrays Rd, RD3, Blenheim	3921	15/04/2003	22/04/2003		O2	Fuji	Not isolated
23/04/2003	CPH0390443	Centrewood, Blenheim	Five Oaks Orchard	Murrays Rd, RD3, Blenheim	3921	15/04/2003	22/04/2003		O3	Fuji	Not isolated
23/04/2003	CPH0390443	Centrewood, Blenheim	Five Oaks Orchard	Murrays Rd, RD3, Blenheim	3921	15/04/2003	22/04/2003		O4	Fuji	Not isolated
23/04/2003	CPH0390443	Centrewood, Blenheim	Five Oaks Orchard	Murrays Rd, RD3, Blenheim	3921	15/04/2003	22/04/2003		O5	Fuji	Not isolated
23/04/2003	CPH0390443	Centrewood, Blenheim	Bearcroft Orchard	151 Rivers Rd, Appleby RD1, Nelson	4108	15/04/2003	22/04/2003		O1	Fuji	Not isolated
23/04/2003	CPH0390443	Centrewood, Blenheim	Bearcroft Orchard	151 Rivers Rd, Appleby RD1, Nelson	4108	15/04/2003	22/04/2003		O2	Fuji	Not isolated
23/04/2003	CPH0390443	Centrewood, Blenheim	Bearcroft Orchard	151 Rivers Rd, Appleby RD1, Nelson	4108	15/04/2003	22/04/2003		O3	Fuji	Not isolated
23/04/2003	CPH0390443	Centrewood, Blenheim	Bearcroft Orchard	151 Rivers Rd, Appleby RD1, Nelson	4108	15/04/2003	22/04/2003		O4	Fuji	Not isolated
23/04/2003	CPH0390443	Centrewood, Blenheim	Bearcroft Orchard	151 Rivers Rd, Appleby RD1, Nelson	4108	15/04/2003	22/04/2003		O5	Fuji	Not isolated
2 /05 2003	AMC0391400	Mr Apple, Whakatu	R1897 Bostock-Downs	307 Ngatawara Rd, Bridge Pa	583 CO1	23/04/2003	1/05/2003		O1	Braeburn	Not isolated
2 /05 2003	AMC0391400	Mr Apple, Whakatu	R1897 Bostock-Downs	307 Ngatawara Rd, Bridge Pa	583 CO1	23/04/2003	1/05/2003		O2	Braeburn	Not isolated
2 /05 2003	AMC0391400	Mr Apple, Whakatu	R1897 Bostock-Downs	307 Ngatawara Rd, Bridge Pa	583 CO1	23/04/2003	1/05/2003		O3	Braeburn	Not isolated
2 /05 2003	AMC0391400	Mr Apple, Whakatu	R1897 Bostock-Downs	307 Ngatawara Rd, Bridge Pa	583 CO1	23/04/2003	1/05/2003		O4	Braeburn	Not isolated
2 /05 2003	AMC0391400	Mr Apple, Whakatu	R1897 Bostock-Downs	307 Ngatawara Rd, Bridge Pa	583 CO1	23/04/2003	1/05/2003		O5	Braeburn	Not isolated
2 /05 2003	AMC0391401	Mr Apple, Whakatu	R1894 Bostock-Danellen	340 Swamp Rd, Waipawa	583 CO4	25/04/2003	1/05/2003		O1	Fuji	Not isolated
2 /05 2003	AMC0391401	Mr Apple, Whakatu	R1894 Bostock-Danellen	340 Swamp Rd, Waipawa	583 CO4	25/04/2003	1/05/2003		O2	Fuji	Not isolated
2 /05 2003	AMC0391401	Mr Apple,	R1894 Bostock-	340 Swamp Rd, Waipawa	583 CO4	25/04/2003	1/05/2003		O3	Fuji	Not

		Whakatu	Danellen								isolated
2 /05 2003	AMC0391401	Mr Apple, Whakatu	R1894 Bostock-Danellen	340 Swamp Rd, Waipawa	583 CO4	25/04/2003	1/05/2003		O4	Fuji	Not isolated
2 /05 2003	AMC0391401	Mr Apple, Whakatu	R1894 Bostock-Danellen	340 Swamp Rd, Waipawa	583 CO4	25/04/2003	1/05/2003		O5	Fuji	Not isolated
2 /05 2003	AMC0391402	Mr Apple, Whakatu	R1891 Bostock - Goldwater	447 Swamp Rd, Waipawa	583 CO5	27/04/2003	1/05/2003		O1	Fuji	Not isolated
2 /05 2003	AMC0391402	Mr Apple, Whakatu	R1891 Bostock - Goldwater	447 Swamp Rd, Waipawa	583 CO5	27/04/2003	1/05/2003		O2	Fuji	Not isolated
2 /05 2003	AMC0391402	Mr Apple, Whakatu	R1891 Bostock - Goldwater	447 Swamp Rd, Waipawa	583 CO5	27/04/2003	1/05/2003		O3	Fuji	Not isolated
2 /05 2003	AMC0391402	Mr Apple, Whakatu	R1891 Bostock - Goldwater	447 Swamp Rd, Waipawa	583 CO5	27/04/2003	1/05/2003		O4	Fuji	Not isolated
2 /05 2003	AMC0391402	Mr Apple, Whakatu	R1891 Bostock - Goldwater	447 Swamp Rd, Waipawa	583 CO5	27/04/2003	1/05/2003		O5	Fuji	Not isolated
21/05/2003	AMC0391654	Mr Apple, Whakatu	R1891 Bostock - Goldwater	447 Swamp Rd, Waipawa	583 CO5	9/03/2003	20/05/2003		O1	Royal Gala	Not isolated
21/05/2003	AMC0391654	Mr Apple, Whakatu	R1891 Bostock - Goldwater	447 Swamp Rd, Waipawa	583 CO5	9/03/2003	20/05/2003		O2	Royal Gala	Not isolated
21/05/2003	AMC0391654	Mr Apple, Whakatu	R1891 Bostock - Goldwater	447 Swamp Rd, Waipawa	583 CO5	9/03/2003	20/05/2003		O3	Royal Gala	Not isolated
21/05/2003	AMC0391654	Mr Apple, Whakatu	R1891 Bostock - Goldwater	447 Swamp Rd, Waipawa	583 CO5	9/03/2003	20/05/2003		O4	Royal Gala	Not isolated
21/05/2003	AMC0391654	Mr Apple, Whakatu	R1891 Bostock - Goldwater	447 Swamp Rd, Waipawa	583 CO5	9/03/2003	20/05/2003		O5	Royal Gala	Not isolated
21/05/2003	AMC0391655	Mr Apple, Whakatu	R1460 Kinross Orchard	297 Omaranui Rd, Napier	4041 CO1	20/04/2003	31/05/2003		O1	Pacific Queen	Not isolated
21/05/2003	AMC0391655	Mr Apple, Whakatu	R1460 Kinross Orchard	297 Omaranui Rd, Napier	4041 CO1	20/04/2003	31/05/2003		O2	Pacific Queen	Not isolated
21/05/2003	AMC0391655	Mr Apple, Whakatu	R1460 Kinross Orchard	297 Omaranui Rd, Napier	4041 CO1	20/04/2003	31/05/2003		O3	Pacific Queen	Not isolated
21/05/2003	AMC0391655	Mr Apple, Whakatu	R1460 Kinross Orchard	297 Omaranui Rd, Napier	4041 CO1	20/04/2003	31/05/2003		O4	Pacific Queen	Not isolated
21/05/2003	AMC0391655	Mr Apple, Whakatu	R1460 Kinross Orchard	297 Omaranui Rd, Napier	4041 CO1	20/04/2003	31/05/2003		O5	Pacific Queen	Not isolated

## Appendix 5 continued

MAF Project Code: FMA 128. Examination of IFP Apples for <i>Salmonella</i>										
Date received	PHL Job No	Packhouse	Name of Orchard & R Pin No	Physical Location	Date harvested	Date packed	Run No	Sample No	Apple Variety	<i>Salmonella</i> result per sample
19/03/2003	CPH0390296	Molyneux, Cromwell	Molyneux Orchard	Cnr Orchard Rd & State Highway 6	15/03/2003	18/03/2003		1	Royal Gala	Not isolated
19/03/2003	CPH0390296	Molyneux, Cromwell	Molyneux Orchard	Cnr Orchard Rd & State Highway 6	15/03/2003	18/03/2003		2	Royal Gala	Not isolated
19/03/2003	CPH0390296	Molyneux, Cromwell	Molyneux Orchard	Cnr Orchard Rd & State Highway 6	15/03/2003	18/03/2003		3	Royal Gala	Not isolated
19/03/2003	CPH0390296	Molyneux, Cromwell	Molyneux Orchard	Cnr Orchard Rd & State Highway 6	15/03/2003	18/03/2003		4	Royal Gala	Not isolated
19/03/2003	CPH0390296	Molyneux, Cromwell	Molyneux Orchard	Cnr Orchard Rd & State Highway 6	15/03/2003	18/03/2003		5	Royal Gala	Not isolated
19/03/2003	CPH0390296	Molyneux, Cromwell	JR Webb & Sons	Wanaka Rd, 2RD, Cromwell	14/03/2003	18/03/2003		1	Royal Gala	Not isolated
19/03/2003	CPH0390296	Molyneux, Cromwell	JR Webb & Sons	Wanaka Rd, 2RD, Cromwell	14/03/2003	18/03/2003		2	Royal Gala	Not isolated
19/03/2003	CPH0390296	Molyneux, Cromwell	JR Webb & Sons	Wanaka Rd, 2RD, Cromwell	14/03/2003	18/03/2003		3	Royal Gala	Not isolated
19/03/2003	CPH0390296	Molyneux, Cromwell	JR Webb & Sons	Wanaka Rd, 2RD, Cromwell	14/03/2003	18/03/2003		4	Royal Gala	Not isolated
19/03/2003	CPH0390296	Molyneux, Cromwell	JR Webb & Sons	Wanaka Rd, 2RD, Cromwell	14/03/2003	18/03/2003		5	Royal Gala	Not isolated
19/03/2003	AMC0390846	Mr Apple, Hastings	R1754 Cooper Hort Ltd	NA	24/02/2003	18/03/2003	6263	1	Royal Gala	Not isolated
19/03/2003	AMC0390846	Mr Apple, Hastings	R1754 Cooper Hort Ltd	NA	24/02/2003	18/03/2003	6263	2	Royal Gala	Not isolated
19/03/2003	AMC0390846	Mr Apple, Hastings	R1754 Cooper Hort Ltd	NA	24/02/2003	18/03/2003	6263	3	Royal Gala	Not isolated
19/03/2003	AMC0390846	Mr Apple, Hastings	R1754 Cooper Hort Ltd	NA	24/02/2003	18/03/2003	6263	4	Royal Gala	Not isolated
19/03/2003	AMC0390846	Mr Apple, Hastings	R1754 Cooper Hort Ltd	NA	24/02/2003	18/03/2003	6263	5	Royal Gala	Not isolated

		Hastings	Ltd							isolated
19/03/2003	AMC0390846	Mr Apple, Hastings	R1467 Meikle	352 Napier Rd, Havelock Nth	13/03/2003	18/03/2003	6262	1	Royal Gala	Not isolated
19/03/2003	AMC0390846	Mr Apple, Hastings	R1467 Meikle	352 Napier Rd, Havelock Nth	13/03/2003	18/03/2003	6262	2	Royal Gala	Not isolated
19/03/2003	AMC0390846	Mr Apple, Hastings	R1467 Meikle	352 Napier Rd, Havelock Nth	13/03/2003	18/03/2003	6262	3	Royal Gala	Not isolated
19/03/2003	AMC0390846	Mr Apple, Hastings	R1467 Meikle	352 Napier Rd, Havelock Nth	13/03/2003	18/03/2003	6262	4	Royal Gala	Not isolated
19/03/2003	AMC0390846	Mr Apple, Hastings	R1467 Meikle	352 Napier Rd, Havelock Nth	13/03/2003	18/03/2003	6262	5	Royal Gala	Not isolated
19/03/2003	AMC0390846	Mr Apple, Hastings	R1225 Montrose	171 Tukituki Rd, Hastings	17/03/2003	18/03/2003	6266	1	Royal Gala	Not isolated
19/03/2003	AMC0390846	Mr Apple, Hastings	R1225 Montrose	171 Tukituki Rd, Hastings	17/03/2003	18/03/2003	6266	2	Royal Gala	Not isolated
19/03/2003	AMC0390846	Mr Apple, Hastings	R1225 Montrose	171 Tukituki Rd, Hastings	17/03/2003	18/03/2003	6266	3	Royal Gala	Not isolated
19/03/2003	AMC0390846	Mr Apple, Hastings	R1225 Montrose	171 Tukituki Rd, Hastings	17/03/2003	18/03/2003	6266	4	Royal Gala	Not isolated
19/03/2003	AMC0390846	Mr Apple, Hastings	R1225 Montrose	171 Tukituki Rd, Hastings	17/03/2003	18/03/2003	6266	5	Royal Gala	Not isolated
27/03/2003	CPH0390331	Molyneux, Cromwell	H&J Roberts Orchard	McIntosh Rd, RD1, Alexandra	4/03/2003	24/03/2003		1	Royal Gala	Not isolated
27/03/2003	CPH0390331	Molyneux, Cromwell	H&J Roberts Orchard	McIntosh Rd, RD1, Alexandra	4/03/2003	24/03/2003		2	Royal Gala	Not isolated
27/03/2003	CPH0390331	Molyneux, Cromwell	H&J Roberts Orchard	McIntosh Rd, RD1, Alexandra	4/03/2003	24/03/2003		3	Royal Gala	Not isolated
27/03/2003	CPH0390331	Molyneux, Cromwell	H&J Roberts Orchard	McIntosh Rd, RD1, Alexandra	4/03/2003	24/03/2003		4	Royal Gala	Not isolated
27/03/2003	CPH0390331	Molyneux, Cromwell	H&J Roberts Orchard	McIntosh Rd, RD1, Alexandra	4/03/2003	24/03/2003		5	Royal Gala	Not isolated
27/03/2003	CPH0390331	Molyneux, Cromwell	Springvale Orchard	Rockview Rd, Alexandra	11/03/2003	24/03/2003		1	Royal Gala	Not isolated
27/03/2003	CPH0390331	Molyneux, Cromwell	Springvale Orchard	Rockview Rd, Alexandra	11/03/2003	24/03/2003		2	Royal Gala	Not isolated

27/03/2003	CPH0390331	Molyneux, Cromwell	Springvale Orchard	Rockview Rd, Alexandra	11/03/2003	24/03/2003		3	Royal Gala	Not isolated
27/03/2003	CPH0390331	Molyneux, Cromwell	Springvale Orchard	Rockview Rd, Alexandra	11/03/2003	24/03/2003		4	Royal Gala	Not isolated
27/03/2003	CPH0390331	Molyneux, Cromwell	Springvale Orchard	Rockview Rd, Alexandra	11/03/2003	24/03/2003		5	Royal Gala	Not isolated
27/03/2003	CPH0390331	Molyneux, Cromwell	Sarita Orchard	PO Box 157 Cromwell	17/03/2003	24/03/2003		1	Royal Gala	Not isolated
27/03/2003	CPH0390331	Molyneux, Cromwell	Sarita Orchard	PO Box 157 Cromwell	17/03/2003	24/03/2003		2	Royal Gala	Not isolated
27/03/2003	CPH0390331	Molyneux, Cromwell	Sarita Orchard	PO Box 157 Cromwell	17/03/2003	24/03/2003		3	Royal Gala	Not isolated
27/03/2003	CPH0390331	Molyneux, Cromwell	Sarita Orchard	PO Box 157 Cromwell	17/03/2003	24/03/2003		4	Royal Gala	Not isolated
27/03/2003	CPH0390331	Molyneux, Cromwell	Sarita Orchard	PO Box 157 Cromwell	17/03/2003	24/03/2003		5	Royal Gala	Not isolated
28/03/2003	AMC0390977	Mr Apple, Hastings	R1638 Parenga Partnership	Springfield, Hastings	11/03/2003	24/04/2003	6319	1	Royal Gala	Not isolated
28/03/2003	AMC0390977	Mr Apple, Hastings	R1638 Parenga Partnership	Springfield, Hastings	11/03/2003	24/04/2003	6319	2	Royal Gala	Not isolated
28/03/2003	AMC0390977	Mr Apple, Hastings	R1638 Parenga Partnership	Springfield, Hastings	11/03/2003	24/04/2003	6319	3	Royal Gala	Not isolated
28/03/2003	AMC0390977	Mr Apple, Hastings	R1638 Parenga Partnership	Springfield, Hastings	11/03/2003	24/04/2003	6319	4	Royal Gala	Not isolated
28/03/2003	AMC0390977	Mr Apple, Hastings	R1638 Parenga Partnership	Springfield, Hastings	11/03/2003	24/04/2003	6319	5	Royal Gala	Not isolated
28/03/2003	AMC0390978	Mr Apple, Hastings	R1095 Willowbank Orchard	1419 SH50, Waiohiki	16/03/2003	24/04/2003		1	Gala	Not isolated
28/03/2003	AMC0390978	Mr Apple, Hastings	R1095 Willowbank Orchard	1419 SH50, Waiohiki	16/03/2003	24/04/2003		2	Gala	Not isolated
28/03/2003	AMC0390978	Mr Apple, Hastings	R1095 Willowbank Orchard	1419 SH50, Waiohiki	16/03/2003	24/04/2003		3	Gala	Not isolated
28/03/2003	AMC0390978	Mr Apple, Hastings	R1095 Willowbank Orchard	1419 SH50, Waiohiki	16/03/2003	24/04/2003		4	Gala	Not isolated
28/03/2003	AMC0390978	Mr Apple, Hastings	R1095 Willowbank Orchard	1419 SH50, Waiohiki	16/03/2003	24/04/2003		5	Gala	Not isolated

		Hastings	Orchard							isolated
28/03/2003	AMC0390980	Mr Apple, Hastings	R1197 Taylor Orchard	127 Thompson Rd, Havelock Nth	10/03/2003	24/04/2003		1	Royal Gala	Not isolated
28/03/2003	AMC0390980	Mr Apple, Hastings	R1197 Taylor Orchard	127 Thompson Rd, Havelock Nth	10/03/2003	24/04/2003		2	Royal Gala	Not isolated
28/03/2003	AMC0390980	Mr Apple, Hastings	R1197 Taylor Orchard	127 Thompson Rd, Havelock Nth	10/03/2003	24/04/2003		3	Royal Gala	Not isolated
28/03/2003	AMC0390980	Mr Apple, Hastings	R1197 Taylor Orchard	127 Thompson Rd, Havelock Nth	10/03/2003	24/04/2003		4	Royal Gala	Not isolated
28/03/2003	AMC0390980	Mr Apple, Hastings	R1197 Taylor Orchard	127 Thompson Rd, Havelock Nth	10/03/2003	24/04/2003		5	Royal Gala	Not isolated
28/03/2003	AMC0390981	Mr Apple, Hastings	R1071 Bo Val Orchard	14 Grassmere Rd, Meenae	3/03/2003	24/04/2003		1	Gala	Not isolated
28/03/2003	AMC0390981	Mr Apple, Hastings	R1071 Bo Val Orchard	14 Grassmere Rd, Meenae	3/03/2003	24/04/2003		2	Gala	Not isolated
28/03/2003	AMC0390981	Mr Apple, Hastings	R1071 Bo Val Orchard	14 Grassmere Rd, Meenae	3/03/2003	24/04/2003		3	Gala	Not isolated
28/03/2003	AMC0390981	Mr Apple, Hastings	R1071 Bo Val Orchard	14 Grassmere Rd, Meenae	3/03/2003	24/04/2003		4	Gala	Not isolated
28/03/2003	AMC0390981	Mr Apple, Hastings	R1071 Bo Val Orchard	14 Grassmere Rd, Meenae	3/03/2003	24/04/2003		5	Gala	Not isolated
28/03/2003	AMC0390982	Mr Apple, Hastings	R1068 Mavallan Orchard	902/904 Norton Rd, Hastings	15/03/2003	24/04/2003		1	Gala	Not isolated
28/03/2003	AMC0390982	Mr Apple, Hastings	R1068 Mavallan Orchard	902/904 Norton Rd, Hastings	15/03/2003	24/04/2003		2	Gala	Not isolated
28/03/2003	AMC0390982	Mr Apple, Hastings	R1068 Mavallan Orchard	902/904 Norton Rd, Hastings	15/03/2003	24/04/2003		3	Gala	Not isolated
28/03/2003	AMC0390982	Mr Apple, Hastings	R1068 Mavallan Orchard	902/904 Norton Rd, Hastings	15/03/2003	24/04/2003		4	Gala	Not isolated
28/03/2003	AMC0390982	Mr Apple, Hastings	R1068 Mavallan Orchard	902/904 Norton Rd, Hastings	15/03/2003	24/04/2003		5	Gala	Not isolated
2/04/2003	CPH0390349	Centrewood, Blenheim	Greenfields Orchard	Muller Rd, Blenheim	12-13/03/03	31/03/2003		1	Royal Gala	Not isolated
2/04/2003	CPH0390349	Centrewood, Blenheim	Greenfields Orchard	Muller Rd, Blenheim	12-13/03/03	31/03/2003		2	Royal Gala	Not isolated

2/04/2003	CPH0390349	Centrewood, Blenheim	Greenfields Orchard	Muller Rd, Blenheim	12-13/03/03	31/03/2003		3	Royal Gala	Not isolated
2/04/2003	CPH0390349	Centrewood, Blenheim	Greenfields Orchard	Muller Rd, Blenheim	12-13/03/03	31/03/2003		4	Royal Gala	Not isolated
2/04/2003	CPH0390349	Centrewood, Blenheim	Greenfields Orchard	Muller Rd, Blenheim	12-13/03/03	31/03/2003		5	Royal Gala	Not isolated
2/04/2003	CPH0390349	Centrewood, Blenheim	Grant Jolly	297 Middle Renwick Rd, Blenheim	13-19/03/03	31/03/2003		1	Royal Gala	Not isolated
2/04/2003	CPH0390349	Centrewood, Blenheim	Grant Jolly	297 Middle Renwick Rd, Blenheim	13-19/03/03	31/03/2003		2	Royal Gala	Not isolated
2/04/2003	CPH0390349	Centrewood, Blenheim	Grant Jolly	297 Middle Renwick Rd, Blenheim	13-19/03/03	31/03/2003		3	Royal Gala	Not isolated
2/04/2003	CPH0390349	Centrewood, Blenheim	Grant Jolly	297 Middle Renwick Rd, Blenheim	13-19/03/03	31/03/2003		4	Royal Gala	Not isolated
2/04/2003	CPH0390349	Centrewood, Blenheim	Grant Jolly	297 Middle Renwick Rd, Blenheim	13-19/03/03	31/03/2003		5	Royal Gala	Not isolated
3/04/2003	AMC0391057	Mr Apple, Whakatu	R1465 Haurakau Orchard	Anderson Rd, Whakatu	18/03/2003	31/03/2003		1	Orin	Not isolated
3/04/2003	AMC0391057	Mr Apple, Whakatu	R1465 Haurakau Orchard	Anderson Rd, Whakatu	18/03/2003	31/03/2003		2	Orin	Not isolated
3/04/2003	AMC0391057	Mr Apple, Whakatu	R1465 Haurakau Orchard	Anderson Rd, Whakatu	18/03/2003	31/03/2003		3	Orin	Not isolated
3/04/2003	AMC0391057	Mr Apple, Whakatu	R1465 Haurakau Orchard	Anderson Rd, Whakatu	18/03/2003	31/03/2003		4	Orin	Not isolated
3/04/2003	AMC0391057	Mr Apple, Whakatu	R1465 Haurakau Orchard	Anderson Rd, Whakatu	18/03/2003	31/03/2003		5	Orin	Not isolated
3/04/2003	AMC0391058	Mr Apple, Whakatu	R1599 Metfield Home	456Twyford Rd, Hastings	7/03/2003	31/03/2003		1	Royal Gala	Not isolated
3/04/2003	AMC0391058	Mr Apple, Whakatu	R1599 Metfield Home	456Twyford Rd, Hastings	7/03/2003	31/03/2003		2	Royal Gala	Not isolated
3/04/2003	AMC0391058	Mr Apple, Whakatu	R1599 Metfield Home	456Twyford Rd, Hastings	7/03/2003	31/03/2003		3	Royal Gala	Not isolated
3/04/2003	AMC0391058	Mr Apple, Whakatu	R1599 Metfield Home	456Twyford Rd, Hastings	7/03/2003	31/03/2003		4	Royal Gala	Not isolated
3/04/2003	AMC0391058	Mr Apple, Whakatu	R1599 Metfield Home	456Twyford Rd, Hastings	7/03/2003	31/03/2003		5	Royal Gala	Not isolated

		Whakatu								isolated
3/04/2003	AMC0391059	Mr Apple, Whakatu	R1756 Cooper Hort Ltd	NA	6/03/2003	31/03/2003		1	Royal Gala	Not isolated
3/04/2003	AMC0391059	Mr Apple, Whakatu	R1756 Cooper Hort Ltd	NA	6/03/2003	31/03/2003		2	Royal Gala	Not isolated
3/04/2003	AMC0391059	Mr Apple, Whakatu	R1756 Cooper Hort Ltd	NA	6/03/2003	31/03/2003		3	Royal Gala	Not isolated
3/04/2003	AMC0391059	Mr Apple, Whakatu	R1756 Cooper Hort Ltd	NA	6/03/2003	31/03/2003		4	Royal Gala	Not isolated
3/04/2003	AMC0391059	Mr Apple, Whakatu	R1756 Cooper Hort Ltd	NA	6/03/2003	31/03/2003		5	Royal Gala	Not isolated
3/04/2003	AMC0391060	Mr Apple, Whakatu	R1152 Collstan Orchard	499 Lawn Rd, Hastings	10/03/2003	31/03/2003		1	Brookfield	Not isolated
3/04/2003	AMC0391060	Mr Apple, Whakatu	R1152 Collstan Orchard	499 Lawn Rd, Hastings	10/03/2003	31/03/2003		2	Brookfield	Not isolated
3/04/2003	AMC0391060	Mr Apple, Whakatu	R1152 Collstan Orchard	499 Lawn Rd, Hastings	10/03/2003	31/03/2003		3	Brookfield	Not isolated
3/04/2003	AMC0391060	Mr Apple, Whakatu	R1152 Collstan Orchard	499 Lawn Rd, Hastings	10/03/2003	31/03/2003		4	Brookfield	Not isolated
3/04/2003	AMC0391060	Mr Apple, Whakatu	R1152 Collstan Orchard	499 Lawn Rd, Hastings	10/03/2003	31/03/2003		5	Brookfield	Not isolated
3/04/2003	AMC0391061	Mr Apple, Whakatu	R1469 Pilos Orchard	468 Twyford Rd, Hastings	24/03/2003	31/03/2003		1	Braeburn	Not isolated
3/04/2003	AMC0391061	Mr Apple, Whakatu	R1469 Pilos Orchard	468 Twyford Rd, Hastings	24/03/2003	31/03/2003		2	Braeburn	Not isolated
3/04/2003	AMC0391061	Mr Apple, Whakatu	R1469 Pilos Orchard	468 Twyford Rd, Hastings	24/03/2003	31/03/2003		3	Braeburn	Not isolated
3/04/2003	AMC0391061	Mr Apple, Whakatu	R1469 Pilos Orchard	468 Twyford Rd, Hastings	24/03/2003	31/03/2003		4	Braeburn	Not isolated
3/04/2003	AMC0391061	Mr Apple, Whakatu	R1469 Pilos Orchard	468 Twyford Rd, Hastings	24/03/2003	31/03/2003		5	Braeburn	Not isolated
3/04/2003	AMC0391062	Mr Apple, Whakatu	R1079 Kincaple Orchard	Farndon Rd, Clive	31/03/2003	31/03/2003	6385	1	Braeburn	Not isolated
3/04/2003	AMC0391062	Mr Apple, Whakatu	R1079 Kincaple Orchard	Farndon Rd, Clive	31/03/2003	31/03/2003	6385	2	Braeburn	Not isolated



3/04/2003	AMC0391062	Mr Apple, Whakatu	R1079 Kincaple Orchard	Farndon Rd, Clive	31/03/2003	31/03/2003	6385	3	Braeburn	Not isolated
3/04/2003	AMC0391062	Mr Apple, Whakatu	R1079 Kincaple Orchard	Farndon Rd, Clive	31/03/2003	31/03/2003	6385	4	Braeburn	Not isolated
3/04/2003	AMC0391062	Mr Apple, Whakatu	R1079 Kincaple Orchard	Farndon Rd, Clive	31/03/2003	31/03/2003	6385	5	Braeburn	Not isolated
9/04/2003	CPH0390387	Centrewood, Blenheim	Cherry Grove Orchard	Jeffries Rd, RD3 Blenheim	3/04/2003	4/04/2003		1	Pacific Queen	Not isolated
9/04/2003	CPH0390387	Centrewood, Blenheim	Cherry Grove Orchard	Jeffries Rd, RD3 Blenheim	3/04/2003	4/04/2003		2	Pacific Queen	Not isolated
9/04/2003	CPH0390387	Centrewood, Blenheim	Cherry Grove Orchard	Jeffries Rd, RD3 Blenheim	3/04/2003	4/04/2003		3	Pacific Queen	Not isolated
9/04/2003	CPH0390387	Centrewood, Blenheim	Cherry Grove Orchard	Jeffries Rd, RD3 Blenheim	3/04/2003	4/04/2003		4	Pacific Queen	Not isolated
9/04/2003	CPH0390387	Centrewood, Blenheim	Cherry Grove Orchard	Jeffries Rd, RD3 Blenheim	3/04/2003	4/04/2003		5	Pacific Queen	Not isolated
9/04/2003	CPH0390387	Centrewood, Blenheim	Greenfields Orchard	Muller Rd, Blenheim	3/04/2003	4/04/2003		1	Pacific Queen	Not isolated
9/04/2003	CPH0390387	Centrewood, Blenheim	Greenfields Orchard	Muller Rd, Blenheim	3/04/2003	4/04/2003		2	Pacific Queen	Not isolated
9/04/2003	CPH0390387	Centrewood, Blenheim	Greenfields Orchard	Muller Rd, Blenheim	3/04/2003	4/04/2003		3	Pacific Queen	Not isolated
9/04/2003	CPH0390387	Centrewood, Blenheim	Greenfields Orchard	Muller Rd, Blenheim	3/04/2003	4/04/2003		4	Pacific Queen	Not isolated
9/04/2003	CPH0390387	Centrewood, Blenheim	Greenfields Orchard	Muller Rd, Blenheim	3/04/2003	4/04/2003		5	Pacific Queen	Not isolated
9/04/2003	CPH0390387	Centrewood, Blenheim	De Castro Orchard	Muller Rd, Blenheim	24-28/03/03	4/04/2003		1	Braeburn	Not isolated
9/04/2003	CPH0390387	Centrewood, Blenheim	De Castro Orchard	Muller Rd, Blenheim	24-28/03/03	4/04/2003		2	Braeburn	Not isolated
9/04/2003	CPH0390387	Centrewood, Blenheim	De Castro Orchard	Muller Rd, Blenheim	24-28/03/03	4/04/2003		3	Braeburn	Not isolated
9/04/2003	CPH0390387	Centrewood, Blenheim	De Castro Orchard	Muller Rd, Blenheim	24-28/03/03	4/04/2003		4	Braeburn	Not isolated
9/04/2003	CPH0390387	Centrewood, Blenheim	De Castro Orchard	Muller Rd, Blenheim	24-	4/04/2003		5	Braeburn	Not

		Blenheim			28/03/03					isolated
10/04/2003	CPH0390400	Molyneux, Cromwell	Molyneux Orchard	Cnr Orchard Rd & State Highway 6	7/04/2003	7/04/2003		1	Fuji	Not isolated
10/04/2003	CPH0390400	Molyneux, Cromwell	Molyneux Orchard	Cnr Orchard Rd & State Highway 6	7/04/2003	7/04/2003		2	Fuji	Not isolated
10/04/2003	CPH0390400	Molyneux, Cromwell	Molyneux Orchard	Cnr Orchard Rd & State Highway 6	7/04/2003	7/04/2003		3	Fuji	Not isolated
10/04/2003	CPH0390400	Molyneux, Cromwell	Molyneux Orchard	Cnr Orchard Rd & State Highway 6	7/04/2003	7/04/2003		4	Fuji	Not isolated
10/04/2003	CPH0390400	Molyneux, Cromwell	Molyneux Orchard	Cnr Orchard Rd & State Highway 6	7/04/2003	7/04/2003		5	Fuji	Not isolated
10/04/2003	CPH0390400	Molyneux, Cromwell	Spingvale Orchard	Rockview Rd, Alexandra	7/04/2003	7/04/2003		1	Fuji	Not isolated
10/04/2003	CPH0390400	Molyneux, Cromwell	Spingvale Orchard	Rockview Rd, Alexandra	7/04/2003	7/04/2003		2	Fuji	Not isolated
10/04/2003	CPH0390400	Molyneux, Cromwell	Spingvale Orchard	Rockview Rd, Alexandra	7/04/2003	7/04/2003		3	Fuji	Not isolated
10/04/2003	CPH0390400	Molyneux, Cromwell	Spingvale Orchard	Rockview Rd, Alexandra	7/04/2003	7/04/2003		4	Fuji	Not isolated
10/04/2003	CPH0390400	Molyneux, Cromwell	Spingvale Orchard	Rockview Rd, Alexandra	7/04/2003	7/04/2003		5	Fuji	Not isolated
10/04/2003	AMC0391161	Mr Apple, Whakatu	R1487 Kenley Farm	116 Te Mata Mangateretere Rd, Hastings	5/04/2003	7/04/2003	6445	1	Braeburn	Not isolated
10/04/2003	AMC0391161	Mr Apple, Whakatu	R1487 Kenley Farm	116 Te Mata Mangateretere Rd, Hastings	5/04/2003	7/04/2003	6445	2	Braeburn	Not isolated
10/04/2003	AMC0391161	Mr Apple, Whakatu	R1487 Kenley Farm	116 Te Mata Mangateretere Rd, Hastings	5/04/2003	7/04/2003	6445	3	Braeburn	Not isolated
10/04/2003	AMC0391161	Mr Apple, Whakatu	R1487 Kenley Farm	116 Te Mata Mangateretere Rd, Hastings	5/04/2003	7/04/2003	6445	4	Braeburn	Not isolated
10/04/2003	AMC0391161	Mr Apple, Whakatu	R1487 Kenley Farm	116 Te Mata Mangateretere Rd, Hastings	5/04/2003	7/04/2003	6445	5	Braeburn	Not isolated
10/04/2003	AMC0391162	Mr Apple, Whakatu	R1400 Knight Partnership	149 Raupare Rd, Hastings	5/04/2003	7/04/2003	6443	1	Braeburn	Not isolated
10/04/2003	AMC0391162	Mr Apple, Whakatu	R1400 Knight Partnership	149 Raupare Rd, Hastings	5/04/2003	7/04/2003	6443	2	Braeburn	Not isolated

10/04/2003	AMC0391162	Mr Apple, Whakatu	R1400 Knight Partnership	149 Raupare Rd, Hastings	5/04/2003	7/04/2003	6443	3	Braeburn	Not isolated
10/04/2003	AMC0391162	Mr Apple, Whakatu	R1400 Knight Partnership	149 Raupare Rd, Hastings	5/04/2003	7/04/2003	6443	4	Braeburn	Not isolated
10/04/2003	AMC0391162	Mr Apple, Whakatu	R1400 Knight Partnership	149 Raupare Rd, Hastings	5/04/2003	7/04/2003	6443	5	Braeburn	Not isolated
10/04/2003	AMC0391163	Mr Apple, Whakatu	R1165 Aporonui Orchard	75 Palomino Rd, Hastings	3/04/2003	7/04/2003	6448	1	Braeburn	Not isolated
10/04/2003	AMC0391163	Mr Apple, Whakatu	R1165 Aporonui Orchard	75 Palomino Rd, Hastings	3/04/2003	7/04/2003	6448	2	Braeburn	Not isolated
10/04/2003	AMC0391163	Mr Apple, Whakatu	R1165 Aporonui Orchard	75 Palomino Rd, Hastings	3/04/2003	7/04/2003	6448	3	Braeburn	Not isolated
10/04/2003	AMC0391163	Mr Apple, Whakatu	R1165 Aporonui Orchard	75 Palomino Rd, Hastings	3/04/2003	7/04/2003	6448	4	Braeburn	Not isolated
10/04/2003	AMC0391163	Mr Apple, Whakatu	R1165 Aporonui Orchard	75 Palomino Rd, Hastings	3/04/2003	7/04/2003	6448	5	Braeburn	Not isolated
10/04/2003	AMC0391164	Mr Apple, Whakatu	R1240 Williams Family Trust	128 Longlands Rd, Hastings	3/04/2003	7/04/2003	6453	1	Braeburn	Not isolated
10/04/2003	AMC0391164	Mr Apple, Whakatu	R1240 Williams Family Trust	128 Longlands Rd, Hastings	3/04/2003	7/04/2003	6453	2	Braeburn	Not isolated
10/04/2003	AMC0391164	Mr Apple, Whakatu	R1240 Williams Family Trust	128 Longlands Rd, Hastings	3/04/2003	7/04/2003	6453	3	Braeburn	Not isolated
10/04/2003	AMC0391164	Mr Apple, Whakatu	R1240 Williams Family Trust	128 Longlands Rd, Hastings	3/04/2003	7/04/2003	6453	4	Braeburn	Not isolated
10/04/2003	AMC0391164	Mr Apple, Whakatu	R1240 Williams Family Trust	128 Longlands Rd, Hastings	3/04/2003	7/04/2003	6453	5	Braeburn	Not isolated
10/04/2003	AMC0391165	Mr Apple, Whakatu	R1401 Knight Partnership	York Rd, Hastings	3/04/2003	7/04/2003	6444	1	Braeburn	Not isolated
10/04/2003	AMC0391165	Mr Apple, Whakatu	R1401 Knight Partnership	York Rd, Hastings	3/04/2003	7/04/2003	6444	2	Braeburn	Not isolated
10/04/2003	AMC0391165	Mr Apple, Whakatu	R1401 Knight Partnership	York Rd, Hastings	3/04/2003	7/04/2003	6444	3	Braeburn	Not isolated
10/04/2003	AMC0391165	Mr Apple, Whakatu	R1401 Knight Partnership	York Rd, Hastings	3/04/2003	7/04/2003	6444	4	Braeburn	Not isolated
10/04/2003	AMC0391165	Mr Apple, Whakatu	R1401 Knight Partnership	York Rd, Hastings	3/04/2003	7/04/2003	6444	5	Braeburn	Not isolated

		Whakatu	Partnership							isolated
16/04/2003	CPH0390431	Molyneux, Cromwell	Springvale Orchard	Rockview Rd, Alexandra	9/04/2003	15/04/2003		1	Braeburn	Not isolated
16/04/2003	CPH0390431	Molyneux, Cromwell	Springvale Orchard	Rockview Rd, Alexandra	9/04/2003	15/04/2003		2	Braeburn	Not isolated
16/04/2003	CPH0390431	Molyneux, Cromwell	Springvale Orchard	Rockview Rd, Alexandra	9/04/2003	15/04/2003		3	Braeburn	Not isolated
16/04/2003	CPH0390431	Molyneux, Cromwell	Springvale Orchard	Rockview Rd, Alexandra	9/04/2003	15/04/2003		4	Braeburn	Not isolated
16/04/2003	CPH0390431	Molyneux, Cromwell	Springvale Orchard	Rockview Rd, Alexandra	9/04/2003	15/04/2003		5	Braeburn	Not isolated
16/04/2003	CPH0390431	Molyneux, Cromwell	JR Laing	Strode Rd, Alexandra	11/04/2003	15/04/2003		1	Braeburn	Not isolated
16/04/2003	CPH0390431	Molyneux, Cromwell	JR Laing	Strode Rd, Alexandra	11/04/2003	15/04/2003		2	Braeburn	Not isolated
16/04/2003	CPH0390431	Molyneux, Cromwell	JR Laing	Strode Rd, Alexandra	11/04/2003	15/04/2003		3	Braeburn	Not isolated
16/04/2003	CPH0390431	Molyneux, Cromwell	JR Laing	Strode Rd, Alexandra	11/04/2003	15/04/2003		4	Braeburn	Not isolated
16/04/2003	CPH0390431	Molyneux, Cromwell	JR Laing	Strode Rd, Alexandra	11/04/2003	15/04/2003		5	Braeburn	Not isolated
16/04/2003	CPH0390431	Molyneux, Cromwell	H & J Roberts	MacIntosh Rd, Earnscliffe, Alexandra	10/04/2003	15/04/2003		1	Braeburn	Not isolated
16/04/2003	CPH0390431	Molyneux, Cromwell	H & J Roberts	MacIntosh Rd, Earnscliffe, Alexandra	10/04/2003	15/04/2003		2	Braeburn	Not isolated
16/04/2003	CPH0390431	Molyneux, Cromwell	H & J Roberts	MacIntosh Rd, Earnscliffe, Alexandra	10/04/2003	15/04/2003		3	Braeburn	Not isolated
16/04/2003	CPH0390431	Molyneux, Cromwell	H & J Roberts	MacIntosh Rd, Earnscliffe, Alexandra	10/04/2003	15/04/2003		4	Braeburn	Not isolated
16/04/2003	CPH0390431	Molyneux, Cromwell	H & J Roberts	MacIntosh Rd, Earnscliffe, Alexandra	10/04/2003	15/04/2003		5	Braeburn	Not isolated
16/04/2003	AMC0391222	Mr Apple, Whakatu	R1165 Aporonui Orchard	75 Palomino Rd, Hastings	13/04/2003	15/04/2003		1	Braeburn	Not isolated
16/04/2003	AMC0391222	Mr Apple, Whakatu	R1165 Aporonui Orchard	75 Palomino Rd, Hastings	13/04/2003	15/04/2003		2	Braeburn	Not isolated

16/04/2003	AMC0391222	Mr Apple, Whakatu	R1165 Aporonui Orchard	75 Palomino Rd, Hastings	13/04/2003	15/04/2003		3	Braeburn	Not isolated
16/04/2003	AMC0391222	Mr Apple, Whakatu	R1165 Aporonui Orchard	75 Palomino Rd, Hastings	13/04/2003	15/04/2003		4	Braeburn	Not isolated
16/04/2003	AMC0391222	Mr Apple, Whakatu	R1165 Aporonui Orchard	75 Palomino Rd, Hastings	13/04/2003	15/04/2003		5	Braeburn	Not isolated
16/04/2003	AMC0391223	Mr Apple, Whakatu	R1401 Knight Partnership	York Rd, Hastings	10/04/2003	15/04/2003		1	Braeburn	Not isolated
16/04/2003	AMC0391223	Mr Apple, Whakatu	R1401 Knight Partnership	York Rd, Hastings	10/04/2003	15/04/2003		2	Braeburn	Not isolated
16/04/2003	AMC0391223	Mr Apple, Whakatu	R1401 Knight Partnership	York Rd, Hastings	10/04/2003	15/04/2003		3	Braeburn	Not isolated
16/04/2003	AMC0391223	Mr Apple, Whakatu	R1401 Knight Partnership	York Rd, Hastings	10/04/2003	15/04/2003		4	Braeburn	Not isolated
16/04/2003	AMC0391223	Mr Apple, Whakatu	R1401 Knight Partnership	York Rd, Hastings	10/04/2003	15/04/2003		5	Braeburn	Not isolated
16/04/2003	AMC0391224	Mr Apple, Whakatu	R1577 Camelot Orchard	141 Raupare Rd, Hastings	12/04/2003	15/04/2003		1	Braeburn	Not isolated
16/04/2003	AMC0391224	Mr Apple, Whakatu	R1577 Camelot Orchard	141 Raupare Rd, Hastings	12/04/2003	15/04/2003		2	Braeburn	Not isolated
16/04/2003	AMC0391224	Mr Apple, Whakatu	R1577 Camelot Orchard	141 Raupare Rd, Hastings	12/04/2003	15/04/2003		3	Braeburn	Not isolated
16/04/2003	AMC0391224	Mr Apple, Whakatu	R1577 Camelot Orchard	141 Raupare Rd, Hastings	12/04/2003	15/04/2003		4	Braeburn	Not isolated
16/04/2003	AMC0391224	Mr Apple, Whakatu	R1577 Camelot Orchard	141 Raupare Rd, Hastings	12/04/2003	15/04/2003		5	Braeburn	Not isolated
16/04/2003	AMC0391225	Mr Apple, Whakatu	R1756 Cooper Horticulture Ltd	NA	8/04/2003	15/04/2003		1	Braeburn	Not isolated
16/04/2003	AMC0391225	Mr Apple, Whakatu	R1756 Cooper Horticulture Ltd	NA	8/04/2003	15/04/2003		2	Braeburn	Not isolated
16/04/2003	AMC0391225	Mr Apple, Whakatu	R1756 Cooper Horticulture Ltd	NA	8/04/2003	15/04/2003		3	Braeburn	Not isolated
16/04/2003	AMC0391225	Mr Apple, Whakatu	R1756 Cooper Horticulture Ltd	NA	8/04/2003	15/04/2003		4	Braeburn	Not isolated
16/04/2003	AMC0391225	Mr Apple, Whakatu	R1756 Cooper Horticulture Ltd	NA	8/04/2003	15/04/2003		5	Braeburn	Not isolated

		Whakatu	Hortculture Ltd							isolated
16/04/2003	AMC0391226	Mr Apple, Whakatu	R1336 Thame Orchard	30 Lawn Rd, Hastings	12/04/2003	15/04/2003		1	Braeburn	Not isolated
16/04/2003	AMC0391226	Mr Apple, Whakatu	R1336 Thame Orchard	30 Lawn Rd, Hastings	12/04/2003	15/04/2003		2	Braeburn	Not isolated
16/04/2003	AMC0391226	Mr Apple, Whakatu	R1336 Thame Orchard	30 Lawn Rd, Hastings	12/04/2003	15/04/2003		3	Braeburn	Not isolated
16/04/2003	AMC0391226	Mr Apple, Whakatu	R1336 Thame Orchard	30 Lawn Rd, Hastings	12/04/2003	15/04/2003		4	Braeburn	Not isolated
16/04/2003	AMC0391226	Mr Apple, Whakatu	R1336 Thame Orchard	30 Lawn Rd, Hastings	12/04/2003	15/04/2003		5	Braeburn	Not isolated
1/05/2003	CPH0390477	Centrewood, Blenheim	Greenfields Orchard	Muller Rd, Blenheim	8-29/04/03	30/04/2003		1	Braeburn	Not isolated
1/05/2003	CPH0390477	Centrewood, Blenheim	Greenfields Orchard	Muller Rd, Blenheim	8-29/04/03	30/04/2003		2	Braeburn	Not isolated
1/05/2003	CPH0390477	Centrewood, Blenheim	Greenfields Orchard	Muller Rd, Blenheim	8-29/04/03	30/04/2003		3	Braeburn	Not isolated
1/05/2003	CPH0390477	Centrewood, Blenheim	Greenfields Orchard	Muller Rd, Blenheim	8-29/04/03	30/04/2003		4	Braeburn	Not isolated
1/05/2003	CPH0390477	Centrewood, Blenheim	Greenfields Orchard	Muller Rd, Blenheim	8-29/04/03	30/04/2003		5	Braeburn	Not isolated
1/05/2003	CPH0390477	Centrewood, Blenheim	Dashwood Grove	Redwood Pass Rd, Lower Dashwood, RD4, Blenheim	29/04/2003	30/04/2003		1	Braeburn	Not isolated
1/05/2003	CPH0390477	Centrewood, Blenheim	Dashwood Grove	Redwood Pass Rd, Lower Dashwood, RD4, Blenheim	29/04/2003	30/04/2003		2	Braeburn	Not isolated
1/05/2003	CPH0390477	Centrewood, Blenheim	Dashwood Grove	Redwood Pass Rd, Lower Dashwood, RD4, Blenheim	29/04/2003	30/04/2003		3	Braeburn	Not isolated
1/05/2003	CPH0390477	Centrewood, Blenheim	Dashwood Grove	Redwood Pass Rd, Lower Dashwood, RD4, Blenheim	29/04/2003	30/04/2003		4	Braeburn	Not isolated
1/05/2003	CPH0390477	Centrewood, Blenheim	Dashwood Grove	Redwood Pass Rd, Lower Dashwood, RD4, Blenheim	29/04/2003	30/04/2003		5	Braeburn	Not isolated
2/05/2003	AMC0391399	Mr Apple, Whakatu	R1152 Collstan Orchard	499 Lawn Rd, Hastings	23/04/2003	28/04/2003		1	Braeburn	Not isolated
2/05/2003	AMC0391399	Mr Apple, Whakatu	R1152 Collstan Orchard	499 Lawn Rd, Hastings	23/04/2003	28/04/2003		2	Braeburn	Not isolated

2/05/2003	AMC0391399	Mr Apple, Whakatu	R1152 Collstan Orchard	499 Lawn Rd, Hastings	23/04/2003	28/04/2003		3	Braeburn	Not isolated
2/05/2003	AMC0391399	Mr Apple, Whakatu	R1152 Collstan Orchard	499 Lawn Rd, Hastings	23/04/2003	28/04/2003		4	Braeburn	Not isolated
2/05/2003	AMC0391399	Mr Apple, Whakatu	R1152 Collstan Orchard	499 Lawn Rd, Hastings	23/04/2003	28/04/2003		5	Braeburn	Not isolated
2/05/2003	AMC0391397	Mr Apple, Whakatu	R1469 Pilos Orchard	468 Twyford Rd, Hastings	19/04/2003	28/04/2003		1	Pink Lady	Not isolated
2/05/2003	AMC0391397	Mr Apple, Whakatu	R1469 Pilos Orchard	468 Twyford Rd, Hastings	19/04/2003	28/04/2003		2	Pink Lady	Not isolated
2/05/2003	AMC0391397	Mr Apple, Whakatu	R1469 Pilos Orchard	468 Twyford Rd, Hastings	19/04/2003	28/04/2003		3	Pink Lady	Not isolated
2/05/2003	AMC0391397	Mr Apple, Whakatu	R1469 Pilos Orchard	468 Twyford Rd, Hastings	19/04/2003	28/04/2003		4	Pink Lady	Not isolated
2/05/2003	AMC0391397	Mr Apple, Whakatu	R1469 Pilos Orchard	468 Twyford Rd, Hastings	19/04/2003	28/04/2003		5	Pink Lady	Not isolated
2/05/2003	AMC0391398	Mr Apple, Whakatu	R1463 Close Orchard	334 SH2, Hastings	23/04/2003	28/04/2003		1	Pink Lady	Not isolated
2/05/2003	AMC0391398	Mr Apple, Whakatu	R1463 Close Orchard	334 SH2, Hastings	23/04/2003	28/04/2003		2	Pink Lady	Not isolated
2/05/2003	AMC0391398	Mr Apple, Whakatu	R1463 Close Orchard	334 SH2, Hastings	23/04/2003	28/04/2003		3	Pink Lady	Not isolated
2/05/2003	AMC0391398	Mr Apple, Whakatu	R1463 Close Orchard	334 SH2, Hastings	23/04/2003	28/04/2003		4	Pink Lady	Not isolated
2/05/2003	AMC0391398	Mr Apple, Whakatu	R1463 Close Orchard	334 SH2, Hastings	23/04/2003	28/04/2003		5	Pink Lady	Not isolated
7/05/2003	CPH0390500	Molyneux, Cromwell	JR Laing	Strode Rd, Alexandra	22/04/2003	28/04/2003		1	Braeburn	Not isolated
7/05/2003	CPH0390500	Molyneux, Cromwell	JR Laing	Strode Rd, Alexandra	22/04/2003	28/04/2003		2	Braeburn	Not isolated
7/05/2003	CPH0390500	Molyneux, Cromwell	JR Laing	Strode Rd, Alexandra	22/04/2003	28/04/2003		3	Braeburn	Not isolated
7/05/2003	CPH0390500	Molyneux, Cromwell	JR Laing	Strode Rd, Alexandra	22/04/2003	28/04/2003		4	Braeburn	Not isolated
7/05/2003	CPH0390500	Molyneux, Cromwell	JR Laing	Strode Rd, Alexandra	22/04/2003	28/04/2003		5	Braeburn	Not isolated

		Cromwell								isolated
7/05/2003	CPH0390500	Molyneux, Cromwell	Molyneux Orchard	Cnr Orchard Rd & StateHighway 6	16/04/2003	28/04/2003		1	Fuji	Not isolated
7/05/2003	CPH0390500	Molyneux, Cromwell	Molyneux Orchard	Cnr Orchard Rd & StateHighway 6	16/04/2003	28/04/2003		2	Fuji	Not isolated
7/05/2003	CPH0390500	Molyneux, Cromwell	Molyneux Orchard	Cnr Orchard Rd & StateHighway 6	16/04/2003	28/04/2003		3	Fuji	Not isolated
7/05/2003	CPH0390500	Molyneux, Cromwell	Molyneux Orchard	Cnr Orchard Rd & StateHighway 6	16/04/2003	28/04/2003		4	Fuji	Not isolated
7/05/2003	CPH0390500	Molyneux, Cromwell	Molyneux Orchard	Cnr Orchard Rd & StateHighway 6	16/04/2003	28/04/2003		5	Fuji	Not isolated
7/05/2003	CPH0390500	Molyneux, Cromwell	Molyneux Orchard	Cnr Orchard Rd & StateHighway 6	28/04/2030	5/05/2003		1	Braeburn	Not isolated
7/05/2003	CPH0390500	Molyneux, Cromwell	Molyneux Orchard	Cnr Orchard Rd & StateHighway 6	28/04/2030	5/05/2003		2	Braeburn	Not isolated
7/05/2003	CPH0390500	Molyneux, Cromwell	Molyneux Orchard	Cnr Orchard Rd & StateHighway 6	28/04/2030	5/05/2003		3	Braeburn	Not isolated
7/05/2003	CPH0390500	Molyneux, Cromwell	Molyneux Orchard	Cnr Orchard Rd & StateHighway 6	28/04/2030	5/05/2003		4	Braeburn	Not isolated
7/05/2003	CPH0390500	Molyneux, Cromwell	Molyneux Orchard	Cnr Orchard Rd & StateHighway 6	28/04/2030	5/05/2003		5	Braeburn	Not isolated
7/05/2003	CPH0390500	Molyneux, Cromwell	JR Laing	Strode Rd, Alexandra	17/04/2003	5/05/2003		1	Braeburn	Not isolated
7/05/2003	CPH0390500	Molyneux, Cromwell	JR Laing	Strode Rd, Alexandra	17/04/2003	5/05/2003		2	Braeburn	Not isolated
7/05/2003	CPH0390500	Molyneux, Cromwell	JR Laing	Strode Rd, Alexandra	17/04/2003	5/05/2003		3	Braeburn	Not isolated
7/05/2003	CPH0390500	Molyneux, Cromwell	JR Laing	Strode Rd, Alexandra	17/04/2003	5/05/2003		4	Braeburn	Not isolated

# This batch of 5 organic Braeburn apple samples was tested positive for *Salmonella* Typhimurium DT12a. As it was a pooled test of the five smaller 35 ml rinse portions it was unsure which sample contributed the *Salmonella* cell or cells to the test.