Risk Management Proposal:
Fresh Table Grapes for Consumption, 
(Vitis vinifera L.)
from Peru

FOR PUBLIC CONSULTATION

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Import and Export Standards
Ministry of Agriculture and Forestry

Risk Management Proposal: Fresh Table Grapes for Consumption from Peru

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# Contents

- **Purpose** .......................................................... 4
- **Background** ..................................................... 4
  - *Commodity description* ............................................ 4
  - *Source information used for the risk management proposal* ..................................................... 4
- **Objective** .......................................................... 5
- **Risk assessment** .................................................. 5
  - *Identified risk organism groups* ........................................ 5
- **Risk management** ............................................... 7
  - *Summary of proposed risk management measures* ..................................................... 7
  - *Specific risk management measures proposed* ..................................................... 7
- **Phytosanitary inspection and certification by SENASA** ..................................................... 10
- **Verification inspection on arrival in New Zealand** ..................................................... 10
- **Auditing** ........................................................... 10
- **Summary of the table grape export pathway from Peru** ..................................................... 11
- **Proposed import health standard requirements** ..................................................... 12
  - *Pre-shipment requirements* ..................................................... 12
  - *Phytosanitary measures* ..................................................... 12
  - *Inspection of the consignment* ..................................................... 12
  - *Transit requirements* ..................................................... 12
  - *Documentation* ..................................................... 12
- **References** ........................................................ 14
- **Appendix 1: The end to end phytosanitary export process with Critical Control Points** ........... 17
- **Appendix 2: Risk organisms** .......................................... 20
Purpose

The purpose of this document is to:

- Provide a summary of the risks associated with the import of fresh table grapes (*Vitis vinifera* L) for human consumption from Peru
- Provide a rationale for the preferred phytosanitary measures considered for managing the risks
- Seek stakeholder feedback on the proposed phytosanitary measures in this risk management proposal (RMP) for the importing requirements for fresh table grapes (*Vitis vinifera* L) for human consumption from Peru to New Zealand.

Background

New Zealand is responding to a market access request for fresh table grapes (*Vitis vinifera* L) for human consumption from Peru. This pathway has the potential to introduce regulated organisms to New Zealand and therefore a risk assessment was conducted to determine the appropriate phytosanitary measures proposed in this document.

Commodity description

The commodity description “table grapes” for human consumption is defined as commercially produced grapes (berries) with pedicel and peduncle, but without tendrils, stems, leaves, roots or any other plant parts.

Source information used for the risk management proposal

The assessment of the risks and appropriate measures draws on the significant body of information that already exists for this commodity and country. The following documents were used to identify risk organism groups on the table grape export pathway to New Zealand from Peru and appropriate measures to mitigate their risk of entry and establishment in New Zealand;

- The New Zealand Ministry of Agriculture and Forestry (MAF) import risk analysis (IRA) for the importation of table grapes from China (MAFBNZ 2009a);
- The United States Department of Agriculture IRA for table grapes from the Republic of Korea into the USA (Hanken 2000, revised 2002);
- Biosecurity Australia’s IRA for Table Grapes from Chile into Australia (Biosecurity Australia 2005);
- Organism specific information from the MAF IRAs for the importation of Pears from China (MAFBNZ 2009c), the importation of Litchi from Taiwan (MAFBNZ 2007), the importation of Citrus fruit from Samoa (MAFBNZ 2008a), the importation of stonefruit from the Pacific NorthWest (MAFBNZ 2009d) and spiders associated with table grapes from the USA (Reed & Newland 2002);
- Current MAF import health standards (IHSs) for table grapes from Chile, Australia, Italy, China, USA and Mexico (MAF IHS 152-02) and historic trade information;
- MAF interception database records (QuanCargo) of organisms intercepted at the New Zealand border on imported table grapes (MAFBNZ 2009b);
- Phytosanitary Information of Fresh Grapes (*Vitis vinifera* L) Cultivation in Peru, 2010 and additional information May 2011. SENASA; Organism, commodity and pathway information.
A pathway assessment for table grapes conducted by MAF in November 2011 in Peru. Table grape production sites and packhouses were included in this assessment.

A general literature and internet search.

Objective

The objective of phytosanitary measures is to effectively manage known risks associated with the importation of fresh table grapes (*Vitis vinifera* L) for human consumption from Peru, in a way that is consistent with New Zealand’s domestic legislation and international obligations under Article 3.1 of the WTO Agreement on the Application of Sanitary and Phytosanitary Measures (the SPS Agreement) ([WTO 1995](#)).

Risk assessment

**Identified risk organism groups**

Risk organisms identified as being associated with table grapes from Peru were grouped according to life cycle traits (for example internal or external fruit feeders) and physical characteristics of the organism. Within each group, there are organisms which have been the subject of previous risk assessments conducted by MAF. These risk assessments were conducted for different pathways (for example table grapes from China). Detailed information on specific organisms can be found in the documents referred to in the section Source information.

The risk organisms are allocated into one of three groups as depicted in Table 1.

Criteria for risk organisms to New Zealand (Appendix 2);

1. present in Peru and absent from New Zealand (or under official control), and
2. likely to be present on the pathway if risk was unmitigated, and
3. known to be associated with fruit (as per previous risk analyses), and
4. their hosts included species present in New Zealand, and
5. climatically able to establish in New Zealand, and/or
6. likely to cause high economic impact to New Zealand (e.g. fruit fly).

Tephritidae fruit flies are assessed as high risk organisms as any incursions of fruit fly would disrupt trade and potentially mean large economic losses for New Zealand exporters of fruit fly host material.

**Table 1: Risk organism groups associated with table grapes from Peru.**

<table>
<thead>
<tr>
<th>Risk organism group</th>
<th>Risk organisms (which require specific measures)</th>
</tr>
</thead>
<tbody>
<tr>
<td>External arthropods</td>
<td><em>Ferrisia virgata</em></td>
</tr>
<tr>
<td>- Cryptic, mobile organisms</td>
<td><em>Chrysomphalus dictyospermi</em></td>
</tr>
<tr>
<td>- Cryptic, non-mobile organisms</td>
<td><em>Pseudaulacaspis pentagona</em></td>
</tr>
<tr>
<td>Internal arthropods</td>
<td><em>Ceratitis capitata</em></td>
</tr>
<tr>
<td></td>
<td><em>Anastrepha fraterculus</em></td>
</tr>
<tr>
<td>Hitchhikers</td>
<td><em>Latrodectus geometricus</em></td>
</tr>
<tr>
<td></td>
<td><em>Latrodectus mactans</em></td>
</tr>
</tbody>
</table>
External arthropods

1. Cryptic and/or small mobile organisms

The organisms in this group are small, not highly conspicuous and detection may require optical enhancement. The main life stage that is associated with table grapes is mobile and is capable of moving between fruit and moving off fruit by its own means, however the distance travelled by these organisms is often relatively small.

The risk for *F. virgata* was assessed on litchi from Taiwan and citrus from Samoa (MAFBNZ 2007; MAFBNZ 2008a) and the likelihood of entry of *F. virgata* was considered moderate to high. The likelihood and economic consequences of establishment are considered moderate. This organism is present in Peru and is monitored for in other production systems (Medina, 2008).

2. Cryptic and/or small non-mobile organisms

The organisms in this group are small, not very conspicuous and detection may require optical enhancement. The main life stage that is associated with table grapes is non-mobile. When fruit is disposed of, the risk organism is not capable of moving from the fruit, unless it develops into the mobile life stage (only capable of moving relatively small distances), which means the fruit needs to stay in a condition that allows further development.

A full assessment of the risks of the following organisms have been conducted previously; *C. dictyospermi* on pears from China and *P. pentagona* on citrus from Samoa (MAFBNZ 2009c; MAFBNZ 2009d). The likelihoods of entry were considered to be low (based on low population levels) and the likelihoods of establishment were considered moderate. The potential economic consequences of establishment of *C. dictyospermi* or *P. pentagona* in New Zealand were considered moderate (MAFBNZ 2009c; MAFBNZ 2009d). These organisms are present in Peru and are monitored for in other production systems (CPC, 2010; Medina, 2008; Meneses, 2007; Watson, 2006).

Internal arthropods

The life stages of this group, that are associated with the fruit, feed within the fruit, and therefore can only move limited distances. Detection of organisms in this group is limited, but often frass, external damage or secondary infections are more obvious signs of infestation. The larvae inside the fruit need to develop into adults for dispersal. After the fruit has been discarded it needs to stay in a condition that allows the further development of larvae into adults. Some larvae are capable of very limited dispersal if the fruit becomes unsuitable.

The two Tephritidae fruit fly family species in Peru of major phytosanitary concern to New Zealand (Genera: *Anastrepha, Ceratitis*) have not been assessed by MAF for table grapes previously, but other fruit flies of phytosanitary concern with similar biology and expected economic consequences have been assessed. For instance, *Bactrocera dorsalis* was assessed on table grapes from China (MAFBNZ 2009a). The likelihood of entry was considered moderate on that pathway and the likelihood of establishment was also considered moderate. The economic consequence of establishment of *B. dorsalis* in New Zealand was considered high (MAFBNZ 2009a). *Bactrocera kirki* and *Bactrocera xanthodes* are considered risk organisms on citrus from Samoa. The likelihood of establishment is high and the economic consequences are considered high (MAFBNZ 2008a). In general, the entry and establishment of Tephritidae fruit flies is considered to have high to severe economic consequences.
**Hitchhikers**

There is evidence of an opportunistic association between table grapes and hitchhiker organisms including spiders. There were 10 border interceptions and 47 post-border detections of spiders, spiderlings or eggs from imported table grapes to New Zealand during the period 2000–2001 (MAFBNZ, 2009b).

A MAF pest risk assessment identified spiders as hitchhiker species on table grapes (Reed & Newland, 2002). *Latrodectus* spp. were intercepted or detected 12 times during the 2000–2001 season with *Latrodectus mactans* being intercepted four times (Reed & Newland, 2002).

*L. mactans* has been recorded on grapevines associated with the berries although it does not feed on the berries. An assessment on table grapes from China identified this spider as a risk organism (MAFBNZ 2009a). The likelihood of entry was considered to be low to moderate. The likelihood of establishment was considered to be moderate to high. The potential economic consequences are considered to be low, while the potential environmental consequences are considered to be moderate. The potential human health consequences of establishment are considered to be high.

**Risk management**

**Summary of proposed risk management measures**

This RMP outlines a combination of phytosanitary measures, including mandatory measures such as phytosanitary inspection, for regulated organisms to New Zealand. The phytosanitary measures proposed below are aligned with current standards and the pre and post harvest practices in the exporting country, where this alignment is possible without compromising New Zealand’s biosecurity.

- **pest free area or a systems approach** (vineyard and packhouse registration, pest management and monitoring, packing management, visual inspection and remedial action) and **cold disinfestation** for fruit flies

AND

- **a systems approach** (including field inspection and inspection in line by SENASA) for hitchhiker organisms including spiders

AND

- **a systems approach** for *Chrysomphalus dictyospermi*, *Ferrisia virgata* and *Pseudaulacaspis pentagona*

AND

- **pre-export phytosanitary inspection and certification**. SENASA to have in place a supporting operational system to maintain and verify the phytosanitary status of consignments

Note: Only table grapes produced in accordance with the official assurance programme (OAP) and import health standard (IHS) and certified with a phytosanitary certificate may be imported into New Zealand from Peru and MAF will verify this with inspection on arrival.

The essential critical control points (CCPs) of the proposed phytosanitary measures across the pathway are described in the “proposed pathway description” (Figure 1) and in the accompanying monitoring and verification procedures (Appendix 1). These CCPs will form the basis of the OAP between Peru and New Zealand.

**Specific risk management measures proposed**

**Pest free area**
Methods and procedures to verify any established pest free area for fruit flies must be in accordance with ISPM 26 (IPPC 2006) and will be in the OAP. The procedures should include monitoring for fruit flies, outbreak criteria, emergency pest control measures and reinstatement criteria.

For all risk organisms, pest free area will be based on research data to establish that table grape growing areas are free of the risk organism. The programme should include trapping, monitoring and methods for specimen identification. The establishment of pest free areas should be in alignment with the international standards ISPM 4 (IPPC 1996) and/or ISPM 10 (IPPC 1999).

**A systems approach**

A systems approach requires two or more phytosanitary measures that are independent of each other. In principle, systems approaches should be composed of a combination of phytosanitary measures that are possible to implement within the exporting country. The combination of these phytosanitary measures reduces the risk to an acceptable level. The systems approach should be in accordance with ISPM 14 (IPPC 2002).

The essential critical control points (CCPs) of the proposed systems approach are described below and identified in the “proposed pathway description” (Figure 1) and accompanying monitoring and verification procedures (Appendix 1).

- **Vineyard registration**

  SENASA, as the designated National Plant Protection Organisation (NPPO) for Peru will register all commercial vineyards producing table grapes for export to New Zealand prior to the commencement of the growing season. Only commercially produced table grapes may be imported into New Zealand. SENASA will verify vineyards are complying with the export programme/workplan agreed between Peru and New Zealand prior to the export season and during the export season. Registration is required to ensure approved production procedures are followed and provide product traceability along the export pathway.

- **Packhouse/Cold storage/Treatment facility registration**

  SENASA will register all packing, cold storage and treatment facilities processing table grapes for export to New Zealand prior to the commencement of the growing season. SENASA will verify packing and cold storage facilities are compliant with packhouse operations, and sanitation procedures are compliant with the export programme/workplan agreed upon between Peru and New Zealand. Packhouse, cold storage and treatment facility registration is expected to limit the presence of attracted and packhouse associated hitchhikers and allow trace-back information in the event of non-compliance.

- **Integrated pest management**

  All registered vineyards will implement pest control activities and an integrated pest management (IPM) and monitoring programme as outlined in the export programme/workplan agreed upon between Peru and New Zealand. Chemical, biological and cultural control measures are applied when needed and may be dependent on the results of the pest and disease monitoring. Records of control measures are retained.

  All diseased and infected plants/plant parts will be removed and destroyed. Vineyards are to have programmes in place for weed control and pruning. The use of pesticide treatments is limited to prevent the development of pesticide resistance. This general approach is expected to limit the presence of all risk organism groups.

- **Monitoring and surveillance activities**
Vineyards must be monitored by a SENASA accredited person from the start of fruit formation for the presence of *F. virgata, C. dictyospermi, P. pentagona, C. capitata, A. fraterculus* and other Tephritidae fruit flies of concern (*Anastrepha* spp., *Bactrocera* spp., *Ceratitis* spp. and *Rhagoletis* spp.) and surveillance for all Tephritidae fruit flies. The inspection rates must be increased when pest populations increase due to climatic conditions or a decrease in natural predator populations. When required, chemical controls must be applied according to a SENASA approved integrated pest control programme. This step is considered to verify very low to negligible prevalence of high risk organisms.

- **Visual inspection**

Visual inspection of fruit occurs at several points during the routine production and post-harvest pathway for table grapes from Peru. These include:

- In-field monitoring during the growing season;
- Harvesting;
- Sorting and grading;
- Packaging of fruit for export;
- Visual phytosanitary inspection.

NB: The visual phytosanitary inspection is required to verify the efficacy of any treatments before export for the purpose of official assurance.

All export consignments must be inspected during grading and packing by SENASA staff using appropriate optical enhancement (for example 10x magnification with illumination). Technical staff must be trained to recognise regulated organisms and diseases of concern to New Zealand as depicted in Appendix 2. Fruit must be visually examined for signs of damage to the skin or risk organism infestations and to remove any contamination during grading at the packhouse. Any associated extraneous plant material, weed seeds or trash must also be removed during the inspection/packaging grading processes. Fallen fruit or any fruit showing indications of pests or diseases, for example deformity, damaged or broken skin, frass, infestation or infection are not eligible for export to New Zealand. This includes signs of infection or infestation on the pedicel or peduncle.

- **Packaging**

Table grapes from Peru to be packed in new unused boxes with each box labelled identifying vineyard, lot, date and size (SENASA 2011). The packaging used should prevent reinfestation of the table grape bunches. This step is considered necessary to prevent reinfestation and provide traceability if needed for non-compliances.

**Cold disinfection for fruit fly**

*Ceratitis capitata* and *Anastrepha fraterculus* are Tephritidae fruit flies of concern on table grapes from Peru (SENASA 2010). *C. capitata* is also present in Australia, and the current import requirements for table grapes from Australia are as follows: The core temperature of the fruit pulp to be held continuously at one of the following temperature/time combinations immediately before export or in transit, 0°C or below for 13 days or 1°C for 16 days.

The USA requires table grapes from Peru to be cold treated in transit against *C. capitata* and *A. fraterculus* at the upper limit of 1.67°C for 17 days.

To mitigate the risks of *C. capitata* and *A. fraterculus* table grapes from Peru must be treated according to the schedule as follows. The core temperature of the fruit pulp needs to be held continuously at one of the following temperature/time combinations during transit to New Zealand:
<table>
<thead>
<tr>
<th>≤1.11°C</th>
<th>≤1.67°C</th>
</tr>
</thead>
<tbody>
<tr>
<td>15 days</td>
<td>17 days</td>
</tr>
</tbody>
</table>

**Phytosanitary inspection and certification by SENASA**

All consignments must be sampled and visually inspected for regulated organisms prior to phytosanitary certification by the exporting NPPO. Where a regulated organism is detected, appropriate management action will be conducted, or the fruit will not be exported to New Zealand. In the event that no regulated organisms are found and all requirements of the IHS and OAP have been met, a phytosanitary certificate will be issued, which should be in accordance with the IHS and ISPM 7 (IPPC 2011).

**Verification inspection on arrival in New Zealand**

MAF may inspect a sample taken from each lot on arrival in New Zealand to verify efficacy of pest management actions undertaken. The sampling procedure will be in accordance with section 4.4 of the MAF IHS 152-02 for the importation and clearance of fresh fruit and vegetables into New Zealand. If a treatment has failed, or regulated organisms, extraneous plant material, weed seeds or trash are intercepted, one or more of the following actions will be undertaken: re-sorting of the consignment, treatment where an efficacious treatment is available, re-shipment or destruction of the consignment and/or the temporary suspension of the pathway on the detection of risk organisms for which pre-export phytosanitary measures are required. The suspension will continue until the cause of the non-compliance has been identified and corrective actions have been implemented and approved by MAF.

Note: Independent of the measures, phytosanitary sample inspection by the NPPO of Peru and verification inspection upon arrival in New Zealand by MAF will take place.

**Auditing**

MAF will monitor interceptions of regulated pests including hitchhikers and the appropriateness/effectiveness of phytosanitary measures on the commencement of trade. Hitchhiker pests have their regulatory status classified on the MAF Biosecurity Organisms Register for Imported Commodities (BORIC) (http://www.maf.govt.nz/biosecurity/pests-diseases/registers-lists/boric/).

**Figure 1: Proposed export pathway**
Summary of the table grape export pathway from Peru

Pathway description

Peru’s Ministry of Agriculture’s National Agricultural Health Service (SENASA) has provided MAF with information regarding the table grapes commodity, production system, and pests and diseases. This information, together with standard practices, was used to compile the proposed pathway description (see Figure 1). The proposed phytosanitary export process outlining the critical control points in the proposed pathway is described in Appendix 1.

1. Table grape vineyards are required to be registered with SENASA and meet SENASA export programme standards before the season starts to be approved for export. For in-field pest and disease control, only agricultural chemicals registered with SENASA are used, providing they meet New Zealand’s import standards. Where pest free area is the management measure being used, monitoring records are to be available as evidence to support the pest free status of that area.

2. Table grapes are harvested from October to March. Each bunch is inspected at harvest before being transported to the packhouse. The table grapes are transported to the fumigation chambers to be treated for botrytis with 500g SO$_2$ at 22\(^{\circ}\)C for 11 mins. Packhouses receive table grapes from registered growers and lots are identified by vineyard/production unit code/variety/date of harvest for traceability.

3. The table grapes are packed in SENASA-registered packing houses, damaged or infested/infected fruits are removed and destroyed. SENASA inspectors inspect bunches for the presence of spiders at this stage. The table grapes are packed into carton boxes in different packaging dependent on the market. Cartons have SO$_2$ pads added and are monitored to prevent infestation by contaminating organisms. Cartons exhibit traceability labels identifying vineyard/production unit code/variety/date of harvest. The table grapes are pre-cooled for 8 hours and then stored at a pulp temperature of 1°C to 1.5°C. The cold disinfestation for fruit fly is undertaken in transit.

4. SENASA performs the phytosanitary inspection of the table grapes in the coldroom. If no pests/diseases are found, the refrigerated container is closed and sealed and SENASA issues the phytosanitary certificate and the table grapes are cleared for export to New Zealand.

5. Export documents including the phytosanitary certificate specifying any treatment and accompany each consignment that is either air or sea freighted. Cold disinfestation is performed in transit and SENASA verifies that the temperature probes are calibrated, placed correctly in fruit pulp and the temperature recorder is working.

6. Fruit and relevant export documents are examined in New Zealand by MAF inspectors to ensure compliance with New Zealand’s phytosanitary requirements.

7. Any consignment not complying with New Zealand’s phytosanitary requirements is treated, resorted, re-shipped or destroyed. The exporting country is notified of the non-compliance.

8. Fruit receiving biosecurity clearance is able to be distributed by the importer.
Proposed import health standard requirements

Phytosanitary measures to manage the risk of regulated organisms on the table grape import pathway are the use of pest free areas, a systems approach with critical control points for high risk regulated organisms and hitchhiker organisms including spiders and a systems approach and cold disinfestation treatment for fruit flies.

The measures directed against the high risk regulated organisms are considered to also manage the risk posed by other potential risk organisms on the pathway. If (part of) the critical control points of the systems approach are not performed or if equivalent measures are preferred, specific risks can be managed by equivalent measures following assessment and approval by MAF. Other risk management measures will be assessed as equivalent measures, when supporting evidence is provided in accordance with ISPM 24 (IPPC 2005).

Based on the evaluation of the phytosanitary measures proposed for the management of regulated organisms and regulated organism groups, the following specific import conditions for table grapes (Commodity Sub-Class: Fresh Fruit/ Vegetables) from Peru are recommended including additional declarations to be included on the phytosanitary certificate:

**Pre-shipment requirements**

Only table grapes commercially produced in accordance with the OAP and IHS and certified on a phytosanitary certificate may be imported into New Zealand from Peru.

**Phytosanitary measures**

MAF requires the NPPO of Peru to undertake pest control activities that are effective against high risk regulated organisms prior to the commodity arriving in New Zealand and phytosanitary certification will need to attest to this accordingly. The high risk regulated organisms are: *Anastrepha fraterculus, Ceratitis capitata, Chrysomphalus dictyospermi, Ferrisia virgata, Latrodectus geometricus, Latrodectus mactans* and *Pseudaulacaspis pentagona*.

**Inspection of the consignment**

MAF requires the NPPO of Peru to sample and visually inspect the consignment according to official procedures for all the regulated organisms specified by MAF. A phytosanitary certificate should not be issued if live regulated organism(s) or “unlisted” organism(s) are detected, unless the consignment is effectively treated.

**Transit requirements**

The NPPO of Peru must ensure that the consignment (prior to export) is held and transported in a manner to ensure that infestation or reinfestation does not occur following phytosanitary certification.

**Documentation**

**Official Assurance Programme:** Table grapes may only be imported into New Zealand from Peru under the terms of the OAP between New Zealand and Peru.

**Phytosanitary certificate:** Required and issued by the NPPO of Peru when satisfied that the phytosanitary activities required by MAF have been met.
**Additional declarations to the phytosanitary certificate**

(i) “The table grapes in this consignment have undergone pest control activities effective against *Anastrepha fraterculus*, *Ceratitis capitata*, *Chrysomphalus dictyospermi*, *Ferrisia virgata*, *Latrodectus geometricus*, *Latrodectus mactans* and *Pseudaulacaspis pentagona* in accordance with the Official Assurance Programme”

AND

(ii) “The table grapes in this consignment have been treated in accordance with Section 3.1 of the Official Assurance Programme between the New Zealand Ministry of Agriculture and Forestry and the Peruvian Ministerio de Agricultura Servicio Nacional de Sanidad Agraria, concerning the access of host material of economically significant fruit fly species from Peru to New Zealand.”

Note: Full details of the treatments must be included in the “disinfestation and/or disinfection treatment” area of the phytosanitary certificate or as an endorsed attachment to the phytosanitary certificate. Details of the treatment duration and/or temperature must be recorded. For any cold disinfestation completed in-transit; printouts of all temperature sensors or direct electronic downloads must be made available to MAF at the port of arrival in New Zealand for final phytosanitary clearance of the container.
References

Biosecurity Australia (2005) Final Report for the Import Risk Analysis for Table Grapes from Chile. Biosecurity Australia, Canberra, Australia.


MAFBNZ (2009b) Analysis And Profiling Group’s Interception Database. New Zealand Ministry of Agriculture and Forestry.


PPIN. Plant Pest Information Network, MAF Database Date indicated.

Reed, C., Newland, S. (2002) Pest Risk Assessment: Spiders Associated With Table Grapes from United States of America (State Of California), Australia, Mexico and Chile. MAF Biosecurity, Ministry of Agriculture and Forestry; Wellington, New Zealand.


SENASA (2011). Export programme documentation and the National fruit fly control and eradication programme.


### Appendix 1: The end to end phytosanitary export process with Critical Control Points

This summary identifies points, steps and/or procedures where control can be applied to prevent or minimise risk to an acceptable level. Critical control points that are required by MAF as part of the Official Assurance Programme (OAP) agreed with Peru are mentioned in the last column.

<table>
<thead>
<tr>
<th>Pathway Step</th>
<th>Description of Measures</th>
<th>Risk organisms targeted</th>
<th>Risk Management Outcomes</th>
<th>Monitoring procedures (who, what, when, how)</th>
<th>Verification procedures i.e. objective evidence (who, what, other)</th>
<th>Related Documentation Standards/Agreements</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Production (1)</strong></td>
<td></td>
<td></td>
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<tr>
<td>In-field pest control</td>
<td>IPM strategies used for the control of pests (briefly described above)</td>
<td>External arthropods Cryptic, mobile organisms Cryptic, non-mobile organisms Internal organisms Hitchhikers</td>
<td>Low infestation/ infection of fruit</td>
<td>Technical specialists visit and advise growers of pest control measures during growing season.</td>
<td>SENASA verification procedures e.g. checks of grower records, spray diaries, grower training records etc.</td>
<td>SENASA standard for pest management</td>
</tr>
<tr>
<td></td>
<td>Specific control programmes for fruit fly, weevils, scales, mealybugs, Lepidoptera and fungal pathogens</td>
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<td>SENASA grower export approval</td>
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<td>Valid orchard registration number</td>
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<td>Export programme/workplan</td>
</tr>
<tr>
<td>Specific monitoring activities</td>
<td>Specific monitoring activities for the high risk organisms of concern</td>
<td>A. fraterculus C. capitata C. diotyospermi F. virgata Hitchhikers including L. geometricus and L. mactans P. pentagona Other Tephritidae fruit flies</td>
<td>Validation of pest freedom areas and/or low infestation rates</td>
<td>Vineyards are monitored on a regular basis by technical staff for the presence of the high risk organisms.</td>
<td>SENASA verification procedures e.g. grower records, in-season grower audits</td>
<td>Export programme/workplan</td>
</tr>
<tr>
<td><strong>Harvest &amp; transport (2)</strong></td>
<td></td>
<td></td>
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<tr>
<td>To pack house</td>
<td>Registered and export approved growers transport fruit to approved pack houses</td>
<td>Fruit from registered growers accepted by approved pack houses.</td>
<td>Pack house staff check grower export registration on arrival of fruit at pack house</td>
<td>SENASA verification procedures e.g. SENASA vineyard and pack house approvals</td>
<td></td>
<td>SENASA vineyard and pack house approvals</td>
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<td></td>
<td>Register of growers/orchards eligible to export to NZ</td>
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<td>SENASA registered pack house export approval</td>
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<td>Export programme/workplan</td>
</tr>
<tr>
<td>Pack House Processing (3)</td>
<td>Fruit inspected by SENASA or treated with sulphur dioxide/CO₂ fumigation upon entering the pack house</td>
<td>Hitchhikers including L. geometricus and L. mactans External arthropods</td>
<td>Extremely low to negligible presence of spiders on fruit</td>
<td>Pack house staff ensure all incoming grapes are treated according to schedule</td>
<td>Packhouse procedures SENASA verification procedures.</td>
<td>Packhouse procedures</td>
</tr>
<tr>
<td>SENASA inspection or Sulphur dioxide/CO₂ fumigation</td>
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<td>Export programme/workplan</td>
</tr>
</tbody>
</table>

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1 Critical control points – points in the production and/or post-production chain where it is essential (and a requirement by MAF) to control or remove risk organisms
<table>
<thead>
<tr>
<th>Pathway Step</th>
<th>Description of Measures</th>
<th>Risk organisms targeted</th>
<th>Risk Management Outcomes</th>
<th>Monitoring procedures (who, what, when, how)</th>
<th>Verification procedures i.e. objective evidence (who, what, other)</th>
<th>Related Documentation Standards/Agreements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pack House Processing (3) Sorting/Grading</td>
<td>Infected/infested fruit removed</td>
<td>External arthropods Hitchhikers including <em>L. geometricus</em> and <em>L. mactans</em></td>
<td>Removal of all visually detectable/symptomatic infected/infested fruit</td>
<td>Pack house staff remove infected/infested fruit by hand, segregate it and clearly label for disposal</td>
<td>SENASA verification procedures e.g. checks of segregation of non-compliant fruit</td>
<td>Documented pack house procedures, Export programme/workplan</td>
</tr>
<tr>
<td>Pack House Processing (3)</td>
<td>Visual inspection</td>
<td>Visual inspection by technical packhouse staff using optical enhancement</td>
<td>Removal of all infested fruit or fruit showing signs of deformity or infestations</td>
<td>Pack house staff remove any fruit showing signs of infestation, infection or damage.</td>
<td>SENASA verification procedures e.g. checks of segregation of non-compliant fruit, records of pests and pathogens found. Facility cleaned and secured against pest introduction</td>
<td>Documented pack house procedures, Export programme/workplan</td>
</tr>
<tr>
<td>Pack House Processing (3) Packaging &amp; Labelling</td>
<td>Only graded and visually inspected fruit is packed into clean cartons in a way that prevents infestation by contaminating organisms. Cartons show relevant, accurate traceability information.</td>
<td>[Reinfesting] internal and external arthropods and fruit pathogens</td>
<td>No reinfestation of packaged fruit can occur Traceability information allows product to be traced back and traced forward</td>
<td>Pack house staff only pack graded and visually inspected fruit into clean cartons Pack house staff use insect-proof cartons, add SO₂ pads and clearly label cartons with traceability information.</td>
<td>SENASA staff visually inspect fruit for pests &amp; pathogens and check traceability information.</td>
<td>Documented pack house procedures, Export programme/workplan</td>
</tr>
<tr>
<td>Phytosanitary inspection (4)</td>
<td>A visual phytosanitary inspection of the appropriate sample size to verify that the measures at the above critical control points have been applied effectively</td>
<td>External arthropods Cryptic mobile organisms Cryptic sessile organisms Internal arthropods Hitchhikers including <em>L. geometricus</em> and <em>L. mactans</em></td>
<td>Fruit is free of detectable fruit pests and pathogens. Traceability information is correct and cartons are pest proof.</td>
<td>SENASA staff visually inspect fruit for pests &amp; pathogens and check traceability information prior to transport to NZ. Fruit is rejected/resorted/ treated if requirements are not met.</td>
<td>SENASA verify that all fruit has undergone above critical control point measures and that traceability information is correct.</td>
<td>Export programme/workplan</td>
</tr>
<tr>
<td>Pathway Step</td>
<td>Description of Measures</td>
<td>Risk organisms targeted</td>
<td>Risk Management Outcomes</td>
<td>Monitoring procedures (who, what, when, how)</td>
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<tr>
<td>Post-certification product security (4)</td>
<td>Fruit is secured against reinfestation</td>
<td>[Reinfesting] internal and external arthropods, hitchhikers including <em>L. geometricus</em> and <em>L. mactans</em> and fruit pathogens</td>
<td>No reinfestation or substitution of product</td>
<td>Storage facility staff ensure that product is segregated and secured against reinfestation, substitution prior to export</td>
<td>Phytosanitary certificate issued when all IHS and OAP requirements have been verified as being met</td>
<td>MAF IHS, Export programme/workplan</td>
</tr>
<tr>
<td>Transport to NZ (5)</td>
<td>Export fruit [+ accompanying documentation] is freighted to New Zealand in sealed containers</td>
<td>[Reinfesting] internal and external arthropods and fruit pathogens</td>
<td>No reinfestation, re-infection or substitution of product</td>
<td>SENASA seals containers and records seal number on phytosanitary certificate</td>
<td>Seal number on container matches phytosanitary certificate</td>
<td>SENASA phytosanitary procedures, ISPMs, Export programme/workplan</td>
</tr>
</tbody>
</table>
| Transport to NZ (5) In transit cold disinfection * | Fruit is cold treated according to appropriate schedule | *A. fraterculus*  
*C. capitata*  
External arthropods | Mitigation of the risk posed by the Tephritidae fruit flies | Pack house staff place probes and verifies thermal recorder | SENASA inspects effective placing of probes and thermal recorder. If performed pre-export, SENASA keeps record of read-outs | MAF IHS, Phytosanitary certificate, Export programme/workplan |
| Verification Inspection (6) and (7) | Documentation, seal(s), thermal read-outs and fruit is inspected before being cleared, treated, reshipped or destroyed.  
Note: this is not a measure but a verification inspection. | No substitution has occurred and phytosanitary certificate matches consignment  
Consignment subject to treat, reship or destroy if non-compliance found. Pathway may be suspended dependent on regulated organism detected. | Documentation checked to ensure IHS and OAP requirements have been met. | A MAF biosecurity inspector checks accompanying export documentation (e.g. seal number, treatment information and additional declarations) and inspects sample of fruit for presence of risk organisms | MAF Border Clearance Procedures, Phytosanitary certificate, IHS |
| Distribution (8) | Cleared product available for distribution throughout NZ | | | | |

*The phytosanitary certificate will specify in-transit cold disinfection. Table grapes cold disinfested in-transit must be presented with appropriate temperature records for phytosanitary inspection.*
## Appendix 2: Risk organisms

The list below has been generated from the different information sources described in the Source information section.

Exclusions from the list include:

1. all non-regulated organisms/present in New Zealand and not considered a vector or potential vector.
2. organisms unlikely to follow the pathway, including:
   a. organisms not associated with fruit (e.g. *Naupactus leucoloma*, adults feed at the bases of leaf margins, leaving characteristic “notching”; larvae attack the tap roots and the basal parts of stems and are therefore unlikely to follow the pathway).
   b. organisms not expected to remain with the fruit during harvest because of size, mobility or harvesting methods (e.g. *Apis indica* and *Theretra oldenlandiae*) but including hitchhikers
3. organisms identified previously not to be a risk on table grapes (e.g. *Oraesia emarginata*, *Peridroma saucia* and *Calyptra lata*. MAFBNZ 2009a)
4. organisms identified at genus level only, as a genera may contain species that are not a risk on the commodity
5. organisms where insufficient evidence exists that they are present in Peru.

Note: organisms not added to the risk organism list remain ‘regulated organisms’ that warrant action upon interception.

<table>
<thead>
<tr>
<th>Organism Authority</th>
<th>Taxonomy</th>
<th>Present in NZ</th>
<th>Brief assessment</th>
<th>Phytosanitary measures to mitigate risk of entry and establishment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Arthropods</strong></td>
<td></td>
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</tr>
<tr>
<td><em>Anastrepha fraterculus</em></td>
<td>Diptera:Tephritidae</td>
<td>N (PPIN 2010)</td>
<td>This Tephritidae fruit fly is present on table grape bunches in Peru (SENASA 2010). It is not present in New Zealand. Tephritidae fruit flies are high priority risk organisms, establishment would lead to severe economic consequences.</td>
<td>PFA or Systems Approach and Cold Disinfestation</td>
</tr>
<tr>
<td><em>Argyrotaenia sphaleropa</em></td>
<td>Lepidoptera:Tortricidae</td>
<td>N (Dugdale 1988, Hoare 2001, PPIN 2009)</td>
<td>This organism is present on grape bunches (Morandi Filho et al., 2007) and is present in Peru (Combe Loere, 1958). The larvae feed on young fruit, resulting in fruit drop. Large larvae feed among clusters of ripening fruits and attach with silken thread webs (Meneguim &amp; Hohmann 2007).</td>
<td>Systems Approach</td>
</tr>
<tr>
<td><em>Aspidotus destructor</em></td>
<td>Hemiptera:Diaspididae</td>
<td>N (Charles &amp; Henderson 2002, PPIN 2009)</td>
<td>A risk analysis on citrus from Samoa identified this organism as a risk on that pathway. The New Zealand climate is considered suitable for establishment (MAFBNZ 2008a). The organism is present on table grape bunches (Watson 2006) and present in Peru (UK CAB International 1966).</td>
<td>Systems Approach</td>
</tr>
<tr>
<td><em>Ceratitis capitata</em></td>
<td>Diptera:Tephritidae</td>
<td>N (MAF 2007; PPIN 2010)</td>
<td>This organism is present on grape bunches (Ye et al., 2007). It is present in Peru (SENASA 2010). It is not present in New Zealand. Tephritidae fruit flies are high priority risk organisms and establishment would lead to severe economic consequences.</td>
<td>Systems Approach</td>
</tr>
<tr>
<td><em>Ceroplastes ruscii</em></td>
<td>Hemiptera:Coccidae</td>
<td>N (PPIN 2009)</td>
<td>This organism is present in Peru (Marín–Loayza &amp; Cisneros–Vera, 1994). This organism is present on grape bunches and considered a risk organism on table grapes from Italy (MAF 152-02).</td>
<td>Systems Approach</td>
</tr>
<tr>
<td><em>Chrysomphalus dictyospermi</em></td>
<td>Hemiptera:Diaspididae</td>
<td>N (Charles &amp; Henderson 2002, PPIN 2009)</td>
<td>A risk assessment on <em>Pyrus</em> from China identified this organism as a risk on that pathway. The New Zealand climate is considered to be suitable for establishment and economic consequences are considered to be moderate (MAFBNZ 2008c). This organism is known to be present on table grape bunches (CPC, 2010) and present in Peru (Medina 2008).</td>
<td>Systems Approach</td>
</tr>
<tr>
<td><em>Eriopis connexa</em></td>
<td>Coleoptera:Coccinellidae</td>
<td>N (Scot and Emberson, 1996; PPIN, 2009)</td>
<td>This organism is present in Peru (Navarrete &amp; Landa 2008). The organism has an indirect association with table grape bunches (Curtovic et al., 1995). A risk assessment on table grapes from China identified organisms with a similar biology as a risk on table grape bunches (MAFBNZ 2008a).</td>
<td>Systems Approach</td>
</tr>
<tr>
<td><em>Ferrisia virgata</em></td>
<td>Hemiptera:Pseudococcidae</td>
<td>N (Spiller &amp; Wise 1982; Scot &amp; Emberson 1999; PPIN 2010)</td>
<td>This organism is present on table grape bunches and is known to be present in Peru (Medina, 2008). A risk analysis on citrus from Samoa identified this organism as a risk on that pathway. The New Zealand climate is considered suitable for establishment (MAFBNZ 2008a).</td>
<td>Systems Approach</td>
</tr>
<tr>
<td><em>Heliothis virescens</em></td>
<td>Lepidoptera:Noctuidae</td>
<td>N (PPIN 2010)</td>
<td>This organism is present on bunches in Peru (SENASA 2010). All stages tend to feed on flowers, tender new leaves and fruit. Later larval stages tunnel 5-15 cm into the soil. Frass is visible on fruit (CPC, 2010).</td>
<td>Systems Approach</td>
</tr>
<tr>
<td>Organism Authority</td>
<td>Taxonomy</td>
<td>Present in NZ</td>
<td>Brief assessment</td>
<td>Phytosanitary measures to mitigate risk of entry and establishment</td>
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<tr>
<td>Hippodamia convergens</td>
<td>Coleoptera:Coccinellidae</td>
<td>N (PPIN 2009)</td>
<td>This organism is present in Peru (Yabar et al., 2002). Ladybirds do not feed on plants, but rather on phytophagous arthropods. They may be present on any part of the plant that their prey is present on (MAFBNZ 2009d). The likelihood of entry via stonefruit from the Pacific Northwest was considered low and thorough inspections are considered likely to detect them (MAFBNZ 2009d).</td>
<td>Systems Approach</td>
</tr>
<tr>
<td>Latrodeuctus geometricus</td>
<td>Araneae: Theridiidae</td>
<td>N (Forster &amp; Forster 1999; PPIN 2009)</td>
<td>A MAF risk assessment on table grapes from China identified this organism as a risk on table grape bunches (MAFBNZ 2009a). This organism is present in Peru (Woll et al., 2003).</td>
<td>Systems Approach</td>
</tr>
<tr>
<td>Latrodeuctus mactans</td>
<td>Araneae: Theridiidae</td>
<td>N (Forster &amp; Forster 1999; PPIN 2009)</td>
<td>A risk assessment on table grapes from China identified this organism as a risk on table grape bunches (MAFBNZ 2009a). This organism is present in Peru (Esquerre de Ramirez et al., 1971).</td>
<td>Systems Approach</td>
</tr>
<tr>
<td>Pseudaulacaspis pentagona</td>
<td>Hemiptera:Diaspididae</td>
<td>N (Charles &amp; Henderson 2002; previously recorded erroneously as present; PPIN 2010)</td>
<td>A risk assessment on stonefruit from the Pacific Northwest identified this organism as a risk on that pathway. The New Zealand climate is considered to be suitable for establishment and economic consequences were considered to be moderate (MAFBNZ 2009d). This organism is known to be present on table grape bunches (Watson, 2006) and present in Peru (Meneses 2007).</td>
<td>Systems Approach</td>
</tr>
<tr>
<td>Pseudococcus maritimus</td>
<td>Hemiptera:Pseudococcidae</td>
<td>N (Cox, 1977; PPIN, 2009; Ben-Dov et al, 2006).</td>
<td>This organism is present in Peru (Smith et al., 1996). A risk assessment on table grapes from China considered this organism a risk on that pathway (MAFBNZ 2009a). The New Zealand climate is considered to be suitable for establishment.</td>
<td>Systems Approach</td>
</tr>
<tr>
<td>Scirtothrips citri</td>
<td>Thysanoptera:Thripidae</td>
<td>N (PPIN 2009)</td>
<td>This organism is present in Peru (Meca et al., 2009). It is also present on table grape bunches (AQIS 1999). This organism is considered a risk on table grapes from the California (MAFBNZ 152-02).</td>
<td>Systems Approach</td>
</tr>
<tr>
<td>Selenaspis articulatus</td>
<td>Hemiptera:Diaspididae</td>
<td>N (PPIN 2010)</td>
<td>This organism is known to be present on table grape bunches in Peru (SENASA 2010). This is a tropicopolitan species and a minor pest on most hosts. It is the most important citrus pest in Peru and integrated control is used with good effect (CPC, 2010).</td>
<td>Systems Approach</td>
</tr>
</tbody>
</table>