



Pacific Horticultural and Agricultural Market Access Program (PHAMA)

Technical Report 57: Improved System for Managing
Biosecurity Risks Associated with Horticultural Seed
Imports (FIJI21)

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Table of Contents

Executive Summary	iii
1 Background and Key Points	1
2 Seeds Covered in the Activity.....	2
3 Proposed Changes to Import Policies for Seed	3
4 Proposed Import Policies for Priority Horticultural Seed.....	5
4.1 Summary.....	5
4.2 General Conditions.....	6
4.3 Papaya	7
4.4 Tomato.....	7
4.5 Tobacco	8
4.6 <i>Brassica</i> (Salad Leaves).....	8
5 Approved Seed Treatments.....	10
6 Framework for Assessing Seed Suppliers	12
7 Limitations	13

Tables

Table 5-1	Fungicide treatment options for seed for sowing.....	10
Table 5-2	Treatment options for seed found to be infested with arthropods during on-arrival inspection.....	11

Appendices

Appendix A	Activity Tasking Note
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Abbreviations

Abbreviation	Description
ACIAR	Australian Centre for International Agricultural Research
BAF	Biosecurity Authority of Fiji
DAFF	Department of Agriculture, Fisheries and Forestry (Australia)
GM	Genetically modified
GMO	Genetically modified organism
ICON	The Australian Government Department of Agriculture's import conditions database
IPPC	International Plant Protection Convention
ISPM	International Standard for Phytosanitary Measures
MAWG	Market Access Working Group
MDF	Market Development Facility
MPI	Ministry of Primary Industries (Fiji)
NPPO	National Plant Protection Organisation
NZMPI	New Zealand Ministry for Primary Industries
PEQ	Post-entry quarantine
PHAMA	Pacific Horticultural and Agricultural Market Access Program
PMO	Program Management Office
PRSV	Papaya ring spot virus
STA	Short-term Adviser
URS	URS Australia Pty Ltd
USA	United States of America
USDA	United States Department of Agriculture

Executive Summary

The Fiji Market Access Working Group requested PHAMA to review and recommend refinements to existing seed import policy to ensure pest risks are managed without overly restricting supply. Three separate technical reports have been prepared for Biosecurity Authority Fiji (BAF) to provide the detailed review and recommendations for 1) herb seed; 2) papaya seed; and 3) vegetable, melon and tobacco seed.

Updated *General conditions* have been proposed for the import of all horticultural seed and additional *Specific conditions* proposed for papaya, tobacco, tomato and *Brassica* seeds.

A list of approved seed treatments has been started and will be expanded over time by BAF. A framework of key criteria and issues to consider when assessing potential seed suppliers for accreditation has also been developed.

Good progress has been made on this activity and assistance should continue to be provided, particularly on the development of a list of accredited seed suppliers and implementation of the revised conditions.

1 Background and Key Points

The Fiji Market Access Working Group (MAWG) requested PHAMA to review and recommend refinements to existing seed import policy to ensure pest risks are managed without overly restricting supply. The scope of the activity, including a description of the key tasks and deliverables, is given as Appendix A.

Due to the large amount of information to be assessed and the need to make the recommendations available in a timely way, three separate technical reports were prepared for this activity for use by Biosecurity Authority Fiji (BAF). The reports were prepared in consultation with BAF and were:

Part	Seeds covered	Date finalised
1	Herbs	15/02/2013
2	Papaya	18/04/2013
3	Vegetables, melons and tobacco	31/05/2013

Some of the planned tasks and deliverables for this activity have not been completed. Notes on revisions made to the scope and approach for the activity since it commenced in October 2012 are provided in Appendix A.

Each technical report included information on existing import policies for the seeds into Fiji, Australia and New Zealand; potential pests of quarantine concern; proposed changes to the import requirements; and (in Technical Report part 3) a starting point for an approved list of seed treatments and framework for approved seed suppliers.

A summary of this information is provided in the following sections of this report.

Updated *General conditions* are proposed for the import of all horticultural seed, covering how long import permits should remain valid, additional questions to include on the application form, Phytosanitary Certification, additional declaration for khapra beetle, packaging and labelling, and prohibition of genetically modified (GM) material. These *General conditions* were first described in part 1 of the technical reports and then refined in part 3.

It was recommended that seed of all herbs, capsicum, chili, cucurbits, eggplant, fennel, lettuce, melons, okra and rocket be permitted under the *General conditions*.

For herb seeds, it was also recommended that Kings Seeds in New Zealand should be accepted as an approved supplier.

For papaya seed, a range of recommendations were made for a specific import permit application that had been submitted to BAF in December 2012 plus more broadly for all papaya seed imports. Assessment of applications to import papaya seed will continue to need to be done on a case-by-case basis by BAF but using the recommended framework.

For tobacco, tomato and salad leaf seed, additional *Specific conditions* were recommended to manage the risk of certain quarantine diseases. Several specific technical issues for tomato and salad leaf seed requiring further investigation were also identified.

Part 3 of the technical reports also included a list of approved seed treatments for BAF to expand over time and a framework for BAF to use when assessing potential approved seed suppliers.

2 Seeds Covered in the Activity

The list of seeds to be covered by this activity was prepared based on Fiji's current major horticultural export industries and discussions during October 2012 with BAF, Fiji's Ministry of Primary Industries (MPI), Fiji horticultural industries and importers, and other development programs. Eleven types of seeds were added to the initial list and they were considered to be of equal priority at the time.

Common name	Scientific name
FRUIT	
Melons* (watermelon, rockmelon, honeydew melon)	<i>Citrullus lanatus</i>
Papaya	<i>Carica papaya</i>
VEGETABLES	
Capsicum* (sweet pepper)	<i>Capsicum annuum</i>
Chili	<i>Capsicum annuum, C. baccatum, C. chinense, C. frutescens</i>
Cucurbits* (pumpkin, zucchini, cucumber, squash, butternut)	<i>Curcubita pepo, C. maxima, C. moschata</i>
Eggplant/aubergine	<i>Solanum melongena</i>
Fennel*	<i>Foeniculum vulgare</i>
Lettuce* (cos, mesclun, etc.)	<i>Lactuca sativa</i>
Okra	<i>Abelmoschus esculentus</i>
Rocket*	<i>Eruca sativa</i>
Salad leaves* (mizuna, tatsoi, mustard greens, etc.)	<i>Brassica japonica, B. juncea, B. narinosa / B. rapa var. rosularis, etc.</i>
Tomato*	<i>Lycopersicon esculentum</i>
HERBS	
Basil	<i>Ocimum basilicum</i>
Chives*	<i>Allium schoenoprasum</i>
Coriander	<i>Coriandrum sativum</i>
Dill	<i>Anethum graveolens</i>
Oregano*	<i>Origanum vulgare</i>
Parsley	<i>Petroselinum crispum</i>
Rosemary	<i>Rosmarinus officinalis</i>
Sage	<i>Salvia officinalis</i>
Thyme	<i>Thymus vulgaris</i>
OTHER	
Tobacco*	<i>Nicotiana tabacum</i>

* Indicates crops that were added following discussions in October 2012

3 Proposed Changes to Import Policies for Seed

The following changes to the generic conditions for **all horticultural seed** are recommended:

- Import Permits for seed should be issued with 12 (rather than 3) months' validity to allow importers/suppliers more time to prepare consignments.
- Phytosanitary Certification should be provided by the country from which the seed was exported to Fiji (noting that this may be the country where the seed was grown OR where it was re-exported from). Certification should be based on the standard IPPC certification statement¹ for freedom from pests and contamination.
- Consignments over 100 g from countries where *Trogoderma* (khapra beetle) occurs should have an additional declaration on their Phytosanitary Certificate that they are free from this pest, e.g. "The consignment was inspected and found free from *Trogoderma* (khapra beetle)".
- Requirements for how seeds are packaged should be re-worded to "Packaging must be clean, new, not include hay, straw or other plant-based material and be free from soil and other contaminants".
- Add a requirement that seed must be clearly identified with its scientific name (i.e. genus and species).
- Add a requirement to the effect that "Viable genetically modified seed of any species must not be imported into Fiji unless authorised under the Biosecurity Promulgation Act and, where relevant, the Environment Management Act".
- The application form for Import Permits should specifically ask if the seed will be treated (e.g. fungicide) and/or pelleted or otherwise packaged (e.g. in tape). The Import Permits should then specify if the approval is for pelleted seed.
- Do not have a generic mandatory requirement that seed is treated with insecticide; a requirement for pre-export or on-arrival insecticide treatment should be limited to situations when BAF has specific concerns for a type of seed or supplier or when contamination is found during inspection.

The following changes to the specific conditions for **tomato seed** are recommended:

- Preferably only tomato seed produced under commercial practices is permitted.
- Any consignments of non-commercially produced seed (e.g. for research purposes) must have been thoroughly cleaned to remove all traces of flesh.
- Sourced from either a Pest Free Area or Pest Free Place of Production for pepino mosaic virus OR a representative sample tested using appropriate methods and found to be free from pepino mosaic virus OR produced from parent material that was tested using appropriate methods and found to be free from pepino mosaic virus.
- Sourced from either a Pest Free Area or Pest Free Place of Production for potato spindle tuber viroid OR a representative sample tested using appropriate methods and found to be free from potato spindle tuber viroid OR produced from parent material that was tested using appropriate methods and found to be free from potato spindle tuber viroid.

¹ International Standard for Phytosanitary Measures (ISPM) 11 includes a model phytosanitary certificate and certification statement: "This is to certify that the plants, plant products or other regulated articles described herein have been inspected and/or tested according to appropriate official procedures and are considered to be free from the quarantine pests specified by the importing contracting party and to conform with the current phytosanitary requirements of the importing contracting party, including those for regulated non-quarantine pests." The optional statement "They are deemed to be practically free from other pests" should preferably also be provided for seeds for sowing that are exported to Fiji.

Additional requirements for tomato chlorotic dwarf viroid should be considered by BAF in the future based on further review of its geographic distribution and what requirements the New Zealand Ministry for Primary Industries (NZMPI) develop for introduction in September 2014.

The following changes to the specific conditions for **tobacco seed** are recommended:

- As recommended for the generic conditions, the application form for Import Permits for tobacco seed should specifically ask if the seed will be pelleted and/or treated pre-export and what details of the treatment(s) are available. All tobacco seed should be fungicide treated (preferably during the pre-export pelleting process) but a mandatory insecticide treatment should not be required. Options for the fungicide treatment should be developed in collaboration with the applicant for the Import Permit.

4 Proposed Import Policies for Priority Horticultural Seed

4.1 Summary

The proposed import requirements for the priority horticultural seed are summarised below, then details provided for the “General conditions” and any specific requirements for each type of seed.

Common name	Scientific name	Proposed import requirement
FRUIT		
Melons	<i>Citrullus lanatus</i>	General conditions
Papaya	<i>Carica papaya</i>	General conditions plus case-by-case assessment of supplier
VEGETABLES		
Capsicum (sweet pepper)	<i>Capsicum annuum</i>	General conditions
Chilli	<i>Capsicum annuum</i> , <i>C. baccatum</i> , <i>C. chinense</i> , <i>C. frutescens</i>	General conditions
Cucurbits (pumpkin, zucchini, cucumber, squash, butternut)	<i>Curcubita pepo</i> , <i>C. maxima</i> , <i>C. moschata</i>	General conditions
Eggplant/aubergine	<i>Solanum melongena</i>	General conditions
Fennel	<i>Foeniculum vulgare</i>	General conditions
Lettuce (cos, mesclun, etc.)	<i>Lactuca sativa</i>	General conditions
Okra	<i>Abelmoschus esculentus</i>	General conditions
Rocket	<i>Eruca sativa</i>	General conditions
Salad leaves (mizuna, tatsoi, mustard greens)	<i>Brassica japonica</i> , <i>B. juncea</i> , <i>B. narinosa</i> / <i>B. rapa</i> var. <i>rosularis</i> , etc.	General conditions plus fungicide treatment
Tomato	<i>Lycopersicon esculentum</i>	General conditions plus commercially produced plus testing or sourced from an area free from pepino mosaic virus and potato spindle tuber viroid (and potentially tomato chlorotic dwarf viroid)
HERBS		
Basil	<i>Ocimum basilicum</i>	General conditions
Chives	<i>Allium schoenoprasum</i>	General conditions
Coriander	<i>Coriandrum sativum</i>	General conditions
Dill	<i>Anethum graveolens</i>	General conditions
Oregano	<i>Origanum vulgare</i>	General conditions
Parsley	<i>Petroselinum crispum</i>	General conditions
Rosemary	<i>Rosmarinus officinalis</i>	General conditions
Sage	<i>Salvia officinalis</i>	General conditions
Thyme	<i>Thymus vulgaris</i>	General conditions
OTHER		
Tobacco	<i>Nicotiana tabacum</i>	General conditions plus fungicide treatment plus freedom from tobacco ring spot, tobacco streak and tobacco bunchy stunt viruses

4.2 General Conditions

- Import Permit required
 - Normally for single entry and valid for 12 months; multiple entry on case-by-case basis.
- Application form for Import Permits to specifically ask if the seed will be pelleted or otherwise packaged (e.g. in tape) and/or treated (e.g. fungicide) and any details
 - Import Permits should then specify if the approval is for pelleted seed.
- Phytosanitary Certificate required
 - Provided by the country from which the seed was exported to Fiji (noting that this may be the country where the seed was grown OR where it was re-exported from);
 - Based on the standard IPPC certification statement² for freedom from pests and contamination.
- Additional declaration for freedom from *Trogoderma* (khapra beetle) for consignments over 100 g from countries where this pest occurs³
 - For example “The consignment was inspected and found free from *Trogoderma* (khapra beetle)”.
- Packaging must be clean, new, not include hay, straw or other plant-based material and be free from soil and other contaminants.
- Seed must be clearly identified with its scientific name (i.e. genus and species).
- Viable genetically modified seed of any species must not be imported into Fiji unless authorised under the Biosecurity Promulgation Act and, where relevant, the Environment Management Act.
- No mandatory requirement that seed is treated with insecticide or fungicide.
- Inspection on arrival
 - On arrival, each line of seed will undergo inspection to verify that the seed and associated documentation complies with the requirements of the import permit.
 - The details of the inspection should vary depending on the status of the seed, for example:
 - a. **Minimal inspection** plus document checks for seed that is hermetically sealed⁴ and from approved sources;
 - b. **Minimal inspection** plus document checks for seed that is hermetically sealed and has been exported from Australia or New Zealand after initially being imported into these countries OR being produced there;
 - c. **More rigorous inspection** to verify visual freedom from pests and extraneous contamination of quarantine concern, and that only seeds listed on the import permit are present for non-hermetically sealed seed.

² ISPM 11 includes a model phytosanitary certificate and certification statement: “This is to certify that the plants, plant products or other regulated articles described herein have been inspected and/or tested according to appropriate official procedures and are considered to be free from the quarantine pests specified by the importing contracting party and to conform with the current phytosanitary requirements of the importing contracting party, including those for regulated non-quarantine pests.” The optional statement “They are deemed to be practically free from other pests” should preferably also be provided for seeds for sowing that are exported to Fiji.

³ Based on the list maintained by DAFF: <http://www.daff.gov.au/aqis/import/cargo/pests/khapra-beetle>

⁴ Hermetically sealed seed may include small retail packs for home gardeners with 100–1000 seeds in foil sachets; metal tins with aluminium or other internal seals; or commercially sealed flexible Mylar™ bags.

4.3 Papaya

General conditions **plus** case-by-case assessment of potential supplier. Detailed recommendations for papaya seed including the biosecurity issues of concern, certification and testing requirements were provided in part 2 of the technical reports prepared for BAF. Key specific recommendations include:

- Preferably, seed is sourced from locations where bacterial crown rot disease (*Erwinia papaya* and *Erwinia caricae*) and papaya dieback disease (*Erwinia mallotivora*) are not known to occur, OR seed is treated (see below).
- Australia's assessment of the distribution of where bacterial crown rot disease and papaya disorder disease are considered to occur is adopted by BAF⁵:
 - Anguilla; Antigua & Barbuda; Barbados; Brazil; Dominica; Fiji; Grenada; Guadeloupe; Indonesia; Japan; Malaysia; Martinique; Montserrat; Northern Mariana Islands; Philippines; St Croix; St Kitts & Nevis; St Lucia; St Vincent & The Grenadines; Tonga; Trinidad & Tobago; Venezuela; Virgin Islands (United States).
- The wording of the additional declarations required by Australia for country freedom from bacterial crown rot and papaya disorder diseases is adopted by BAF:
 - "Bacterial Crown Rot disease (*Erwinia papaya* and *Erwinia caricae*) and Papaya Dieback Disease (*Erwinia mallotivora*) are not known to occur in [insert country of origin]".
- The treatment required by Australia for papaya seeds sourced from countries where bacterial crown rot and papaya dieback disease occur is adopted by BAF (see below).
 - Hot water at 50°C for not less than 20 minutes then 1% sodium hypochlorite for not less than 10 minutes.
- Only seed considered to be free from papaya ring spot virus (PRSV) is imported.
- Testing for genetically modified organism (GMO) may be required depending on what certification and other assurances can be provided.
- Growth in post-entry quarantine (PEQ) may be required depending on what certification and other assurances can be provided for disease freedom.

Treatment T9371 (Sodium hypochlorite): Immerse in a solution (NaOCl), 1% available chlorine for 10 minutes. Sodium hypochlorite is available as Milton® (1%) or domestic bleach is a stabilised solution giving 4% available chlorine (dilute 1 plus 3).

Treatment T9504 (Hot Water): Immerse at 50°C for not less than 20 minutes. The temperature in the water bath must be maintained at 50°C +/- 1°C for the duration of the treatment. After immersion, the plant material should be cooled and dried as quickly as possible. When the plant material is dry, a protective fungicidal dust treatment is desirable.

4.4 Tomato

General conditions **plus** commercially produced **plus** tested and found free or sourced from an area free from pepino mosaic virus and potato spindle tuber viroid.

⁵ Available by searching under papaya/seed for sowing on the Australian Department of Agriculture's import conditions database (ICON). Available via <http://www.daff.gov.au/> or at http://apps.daff.gov.au/icon32/asp/ex_querycontent.asp

Only tomato seed produced using commercial practices is permitted unless there is a justified reason to import tomato seed that has not been produced in this way (e.g. seed to be imported from overseas research facilities for research purposes in Fiji). Any seed not produced using commercial practices must have been thoroughly cleaned pre-export to remove all traces of flesh.

Phytosanitary Certificate to have additional declarations to the effect that:

The tomato seeds are:

Sourced from either a Pest Free Area or Pest Free Place of Production for pepino mosaic virus OR a representative sample tested using appropriate methods and found to be free from pepino mosaic virus OR produced from parent material that was tested using appropriate methods and found to be free from pepino mosaic virus.

AND

Sourced from either a Pest Free Area or Pest Free Place of Production for potato spindle tuber viroid OR a representative sample tested using appropriate methods and found to be free from potato spindle tuber viroid OR produced from parent material that was tested using appropriate methods and found to be free from potato spindle tuber viroid.

Additional requirements for tomato chlorotic dwarf viroid to be considered by BAF during 2013–14 in consultation with NZMPI.

4.5 Tobacco

General conditions **plus** freedom from tobacco ring spot, tobacco streak and tobacco bunchy stunt viruses **plus** fungicide treatment.

Phytosanitary Certificate to have an additional declaration to the effect that:

The tobacco seeds are considered to be free from tobacco ring spot, tobacco streak and tobacco bunchy stunt viruses.

If treated pre-export, the details of the treatment are to be recorded in the Disinfestation and/or Disinfection Treatment section of the Phytosanitary Certificate OR to be clearly included in the commercial labelling or documentation accompanying the seed.

Options for a suitable broad spectrum fungicide treatment (active ingredients and how applied) to be developed in collaboration with the applicant for the Import Permit. Options for the fungicide treatment include:

- Metalaxyl at 0.7 g a.i. per kg seed and captan at 0.7 g a.i. per kg seed.
- Metalaxyl at 0.7 g a.i. per kg seed and thiram at 1 g a.i. per kg seed.

4.6 Brassica (Salad Leaves)

General conditions **plus** fungicide treatment either pre-export or on-arrival.

Options for the fungicide treatment include⁶:

- Metalaxyl-M at 0.26 g a.i. per kg of seed, Thiram at 0.57 g a.i. per kg of seed and thiabendazole at 0.015 g a.i. per kg of seed.

⁶ Taken from the requirements to import Brassica seed into New Zealand.

- Fosetyl aluminium at 1.53 g a.i. per kg of seed, thiram at 0.5 g a.i. per kg of seed and thiabendazole at 0.37 g a.i. per kg of seed.

If treated pre-export, the details of the treatment are to be recorded in the Disinfestation and/or Disinfection Treatment section of the Phytosanitary Certificate OR to be clearly included in the commercial labelling or documentation accompanying the seed.

5 Approved Seed Treatments

Suitable treatments to start building a list of approved seed treatments for Fiji have been collated based on the fungicide and fumigation treatments currently accepted by NZMPI. Generic treatments for insects are not required for seeds imported into New Zealand or Australia and the only approved treatments for insects are fumigations. NZMPI is reviewing⁷ suitable fungicide treatments for seed and, if available to BAF, the outcomes will be a useful resource in the future.

Table 5-1 Fungicide treatment options for seed for sowing

Seed type	Fungicide treatments (grams (g) or milligrams (mg) of active ingredient per kg seed)
Vegetable, herb and ornamental	Benomyl at 2.5 g a.i. Captan at 2 g a.i. Carbendazim at 2.5 g a.i. Iprodione at 2.5 g a.i. Thiophanate methyl at 2.5 g a.i. Thiram at 2 g a.i.
Brassica (for salad leaves)	Metalaxyl-M at 0.26 g a.i., thiram at 0.57 g a.i. and thiabendazole at 0.015 g a.i. Fosetyl aluminium at 1.53 g a.i., thiram at 0.5 g a.i. and thiabendazole at 0.37 g a.i.*
Tobacco	Metalaxyl at 0.7 g a.i. and captan at 0.7 g a.i. Metalaxyl at 0.7 g a.i. and thiram at 1 g a.i.
Grasses, oats, barley, etc.	Carboxin at 0.8 g a.i. and thiram at 0.8 or 1 g a.i. Carboxin at 0.8 g a.i. and captan at 0.7 g a.i. Imazalil at 80 mg a.i. and triadimenol at 220 mg a.i. Imazalil at 80 mg a.i. and flutriafol at 80 mg a.i. Imazalil at 0.05 g a.i. and Flutriafol at 0.05 g a.i. Imazalil at 0.05 g a.i. and Tebuconazole at 0.025 g a.i. Imazalil at 0.05 g a.i. and Carboxin at 0.8 g a.i. Triadimenol at 0.375 g a.i. and Fuberidazole 0.15 g a.i. Triadimenol at 0.23 g a.i., Fuberidazole 0.15 g a.i and Imazalil 0.075 g
Legumes/pulses	Metalaxyl-M at 0.35 g a.i, fludioxonil at 0.1 g a.i and cymoxanil 0.2 g a.i Fosetyl aluminium at 1.53 g a.i, thiram at 0.5 g a.i and thiabendazole at 0.37 g a.i
Maize/corn	Carboxin at 0.8 g a.i. and captan at 0.7 g a.i. Carboxin at 0.8 g a.i. and thiram at 0.8 g a.i. Difenoconazole at 0.12 g a.i and mefenoxam at 0.01 g a.i Fludioxonil at 0.025 g a.i. and metalaxyl at 0.03 g a.i. Fludioxonil at 0.025 g a.i. and mefenoxam at 0.01 g a.i. Imazalil at 80 mg a.i. and flutriafol at 80 mg a.i. Imazalil at 80 mg a.i. and triadimenol at 220 mg a.i.

* Same treatment option as for legumes/pulses

⁷ Proposals were sought in November 2012 for a project titled *Evaluation of seed treatment fungicides for quarantine control* (RFP 16207). The aim of the project was to identify fungicides and other treatments with the capacity to achieve levels of control suitable for quarantine treatment of seed-borne pathogens that may be of biosecurity concern to New Zealand.

Table 5-2 Treatment options for seed found to be infested with arthropods during on-arrival inspection

Reason for treatment	Short code	Treatment / chemical	Pressure/ humidity	Dosage	Temp. °C	Time
Insects except <i>Trogoderma</i>	SST1	MeBr	Vac:91 KPa	40 g/m ³	20	3 hrs
		MeBr	Atm	16 g/m ³	20+	24 hrs
		MeBr	Atm	24 g/m ³	10–19	24 hrs
		Phosphine	Atm	2 g/m ³	10–15	7 days
		Phosphine	Atm	2 g/m ³	16–20	6 days
		Phosphine	Atm	2 g/m ³	21–25	5 days
		Phosphine	Atm	2 g/m ³	26+ (max 35)	4 days
<i>Trogoderma</i>	SPT3	MeBr	Atm	120 g/m ³	10–15	12 hrs
			Atm	96 g/m ³	16–20	12 hrs
			Atm	72 g/m ³	21–26	12 hrs
			Atm	56 g/m ³	27–31	12 hrs
			Atm	40 g/m ³	32+	12 hrs
Mites	SST2	MeBr	Atm	SST1 then hold securely and re-fumigate after 12–14 days.		

6 Framework for Assessing Seed Suppliers

Part 1 of the technical reports prepared for BAF included an assessment of sources that were potentially likely to supply herb seeds to Fiji in early 2013 to consider if they could become approved suppliers. The assessment was based on the criteria being developed by the Australian Department of Agriculture, Fisheries and Forestry (DAFF) as part of their review of import policy for grapevine propagative material. The same criteria were used in part 2 of the technical reports to assess a potential source of papaya seed. Based on this, the suggested criteria and types of issues to consider for each when assessing potential seed suppliers are:

1. Capacity for oversight by the National Authority / National Plant Protection Organization (NPPO)
 - Who is the NPPO and how are they already involved?
 - What other activities might need to be done by the NPPO?
 - Are there other government or industry bodies involved in the production and export process?
2. Capacity of the supplier to produce propagative material that is free of / tested for relevant pathogens, pests and GM material.
 - How is the seed currently sourced or produced?
 - What standardised or quality systems are used and what documents are available?
 - What pests and diseases are present in the country/area/place of production and which ones are of quarantine concern?
 - What is done to control pests and diseases in the country/area/place of production?
 - What testing is already done of the seed and what else might be needed?
3. Capacity of the supplier to meet containment and security requirements
 - What is the physical set-up of the supplier and all other steps in the production process?
 - How is the phytosanitary status of the area/place of production maintained?
 - What else might need to be done to ensure the phytosanitary status is maintained?
4. Audits and inspections
 - What audits are already done of the supplier or other organisations involved in the production process?
 - Are there any government or commercial accreditation organisations involved?
 - What desk and/or site audits might BAF or other Fijian agencies need to do?
 - What information is available in advance to start a desk audit?
5. Identity preservation systems
 - How does the supplier currently identify the seed being produced?
 - How could seed arriving in Fiji be traced back through the production process?
 - Could the seed be mixed or contaminated by other seed during the production/export process?
6. On arrival verification
 - What would need to be done on-arrival to verify the identity and phytosanitary status of the seed?
 - Are any special procedures or facilities required on-arrival to inspect and/or grow the seed in PEQ?

7 Limitations

URS Australia Pty Ltd (URS) has prepared this report in accordance with the usual care and thoroughness of the consulting profession for the use of AusAID and only those third parties who have been authorised in writing by URS to rely on the report. It is based on generally accepted practices and standards at the time it was prepared. No other warranty, expressed or implied, is made as to the professional advice included in this report. It is prepared in accordance with the scope of work and for the purpose outlined in the Proposal dated 10 September 2012.

The methodology adopted and sources of information used by URS are outlined in this report. URS has made no independent verification of this information beyond the agreed scope of works and URS assumes no responsibility for any inaccuracies or omissions. No indications were found during our investigations that information contained in this report as provided to URS was false.

This report was prepared between October 2012 and October 2013 and is based on the conditions encountered and information reviewed at the time of preparation. URS disclaims responsibility for any changes that may have occurred after this time.

This report should be read in full. No responsibility is accepted for use of any part of this report in any other context or for any other purpose or by third parties.

Appendix A

Appendix A Activity Tasking Note

DATE: 10/09/2012

ACTIVITY TITLE: Improved system for managing biosecurity risks associated with horticultural seed imports

ACTIVITY CODE: FIJI21

SUB-CONTRACTOR NAMES AND POSITIONS:

Bronwyn Wiseman – Plant Pathologist and Quarantine Specialist

Gavin Edwards – Crop Management and Control Systems Specialist

Stephen Day – Quarantine Certification and Accreditation Specialist

BACKGROUND:

Fiji horticulture relies heavily on imported seed for fruit and vegetable production, for both the domestic and export markets. To maintain freedom from serious exotic pests potentially associated with seed imports, it is important to have a robust system in place to reduce the risk of introducing new pests of quarantine concern without placing undue restrictions on supply.

Quarantine authorities can employ a range of measures to manage possible risks associated with imported seeds. These include identification of the pests and diseases of quarantine concern, use of accredited seed suppliers (including audit and verification of supplier seed production systems), PEQ (including use of private PEQs) and specific import requirements related to pests and disease of quarantine concern.

The recent detection (currently being confirmed) of a serious papaya disease that has most likely been introduced by infected seed is a clear example of the need for a stringent seed import policy. This recent example, coupled with the seemingly common situation where growers experience difficulty in gaining timely approval to import seed in the quantity required or experience undue delays in the import/clearance process, clearly underlines the urgent need for updating of Fiji seed import policy. The Fiji MAWG has requested PHAMA to review and recommend refinements to existing seed import policy to ensure pest risks are managed without overly restricting supply.

This activity will help underpin the operation of a number of existing horticultural export pathways, notably papaya (Australia, New Zealand and Hong Kong), eggplant (New Zealand), chili (New Zealand), non-fruit fly host vegetables (Australia and New Zealand), and various herbs (New Zealand). It will also provide a framework for food security-related seed imports, and strongly supports the ACIAR-funded Vegetable Development Program and proposed activities under AusAID's Market Development Facility (MDF). Importantly, the activity may also provide a template for regional quarantine related seed import policy.

Appendix A

SCOPE OF WORK:

Key tasks include:

In consultation and co-operation with BAF, MPI and Fiji horticultural industries and importers:

- (i) Determine Fiji's current seed import priority list, with emphasis on major horticultural export industries in Fiji; notably:
 - Papaya (*Carica papaya*)
 - Eggplant/aubergine (*Solanum melongena*)
 - Chilli (*Capsicum frutescens*)
 - Okra (*Abelmoschus esculentus*)
 - Herbs, including:
 - Basil (*Ocimum basilicum*)
 - Coriander (*Coriandrum sativum*)
 - Dill (*Anethum graveolens*)
 - Parsley (*Petroselinum crispum*)
 - Rosemary (*Rosmarinus officinalis*)
 - Sage (*Salvia officinalis*)
 - Thyme (*Thymus vulgaris*)
 - Other vegetable seeds as advised.
- (ii) Review existing BAF, Australian and New Zealand import and risk management policies for prioritised horticultural seed.
- (iii) Develop pest lists associated with seeds of the horticultural species (as above) for which seed will be sourced overseas and determine pests of quarantine concern for Fiji.
- (iv) Develop a draft imported seed risk assessment report, including possible pest mitigation measures, to manage the risks associated with the pests of quarantine concern to Fiji associated with these seed imports. The draft document to contain the results of tasks (i) and (ii); consideration of BAF and MPI GMO seed policy position and contaminant weed seed to be included where relevant.
- (v) Distribute the imported seed risk assessment report to relevant stakeholders and seek comment through workshops and consultation.
- (vi) Finalise the imported seed risk assessment report and identify next steps for implementation of the finalised policy, including identification of roles and responsibilities for BAF and MPI (regulatory and potentially PEQ), importers, overseas suppliers and treatment providers. If required, identify and help develop quarantine pest testing procedures as part of PEQ.
- (vii) Develop and help BAF implement operational systems and associated documentation (including verification procedures) to manage identified quarantine risks associated with imported seeds. Implementation to include training/workshops as required and development of extension and awareness materials.
- (viii) Identify and provide a list of accredited seed suppliers for the specified seed list, considering that import quantities into Fiji in many cases will be small.
- (ix) Assist BAF and MPI with the verification of international accredited seed sources. This is likely to involve visits to accredited seed sources and assessment of their accreditation methods.

Appendix A

Three short-term advisers (STAs) will be deployed under this activity due to the complexity of tasks involved and the importance of this issue as highlighted by the recent suspected detection of a serious seed-borne disease of papaya that has the potential to devastate the Fiji papaya export industry.

Each STA will have a primary role in this activity as outlined below but will also assist with other areas as required.

Bronwyn Wiseman is a plant pathologist and will have primary carriage of the activity. In addition to this, Bronwyn will manage the risk assessments for plant pests associated with imported seeds; summary of Australia and New Zealand policies on imported seeds; determination of accredited seed sources; and development of PEQ requirements for seeds.

Gavin Edwards will be responsible for the development of the draft final risk assessment document and the final imported seed overarching policy document.

Stephen Day will be responsible for assisting with the development, implementation and verification of operational systems to manage identified quarantine risks associated with imported seeds. In addition, he will have primary carriage for the delivery of any training/workshop requirements and development of extension and awareness materials.

DELIVERABLES:

- (i) A draft imported seed risk assessment report, including possible pest mitigation measures to manage the risks associated with the pests of quarantine concern to Fiji associated with specified seed imports.
- (ii) A final imported seed risk assessment report, including agreed pest mitigation measures, to be adopted as the Fiji imported seed policy document.
- (iii) An operations manual (including verification procedures) to manage identified quarantine risks associated with imported seeds. This document is to be developed in association with the imported seeds policy document.
- (iv) Conduct of workshops and training activities associated with development of the draft risk assessment report and implementation of operation policy.
- (v) A supplementary report listing accredited international seed suppliers and the results of verification procedures to confirm their accreditation.

CONSULTATION WITH:

Key stakeholders that should be consulted in the process of undertaking this activity include:

- (i) Fiji BAF and MPI staff.
- (ii) Private sector (primary producers, exporters and seed importers).
- (iii) DAFF, MPI, USDA and other quarantine authorities as required.
- (iv) Other aid projects with relevant seed production projects (e.g. ACIAR, MDF).
- (v) Other relevant stakeholders.

DURATION AND TIMING:

Planned activities for the delivery of FIJI21 will require up to 60 days of STA input over multiple assignments, including travel, field investigations, consultations potentially in Australia and New Zealand, and report and pest risk analysis preparation.

Appendix A

This activity will be delivered as follows:

- Tasks (i)–(v) to be completed by 31 December 2012
- Tasks (vi)–(ix) to be completed by 30 April 2013.

Notes on revisions to the scope and approach made since October 2012

Tasks (i)–(iii) were completed as initially specified. After the complexity of the assessment was realised, it was agreed (between PMO and BAF) that tasks (iv)–(vi) would be split into more manageable components. Based on the likely complexity, the split was into herbs; papaya; then the remaining vegetable, melon and tobacco seeds. These three components were then progressed between October 2012 and May 2013 and three detailed technical reports prepared for BAF. The activity was then effectively on-hold while preparations were underway for the end of Phase 1 of the PHAMA program and the commencement of Phase 2. Work on task (vii) recommenced in September 2013. Preliminary work on tasks (viii) and (ix) has been completed in collaboration with BAF. The framework for assessing potential seed suppliers for accreditation was developed and used to assess a supplier of a range of seeds in New Zealand and a supplier of papaya seeds in the USA.

The three finalised technical reports form the specified deliverables (i) and (ii) of an “imported seed risk assessment report”. An operations manual (deliverable iii) and associated training (deliverable iv) was not required for BAF within the current activity. Further identification of possible seed suppliers and verification of their operations was not possible within the current activity.



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