Ministry for Primary Industries
Manatū Ahu Matua

Risk Management Proposal:

Fresh Salacca for Consumption

MPI.IHS.FP.SALACCA

September 2016

New Zealand Government

Growing and Protecting New Zealand

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Submissions

The Ministry for Primary Industries (MPI) invites comment from interested parties on the proposed new import health standard (IHS) for Fresh Salacca for Consumption (MPI.IHS.FP.SALACCA) which is supported by this Risk Management Proposal (RMP).

The meaning of an IHS is defined in section 22(1) of the Biosecurity Act 1993 as "An import health standard specifies requirements to be met for the effective management of risks associated with importing risk goods, including risks arising because importing the goods involves or might involve an incidentally imported new organism".

MPI therefore seeks comment on the requirements (including measures) in the proposed IHS. MPI has developed this proposal based on the available scientific evidence and assessment of this evidence. If you disagree with the measures proposed to manage the risks, please provide either data or published references to support your comments. This will enable MPI to consider additional evidence which may change how risks are proposed to be managed.

The following points may be of assistance in preparing comments:

- Wherever possible, comments should be specific to an IHS requirement (referencing section numbers or pest names as applicable).
- Where possible, reasons, data and supporting published references to support comments are requested.
- The use of examples to illustrate particular points is encouraged.

MPI encourages respondents to forward comments electronically. Please include the following in your submission:

- The title of the consultation document in the subject line of your email;
- Your name and title (if applicable);
- Your organisation's name (if applicable); and
- Your address.

Send submissions to: plantimports@mpi.govt.nz.

However, should you wish to forward submissions in writing, please send them to the following address to arrive by close of business on 10 November 2016.

Plant Imports
Plants, Food & Environment Directorate
Ministry for Primary Industries
PO Box 2526
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Submissions received by the closure date will be considered during the development of the final IHS. Submissions received after the closure date may be held on file for consideration when the issued IHS is next revised/reviewed.

Official Information Act 1982

Please note that your submission is public information and it is MPI policy to publish submissions and the review of submissions on the MPI website. Submissions may also be the subject of requests for information under the Official Information Act 1982 (OIA).

The OIA specifies that information is to be made available to requesters unless there are sufficient grounds for withholding it, as set out in the OIA. Submitters may wish to indicate grounds for withholding specific

information contained in their submission, such as the information is commercially sensitive or they wish personal information to be withheld.

Any decision to withhold information requested under the OIA is reviewable by the Ombudsman.

Contents

Purpose

(1) The purpose of this risk management proposal (RMP) is to:

a) summarise the phytosanitary measures considered for managing pests that may be associated with the import of fresh salacca (*Salacca zalacca*) fruit for consumption;
b) identify how the measures proposed in the draft import health standard (IHS) for "Fresh Salacca for Consumption" effectively manage known biosecurity risks; and
c) explain how these measures are consistent with New Zealand's domestic legislation and international obligations.

(2) The draft IHS is the subject of consultation under section 23(3) of the Biosecurity Act 1993. This RMP provides information to support the consultation on the draft IHS but is not itself the subject of consultation. However MPI will accept comments and suggestions on the RMP in order to improve future IHS consultations.

Scope

(3) This RMP lists the information and process used to determine the pest risk management measures proposed in the draft IHS for Fresh Salacca for Consumption. The RMP includes:

- a summary of pests directly associated with salacca at the point of export;
- a description of pre-export phytosanitary measures and their effectiveness considered for managing pests potentially associated with imported fresh salacca.

(4) This document is in three parts.

- Part 1 provides the background and context used to inform development of the IHS for fresh salacca for consumption from all countries.
- Part 2 provides information specific to the fresh salacca for consumption pathway, and outlines the types of measures which may effectively manage risks associated with importing fresh salacca for consumption from all countries
- Part 3 considers the regulated pests associated with fresh salacca, and determines the appropriate measure to effectively manage risks associated with importing fresh salacca for consumption from Indonesia.

Background

(5) Salacca is a tropical fruit which is not currently able to be imported into New Zealand.

(6) The government of Indonesia has requested access for fresh salacca for consumption to the New Zealand market and provided information on the pests associated with the fruit.

(7) MPI conducted a pathway assurance visit in 2015 for Salacca from Indonesia.

Part 1: Context

Domestic

(9) The New Zealand biosecurity system is regulated through the Biosecurity Act 1993. Section 22 of the Act describes the meaning of an IHS, and requires that the IHS specifies requirements to be met for the effective management of risks associated with importing risk goods (including plants and plant products) into New Zealand.

(10) The Ministry for Primary Industries (MPI) is the government authority responsible for the effective management of risks associated with the importation of risk goods into New Zealand (Part 3, Biosecurity Act 1993).

(11) MPI engages with interested parties and/or affected New Zealand stakeholders and the exporting country requesting market access during the development of an IHS.

(12) MPI follows MPI policies and procedures for the development of an IHS and consultation.

International

(13) Where possible, phytosanitary measures are aligned with international standards, guidelines, and recommendations as per New Zealand's obligations under Article 3.1 of the World Trade Organisation (WTO) Agreement on the Application of Sanitary and Phytosanitary Measures (SPS Agreement), WTO 1995 and section 23(4)(c) of the Biosecurity Act 1993.

(14) The SPS Agreement states that phytosanitary measures must not discriminate unfairly between countries or between imported or domestically produced goods, and where there is a choice of phytosanitary measures to reduce risk to an acceptable level, WTO members must select the least trade restrictive measure.

New Zealand's Biosecurity System

(15) New Zealand operates a biosecurity system for which the phytosanitary aspect (covering plant health) is a key part.

(16) No biosecurity system is capable of reducing risk to zero. The objective of the system is to reduce to an acceptable level the likelihood of entry and establishment of regulated organisms (including pests, diseases and weeds).

(17) An organism is 'regulated' by MPI if it could cause unacceptable economic consequences (i.e. likely to cause unacceptable economic, environmental, socio-cultural or human health impacts in New Zealand) if it were to enter and establish in New Zealand, provided the following conditions are met:

a) is not present in New Zealand; or

b) it is present but under official control in New Zealand;

c) it is able to establish and spread in New Zealand.

- Entry and establishment is defined as 'introduction' by the International Plant Protection Convention (IPPC).

(18) The New Zealand phytosanitary system focuses on ensuring that the most significant pests, for example economically important fruit flies, are unlikely to ever establish in New Zealand. The system also manages risk associated with all regulated pests.

(19) The focus of the IHS for plant-based goods is to manage unacceptable phytosanitary risks identified as being associated with the goods before arrival at the New Zealand border. The expectation is that

commercial consignments of plants and plant products meet New Zealand's phytosanitary import requirements on arrival (risk is managed off-shore).

(20) MPI monitors the pathway performance related to each IHS to ensure it provides the expected level of protection. This is achieved through verification and inspection activities at the border (and where possible, identification of pests detected) and audits of the export systems and critical control points contained in the *Export Plans*.

Importing Fresh Produce

(21) Fresh produce can only be imported subject to an IHS specifying the commodity, and from a country where MPI has approved the systems, programmes and standards for regulatory oversight by the National Plant Protection Authority (NPPO). The export system is subject to audit by MPI.

(22) In circumstances where regulated pests that would cause significant harm if they became established in New Zealand are associated with the commodity, MPI requires the exporting NPPO to negotiate an *Export Plan* (see paragraph 26) with MPI. Exports to New Zealand cannot occur until the *Export Plan* has been agreed by MPI.

Strength of measures

(23) Measures are required for regulated pests (see paragraph 17) where the 'probability of introduction and spread' on a pathway is unacceptable (i.e. if it is able to enter through the pathway, find a suitable host, and able to establish and spread in New Zealand).

(24) The strength of the measure required should be no more than necessary to manage the risk the organism poses. MPI has classified measures into three categories of increasing strength: *Basic Measures*, *Targeted Measures* or *MPI-Specified Measures*.

(25) The strength of measure required depends on the risk posed by the organism on the pathway. This risk is determined by a combination of the consequences the pest may cause if it was introduced into New Zealand and the likelihood that the pest will enter and establish from a pathway. For pests that would result in very high consequences, such as economically important species of fruit fly, *MPI-Specified Measures* are required. This is because these pests would cause significant consequences to New Zealand, even if the likelihood of them entering and establishing (risk) a transient population is low.

(26) The greater the risk of a pest, the greater the level of assurance MPI requires that the pest is not present in a consignment unless the pest has been rendered non-viable (dead or sterile from irradiation). For *Targeted* and/ or *MPI-Specified Measures* an *Export Plan* will be developed, based on an MPI pathway assessment visit (if required). The *Export Plan* will identify how *Targeted* and *MPI-Specified Measures* will be applied. The *Export Plan* must be negotiated with and approved by MPI, and is subject to audit and review by MPI.

(27) The proposed fresh salacca IHS includes all measures accepted for pests assessed as being possibly associated with the commodity.

Part 2: Approach

Commodity Description

(28) "Fresh salacca for consumption" is defined as individual commercially produced salacca (*Salacca zalacca*) fruit, also known as salak or snakefruit. The salacca (fruit) is oval, between 5-7cm long with a brown 'scale'-like skin which tapers to a point.

a) *S. edulis* is recognised as a synonym of *S. zalacca*.

(29) Three main cultivars are grown in the major production areas in Indonesia, and likely to be exported to New Zealand. These cultivars are 'pondoh', 'nglumut', and 'gula pasir' (IAQA, 2013).

(30) "Commercially produced" is defined as the production of export grade fruit sourced from production sites that produce fruit for export under standard cultivation, pest-management, harvesting, disinfestation and packing activities. Infested, infected or damaged fruit must be discarded prior to packing.

a) Commercially produced salacca are graded to remove:
   - obviously damaged fruit, and plant material (such as the stem and woody material) other than the fruit;
   - all plant material from species other than *Salacca zalacca*.

b) Private consignments and products produced through non-commercial systems (for example, 'backyard' production) do not meet the definition of commercially produced, and are excluded from the scope of this RMP and the IHS: Fresh Salacca for Consumption.

Information Sources

(31) The following information was used to identify risk organisms associated with fresh salacca and the appropriate measures to manage the risk of their introduction (entry and establishment) into New Zealand:

a) Final import risk analysis report for fresh salacca fruit from Indonesia (DoA, 2014);
b) Generic Pest Risk Assessment: Armoured scale insects (Hemiptera: Coccoidea: Diaspididae) on the fresh produce pathway (MPI, 2014);
c) Technical advice (MPI 2016);
d) MPI Indonesia salacca pathway assessment (MPI, 2015)
e) Relevant literature and database searches;
f) Industry production, harvest and post-harvest practises in the exporting country.

Assessment

(32) The above information sources were used to assess an organisms' potential to enter New Zealand via the fresh salacca import pathway, be exposed to a suitable host, and establish and spread in New Zealand. The pest assessment process follows part 2.1 of the International Standard for Phytosanitary Measures (ISPM) 11: *Pest risk analysis for quarantine pests*, MPI import risk analysis procedures and considered:

a) Presence or absence in the exporting country;
b) Presence or absence in New Zealand;
c) Regulatory status in New Zealand;
d) Association with the commodity and pathway;
e) Potential for establishment and spread in New Zealand;
f) And potential for economic consequences in New Zealand.

(33) All organisms identified as 'pests of concern' were assessed by MPI to determine the 'probability of introduction and spread' (entry into New Zealand, exposure to suitable hosts, establishment and spread) in New Zealand (following part 2.2 of ISPM 11).

Description of measures

(34) The biosecurity system in New Zealand operates a series of components or layers (pre-border, border, and post-border) that together provide a high level of assurance that pests are unlikely to establish in New Zealand. No one part of the system is able to achieve the necessary assurance on its own. The main components in the pre-border and border system include:

a) commercial production and packhouse activities (*Basic Measures*) to reduce pest prevalence on a commodity;

b) application of an additional measure to reduce pest prevalence on a commodity (*Targeted* and/ or *MPI-Specified Measure* where required);

c) official pre-export inspection and phytosanitary certification to verify that pre-export measures have been undertaken and effective as required by MPI and that the consignment is free from regulated pests;

d) on-arrival inspection may be conducted in New Zealand to verify pests are not present in a representative sample (e.g. no live regulated visible pests in a 600 unit sample);

e) remedial action (for example treatment) if a pest is detected prior to biosecurity clearance being given for a consignment.

(35) Measures of different strengths (*Basic*, *Targeted*, or *MPI-Specified*) are applied according to the risk of entry and establishment posed by a pest on the pathway and reduce the likelihood of introduction to a very low level on a consignment.

Basic Measures

(36) *Basic measures* are required to manage all organisms that could enter and establish in New Zealand. *Basic measure* pests are pests identified through risk assessment as possibly being on the pathway. *Basic Measures* include (but are not restricted to) the following required components:

Commercial production

(37) All fresh produce for export to New Zealand, regardless of the associated pests, must be commercially produced using a quality system, recognised standard cultivation, pest management, harvest and packaging activities.

(38) Commercial production of salacca includes:

a) Recognised standard cultivation
- production site management and hygiene practices such as in-field weed control.

b) Pest management
- grower pest monitoring;
- grower management of pests and diseases.

c) Harvest activities
- sorting of fruit to remove extraneous matter (such as plant material and excess soil) and non-export quality produce.

d) Packaging activities
- removal of remnant soil and extraneous material ;
- removal of the woody stem from the salacca fruit;
- salacca packed into new and clean material;
- product security maintained following export certification to prevent pest re-infestation.

(39) All fresh produce for export to New Zealand must be of export grade to minimise the likelihood of infested or infected fresh produce entering the export supply chain.

(40) For many pests *Basic Measures* are sufficient to reduce their prevalence in a consignment to a very low level thus limiting their potential to establish and spread in New Zealand if they entered undetected.

Targeted Measures

(41) *Targeted Measures* are used to manage the risk of entry and establishment of pests that are unlikely to be sufficiently managed by *Basic Measures*.

(42) Pests which present a higher risk (consequence and likelihood of introduction) require measures of a higher strength (e.g. *Targeted* Measures) compared with those pathways where the risk is lower.

(43) An *Export Plan* is required for all commodities that may be associated with pests identified by MPI as requiring *Targeted Measures*. The components of an *Export Plan* may differ between countries and commodities because the growing systems and agricultural practices differ but can be similarly effective. The *Export Plan* provides a description of how the agreed *Targeted Measures* will be applied to manage these pests (where required) and is negotiated between New Zealand and the individual exporting country NPPO.

(44) *Targeted Measures* include a very wide range of options and provide MPI with the assurance that pest populations on the exported product are reduced to a level that will not enable the pest to establish a population in New Zealand.

(45) A *Targeted Measure* may also be efficacious against non-target pests.

(46) The following measures are some that may be considered for managing pests requiring *Targeted Measures*:

a) Country freedom;
   - additional measures or an *Export Plan* are not required where 'country freedom' status is recognised by MPI for the export country.

b) Pest free area;
   - MPI will audit the management of pest free areas for compliance with ISPM 4: *Requirements for the establishment of pest free areas*.

c) Pest free place of production;
   - MPI will audit the management of pest free place of production for compliance with ISPM 10: *Requirements for the establishment of pests free places of production and pest free production sites*.

d) Pest control activities (in-field);

e) Systems Approaches;
   - Systems Approach is composed of two or more independent measures, as negotiated between MPI and the exporting country;
   - independent measures may vary between exporting countries.

f) End-point treatment.

(47) *Targeted Measures* are subject to pathway assurance audit by MPI.

MPI-Specified Measures

(48) An *Export Plan* is required for all commodities that may be associated with pests identified by MPI as requiring *MPI-Specified Measures*.

(49) *MPI-Specified Measures* are required when the consequence of establishment of a pest is very high and where entry and establishment is likely as a result of the pathway.

a) The selection of an appropriate *MPI-Specified Measure* is based largely on quantitative data that supports a high level of phytosanitary assurance. Quantitative data may be supported by qualitative information, especially with respect to approval of a systems approach.

b) A *MPI-Specified Measure* may also be effective against non-target pests.

(50) Wherever possible, MPI uses ISPMs (or regional standards if applicable) to identify the appropriate requirements for imported plant commodities.

(51) *MPI-Specified Measures* are subject to pathway assurance audit by MPI.

Certification and verification

Pre-export inspection and phytosanitary certification

(52) Pre-export inspection and phytosanitary certification by the exporting NPPO of all commercially produced fresh produce for export to New Zealand is required to provide assurances of freedom from visually detectable regulated pests. Assurance is also required that measures for pests that are not visually detectable have been applied.

(53) The phytosanitary certification process includes:

a) verification that any *Basic*, *Targeted* and *MPI-Specified* Measures required by MPI have been met;

b) sampling and inspection to determine pest freedom;

i) a minimum sample of 600 randomly selected salacca fruit must be visually inspected by the exporting country NPPO using official procedures and, where necessary, at 10x magnification to ensure detection of cryptic or small pests. The visual inspection can include cutting salacca fruit to identify pests located within the fruit. Consistent with international practice, the inspected sample must be free from regulated pests.

ii) where any live regulated pest is found in the inspected lot, an appropriate measure must be applied (for example fumigation with an efficacious chemical) or the lot must be rejected for export to New Zealand.

c) any remedial action taken as agreed with MPI.

Verification on arrival in New Zealand

(54) A consignment will normally have a representative sample taken and inspected for the absence of regulated pests. Any reduction in the level of inspection from current on-arrival levels is based on sound evidence of the compliance of a pathway. In a few cases where a pathway is highly compliant inspections will be conducted on an audit basis to ensure ongoing compliance.

(55) When a consignment is found to be infested with live regulated pests on arrival in New Zealand, one of the following risk management activities will be applied:

a) reshipment of the consignment;

b) destruction of the consignment; or

c) treatment of the consignment. Treatment may include:

- re-conditioning to remove infested or infected fruit; or
- fumigation to kill regulated pests.

Part 3: Pest Risk Assessment and Management

(56) This section only includes a review of pests identified from the information sources included in paragraph (30).

Summary of risk associated with the importation of fresh salacca from Indonesia

(57) Pests identified as potentially associated with salacca production in Indonesia were included in this assessment. These include species that use the commodity for some part of their lifecycle, as well as species where there is existing evidence to suggest they have an opportunistic association with the commodity.

(58) Pests are defined as "Any species, strain or biotype of plant, animal or pathogenic agent injurious to plants or plant products" (ISPM 5: Glossary of Phytosanitary Terms). Pests are categorised as a quarantine pest for New Zealand if the pest:

a) is not present in New Zealand or is not widely distributed and under official control; or
b) is a vector of a quarantine pest for New Zealand; or
c) is a different strain to the pests present in New Zealand and has a different impact (e.g. host range, pathogenicity); and
d) would cause unwanted harm if the pest became established in New Zealand.

(59) Assessment of the 50 pests potentially associated with salacca from Indonesia identified nine quarantine pests that present a potential risk on this import pathway because:

a) they are associated with fresh salacca; and
b) are present in Indonesia.

The other 41 pests do not present a risk on the pathway because they did not meet these criteria and did not require additional assessment.

(60) Five of the nine pests present a potential risk on the Indonesia salacca pathway (possibility of being on the product at point of export, capable of establishing and spreading in New Zealand and causing economic consequences), as identified in Table 1 below, and are discussed further in this section.

a) The remaining four organisms are not considered to present a risk on the pathway (unlikely to be on the product at point of export, or will not survive transit to New Zealand) and therefore do not require additional assessment.

b) A summary of the pest risk assessments undertaken in the assessment for the 50 pests is presented in Appendix 1.

Table 1. Regulated pest groups associated with fresh salacca from Indonesia.

Group	Pests
Insects	*Dysmicoccus* spp. *Planococcus* spp. *Pseudococcus* spp.
Fruit Pathogens	*Marasmius palmivorus* *Thielaviopsis paradoxa*

Determination of phytosanitary measures included in the draft IHS

(61) MPI requires measures to be applied to reduce to a very low level the risk of entry and establishment of a pest on a pathway. Attaining zero biosecurity risk is not possible in any system.

Measures identified for specific pests

(62) The following reasons and evidence summarised from DoA (2014) and MPI (2016), support this determination (also see Appendix 1):

***Dysmicoccus* spp.** [1] (species not present in NZ)

***Planococcus* spp.** [1] (species not present in NZ) and

***Pseudococcus* spp.** [1] (species not present in NZ)

(63) *Dysmicoccus* spp., *Planococcus* spp., and *Pseudococcus* spp. pose a low risk to New Zealand because:

a) If they were to enter on salacca fruit they would be limited in their capacity to move to a suitable host;
b) Tropical species will be restricted in their distribution by climate;
c) If species could establish, current control measures will limit their impact to commercial hosts and the economic and environmental impact is likely to be low.

(64) *Basic Measures* are justified and sufficient to manage the low risk posed by *Dysmicoccus* spp., *Planococcus* spp., and *Pseudococcus* spp. because:

a) Commercial production activities will reduce populations of *Dysmicoccus* spp., *Planococcus* spp., and *Pseudococcus* spp. in salacca production sites;
    i) *Dysmicoccus* spp., *Planococcus* spp., and *Pseudococcus* spp. injure host plants and affect photosynthesis. Monitoring for plants displaying signs/symptoms of infestation during production will identify affected plants, resulting in pest controls being applied (see Commercial Production).

b) Harvest and packing activities will reduce the likelihood of *Dysmicoccus* spp., *Planococcus* spp., and *Pseudococcus* spp. being associated with salacca fruit at export;
    i) *Dysmicoccus* spp., *Planococcus* spp., and *Pseudococcus* spp. can lay eggs on salacca fruit, with nymphs and adults also present on salacca fruit (DoA, 2014). *Dysmicoccus* spp., *Planococcus* spp., and *Pseudococcus* spp. will probably be detected and removed during fruit grading and preparation for export.
    ii) Detection of *Dysmicoccus* spp., *Planococcus* spp., and *Pseudococcus* spp. will require remedial action prior to export certification.

c) *Dysmicoccus* spp., *Planococcus* spp., and *Pseudococcus* spp. are likely to be obvious during official visual inspection.
    i) The white mealy wax secreted by adult mealybugs is obvious visually against the golden brown skin of salacca fruits (Williams, 2004 in DoA, 2014).
    ii) Any mealybug present will be on the skin of the fruit as no mealybug life stage is an internal feeder on salacca fruit (MPI, 2014; DoA, 2014).
    iii) The morphology of the salacca fruit provides no locations for mealybugs to hide (DoA, 2014).
    iv) Detection of *Dysmicoccus* spp., *Planococcus* spp., and *Pseudococcus* spp. will require remedial action prior to export certification.

[1] The specific species within this genera that are associated with salacca fruit are not able to be identified based on the available scientific literature (DoA, 2014). Therefore, it is assumed that the species of mealybugs from within these genera that are associated with salacca are probably those associated with other palm species.

Marasmius palmivorus (fungus)

(65) *Marasmius palmivorus* poses a low risk to New Zealand because:

a) If it were to enter on salacca fruit it would be limited in its capacity to disperse and cause infection because:

i) low levels of inoculum (spores and mycelium) present on fruit at export;
ii) availability and proximity of a suitable host;
iii) suitable environmental conditions to promote development.

b) If the fungus could establish the economic and environmental impact is assessed as low.

(66) *Basic Measures* are justified and sufficient to manage the risk from *M. palmivorus* because:

a) Commercial production activities will reduce the incidence of *M. palmivorus* in salacca production sites;

(i) *M. palmivorus* spreads to healthy fruit when there are high inoculum levels present on the fruiting tree. Salacca fruit that has not developed, or left to rot on the tree after fruit maturity, provides a potential infection foci for *M. palmivorus* (DoA, 2014). Monitoring for plants displaying signs/symptoms of infection during production will identify affected plants, resulting in pest controls being applied (see Commercial Production).

b) *M. palmivorus* is likely to be obvious during official visual inspection.

i) Early *M. palmivorus* infection on salacca appears as pink or white mycelium (DoA, 2014).
ii) Later stage infection results in blackening and softening of skin, followed by a brown wet rot (DoA, 2014).
iii) Large numbers of compatible mycelia join to form a fruiting body. The fruiting body is 'mushroom like' and 2-2.5 cm in height with a cap width of 2-4cm in diameter (DoA, 2014).
iv) Detection of *M. palmivorus* will require remedial action prior to export certification.

Thielaviopsis paradoxa (fungus)

(67) *Thielaviopsis paradoxa* poses a low risk to New Zealand because:

a) it were to enter on salacca fruit it would be limited in its capacity to disperse and cause infection due to:

i) availability and proximity of a suitable host;
ii) suitable environmental conditions to promote development.

b) If the fungus could establish, the economic and environmental impact is assessed as low.

(68) *Basic Measures* are justified and sufficient to manage the risk from *T. paradoxa* because:

a) Commercial production activities will reduce incidence of *T. paradoxa* in salacca production sites;

i) Standard orchard management practices (pruning, thinning and sanitation) would limit the opportunity for obviously infected fruit to be harvested, or for high levels of inoculum to develop within orchards (DoA, 2014; MPI, 2016).
ii) *T. paradoxa* spreads to healthy fruit through wounds on the fruit surface (MPI, 2016). Monitoring for plants displaying signs/symptoms of infection during production will identify affected plants, resulting in pest controls being applied (see Commercial Production).

b) Harvest and packing activities will reduce the likelihood of *T. paradoxa* being associated with salacca fruit at export;

i) Obviously infected fruit will be detected and removed during fruit grading and preparation for export.
ii) Wounded or damaged fruit which would be susceptible to infection would not meet export standard and be rejected for export.

c) *T. paradoxa* is likely to be obvious during official visual inspection.

i) Infected fruit discolours brown to black with white mycelia on the lesions (Soytong and Jitkasemsuk, 2001).
ii) Fruit infected with *T. paradoxa* will require removal from consignments prior to export certification.

Summary of Proposed Measures

(69) MPI considers the risks associated with the importation of fresh salacca will be effectively managed by applying basic risk management measures (Table 3), specifically:

- in-field practices and pest controls;
- harvest and packhouse activities;
- pre-export inspection and certification, overseen by the exporting country NPPO.

(70) Each step in the export system reduces the likelihood of pests being present on the pathway. MPI will verify and inspect the consignment to ensure the requirements in the IHS have been met. Non-compliant consignments will be treated, re-shipped or destroyed.

(71) The measures MPI has identified as necessary to manage pests associated with salacca fruit are described below:

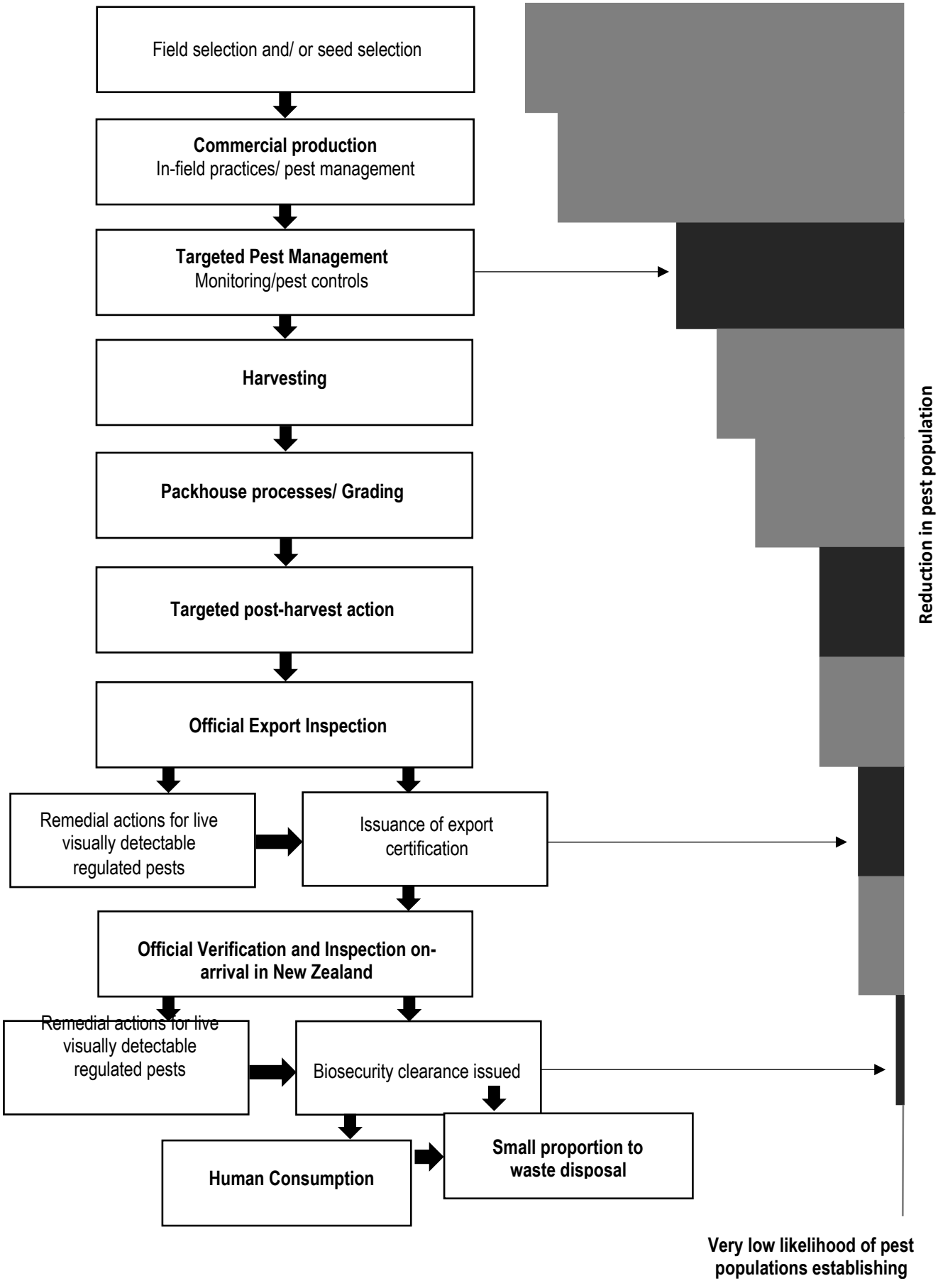
Table 2. Measure required to manage the risk associated with the salacca import pathway.

Pest	Measures Required
Insects (mealybugs) • *Dysmicoccus* spp. • *Planococcus* spp. • *Pseudococcus* spp.	Basic Measures
Fungi • *Marasmius palmivorus* • *Thielaviopsis paradoxa*	Basic Measures

(72) The measures contained in the IHS are subject to regular review based on pathway compliance, emerging risk assessment, new information/intelligence, and results of audit of the export system.

(73) MPI will monitor interceptions of all regulated pests (and hitchhikers) and the appropriateness/ effectiveness of phytosanitary measures during trade.

Table 3. New Zealand biosecurity system - Layers of protection for imported fresh produce



Part 3: References

Biosecurity Act 1993. http://www.legislation.govt.nz/default.aspx

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Appendix 1: Pest Categorisation

The pest categorisation process (table below) identifies all pests and diseases found to be associated with salacca in Indonesia, determines their presence (or absence) in New Zealand, and considers if they might be associated with fruit for export. A summary of key conclusions from the risk analysis process is included where a pest has been identified as a potential quarantine pest. Recommended risk management measures (from part 2 of this RMP) are included in the final column.

Note: the table follows the risk analysis process and terminology identified in part 2 of the international standard, ISPM11: *Pest risk analysis for quarantine pests*. ISPM 5 defines 'quarantine pest' as "*a pest of potential economic importance to [New Zealand] and not yet present there, or present but not widely distributed and being officially controlled*".

Scientific name		Conclusion	Reason	- Evidence to support	Is a measure justified?
Hemiptera	***Dysmicoccus* spp.** (species not present in NZ) [Pseudococcidae]	Has the potential to be a quarantine pest on this pathway.	*Dysmicoccus* spp. are associated with the pathway.	- Some species are present in Indonesia (DoA, 2014). - Some, but not all, species are present in New Zealand (NZOR, 2016; PPIN, 2016). - Associated with leaves, flowers and fruit of salacca palms (DoA, 2014).	**Yes**
		And is likely to enter, establish and spread if it entered NZ	*Dysmicoccus* spp. are capable of entering via the import pathway, being exposed to hosts, establishing and spreading in New Zealand.	- The fruit skin, where mealybugs would be present, will routinely be discarded (it is not consumed), sometimes to compost (MPI, 201, MPI 2016). - Reproduce sexually and parthenogenetically. - Limited mobility will limit access to new host plants (DoA, 2014). - Some species in this genus are polyphagous (DoA, 2014), with a host range possibly including commercially produced crops and native species such as nikau palm (MPI, 2016). - Establishment is likely to be limited to warmer areas of New Zealand and protected environments such as glasshouses (MPI, 2016).	
		And has the potential to cause economic consequences which are sufficient to justify risk management measures on this pathway.	*Dysmicoccus* spp. are capable of causing low level economic and environmental impacts if it established in New Zealand**.**	- Some species in the Pseudococcidae family are vectors of plant viruses (MPI, 2014). - Existing insect control programmes are likely to provide some level of control, which is likely to limit impact in commercial production to a low level (MPI, 2016).	
	***Planococcus* spp.** (species not present in NZ)	Has the potential to be a quarantine pest on this pathway.	*Planococcus* spp. are associated with the pathway.	- Some species are present in Indonesia (DoA, 2014). - Some, but not all, species are present in New Zealand (NZOR, 2016; PPIN, 2016). - Associated with leaves, flowers and fruit of salacca palms (DoA, 2014).	**Yes**

Scientific name	Conclusion	Reason	- Evidence to support	Is a measure justified?
[Pseudococcidae]	**And** is likely to enter, establish and spread if it entered NZ	*Planococcus* spp. are capable of entering via the import pathway, being exposed to hosts, establishing and spreading in New Zealand.	- The fruit skin, where mealybugs would be present, will routinely be discarded (it is not consumed), sometimes to compost (MPI, 2014). - Reproduce sexually and parthenogenetically. - Limited mobility will limit access to new host plants (DoA, 2014). - Some species in this genus are polyphagous (DoA, 2014), with a host range possibly including commercially produced crops and native species such as nikau palm (MPI, 2016). - Establishment is likely to be limited to warmer areas and protected environments such as glasshouses (MPI, 2016).	
	And has the potential to cause economic consequences which are sufficient to justify risk management measures on this pathway.	*Planococcus* spp. are capable of causing low level economic and environmental impacts if it established in New Zealand**.**	- Some species in the Pseudococcidae family are vectors of plant viruses (MPI, 2014). - Existing insect control programmes are likely to provide some level of control, which is likely to limit impact in commercial production to a low level (MPI, 2016).	
***Pseudococcus* spp.** (species not present in NZ) [Pseudococcidae] Except: *Pseudococcus longispinus*	Has the potential to be a quarantine pest on this pathway	*Pseudococcus* spp. are associated with the pathway.	- Some species are present in Indonesia (DoA, 2014). - Some, but not all, species are present in New Zealand (NZOR, 2016; PPIN, 2016). - Associated with leaves, flowers and fruit of salacca palms (DoA, 2014).	**Yes**
	And, the likelihood of introduction and spread is sufficient to justify risk management on this pathway	*Pseudococcus* spp. are capable of entering via the import pathway, being exposed to hosts, establishing and spreading in New Zealand.	- The fruit skin, where mealybugs would be present, will routinely be discarded (it is not consumed), sometimes to compost (MPI, 2014). - Reproduce sexually and parthenogenetically. - Limited mobility will limit access to new host plants (DoA, 2014). - Some species in this genus are polyphagous (DoA, 2014), with a host range possibly including commercially produced crops and native species such as nikau palm (MPI, 2016). - Establishment is likely to be limited to warmer areas and protected environments such as glasshouses (MPI, 2016).	
	And, the potential economic consequences are sufficient to justify risk management on this pathway	*Pseudococcus* spp. are capable of causing low level economic and environmental impacts if it established in New Zealand.	- Some species in the Pseudococcidae family are vectors of plant viruses (MPI, 2014). - Existing insect control programmes are likely to provide some level of control, which is likely to limit impact in commercial production to a low level (MPI, 2016).	

Scientific name		Conclusion	Reason	- Evidence to support	Is a measure justified?
Fungi	***Marasmius palmivorus*** (causal agent of brunch rot) Sharples [Agaricales: Marasmiaceae]	Has the potential to be a quarantine pest on this pathway	*Marasmius palmivorus* is associated with the pathway.	- Is present in Indonesia (DoA, 2014). - Is not recorded in New Zealand (NZFungi, 2016). - Has been reported from the fruit of *Salacca wallichiana* in Thailand. It is therefore assumed that *S. zalacca* fruit is also a host (DoA, 2014).	**Yes**
		And, the likelihood of introduction and spread is sufficient to justify risk management on this pathway	*Marasmius palmivorus* is capable of entering via the import pathway, being exposed to hosts, establishing and spreading in New Zealand.	- Spores may be undetected by visual inspection of imported fruit (MPI, 2016). - Rotten and over-ripe fruit will routinely be discarded, sometimes to compost. - Ornamental palm species (potentially including Nikau palm) are likely hosts (MPI, 2016). - Establishment is likely to be limited to protected environments, with disease potential restricted by climatic conditions (MPI, 2016).	
		And, the potential economic consequences are sufficient to justify risk management on this pathway	*Marasmius palmivorus* is capable of causing low level economic and environmental impacts if it established in New Zealand.	- It has been assumed that native palm species (potentially including Nikau palm) present in New Zealand may be host species (MPI, 2016). - Fruit for consumption is not commercially grown on palm trees in New Zealand, limiting any direct impact of bunch rot (MPI, 2016). - Climatic conditions would limit disease potential and limit possible economic and environmental impacts to a very low level (DoA, 2014; MPI, 2016).	
	Thielaviopsis paradoxa (De Seynes) Hohn., 1904 [Microascales: Ceratocystidaceae]	Has the potential to be a quarantine pest on this pathway	*Thielaviopsis paradoxa* is associated with the pathway.	- Is present in Indonesia (DoA, 2014). - Is not recorded as present in New Zealand (NZ Fungi, 2016). Previously *T. paradoxa* was thought to be present in NZ, however these specimens have been reclassified based on recent redefinition of this species (Mbenoun et al., 2014; NZ Fungi, 2016). - Has been reported from salacca fruit (MPI, 2016).	**Yes**
		And, the likelihood of introduction and spread is sufficient to justify risk management on this pathway	*Thielaviopsis paradoxa* is capable of entering via the import pathway, being exposed to hosts, establishing and spreading in New Zealand.	- Infection is characterised by white mycelium which develop into black lesions on the fruit skin. Wounds are the usual infection site (MPI, 2016). - Spores may be undetected by visual inspection. - Rotten fruit will routinely be discarded, sometimes to compost. - Is polyphagous, with suitable host are present in limited numbers in New Zealand. Reported host species include species present in New Zealand such as eucalyptus, kumara, potato, lettuce and pumpkin (MPI, 2016). - Establishment may be possible throughout New Zealand, however disease potential will be restricted by climatic conditions (MPI, 2016).	

Scientific name		Conclusion	Reason	- Evidence to support	Is a measure justified?
		And, the potential economic consequences are sufficient to justify risk management on this pathway	*Thielaviopsis paradoxa* is capable of causing low level economic and environmental impacts if it established in New Zealand.	- Host range in New Zealand is limited – major hosts include some species in the palm family. Nikau and ornamental palms may be hosts. Minor hosts include eucalyptus, maize, carrots, pumpkin, kumara, potato and lettuce (MPI, 2016). - Climatic conditions would limit disease potential and limit possible economic and environmental impacts to a low level (MPI, 2016).	
Coleoptera	***Adoretus sinicus*** Burmeister, 1855 [Scarabaeidae]	Does not fulfil the criteria of a quarantine pest on this pathway.	*Adoretus sinicus* is not associated with the pathway.	- Is present in Indonesia (DoA, 2014). - Is not recorded in New Zealand (NZOR, 2016; PPIN, 2016). - Associated with leaves of salacca palms and dead plant material (DoA, 2014).	**No**
	Callispa elegans Baly, 1876 [Chrysomelidae]	Does not fulfil the criteria of a quarantine pest on this pathway	*Callispa elegans* is not associated with the pathway	- Is present in Indonesia (DoA, 2014). - Is not recorded in New Zealand (NZOR, 2016; PPIN, 2016). - Associated with leaves of salacca palms (DoA, 2014).	**No**
	Callispa pusilla Gestro, 1896 [Chrysomelidae]	Does not fulfil the criteria of a quarantine pest on this pathway	*Callispa pusilla* is not associated with the pathway	- Is present in Indonesia (DoA, 2014). - Is not recorded in New Zealand (NZOR, 2016; PPIN, 2016). - Associated with leaves of salacca palms (DoA, 2014).	**No**
	***Carpophilus* spp.** [Nitidulidae]	Does not fulfil the criteria of a quarantine pest on this pathway	*Carpophilus* spp. are not associated with the pathway	- Some species are present in Indonesia (DoA, 2014). - Some, but not all, species are present in New Zealand (NZOR, 2016; PPIN, 2016). - Some *Carpophilus* species are known to attack healthy fruit, but no record found which associate these species with salacca fruit (DoA, 2014).	**No**
	Holotrichia javana Brenske, 1892 [Scarabaeidae]	Does not fulfil the criteria of a quarantine pest on this pathway	*Holotrichia javana* is not associated with the pathway	- Is present in Indonesia (DoA, 2014). - Is not recorded in New Zealand (NZOR, 2016; PPIN, 2016). - Associated with leaves, roots, and bark of salacca palms (DoA, 2014).	**No**
	Lepidiota stigma (Fabricius, 1798) [Scarabaeidae]	Does not fulfil the criteria of a quarantine pest on this pathway	*Lepidiota stigma* is not associated with the pathway	- Is present in Indonesia (DoA, 2014). - Is not recorded in New Zealand (NZOR, 2016; PPIN, 2016). - Associated with leaves and roots of salacca palms (DoA, 2014).	**No**
	***Nodocnemus* spp.** [Curculionidae]	Has the potential to be a quarantine pest on this pathway.	*Nodocnemus* spp. are associated with the pathway.	- Some species are present in Indonesia (DoA, 2014). - Is not recorded in New Zealand (NZOR, 2016; PPIN, 2016). - Adults are attracted to decaying fruit, but not sound, undamaged export quality fruit (DoA, 2014). - Associated with salacca flowers and fruit stalk (DoA, 2014).	**No**

Scientific name	Conclusion	Reason	- Evidence to support	Is a measure justified?
	However, it is not likely to enter via the pathway and therefore risk management measures are not justified.	*Nodocnemus* spp. are not capable of entering through the pathway.	- Salacca fruit are removed from the stalk during harvesting processes. Stems will not be exported with fruit.	
Omotemnus miniatocrinitus Chevrolat, 1882 [Curculionidae]	Has the potential to be a quarantine pest on this pathway.	*Omotemnus miniatocrinitus* is associated with the pathway.	- Is present in Indonesia (DoA, 2014). - Is not recorded in New Zealand (NZOR, 2016; PPIN, 2016). - Associated with the trunk of salacca palms and rotten fruits (DoA, 2014).	**No**
	However, it is not likely to enter via the pathway and therefore risk management measures are not justified.	*Omotemnus miniatocrinitus* is not capable of entering through the pathway.	- Rotten fruit with *O. miniatocrinitus* would be removed during harvest and pre-export processes.	
Omotemnus serrirostris Boheman, 1845 [Curculionidae]	Does not fulfil the criteria of a quarantine pest on this pathway	*Omotemnus serrirostris* is not associated with the pathway	- Is present in Indonesia (DoA, 2014). - Is not recorded in New Zealand (NZOR, 2016; PPIN, 2016). - Associated with the trunk of salacca palms (DoA, 2014).	**No**
Pistosia inornata (Gestro, 1892) [Chrysomelidae]	Does not fulfil the criteria of a quarantine pest on this pathway	*Pistosia inornata* is not associated with the pathway	- Is present in Indonesia (DoA, 2014). - Is not recorded in New Zealand (NZOR, 2016; PPIN, 2016). - Associated with leaves of salacca palms (DoA, 2014).	**No**
Rhynchophorus ferrugineus (Olivier, 1790) [Curculionidae]	Does not fulfil the criteria of a quarantine pest on this pathway	*Rhynochophorus ferrugineus* is not associated with the pathway	- Is present in Indonesia (DoA, 2014). - Is not recorded in New Zealand (NZOR, 2016; PPIN, 2016). - Associated with trunk, crown and leaf petiole of salacca palms (DoA, 2014).	**No**
Rhynchophorus palmarum (Linnaeus, 1758) [Curculionidae]	Does not fulfil the criteria of a quarantine pest on this pathway	*Rhynochophorus palmarum* is not associated with the pathway	- Is present in Indonesia (DoA, 2014). - Is not recorded in New Zealand (NZOR, 2016; PPIN, 2016). - Associated with flowers, trunk and crown of salacca palms (DoA, 2014).	**No**

Scientific name		Conclusion	Reason	- Evidence to support	Is a measure justified?
Hemiptera	***Astegopteryx nipae*** (van der Goot, 1917) [Aphididae]	Does not fulfil the criteria of a quarantine pest on this pathway	*Astegopteryx nipae* is not associated with the pathway	- Is present in Indonesia (DoA, 2014). - Is not recorded in New Zealand (NZOR, 2016; PPIN, 2016). - Associated with leaves of salacca palms (DoA, 2014).	**No**
	Astegopteryx rappardi Hille Ris Lambers, 1953 [Aphididae]	Does not fulfil the criteria of a quarantine pest on this pathway	*Astegopteryx rappardi* is not associated with the pathway	- Is present in Indonesia (DoA, 2014). - Is not recorded in New Zealand (NZOR, 2016; PPIN, 2016). - Associated with leaves of salacca palms (DoA, 2014).	**No**
	Cerataphis lataniae (Boisduval, 1867) [Aphididae]	Does not fulfil the criteria of a quarantine pest on this pathway	*Cerataphis lataniae* is not associated with the pathway	- Is present in Indonesia (DoA, 2014). - Is not recorded in New Zealand (NZOR, 2016; PPIN, 2016). - Associated with leaves of salacca palms (DoA, 2014).	**No**
	Ischnaspis longirostris (Signoret, 1882) [Diaspididae]	Does not fulfil the criteria of a quarantine pest on this pathway	*Ischnaspis longirostris* is not associated with the pathway	- Is present in Indonesia (DoA, 2014). - Is not recorded in New Zealand (NZOR, 2016; PPIN, 2016). - Associated with leaves and bark of salacca palms. There is no record of *I. longitostris* being associated with salacca fruit (DoA, 2014).	**No**
	Pseudococcus longispinus (Targiono Tozzetti, 1867) [Pseudococcidae]	Has the potential to be a quarantine pest on this pathway.	*Pseudococcus longispinus* is associated with the pathway.	- Is present in Indonesia (DoA, 2014). - Is recorded in New Zealand (NZOR, 2016; PPIN, 2016). - Associated with salacca fruit (MPI, 2016).	**No**
		However, risk management is not justified on this pathway	*Pseudococcus longispinus* is not of concern on the pathway	- *Pseudococcus longispinus* is a vector of grapevine diseases, and is not known to vector any viruses in salacca (MPI, 2016). Salacca is grown in a monoculture, or in conjunction with shade species (DoA, 2014). It is very unlikely that any individual mealybug present on salacca fruit would have been previously exposed to grapevines (MPI, 2016).	
	***Tolumnia* spp.** [Pentatomidae]	Does not fulfil the criteria of a quarantine pest on this pathway	*Tolumnia* spp. are associated with the pathway	- Some species are present in Indonesia (DoA, 2014). - Is not recorded in New Zealand (NZOR, 2016; PPIN, 2016). - Associated with fruit, leaves and stems of salacca (MPI 2016).	**No**
		However, it is not likely to enter via the pathway and therefore risk management measures are not justified.	*Tolumnia* spp. are not capable of entering through the pathway.	- There is only a very low likelihood that *Tolumnia* sp. immatures would be associated with salacca fruit, and any present would be likely to be removed during processing and brushing (MPI, 2016). - Harvesting operations would disturb adults removing them from fruit (DoA, 2014).	

Scientific name		Conclusion	Reason	- Evidence to support	Is a measure justified?
Hymenoptera	***Trigona* spp.** [Apidae]	Does not fulfil the criteria of a quarantine pest on this pathway	*Trigona* spp. are not associated with the pathway	- Some species are present in Indonesia (DoA, 2014). - Is not recorded in New Zealand (NZOR, 2016; PPIN, 2016). - Associated with pollen and flowers of salacca palms (DoA, 2014).	**No**
Lepidoptera	***Amathusia ochraceofusca subsp. ochraceofusca*** Honrath, 1888 [Nymphalidae]	Does not fulfil the criteria of a quarantine pest on this pathway	*Amathusia ochraceofusca subsp. ochraceofusca* is not associated with the pathway	- Is present in Indonesia (DoA, 2014). - Is not recorded in New Zealand (NZOR, 2016; PPIN, 2016). - Associated with leaves of salacca palms (DoA, 2014).	**No**
	***Darna* spp.** [Limacodidae]	Does not fulfil the criteria of a quarantine pest on this pathway	*Darna* spp. are not associated with the pathway	- Some species are present in Indonesia (DoA, 2014). - Is not recorded in New Zealand (NZOR, 2016; PPIN, 2016). - Associated with leaves of salacca palms (DoA, 2014).	**No**
	Hidari irava (Moore, 1858) [Hersperiidae]	Does not fulfil the criteria of a quarantine pest on this pathway	*Hidari irava* is not associated with the pathway	- Is present in Indonesia (DoA, 2014). - Is not recorded in New Zealand (NZOR, 2016; PPIN, 2016). - Associated with leaves of salacca palms (DoA, 2014).	**No**
	Lotonus avesta (Hewitson, 1868) [Hesperiidae]	Does not fulfil the criteria of a quarantine pest on this pathway	*Lotonus avesta* is not associated with the pathway	- Is present in Indonesia (DoA, 2014). - Is not recorded in New Zealand (NZOR, 2016; PPIN, 2016). - Associated with leaves of salacca palms (DoA, 2014).	**No**
	Parasa lepida (Cramer, 1799) [Limacodidae]	Does not fulfil the criteria of a quarantine pest on this pathway	*Parasa lepida* is not associated with the pathway	- Is present in Indonesia (DoA, 2014). - Is not recorded in New Zealand (NZOR, 2016; PPIN, 2016). - Associated with leaves of salacca palms (DoA, 2014).	**No**
	Ploneta diducta (Snellen, 1900) [Limacodidae]	Does not fulfil the criteria of a quarantine pest on this pathway	*Plonesta diducta* is not associated with the pathway	- Is present in Indonesia (DoA, 2014). - Is not recorded in New Zealand (NZOR, 2016; PPIN, 2016). - Associated with leaves of salacca palms (DoA, 2014).	**No**
	***Setora* spp.** [Limacodidae]	Does not fulfil the criteria of a quarantine pest on this pathway	*Setora* spp. are not associated with the pathway	- Some species are present in Indonesia (DoA, 2014). - Is not recorded in New Zealand (NZOR, 2016; PPIN, 2016). - Associated with leaves of salacca palms (DoA, 2014).	**No**

Scientific name		Conclusion	Reason	- Evidence to support	Is a measure justified?
Orthoptera	***Sexava coriacea*** (Linnaeus, 1758) [Tettigoniidae]	Does not fulfil the criteria of a quarantine pest on this pathway	*Sexava coriacea* is not associated with the pathway	- Is present in Indonesia (DoA, 2014). - Is not recorded in New Zealand (NZOR, 2016; PPIN, 2016). - Associated with leaves of salacca palms (DoA, 2014).	**No**
	Sexava karnyi Leefmans, 1927 [Tettigoniidae]	Does not fulfil the criteria of a quarantine pest on this pathway	*Sexava karnyi* is not associated with the pathway	- Is present in Indonesia (DoA, 2014). - Is not recorded in New Zealand (NZOR, 2016; PPIN, 2016). - Associated with leaves of salacca palms (DoA, 2014).	**No**
	Sexava nubila (Stal, 1874) [Tettigoniidae]	Does not fulfil the criteria of a quarantine pest on this pathway	*Sexava nubila* is not associated with the pathway	- Is present in Indonesia (DoA, 2014). - Is not recorded in New Zealand (NZOR, 2016; PPIN, 2016). - Associated with leaves of salacca palms (DoA, 2014).	**No**
Bacteria	***Pectobacterium carotovorum subsp. carotovorum*** (Jones, 1901) Hauben et al. 1999 [Enterobacteriaceae]	Does not fulfil the criteria of a quarantine pest on this pathway	*Pectobacterium carotovorum subsp. carotovorum* is present in New Zealand	- Is present in Indonesia (DoA, 2014) - Is present in New Zealand (NZ Fungi, 2016; Pers com Bevan Weir, 2016).	**No**
Fungi	***Aspergillus* spp.** [Eurotiales: Trichomaceae]	Does not fulfil the criteria of a quarantine pest on this pathway	*Aspergillus* spp. are not associated with the pathway	- Some species are present in Indonesia (DoA, 2014). - Some, but not all, species are present in New Zealand (NZ Fungi 2016). - Reported as causing fruit rot of salacca infested with *Thielaviopsis paradoxa* (or possibly other fungi) as a secondary pathogen (DoA 2016). *Aspergillus* sp. invades via wounds or due to fruit being in a weakened state (DoA 2016) (and therefore not export quality)	**No**
	***Cercospora* spp.** [Capnodiales: Mycospaerellaceae]	Does not fulfil the criteria of a quarantine pest on this pathway	*Cercospora* spp. are not associated with the pathway	- Some species are present in Indonesia (DoA, 2014). - Some, but not all, species are present in New Zealand (NZ Fungi 2016). - Species in this genus cause leaf diseases in palms (DoA, 2014).	**No**
	Erythricium salmonicolor (Berk. & Broome) Julich [Polyporales: Phanerochaetaveae]	Does not fulfil the criteria of a quarantine pest on this pathway	*Erythricium salmonicolor* is not of concern on the pathway	- Is present in Indonesia (DoA, 2014) - Is present in New Zealand (NZ Fungi, 2016)	**No**

Scientific name	Conclusion	Reason	- Evidence to support	Is a measure justified?
***Fusarium* spp.** [Hypocreales: Nectriaceae] Exception: *Fusarium incarnatum* *Fusarium solani* *Fusarium oxysporum* *Fusarium proliferatum*	Does not fulfil the criteria of a quarantine pest on this pathway	*Fusarium* spp. are not associated with the pathway	- Some species are present in Indonesia (DoA, 2014). - Some, but not all, species are present in New Zealand (NZ Fungi 2016). - Reported as causing fruit rot of salacca infested with *Thielaviopsis paradoxa* (or possibly other fungi) as a secondary pathogen (DoA, 2014). However fruit infested with *T. paradoxa*, or wounded or damaged fruit susceptible to infection would not be of export grade and rejected for export.	**No**
Fusarium incarnatum ***Fusarium solani*** ***Fusarium oxysporum*** ***Fusarium proliferatum*** [Hypocreales: Nectriaceae]	Does not fulfil the criteria of a quarantine pest on this pathway	*Fusarium* spp. are not of concern on the pathway	- Species are present in Indonesia (DoA, 2014). - Present in New Zealand	
Lasiodiplodia theobromae Griffon & Maubl. [Botryospaeriales: Botryospaericeae]	Does not fulfil the criteria of a quarantine pest on this pathway	*Lasiodiplodia theobromae* is not of concern on the pathway	- Is present in Indonesia (DoA, 2014) - Is present in New Zealand (NZ Fungi, 2016)	**No**
Lembosia zalaccae Hansf. [Capnodiales: Asterinaceae]	Does not fulfil the criteria of a quarantine pest on this pathway	*Lembosia salaccae* is not associated with the pathway	- Is present in Indonesia (DoA, 2014). - Is not recorded in New Zealand (NZFungi, 2016). - Associated with foliage of salacca palms (DoA, 2014).	**No**
Marasmius javanicus Retnowati [Agaricales: Marasmiaceae]	Does not fulfil the criteria of a quarantine pest on this pathway	*Marasmius javanicus* is not associated with the pathway	- Is present in Indonesia (DoA, 2014). - Is not recorded in New Zealand (NZFungi, 2016). - Associated with degrading leafy and woody debris (DoA, 2014).	**No**
***Mycena* spp.** [Agricales: Mycenaceae]	Does not fulfil the criteria of a quarantine pest on this pathway	*Mycena* spp. are not associated with the pathway	- Some species are present in Indonesia (DoA, 2014). - Some, but not all, species are present in New Zealand (NZ Fungi 2016). - Associated with woody parts of salacca palms including stalks (DoA, 2014).	**No**
***Pestalotia* spp.** [Xylariales: Amphispaericaeae]	Does not fulfil the criteria of a quarantine pest on this pathway	*Pestalotia* spp. are not associated with the pathway	- Some species are present in Indonesia (DoA, 2014). - Some, but not all, species are present in New Zealand (NZ Fungi, 2016). - Associated with leaves of salacca palms (DoA, 2014).	**No**

Scientific name		Conclusion	Reason	- Evidence to support	Is a measure justified?
	Pestalotiopsis palmarum (Cooke) Stewart [Xylariales: Amphispaeriaceae]	Does not fulfil the criteria of a quarantine pest on this pathway	*Pestalotiopsis pamarum* is not of concern on the pathway	- Is present in Indonesia (DoA, 2014) - Is present in New Zealand (NZ Fungi, 2016)	**No**
Algae	***Cephaleuros virescens*** Kunze [Trentepohliales: Trentepohliaceae]	Does not fulfil the criteria of a quarantine pest on this pathway	*Cephaleuros virescens* is not of concern on the pathway	- Is present in Indonesia (DoA, 2014) - Is present in New Zealand (NZ Fungi, 2016)	**No**