



Risk Management Proposal:

Fresh Table Grapes for Human Consumption

Equivalent phytosanitary measure for regulated pests of fresh table grapes (*Vitis vinifera*)

FOR PUBLIC CONSULTATION

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Submissions

The Ministry for Primary Industries (MPI) invites comment from interested parties on the proposed equivalent phytosanitary treatment (irradiation) for regulated pests associated with fresh table grapes (*Vitis vinifera*).

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 proposed equivalent phytosanitary treatment (irradiation) for table grapes. MPI has developed this proposal based on the available scientific evidence and assessment of this evidence. If you disagree with the measure 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 and 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 21 February 2018.

Plant Imports
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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.

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Purpose

- (1) The purpose of this risk management proposal (RMP) is to:
 - a) outline the proposed amendment to the import requirements for fresh table grapes (*Vitis vinifera*) for the management of:
 - i) high impact pests *Bactrocera neohumeralis*, *B. tryoni* and *Ceratitis capitata*; and
 - ii) moderate impact pests *Conogethes punctiferalis* and *Maconellicoccus hirsutus*.
 - b) explain how the proposed measures are equivalent to existing measures and are consistent with New Zealand's domestic legislation and international obligations.

Scope

- (2) This RMP provides information and the process used to assess the efficacy of a proposed phytosanitary measure as equivalent to an existing measure.
- (3) The draft amendment to the import health standard (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 IHS amendment 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.

Part 1: Context

Domestic

- (4) 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.
- (5) 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).
- (6) MPI engages with interested parties and/or affected New Zealand stakeholders and the exporting country requesting market access during the development of an IHS.
- (7) MPI follows MPI policies and procedures for the development of an IHS and consultation.

International

- (8) Where possible, phytosanitary measures are aligned with international standards, guidelines, and recommendations to meet 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.
- (9) The SPS Agreement states that phytosanitary measures must not discriminate unfairly between countries or between imported or domestically produced goods. Where there is a choice of phytosanitary measures to reduce risk to an acceptable level, WTO members must select the least trade restrictive measure.
- (10) Setting the least trade restrictive measure to manage risk to an acceptable level in an IHS includes evaluating alternative or equivalent measures as requested by trading partners (Article 4 SPS Agreement).

Equivalence

- (11) For a phytosanitary measure to be approved by MPI as equivalent it must offer the same or greater level of protection to the measures it is replacing or are currently in place.
- (12) The assessment of any equivalence request is based on:

- a) international standards for phytosanitary measures (ISPMs); for example:
 - ISPM 24 (2005) Guidelines for the determination and recognition of equivalence of phytosanitary measures;
 - ISPM 28 (2007) Phytosanitary treatments for regulated pests.
 - b) efficacy data relating to a treatment;
 - c) the target pest(s); and
 - d) other relevant information (e.g. history of trade).
- (13) MPI must ensure that any measure approved is consistent with the Biosecurity Act 1993 and, the Sanitary and Phytosanitary Measures (SPS) agreement with regard to scientific justification, non-discrimination and offer transparency in assessment processes and decisions.

New Zealand's Biosecurity System

- (14) New Zealand operates a biosecurity system for which the phytosanitary aspect (covering plant health) is a key part.
- (15) 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).
- (16) 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.
- (17) 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).
- (18) 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*.

Strength of measures

- (19) Measures are required for regulated pests 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).
- (20) The strength of the measure required should not be 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*.
- (21) 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 a transient population is low.
- (22) 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.

Part 2: Background

- (23) The Ministry for Primary Industries (MPI) issued the IHS: Grape, *Vitis vinifera* from Australia on 20 December 2000, with the requirement for table grapes to be cold treated at a rate of **<1 °C for 16 days**, or **<0 °C for 13 days**.
- (24) The Australian Department of Agriculture and Water Resources (DAWR) has requested that MPI consider irradiation at a rate of **150 Gray (Gy)** as equivalent to the current IHS measure for the management of regulated fruit flies.
 - a) Equivalence of phytosanitary measures is set out in ISPM 24 (Guidelines for the determination and recognition of equivalence of phytosanitary measures).
- (25) The irradiation treatment for fruit flies of economically important fruit flies (150 Gy) to prevent the emergence of adult fruit flies from any host is an internationally agreed treatment under the SPS Agreement (ISPM 28 PT 7). As such MPI has already accepted this treatment.
- (26) Given that the proposed irradiation treatment is internationally recognised as efficacious against all fruit flies in the Tephritidae family, and evidence of efficacy for moderate risk pests associated with table grapes, MPI has assessed the proposed treatment in Part 3 of this RMP.

Trade

- (27) Fresh table grapes are currently approved for import from Australia, Chile, China, Italy, Mexico, Peru, South Korea and the United States of America (USA).
- (28) The bulk of table grape imports come from the USA (47%¹, June to December), Australia (18%¹, January to May), Chile (13%¹, December to June), Mexico (10%¹, May to July), Peru (9%¹, October to March), Korea (2%¹, July to October).
- (29) New Zealand has imported fresh table grapes from Australia for over 16 years. New Zealanders consume large quantities of table grapes and this pathway forms part of a high-volume and highly valued import/export segment.

Commodity Description

- (30) Fresh table grapes for consumption are defined as commercially-produced export grade bunches of grapes from the Vitaceae family and includes the grape, pedicel and peduncle.
- (31) The commodity should be free from leaves, roots, any other plant parts or extraneous material.

Current IHS Requirements

- (32) The current measures for table grapes from Australia for the management of *B. tryoni* and other species of fruit flies are:
 - a) Country Freedom;
OR
 - b) Pest Free Area (in country);
OR
 - c) Cold treated at a rate of <1 °C for 16 days, or <0 °C for 13 days.
- (33) The current measures for table grapes from Australia for the management of *Conogethes punctiferalis* and *Maconellicoccus hirsutus* are:
 - a) Appropriate pest control activities;
OR

¹ Based on number of consignments imported between 01/01/2015 to 01/01/2017 [QuanCargo, 2017]

- b) Sourced from a pest free area.

Proposed Amendments to the IHS

Measures for fruit flies

- (34) The following amendment to the IHS is proposed as equivalent to current measures to manage economically significant fruit flies. The IHS is proposed to include the following additional MPI-Specified Measure as an option to manage *Bactrocera neohumeralis*, *B. tryoni* and *Ceratitidis capitata*:
 - a) Irradiation at a rate of 150 Gy;
- (35) No change to current cold treatment rates or pest free area requirements is proposed.

Measures for moderate risk pests

- (36) The following amendment to the IHS is proposed as equivalent to current measures to manage moderate risk pests. The IHS is proposed to include the following additional Targeted Measure as an option to manage *Conogethes punctiferalis* and *Maconellicoccus hirsutus*:
 - a) Irradiation at an effective dose (e.g. minimum absorbed dose of 289Gy).
- (37) No change to appropriate pest control activities or pest free area requirements is proposed.

Part 3: Assessment

Summary of Risk

- (38) Fresh table grapes are known hosts of economically significant fruit fly species, and other regulated pests of concern. Tephritidae fruit flies (Table 2) are internally feeding organisms and are considered a high risk, requiring *MPI-Specified Measures* (previously Quarantine Risk Group 3, RG3 pests). Any incursion of live Tephritidae fruit fly could disrupt trade and potentially cause significant economic losses for New Zealand exporters of fruit fly host material.
- a) The fresh table grape export pathway from Australia has been compliant for more than 10 years, without any detections of live or dead fruit flies (MPI, 2016b).
- (39) Fresh table grapes are also known to be hosts of moderate risk pests (previously Quarantine Risk Group 2, RG2 pests, now *Targeted Measure* pests) (Table 2).
- a) Spiders, although requiring an additional level of measure, are not included in the assessment for irradiation equivalence. Spiders are non-plant pests, but regulated due to the risk they pose to human health. Endpoint fumigation with CO₂SO₂, or approved pest control activities is recognised as being efficacious for managing the risk associated with spiders on table grapes.

Table 2: Regulated insect pests of concern associated with fresh table grapes from Australia

	Scientific name	Common name
Targeted Measures	<i>Conogethes punctiferalis</i>	Yellow peach moth
	<i>Maconellicoccus hirsutus</i>	Pink hibiscus mealybug
MPI-Specified Measures	<i>Bactrocera neohumeralis</i>	Lesser Queensland fruit fly
	<i>Bactrocera tryoni</i>	Queensland fruit fly
	<i>Ceratitis capitata</i>	Mediterranean fruit fly

- (40) The proposed equivalent treatment is internationally recognised as efficacious against all Tephritidae fruit flies (ISPM 28 PT 7).
- (41) The proposed equivalent treatment for *Targeted Measure* pests is recognised as efficacious at a rate of 289 Gy for *C. punctiferalis* and *M. hirsutus*.
- (42) Note, use of irradiation as a *Targeted Measure* or *MPI-Specified Measure* for *C. punctiferalis* and *M. hirsutus* must be recorded in a bilateral arrangement prior to its use.

Information Sources

- (43) The following information was used as evidence that the proposed measure is equivalent to the current cold disinfestation measure to manage economically significant *Bactrocera* spp. fruit flies associated with fresh table grapes imported from Australia:
- ISPM 28. *Phytosanitary treatments for regulated pests*, PT 7 (Irradiation treatment for fruit flies of the family Tephritidae (generic)).
 - MPI 2016a. MPI Standard 152.02, Importation and clearance of fresh fruit and vegetables into New Zealand.
 - MPI 2016b. Quancargo imports database (pathway pest interception records).
 - Relevant literature searches.

Treatment Efficacy

- (44) MPI requires (and as per the phytosanitary certificate's certifying statement) that a consignment is visually free from regulated pests. Phytosanitary inspection verifies that a consignment is visually free of regulated pests of concern to New Zealand, or determines the appropriate remedial action to be taken.
- a) If regulated vectors, fungi, weed seeds, viruses or pathogens are detected pre-treatment, the consignment requires conditioning prior to re-inspection and treatment with irradiation; or should be rejected for export.
 - b) Note: Irradiation should not be a substitute for good hygiene, good agricultural or good handling practices.

Tephritidae fruit flies

- (45) Adult Tephritidae fruit flies are likely to be obvious during visual inspection.
- a) Adult fruit flies are small, present on the outside of the fruit and visually obvious against the surface of the fresh table grapes (green and purple flesh colour).
 - Adult *Bactrocera tryoni* are 7.0 - 8.0 mm in length (PHA, undated; GISD, 2016). Adults are a reddish brown in colour, with yellow markings (GISD, 2016).
 - Adult *Bactrocera neohumeralis* are in the *B. tryoni* species complex and a similar size and morphology (PHA, 2016).
 - Adult *Ceratitis capitata* are 3.5 - 5.0 mm in length. Adults are yellowish with a brown tinge, with a distinctive white thorax with black blotches (Thomas *et al.* 2010).
- (46) Presence of Tephritidae fruit fly eggs, larvae or pupae in the fruit can be identified by puncture marks on the fruit surface and associated necrosis.
- (47) The proposed measure (irradiation at a minimum absorbed dose of 150 Gy) is sufficient to manage the likelihood of introduction of all Tephritidae fruit flies for fresh grapes imported from any country for the following reason:
- a) Irradiation as a proposed measure provides an equivalent level of protection to current IHS measures for Tephritidae fruit flies as assessed against ISPM 28 (*Phytosanitary treatments for regulated pests*).
 - i) The efficacy of the treatment at preventing emergence was greater than 99.9968%² at the 95% level of confidence (ISPM 28 PT 7 (Phytosanitary treatments for regulated pests: Irradiation treatment for fruit flies of the family Tephritidae (generic))).
 - ii) The efficacy level of a phytosanitary treatment must be at least 99.99%³ at the 95% confidence level to meet New Zealand's appropriate level of protection for economically important fruit fly species.

Conogethes punctiferalis

- (48) *C. punctiferalis* (yellow peach moth, YPM) are likely to be obvious during visual inspection.
- a) Adult YPM are orange-yellow with a number of conspicuous black spots are located on the wings and body (MPI, 2009). Adult moths have a wingspan of 2.5 cm and are present on the outside of the fruit.
 - b) Eggs are elliptical, about 2 mm in length and laid individually on the skin of the fruit or on the stalk (MPI, 2009).
 - c) Larvae are up to 25 mm in length and bore into the fruit to feed (MPI, 2009). Entry wounds may be obvious on the fruit surface.
 - d) Pupae are brown, 13 mm long and surrounded by shelters of webbing and frass, occurring in or on the surface of the fruit (MPI, 2009).
 - e) Only egg, larvae and pupae are likely to be associated with fruit in international trade, and pupae are likely to be detected and removed during post-harvest inspection (MPI, 2009)

² Equivalent to Probit 9, or no survivors from 90,000 tested individuals.

³ Equivalent to Probit 8.7, or no survivors from 30,000 tested individuals.

Irradiation at a minimum absorbed dose of 289Gy is justified and sufficient to manage the likelihood of introduction of YPM on table grapes because:

- (49) The most radio tolerant Lepidopteran life stages (late instar larvae, pupae and adults; Hallman *et al.*, 2013) are unlikely to be present on hosts at treatment.
 - a) The damage caused by late-instar feeding and pupation is likely to be visibly detectable during production, harvest and packing activities (MPI, 2009) and is likely to render fruit unsuitable for export.
 - i) Late instar larval feeding causes fruit deterioration or early fruit drop e.g. rambutan turn brown (MPI, 2016).
 - ii) Pupae are surrounded by shelters of webbing and frass, and are sometimes on the outside surface of the fruit (MPI, 2009). Pupae are 13 mm in length and 4 mm wide (MPI, 2009).
 - b) Adults are nocturnal and active fliers so are unlikely to be associated with the commodity during the harvesting process (MPI, 2009). Adults have a wingspan of 25 mm (MPI, 2009) and are visibly detectable.
 - c) The imported commodities for which irradiation is currently required are minor hosts (Molet, 2015) and YPM may not be present on the pathway or may be present at very low levels.
- (50) The least radio tolerant life stages (eggs and early instar larvae; Hallman *et al.*, 2013) of Lepidoptera are likely to be managed by a dose of 289Gy based on evidence from another species in the Crambidae family (Hallman & Hellmich 2009).
 - a) Irradiation at a maximum absorbed dose of 289Gy prevented F₁ developing past the first instar in *Ostrinia nubilalis* (Hübner) (Lepidoptera: Crambidae).
 - b) Eggs and early instar larvae of YPM are the most likely lifestages to be present on the pathway as they may go undetected during phytosanitary inspection due to their small size.
 - i) Eggs are laid individually on the surface of fruit and are only 2-2.5mm in length (MPI 2009, 2013). Larvae can grow up to 25mm (note: fully grown larvae, not early instar) (MPI 2009, 2013).
 - c) In-field pest control measures for YPM and/or similar species as part of commercial production is likely to manage the pest to low levels prior to irradiation treatment.
- (51) Note: The rate of 289Gy for the management of YPM is proposed to be updated on other irradiated fresh produce import pathways i.e. capsicum.

Maconellicoccus hirsutus

- (52) Heavy infestations of *M. hirsutus* are likely to be obvious during visual inspection (MPI, 2009).
 - a) Adults and nymphs are a reddish pink colour and covered with a sticky white wax. Both the adult and nymph are visually obvious against the surface of the fresh table grapes (green and purple flesh colour) (MPI, 2009).
 - b) Eggs are laid on the outside of fruit in whitish cottony egg sacks (MPI, 2009).
- (53) Irradiation at a minimum absorbed dose of 289Gy is sufficient to manage the likelihood of introduction of *M. hirsutus* on table grapes because:
 - a) Treatment with a minimum absorbed dose 289 Gy will prevent adults (the most radio tolerant life stage) from laying viable eggs (Jacobsen and Hara, 2003).
 - i) Jacobsen and Hara (2003) exposed 3,093 of the most tolerant life stage (adults) to between 218 and 289 Gy and prevented eclosion⁴ of all of the subsequent eggs produced. This provides a 99.903% level of efficacy (none in 1,031) that any eggs laid from irradiation adults will not enclose.
 - b) In-field pest control measures for *M. hirsutus* and/or similar species as part of commercial production is likely to manage the pest to low levels prior to irradiation treatment.

⁴ Eclosion: act of emerging from the pupal case or hatching from the egg.

Other regulated pests

- (54) Irradiation at a higher dose (up to a maximum absorbed dose of 1000 Gy) may be approved by MPI for non-target pests.

It is important to note that efficacy information for irradiation has not been tested against all regulated pests of concern, nor has it been conclusively demonstrated by large-scale testing. Therefore additional phytosanitary treatments may be required in addition to irradiation on this pathway.

Feasibility

- (55) The application of irradiation at a minimum absorbed dose of 150 Gy and 289 Gy is operationally feasible for the following reasons:
- a) Irradiation has been approved for use as a phytosanitary treatment by Food Safety Australia New Zealand (FSANZ).
 - b) Imported table grapes are regularly irradiated (e.g. from Australia), with no apparent quality or consumer acceptance issues.
 - c) The irradiation facility, Steritech, is currently certified by DAWR as compliant with international and Australian domestic requirements. The irradiation plant is located in Brisbane and is used to treat mangoes, lychee, papaya, tomato and capsicum for export to New Zealand, as well as fresh produce for export to other international destinations (e.g. Australian mango exported to the USA).

Summary of Proposed IHS Requirements

- (56) MPI considers the risks presented by some pests on fresh table grapes import pathway will be effectively managed with irradiation.
- (57) The dose MPI has identified as necessary to manage the identified pests on fresh table grapes are summarised below:

	Organism/group	Life stage	Rate
MPI-Specified pests	Tephritidae fruit flies	Eggs, larvae and pupae	150 Gy
	<i>Bactrocera neohumeralis</i>		
	<i>Bactrocera tryoni</i>		
	<i>Ceratitis capitata</i>		
Targeted pests	<i>Conogethes punctiferalis</i>	Eggs and early instar larvae	289 Gy
	<i>Maconellicoccus hirsutus</i>	All life stages	289 Gy

- (58) All measures contained in the fresh table grape IHS are subject to regular review based on pathway compliance, emerging risk assessment, new information/intelligence, and results of audit of the Export Plan.
- (59) MPI monitors interceptions of all regulated pests (and hitchhikers) and the appropriateness/ effectiveness of phytosanitary measures during trade.

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