Risk Management Proposal:

Import requirements for Capsicum seeds

FOR PUBLIC CONSULTATION

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Contents

Submissions

The Ministry for Primary Industries (MPI) invites comment from interested parties on the proposed changes to the requirements for the importation of capsicum seeds for sowing (Import Health Standard 155.02.05: *Seeds for Sowing*). The proposed changes are supported by this discussion document.

An IHS "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" (section 22(1) Biosecurity Act 1993).

MPI seeks comment on the proposed inclusion of two viroids which are pests of capsicum and other solanaceous crops, and which may be introduced to New Zealand on capsicum seeds for sowing. MPI has developed this proposal based on best 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 a particular change in IHS requirements or a question asked in this document (referencing section numbers or commodity 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 06th April 2016.

Plant Germplasm (Imports) team
Plants, Food & Environment Directorate
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The closure date for this consultation is on the 06th April 2016.
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.

Purpose

1. The purpose of this document is to:
   a) Summarise the biosecurity risks of the seed transmitted quarantine pests (*Potato spindle tuber viroid* (PSTVd) and *Pepper chat fruit viroid* (PCFVd)) associated with imported capsicum seeds for sowing from all countries.
   b) Provide the rationale for the proposed phytosanitary measures to effectively manage the risks of entry of these organisms with capsicum seed.
   c) Establish the feasibility and practicality of implementation of the proposed measures.
   d) Seek stakeholder feedback on the proposed phytosanitary measures.

Background

1. Capsicums are affected by a wide range of viruses, viroids, bacteria and fungi. Many of these organisms are already present in New Zealand, and as such are deemed to be 'non-regulated', meaning that the Ministry for Primary Industries (MPI) will not take action against them if they are identified in imported seeds or crops in New Zealand.

2. A risk analysis on virus and viroid hazards that are seed-borne and that are transmitted seed-to-seedling in capsicum peppers (including chilli and bell peppers: *Capsicum annuum, C. frutescens,* and *C. chinense*) was completed by the MPI in 2012.

3. The risk analysis identified that the basic import requirements in the MPI import health standard (IHS) 155.02.05: *Seeds for Sowing* do not adequately manage the risk posed by seed transmitted viroids. MPI amended the IHS under urgency in August 2014 to include a new schedule for Capsicum seed for sowing. The schedule was created to manage the risk of importation of *Potato spindle tuber viroid* (PSTVd) and specific measures for PSTVd were implemented from 1 September 2014.

4. MPI notified trading partners of the urgent changes via the WTO SPS notification system. Following the International standard ISPM No.13:2001 "*Guidelines for the notification of non-compliance and emergency action*", MPI has reviewed the technical justification for the continuance of the emergency measures for PSTVd in *Capsicum* seed for sowing. A summary of the pest risk analysis is presented in this Risk Management Proposal (RMP).

5. An additional regulated viroid was identified in the 2012 risk analysis as requiring phytosanitary management on the Capsicum seed for sowing pathway: *Pepper chat fruit viroid* (PCFVd). The management of this disease is the subject of this RMP.

CURRENT IMPORT REQUIREMENTS

6. Seeds eligible for import into New Zealand are listed in the Plants Biosecurity Index**:** http://www1.maf.govt.nz/cgi-bin/bioindex/bioindex.pl.

7. The IHS for Seeds for Sowing and IHS for Nursery Stock were urgently amended in August 2014 to put measures in place to manage a range of host species of PSTVd. The specific measures for PSTVd were implemented from 1 September 2014.

8. Capsicum seeds are currently required to meet general requirements and the specific requirements listed in the 'Capsicum' schedule within the seed for sowing import health standard (IHS) 155.02.05: *Seeds for Sowing*. The general requirements for imported seed

require seed to be packaged in clean packets, clearly labelled with the scientific/botanical name, and to be free of any contaminating plant material, debris, soil and contaminating seeds. Seeds are visually inspected at the border to verify the basic conditions have been met.

9. The specific requirements listed in the *Capsicum* schedule require a phytosanitary certificate from the exporting country, certifying that the seeds have either been sourced from a '*Pest free area*' free from PSTVd, sourced from a '*Pest free place of production*' free from PSTVd, or officially tested, on a representative sample, and using appropriate methods, and found free from PSTVd prior to import.

10. Visual inspection of seed at the border cannot detect seeds infected with viruses and viroids, and therefore the basic requirements do not specifically manage the biosecurity risks of this type of organism (viroids).

COMMODITY

11. There are three recognised species complexes of the genus *Capsicum*:
    a) *C. annuum* complex: comprising *C. annuum** L., *C. frutescens**, L., *C. chinense**, *C. chacoense, C. galapahoense*
    b) *C. baccatum* complex: comprising *C. baccatum** L. (synonyms *C. microcarpum**, *C. pendulum**), *C. praetermissum, C. tovarii*
    c) *C. pubescens* complex: comprising *C. pubescens**, *C. cardenasii** *and C. eximium**.

* Species marked with an asterisk are eligible for import into New Zealand.

12. New Zealand imports capsicum seeds from many countries including Australia, Brazil, Chile, China, Denmark, France, Guatemala, India, Israel, Italy, Japan, Korea, Mexico, Morocco, Netherlands, Peru, Serbia, Spain, Taiwan, Tanzania, Thailand, United Kingdom, USA and Vietnam.

TRADE VALUE

13. Bell peppers (*Capsicum annuum*) are an important crop in New Zealand: domestic sales in 2014 were worth $29.3 million, and exports in 2014 were worth $32 million (Plant and Food Research, 2014). They are also a popular crop for home gardeners.

14. A diverse range of chilli peppers are also grown in New Zealand for domestic markets, restaurant and home use. Some commonly grown varieties include the habanero (*C. chinense*), jalapeno (*C. annuum*), and tabasco (*C. frutescens*) chillies, used in many traditional foods including African, Chinese, Indian, Mexican and Malaysian dishes.

SOURCE INFORMATION

15. The following information was used to identify risk organisms and the appropriate measures to manage their entry and establishment in New Zealand:
    a) MPI risk analysis for Capsicum and Tomato (2012): www.mpi.govt.nz/document-vault/2887
    b) Additional technical advice on viruses and viroids associated with capsicum.
    c) Relevant literature and database searches.
    d) Stakeholder discussions prior to, and during the development of this RMP.
    e) MPI diseases of Capsicum 2013, spreadsheet.

INTERNATIONAL OBLIGATIONS

16. Where possible, phytosanitary measures are aligned with international standards, International Plant Protection Convention guidelines, and recommendations as per New Zealand's obligations under Article 3.1 of the WTO Agreement on the Application of Sanitary and Phytosanitary Measures (SPS Agreement), WTO 1995 (http://www.wto.org/english/tratop_e/sps_e/spsagr_e.htm) and section 23(4)(c) of the Biosecurity Act 1993.

17. 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.

Objective

18. To ensure the biosecurity risks associated with the import of capsicum seeds are managed appropriately and are consistent with New Zealand's domestic legislation and international obligations.

Biosecurity risks associated with imported Capsicum seed for sowing

VIROIDS

19. Viroids are highly infectious organisms which replicate inside plant cells and cause plant disease. Common symptoms in susceptible plant hosts range from symptomless to severe symptoms of purpling and chlorosis of leaves, shortening of the leaf internodes, leaf epinasty, thickening and brittleness, and occasional plant death. The diseases do not typically result in plant death, but often result in yield losses or reduced quality.

20. According to European Food Safety Authority (EFSA) (2011) there are three types of situations where viroids belonging to the group pospiviroid (including PSTVd and PCFVd) does not display signs of any obvious symptoms. They are:
    - when the infection happened in certain solanaceous ornamental hosts but also on other non-solanaceous hosts;
    - certain isolates are able to induce only mild symptoms in certain hosts.
    - abiotic factors like, low temperatures and low light intensity can have a direct effect on limiting viroid accumulation and symptom expression on the host.

21. It is known that pospiviroids can be present in the seed of susceptible species and remain viable in dormant seed where it can infect the germinating seedling (EFSA, 2011). Seed-transmission as a result of a viroid infection can occur in two ways: (1) the pathogen is attached to the surface of seeds and can infect seedlings during germination by penetrating little wounds in the seed coat surface (surface seed transmission), or (2) the pathogen enter the reproductive organs in some phase of the growing cycle and come to reside within seed tissues (internal seed transmission).

22. Once the growing seedling becomes infected, the viroid may be readily spread to other plants through plant to plant contact, handling by people, and by contact with contaminated clothing,

through grafting, or through the use of contaminated tools or equipment. Some viroids can also be transmitted by insects feeding on plant sap, or through pollen transfer.

23. If the disease establishes in a perennial host species, there is a potential for persistence and spread in the environment.

Potato spindle tuber viroid

24. The first record of PSTVd naturally infecting *Capsicum annuum* was in New Zealand. Capsicums have been recorded showing only mild symptoms, a slight waviness of the leaf edge (Lebas et al., 2005). However, Verhoeven et al. (2009) experimentally inoculated capsicum plants with PSTVd and recorded that maximum fruit size was reduced. The viroid is highly contagious and is transmitted between plants by touch, either by plants rubbing against each other or people touching plants. The use of cutting or pruning tools or contaminated machinery or any form of physical contact between plants can result in disease transmission. In potatoes it is spread primarily by knives used to cut healthy and infected potato tubers used as seed-potatoes[1] and during handling and planting of the potato crop. After inoculation of a tuber with PSTVd, the viroid can replicate and spread systemically throughout the plant (Agrios, 2005). PSTVd is a regulated pest in New Zealand and designated as an "unwanted organism" under the Biosecurity Act 1993. It current status is 'Transient: actionable, under eradication'.

25. PSTVd is transmitted by seed and pollen of infected *Solanum lycopersicum* and *Solanum tuberosum* plants (Singh, 1970; Lebas et al., 2005; Grasmick and Slack, 1986; Benson and Singh, 1964; EUPHRESCO, 2009; MPI, 2012), and it is likely to be seed transmitted in capsicum seeds (Lebas et al., 2005; MPI, 2012). In tomato seeds, PSTVd occurs within the seed rather than as a contaminant on the surface, as demonstrated by *in-situ* hybridisation (Matsushita et al., 2011). The percentage of infected seedlings, grown from seeds from plants infected with PSTVd ranged from 2 to 31% in tomato (Grasmick and Slack, 1986; Singh, 1970; Benson and Singh, 1964) and 6-12% in potato (using true potato seed) (Singh, 1970; MPI, 2012).

26. According to CABI (2016) PSTVd is found in Afghanistan, Austria, Australia, Azerbaijan, Bangladesh, Belarus, Belgium, Chile, China, Costa Rica, Croatia, Czech Republic, Dominican Republic, Egypt, Germany, India, Iran, Israel, Italy, Japan, Malta, Mexico, Netherlands, Nigeria, Peru, Poland, Russian Federation, Spain, Slovenia, Turkey, Ukraine, United Kingdom, USA, and Venezuela (CPC, 2010). It has also been reported from Greece (Malandraki et al., 2010), and Hungary (EPPO, 2014).

27. The likelihood of PSTVd establishing and spreading in tomato and capsicum crops within a single season is considered to be high. The potential economic impacts if PSTVd established in New Zealand on capsicum have been assessed by MPI as being low to moderate (MPI, 2012). If PSTVd infection of crops is detected early, there may only be a localised impact and the associated costs may not be too great. However if PSTVd infection is not detected immediately, which is likely as some infected plants are symptomless, infection may spread to a wider area, increasing costs of detection and eradication and possible yield losses.

[1] Note that these are not true botanical seeds.

Pepper chat fruit viroid

28. *Pepper chat fruit viroid* (PCFVd) is a pathogen of capsicum pepper and tomato plants (Verhoeven *et al.*, 2009). The viroid was discovered for the first time in 2006, and is now reported from the Netherlands, Canada and Thailand. *Capsicum annuum* (Verhoeven et al., 2009; Verhoeven et al., 2011); and *Solanum lycopersicum* (Reanwarakorn et al., 2011) have been reported as natural hosts. It has been shown experimentally to infect potato plants (Verhoeven *et al*., 2011; MPI, 2012). PCFVd is not known to be present in New Zealand.

29. In capsicum plants, PCFVd causes reduced plant growth and fruit size reduction by up to 50%. It is seed-borne in *Capsicum annuum* (Verhoeven *et al.*, 2011), and has been shown to be transmitted from seed-to-seedling at a rate of 19% (Verhoeven *et al.*, 2009).

30. PCFVd can be mechanically transmitted from plant-to-plant during crop maintenance and handling activities, as occurs with other pospiviroids. The occurrence of PCFVd along rows in commercial crops (Verhoeven *et al.*, 2009) is indicative of the viroid being spread in this manner.

31. PCFVd has not yet been reported in commercial capsicum seed consignments but it is unclear whether commercial seeds are routinely tested for the presence of this viroid. The source of the three known PCFVd infections in capsicum (in Canada, Netherlands and Thailand) is unknown. It is not known whether the viroid is borne internally or externally on the seed surface.

32. MPI propose to regulate PCFVd on *Capsicum* seed because it is highly likely to spread to other capsicum plants or to tomato plants and there is a possibility it could establish in the wider environment. The two main hosts are annual crops, which will limit the likelihood of the viroid persisting beyond one growing season. However there is a potential for the disease to be maintained in the environment by the practice of seed saving or managing practices (i.e. equipment not appropriately cleaned, machinery, movement of people within glasshouse/fields).

33. The viroid is a relatively new and emerging pathogen of *Capsicum* seed and *Solanum lycopersicum.* The extent of adverse impacts for PCFVd in New Zealand are not fully known. It is likely to have similar impacts than other pospiviroids and is assessed as presenting low to moderate economic impacts.

Table 1. Summary of seed-transmitted diseases of Capsicum proposed to require measures in the seed for sowing IHS.

Pathogen	Host/s	Seed-transmission	Status in NZ	Distribution	Reference	Likelihood of entry & establishment on seed	Economic Impacts	Trade Impacts	Additional notes
Potato spindle tuber viroid PSTVd	Capsicum, Potato, Tomato	Transmitted in potato and tomato. Detected in capsicum seeds.	Regulated	Worldwide	Verhoeven et al., 2007; Lebas et al., 2005	Moderate likelihood of entry; Highly likely to be spread through the crop by mechanical means; Likely to establish outside.	Low to moderate.	Expected negative trade impacts of fresh capsicum and tomatoes.	
Pepper chat fruit viroid PCFVd	Capsicum, Tomato, [potato, experimental]	Transmitted in capsicum with a rate of 19%	Regulated	Canada, Netherlands, and , Thailand	Verhoeven et al., 2009, 2011	Moderate likelihood of entry; Highly likely to be spread through the crop by mechanical means; Likelihood of establishment for more than one growing season is uncertain.	Low to moderate, with uncertainty.	Export of fresh capsicums, and possibly other crops.	Emerging risk. Regulated in Australia.

Risk Management

34. In addition to the basic requirements, additional specific measures can be employed to reduce the likelihood of introduction of biosecurity risks associated with seed imported for sowing. The following measures (see below) are proposed to reduce the biosecurity risk of regulated viroids to an acceptable level.

35. The Biosecurity Organisms Register for Imported Commodities (BORIC), lists the regulatory status for pest and disease organisms of plants. If these organisms are intercepted on seed destined for export to New Zealand, then the exporting NPPO is expected to take action to prevent the risk goods being shipped. If these organisms are intercepted on arrival in New Zealand, actions will be taken to prevent the risk goods being given biosecurity clearance if the pest cannot be treated or otherwise managed.

MANAGEMENT MEASURES FOR PSTVD

Country Freedom

36. This current phytosanitary measure is considered appropriate to manage the risk of PSTVd in imported Capsicum seed, and no changes are proposed. For countries where PSTVd is not known to occur, a country freedom declaration can be endorsed on the phytosanitary certificate and provides a sufficient level of assurance that consignments are free from this pathogen. Exporting countries must follow the guidelines established by ISPM 4 when determining country freedom.

Pest Free Place of Production (PFPP)

2. Capsicums have been recorded showing only mild symptoms of PSTVd, a slight waviness of the leaf edge (Lebas et al., 2005). The lack of conspicuous symptoms in *Capsicum* plants limits visual inspection at place of production. For this viroid Pest Free Place of Production based on visual inspection on the field is insufficient in providing assurances that this pathogen is not present. For this viroid, Pest Free Place of Production will only be considered as a risk management option for PSTVd, if parent plant testing for the absence of this specific quarantine pest is used for the official endorsement of Pest Free Place of Production on the phytosanitary certificate.

Seed testing

37. A testing option is also an available measure for PSTVd in the IHS. Internationally available PCR testing methods using universal pospiviroid primers may be used (eg. Monger *et al.*, 2010). Methods like these are used by Australian DAFF to test for PCFVd and PSTVd in tomato and capsicum seeds at the border. Some laboratories have validated their RNA extraction protocols and are able to test seed directly, such as for PSTVd (Verhoeven *et al.*, 2004). Growing season parent plant and seed testing can either be done by an official laboratory or at another laboratory, if the official NPPO has approved the method of testing and will endorse the testing on the phytosanitary certificate.

38. MPI proposes that a representative sample of a minimum of 3000 seeds (sub-sample size of 400 seeds) officially drawn according to the ISTA and AOSA sampling methodology

must be tested using an approved PCR NPPO testing method. The tests and its results must be endorsed on the phytosanitary certificate, to show that the consignment is free of this viroid.

MANAGEMENT MEASURES PROPOSED FOR PCFVD

Pest free area (PFA)

39. *Pepper chat fruit viroid* is a pospiviroid with similar biosecurity risks to PSTVd. For countries free from PCFVd, Pest Free Area can be endorsed on the phytosanitary certificate and provides a sufficient level of assurance that consignments are free from this pathogen. Exporting countries will follow the guidelines established by ISPM 4 in determining Pest free area.

Pest free place of production

40. Pest Free Place of Production systems for specific quarantine pathogens, in compliance with ISPM 10, offers a good level of assurance of freedom from PCFVd. Suppliers can source healthy planting material or resistant cultivars. During the growing season, an official inspection for disease symptoms and/or parent plant testing for the absence of specific quarantine pests can be used for the official endorsement of Pest Free Place of Production on the phytosanitary certificate. Pest Free Place of Production will provide a means to ensure that consignments of seeds produced in the designated production area are free from PCFVd.

Seed testing

41. Testing is also a proposed measure for PCFVd in the IHS. Internationally available PCR testing methods using universal pospiviroid primers may be used (eg. Monger *et al.*, 2010). Methods like these are used by Australian DAFF to test for *Pepper chat fruit viroid* and *Potato spindle tuber viroid* in tomato and capsicum seeds at the border. A PCR test is available for the detection of PCFVd, using primers as per Botermans *et al.*, 2013. This PCR is more sensitive on leaf material than seed, and is recommended for use either in testing parent plants for seed production, or in a grow-out seedling test. Growing season parent plant and seed testing can either be done by an official laboratory or at another laboratory, if the official NPPO has approved the method of testing and will endorse the testing on the phytosanitary certificate.

42. MPI proposes that a representative sample of a minimum of 3000 seeds (sub-sample size of 400 seeds) officially drawn according to the ISTA and AOSA sampling methodology must be tested using an approved ELISA or PCR NPPO testing method. The tests and its results must be endorsed on the phytosanitary certificate, to show that the consignment is free of this viroid.

Feasibility & Practicality of Measures

43. The New Zealand industries for tomatoes, potatoes, capsicum peppers and other solanaceous plants would benefit from the measures implemented to mitigate the risk of importing new viroids into New Zealand.

44. It is not yet known whether Country Freedom, Pest Free Area or Pest Free Place of Production declarations could be supplied by all trading partners for the regulated viroids.

45. Seed testing allows access to seed produced for international markets, and gives a practical option for importing stored inventory of seed, where country of origin is not specified and/or growing season inspections have not previously been undertaken. Given an appropriate and statistically valid sample size, MPI considers that seed testing for the viroids listed in this Risk Management Proposal provide a similar level of assurance as Country Freedom, PFA and PFPP.

46. Seed testing costs may vary from country to country depending on a number of factors, such as the variation in costs for importing the consumables from the manufacturing companies and variation in demand for testing at accredited laboratories.

47. Seed testing costs for the completion of testing in New Zealand have been set following an analysis of MPI's costs to provide these services. Testing prices are set to ensure that charges remain fair and equitable while fully recovering the cost of testing. PHEL only recover costs for staff time and consumables and do not make a profit (http://www.biosecurity.govt.nz/files/biosec/org/phel/mpi-phel-charges-2012.pdf). The testing prices are a true reflection of costs incurred during purchasing (exchange rates) and importing (shipping) the consumables from the manufacturing companies, which are based in the USA and Europe, together with the limited number of tests performed here in New Zealand.

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Appendix 1: Proposed Revision of the Import Health Standard schedule in the Seed for Sowing Standard 155.02.05

Capsicum

The following entry conditions only apply to species in the Plants Biosecurity Index listed under Import Specifications for Seed as "see 155.02.05 under *Capsicum*".

Countries: All

Quarantine Pests: *Pepper chat fruit viroid; Potato spindle tuber viroid*

Phytosanitary Certificate Additional Declarations

(1) In addition to the certifying statement in Part 1.5.2 of this import health standard, if satisfied that the pre-shipment activities have been undertaken, the exporting country NPPO must confirm this by providing the following additional declarations to the phytosanitary certificate:

a) "The [*Capsicum annuum; C. baccatum; C. cardenasii; C. chinense; C. eximium; C. frutescens; C. microcarpum; C. pendulum; C. pubescens*] seeds for sowing in this consignment have been:

i) Inspected in accordance with appropriate official procedures and found to be free of any visually detectable regulated pests.

AND

b) For *Potato spindle tuber viroid* (PSTVd):

i) sourced from (the country or state where the seed was produced) where *Potato spindle tuber viroid* is not known to occur.

OR

ii) sourced from a 'pest free place of production', where parent plant testing was applied and found free from *Potato spindle tuber viroid*

OR

iii) "officially tested, on a representative sample of a minimum of 3000 seeds (sub-sample size of 400 seeds) officially drawn according to the ISTA or AOSA sampling methodology using an approved PCR NPPO testing method, and found to be free from *Potato spindle tuber viroid*".

AND

c) For *Pepper chat fruit viroid* (PCFVd):

i) sourced from a 'pest free area' free from *Pepper chat fruit viroid*;

OR

ii) sourced from a 'pest free place of production' free from *Pepper chat fruit viroid*

OR

iii) "officially tested, on a representative sample of a minimum of 3000 seeds (sub-sample size of 400 seeds) officially drawn according to the ISTA or AOSA sampling methodology using an approved PCR NPPO testing method, and found to be free from *Pepper chat fruit viroid*".