Ministry for Primary Industries
Manatū Ahu Matua

Risk Management Proposal:

Rose *(Rosa* spp.) nursery stock, from: Australia, Austria, Belgium, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Japan, Luxembourg, The Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom

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Plant Imports
Plants, Food & Environment
Ministry for Primary Industries
Pastoral House
25 The Terrace
PO Box 2526
Wellington 6140
New Zealand

Tel: +64 4 894 0100
Fax: +64 4 894 0662

Email: plantimports@mpi.govt.nz

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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 *Rosa* nursery stock which is 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 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 (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 27 June 2016.

Plant Imports
Plants, Food & Environment
Ministry for Primary Industries
PO Box 2526
Wellington 6140
New Zealand

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.

1 Purpose

(1) MPI has reviewed the import requirements for *Rosa* nursery stock from approved countries. The purpose of this document is to:

a) review measures introduced in 2010 for regulated phytoplasmas;
b) propose measures for additional pests and diseases identified as a risk on *Rosa* spp. from approved countries;
c) seek stakeholder feedback on the proposed measures and import requirements as outlined in the draft import health standard schedule attached to this risk management proposal (RMP).

(2) This review does not address any changes to the countries approved for the export of *Rosa* nursery stock to New Zealand.

2 Background

(3) In 2010, three phytoplasmas ('*Candidatus* Phytoplasma mali', '*Candidatus* Phytoplasma asteris', and '*Candidatus* Phytoplasma aurantifolia') were identified as an emerging risk (ER) which may be associated with *Rosa* nursery stock being into New Zealand.

(4) At this time dormant *Rosa* cuttings were required to be imported into a level one Post Entry Quarantine (PEQ) facility for a minimum period of six months for growing season inspection for disease symptom expression.

(5) A Chief Technical Officer (CTO) decision was made to urgently require *Rosa* nursery stock entering New Zealand to be imported into a higher level of quarantine (level 2 post entry quarantine) and tested for the presence of phytoplasmas during the growing season in post entry quarantine.

(6) The IHS was not amended to include these requirements at the time, as a risk analysis was undertaken, but the new conditions were specified on permits since 2010.

(7) An MPI pest risk assessment for *Rosa* nursery stock was completed for phytoplasmas, viruses and other diseases of *Rosa* nursery stock in 2013 (Import Risk Assessment *Rosa*Nursery stock, 2013).

(8) The risk analysis identified two additional *Candidatus* Phytoplasmas and three viruses considered to pose a biosecurity risk on the *Rosa* pathway. The management of these diseases and a review of the emergency measures introduced in 2010 is the subject of this risk management proposal (RMP).

(9) The risk analysis identified other pathogens as potential hazards, but due to limited information of the epidemiology or limited distribution these pathogens, specific measures have not been proposed in the *Rosa* schedule of special conditions. Information about these pathogens can be found in the IRA *Rosa* NS 2013 available on MPIs website.

3 Commodity description

(10) The schedule *Rosa* and the requirements in the IHS: Importation of Nursery Stock covers all species of *Rosa* approved for entry in New Zealand in the MPI Plants Biosecurity Index as nursery stock.

(11) Approved commodities in the *Rosa* IHS schedule include whole plants (including non-dormant cuttings), dormant cuttings and plants in tissue culture from approved countries.

(12) Definition of terms as per section 1.4 'Definitions and Abbreviations' of the 'Importation of Nursery stock standard':

a) cuttings: a nursery stock commodity sub-class for propagation material from the stem only (no roots). Cuttings may be required to be dormant. (*Rosa* cuttings may be imported as dormant or non dormant)
b) dormant: temporarily inactive/suspended growth (cuttings of deciduous species should have no leaves; bulbs should have no leaves or roots).
c) whole plants: a nursery stock commodity sub-class for rooted cuttings and whole plants.

d) plants in tissue culture: plants *in vitro* that have been prepared as tissue culture from one parent by asexual reproduction (clonal techniques) under sterile conditions.

4 Trade

(13) Roses are one of the most popular garden and cut flower plants in the world, and *Rosa* nursery stock is imported for propagation for the nursery trade and the cut flower trade.

(14) Since 2010, *Rosa* nursery stock has been imported from Australia, France, Germany, Ireland, Netherlands, and the United Kingdom.

(15) Prior to the emergency measures for phytoplasmas in 2010, the average number of consignments imported per year was thirteen (representing ~1000 different lines).

(16) Currently there are an average of seven consignments (representing ~100 different lines) of *Rosa* nursery stock imported each year.

5 Current requirements

(17) *Rosa* species eligible for import into New Zealand are listed in the Plant Biosecurity Index https://www1.maf.govt.nz/cgi-bin/bioindex/bioindex.pl

(18) *Rosa* nursery stock can currently be imported from the following MPI approved countries: Australia, Austria, Belgium, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Japan, Luxembourg, The Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom.

(19) *Rosa* nursery stock is currently required to meet general requirements within the import health standard (IHS) 155.02.06: Importation of Nursery stock and the specific requirements listed in the '*Rosa*' schedule. http://mpi.govt.nz/document-vault/1152

(20) Since 2010, when phytoplasmas were recognised as an emerging risk on *Rosa* nursery stock, emergency measures have been applied. The standard has not been amended to include these requirements, but conditions have been specified on permits.

(21) These conditions replace the requirements of the IHS and direct all *Rosa* nursery stock (whole plants, cuttings, and tissue cultures) to be imported into a level 2 PEQ facility for a minimum period of six months for predetermined testing for phytoplasmas and growing season inspection for disease symptom expression.

(22) The mandatory pre-export propiconazole treatments for whole plants (including non-dormant cuttings) and the measures for *Xylella fastidiosa* (under section 2.2.1.12) were in place prior to the emergency measures and still apply to *Rosa* nursery stock.

6 Source information

(23) In the development of the risk management proposal (RMP) the following information was used to identify risk organisms and the appropriate measures to manage their entry and establishment in New Zealand:

- MPI pest risk assessment for *Rosa* nursery stock (IRA *Rosa*Nursery Stock, 2013)
- MPI emerging risks system (ERS) rapid assessment on phytoplasmas
- relevant literature and database searches
- stakeholder discussions during the development of this RMP.

7 International setting

(24) Where possible, phytosanitary measures are aligned with international standards, 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 and section 23(4)(c) of the Biosecurity Act 1993.

(25) 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.

8 Objective

(26) MPI's objective is to ensure the known biosecurity risks associated with *Rosa* nursery stock from approved countries are managed appropriately and are consistent with New Zealand's domestic legislation and international obligations.

9 Summary of Risk

(27) This section identifies the diseases associated with *Rosa* spp. nursery stock identified by the IRA as being a risk to New Zealand. Organisms are determined to be a risk if they are regulated on the commodity if they are:

a) present in the exporting country and absent from New Zealand (or under official control), and
b) likely to be present on the pathway if the risk is unmitigated, or
c) known to be associated with the commodity (as per previous risk analyses), and
d) their hosts include species which are present in New Zealand, and
e) they are climatically able to establish in New Zealand, and/or
f) they are likely to cause high economic impacts to New Zealand (e.g. *Xylella fastidiosa*).

(28) A table of the summary of risk associated with *Rosa* nursery stock can be found in Appendix 1. More detailed information on specific organisms can be found in the Import Risk Assessment *Rosa* Nursery Stock (IRA *Rosa* NS, 2013).

9.1 Phytoplasmas

(29) Phytoplasmas form a distinct clade in the Class *Mollicutes*. The phytoplasma clade has been proposed to represent at least one genus, with each subclade (16Sr RNA) proposed to represent at least one species. (IRA *Rosa* NS, 2013)

(30) Phytoplasmas are systemic within infected plants, although limited to the phloem. Transmission is possible by propagation as tissue cultures (Kaminska *et al*, 2005) or by grafting of infected material, by parasitic plants, or by phloem feeding insect vectors i.e. psyllids and leafhoppers (IRA *Rosa* NS , 2013)

(31) Phytoplasmas often have a wide host range (i.e. *Malus, Citrus, Vitis, Rubus, Prunus*), and many crops which are horticulturally important to New Zealand are hosts of one or some of the following phytoplasmas:

- '*Candidatus* Phytoplasma asteris' (16SrI)
- '*Candidatus* Phytoplasma mali' (16SrX-A)
- '*Candidatus* Phytoplasma aurantiflolia' (16SrII)
- '*Candidatus* Phytoplasma prunorum' (16SrX-B)
- '*Candidatus* Phytoplasma rubi'(16SrV)

(32) Entry and establishment of any of these phytoplasmas into New Zealand could have a negative impact on a number of horticultural industries.

(33) Symptoms in *Rosa* may range from asymptomatic through to severe (symptoms may include: stunted growth, leaf and flower malformation, shoot and flower proliferation, abnormal root growth, as well as a general decline).

(34) These phytoplasmas are not known to be present in New Zealand (Veerakone et al. 2015)

'Candidatus Phytoplasma asteris'

(35) *'Candidatus* Phytoplasma asteris' is often referred to as 'aster yellows' phytoplasma, and has been found to infect roses overseas (IRA *Rosa*NS, 2013). '*Candidatus* Phytoplasma asteris' is not known to be present in New Zealand.

(36) *'Candidatus* Phytoplasma asteris' group (16Sr-I) is the largest of the phytoplasma clade and has been divided into subgroups (A, B, C, D, E and various others) (IRA *Rosa*NS, 2013). Only subgroups B and D are associated with disease in roses.

(37) *'Candidatus* Phytoplasma asteris' subgroup B has been found in France, Germany, Poland, Japan, North America, South America (Chile, Argentina), and Africa); and subgroup D has been found in China, Taiwan, Japan and India (IRA *Rosa*NS, 2013).

(38) This phytoplasma is reported to cause disease in more than 300 plant species, including food crops, trees, ornamentals, and weeds. Some of the economically important plant hosts include alfalfa, apple, *Brassica*, carrot, grapevine, maize, olive, pear, and tomato.

(39) In *Rosa* the severity of symptoms fluctuates from severe to asymptomatic. Symptoms can include abnormal root growth, stunting, flower phyllody and virescence, as well as a general decline which is sometimes fatal (IRA *Rosa*NS, 2013).

(40) Leafhoppers belonging to the genera *Macrosteles, Euscelis, Scaphytopius* and *Aphrodes* are the main vectors of '*Ca*. Phytoplasma asteris', of which none are known to be present in New Zealand other than one species from the *Macrosteles* genera (IRA *Rosa*NS, 2013)

(41) *'Candidatus* Phytoplasma asteris' is known to have low vector specificity, and the plant host range of the phytoplasma is generally only limited by the plants the insect vector feeds on. It is possible that another phloem-feeding insect present in New Zealand may be capable of vectoring this phytoplasma.

(42) MPI considers that specific measures for this phytoplasma are necessary to manage the risk.

'Candidatus Phytoplasma mali'

(43) *'Candidatus* Phytoplasma mali' causes disease to a wide and varied range of hosts and has been reported overseas (found in most of Europe (eradicated from UK), Turkey and Syria) in a number of crops which are horticulturally important to New Zealand. This phytoplasma has significance for fruit production, in particular for *Malus* species (IRA *Rosa* NS, 2013).

(44) '*Candidatus* Phytoplasma mali' is the representative phytoplasma for the subgroup 16SrX-A (IRA *Rosa* NS, 2013)

(45) Infection in *Rosa* may be exhibited by stunted growth, leaf and flower malformation, shoot and flower proliferation, infected plants may even be asymptomatic. Symptom expression may vary depending upon concentration of phytoplasma in the plant (IRA *Rosa* NS, 2013).

(46) Psyllids and leafhoppers of the following species are the main vectors of phytoplasma mali: *Cacopsylla melanoneura*, *Cacopsylla picta* and *Fieberiella florii*. None of these species are known to be present in New Zealand.

(47) *Philaenus spumarius* (spittle bug) which is present in New Zealand, is known to be experimentally capable of transmitting '*Candidatus* Phytoplasma mali' (IRA *Rosa* NS, 2013). It is possible that establishment and spread of this phytoplasma in New Zealand may be limited by a lack of vectors, but this is considered unlikely.

(48) MPI considers that measures for this phytoplasma are necessary to manage the risk.

'Candidatus Phytoplasma aurantifolia'

(49) *'Candidatus* Phytoplasma aurantifolia' has a wide and varied range of hosts and have been reported overseas (i.e. Europe, Asia, Australia, South America) in a number of crops which are of horticultural importance to New Zealand. This phytoplasma has significance for fruit production, in particular for *Citrus* species, but also for many cropping and ornamental plant species (CPC. Phytoplasma aurantifolia)

(50) '*Candidatus* Phytoplasma aurantifolia' (16SrII) comprises several subgroups (A, B, C, D, E, F). The pest risk analysis was carried out at the level of group (16SrII) as reporting of phytoplasma aurantifolia in rose was not defined at any level below 16SrII. (IRA *Rosa* NS, 2013)

(51) The following insects are the main vectors of '*Candidatus* Phytoplasma aurantifolia': *Empoasca papaya, Hishimonus phycitis,* and the highly polyphagous *Empoasca decipiens*), of which none of these species are known to be present in New Zealand. (IRA *Rosa* NS, 2013).

(52) There has been only one record of '*Candidatus* Phytoplasma aurantifolia' DNA found to be infecting *Rosa*. There has been no further mention in literature leading to the assumption that if *Rosa* is a host of this phytoplasma, then it is likely to be asymptomatic.

(53) As this phytoplasma would have a negative impact on horticulturally important crops in New Zealand, MPI is taking a precautionary approach and proposes to retain the measures for this phytoplasma.

'Candidatus Phytoplasma prunorum' and '*Candidatus* Phytoplasma rubi'

(54) *'Candidatus* Phytoplasma prunorum' and '*Candidatus* Phytoplasma rubi' are proposed to be added to the pest list. These phytoplasmas causes disease in a number of hosts and have been reported overseas on crops which are horticulturally important to New Zealand.

(55) *'Candidatus* Phytoplasma prunorum' belongs to the group 16SrX-B (IRA *Rosa* NS 2013) and Rubus stunt phytoplasma is the representative phytoplasma for '*Candidatus* Phytoplasma rubi' (group 16SrV). (Malembic-Maher et al, 2011), (EPPO, 2013).

(56) These phytoplasmas have significance for fruit production - particularly in the production of stonefruit in the *Prunus* genera for *'Candidatus* Phytoplasma prunorum' and in berryfruit from the *Rubus* genera for '*Candidatus* Phytoplasma rubi'.

(57) Both phytoplasmas have been reported in *Rosa canina* (dog rose), used as a rootstock in grafted roses. *Rosa canina* plants infected with *'Candidatus* Phytoplasma prunorum' or *'Candidatus* Phytoplasma rubi' are symptomless. Phytoplasma symptoms in *Prunus* or *Rubus* hosts range from asymptomatic to severe. (IRA *Rosa* NS , 2013)

(58) '*Candidatus* Phytoplasma prunorum' and '*Ca*. P. rubi' are present in 15 out of 27 EU countries, and also Turkey, and Azerbajdzhan (in important stone fruit production areas of Northern Europe).

(59) The following insects are the main known vectors of '*Candidatus* Phytoplasma prunorum' and *'Candidatus* Phytoplasma rubi': psyllid *Cacopsylla pruni* and leafhopper *Macropsis fuscula*) of which neither are known to be present in New Zealand.

(60) MPI considers that measures are necessary to manage the biosecurity risk of these phytoplasmas.

9.2 Viruses

Blackberry chlorotic ringspot virus

(61) *Blackberry chlorotic ringspot virus* (BCRV) is a relatively newly discovered ilarvirus, which has been isolated from blackberry, raspberry, apple and rose (*Rubus, Malus* and *Rosa*) in the US and from blackberry in Scotland (IRA *Rosa* NS, 2013)

(62) This virus is known to be transmitted mechanically, by graft and seed and may have the capability of being transmitted by pollen (IRA *Rosa* NS, 2013). There have been several reports of thrips and bees transmitting ilarviruses as a function of moving pollen from infected to healthy plants (Martin *et al*, 2013).

(63) BCRV induces mild symptoms in tea rose, but is generally asymptomatic (Poudel, 2014), however symptoms on other plants may include chlorotic local lesions, systemic mottling, leaf puckering and occasional epinasty. Infection does affect fruit quality in *Rubus* and *Malus.*

(64) BCRV may have a synergistic effect in combination with other viruses. It has been found to be an integral part of Blackberry yellow vein disease complex and is widespread in roses affected by Rose rosette disease (Poudel, 2014).

(65) BCRV has impacts which extend beyond the rose industry, and can cause disease complexes which could cause more damage or have greater impacts on *Rosa* than just this virus alone.

(66) MPI considers that measures are necessary to manage the biosecurity risk of this virus.

Raspberry ringspot virus

(67) *Raspberry ringspot virus* (RpRSV) in association with *Rosa* plants is a recently recognised emerging risk.

(68) *Raspberry ringspot virus* causes severe disease, primarily in raspberries and strawberries, reducing both growth and fruit yield and killing plants. The disease causes plant mortality, stunted and brittle shoots which have rolled leaves and show dieback progressively from the tips, accompanied by necrosis. (EPPO, RpRSV)

(69) Symptoms in in *Rosa* were first observed in hybrid tea roses in Germany. *Rosa* infected with *Raspberry ringspot virus* were observed exhibiting symptoms of mosaic, chlorotic vein netting and stunting (von Bargen *et al*, 2015).

(70) The main host of RpRSV is raspberries (*Rubus idaeus*). Other important hosts are strawberries (*Fragaria*) and cherries (*Prunus*). It also occurs in gooseberries and red currants (*Ribes*), and grapes (*Vitis*) (EPPO, RpRSV). RpRSV has also been shown to infect a number of other hosts in experimental conditions: *Chenopodium amaranticolor,* cowpeas, *Cucurbita* spp., *Iberis saxatilis*, *Nicotiana* spp., Petunia, *Phaseolus vulgaris*, spinach, tomatoes.

(71) This virus is currently found in a number of countries which are approved for *Rosa* nursery stock to be sourced from: Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Switzerland, and the UK. (EPPO, 2016)

(72) This virus is known to be transmitted mechanically, by graft and seed (particularly by weeds), and is also transmitted by nematodes belonging to the genus *Longidorus* (of which we have three species present in New Zealand). This virus may also have the capability of being transmitted by pollen.

(73) Should RpRSV enter New Zealand it is unlikely it would be limited by host availability as a number of known hosts are grown commercially and in home gardens. It would have a significant impact if it entered and established.

(74) MPI considers that measures are necessary to manage the biosecurity risk of this virus.

Rose rosette virus

(75) *Rose rosette virus* (RoRV) causes rose rosette disease which was first identified in Canada in the 1940's, spreading to the US in the 1970's and 1980's. It has now widespread in the north central, south central and south east USA (IRA *Rosa* NS, 2013.)

(76) Once considered to be a phytoplasma due to the similarity of symptoms, it has now been recognized as a virus classified in the genera *Emaravirus* (ICTV 2014).

(77) RoRV transmission is by the eriophyid mite (*Phyllocoptes fructiphilus)* and by mechanical transmission. It is not known to be seed transmitted.

(78) This mite is not reported to be present in New Zealand, although four other species of *Phyllocoptes* are present in New Zealand. It is unknown if they would be capable of transmitting this virus.

(79) Most *Rosa* species and cultivars are susceptible, although multiflora roses (*Rosa multiflora*) are the main host. *Rosa* are the only known plants susceptible to this disease.

(80) Symptoms on cultivated roses are typically less severe than on multiflora rose. Symptoms of *Rose rosette virus* are highly variable depending on cultivar.

(81) Some common symptoms are as follows: witches' brooms or clustering of small branches; small distorted leaf growth; leaf reddening; excessive thorn production; unusually soft and pliable red or green thorns; thickened stems; or rapid stem elongation.Affected plants will often die within two to three years.

(82) As *Rose rosette virus* has the potential for economic impacts to the rose industry should this virus and the eriophyid mite vector (*Phyllocoptes fructiphilus*) arrive in New Zealand, MPI considers that measures are necessary to manage the biosecurity risk.

9.3 Fungi

(83) Fungi were not assessed as part of the Import Risk Assessment or RMP as the current measures are considered appropriate to manage the biosecurity risk posed by fungi.

Pucciniales (formerly known as Uredinales)

(84) The order Uredinales is now known as the order Pucciniales. Measures for Uredinales will be updated to reflect the new order name.

(85) *Rosa* whole plants and non-dormant cuttings are required to be treated with propiconazole prior to export as a therapeutic/ or prophylactic treatment against rust fungi belonging to the Pucciniales order.

(86) Due to the diminishing approval of propiconazole in exporting countries, it is proposed that the pre-export requirement for whole plants and non-dormant cuttings to be treated with propiconazole be changed.

Phellinus noxius

(87) MPI is currently undertaking a review on the pathogen *Phellinus noxius*. *Rosa* whole plants and rooted cuttings have been identified as a host of this pathogen. While no measures are being proposed at this stage, the layout of the *Rosa* nursery stock schedule in Appendix 2 has split whole plants (including rooted cuttings) from non-dormant cuttings in anticipation of measures for *Phellinus noxius* being added at a later date. More information surrounding the susceptible hosts, distribution and proposed measures will be consulted upon in the next few months.

10 Risk Management

(88) In addition to the basic requirements, specific measures (such as testing, treatment or pest free area certification endorsed by the exporting NPPO) can be employed to manage specific risks of pathogens on imported *Rosa* nursery stock.

(89) The following measures to prevent or minimise known biosecurity risk to an acceptable level are summarised in the table in section 12 'Proposed IHS Requirements'. The table includes options for official phytosanitary declarations, chemical treatments, or testing of nursery stock.

10.1 Proposed phytoplasma measures

(90) As, the introduction of the phytoplasmas: '*Ca*. P. asteris', '*Ca*. P. aurantifolia', '*Ca*. P. mali', '*Ca*. P. prunorum' and '*Ca*. P. rubi' would have impacts greater than to just the rose industry, MPI considers that an increased level of post entry quarantine and specific testing for phytoplasmas is justified.

(91) It is proposed that all of these phytoplasmas are included as regulated pests on the *Rosa* schedule, and that the following measures must be met prior to biosecurity clearance being given:

a) Level two PEQ for a minimum growing period of 6 months
b) Nested or real-time PCR using universal primers (this PCR is capable of detecting all phytoplasmas).

(92) As all forms of *Rosa* nursery stock are capable of being affected or infected by phytoplasmas, it is proposed that *Rosa* tissue culture measures should be the same as for whole plants and cuttings. The tissue cultures must be imported under permit into a level 2 PEQ for a minimum growing season of six months for testing and inspection for disease symptom expression.

(93) While in PEQ the tissue cultures must be ex-flasked into a level 2 PEQ greenhouse as soon as practicable to undergo sampling and pre-determined testing for the presence of phytoplasmas. The six months PEQ period will not commence until the tissue cultures have been ex-flasked into the level 2 PEQ greenhouse.

10.2 Proposed measures for viruses

(94) It is proposed that *Blackberry chlorotic ringspot virus* is included as a regulated pest on the *Rosa* schedule (these measures do not apply to *Rosa* nursery stock imported as tissue cultures), and that the following measures must be met prior to biosecurity clearance being given:

a) A pest free area declaration for *Blackberry chlorotic ringspot virus* must be endorsed on the phytosanitary certificate by the National Plant Protection Organisation (NPPO) of the exporting country.

"The plants have been sourced from a 'Pest free area', free from *Blackberry chlorotic ringspot virus*"

OR

b) PCR testing for *Blackberry chlorotic ringspot virus* on plant material in PEQ.

(95) It is proposed that *Raspberry ringspot virus* is listed as a regulated pest on the *Rosa* schedule (these measures do not apply to *Rosa* nursery stock imported as tissue cultures), and that the following measures must be met prior to biosecurity clearance being given:

a) A pest free area declaration for *Raspberry ringspot virus* must be endorsed on the phytosanitary certificate by the NPPO of the exporting country

"The plants have been sourced from a 'Pest free area', free from *Raspberry ringspot virus*"

OR

b) PCR testing for *Raspberry ringspot virus* on plant material in PEQ.

(96) That *Rose rosette virus* is listed as regulated pests on the *Rosa* schedule (these measures do not apply to *Rosa* nursery stock imported as tissue cultures), and that the following measures must be met prior to biosecurity clearance being given:

a) A pest free area declaration for Rose rosette virus must be endorsed on the phytosanitary certificate by the NPPO of the exporting country and growing season inspection for disease symptom expression.

"The plants have been sourced from a 'Pest free area', free from *Rose rosette virus*"

OR

b) PCR testing for *Rose rosette virus* on plant material in PEQ.

10.3 Proposed measures for fungi

(97) That whole *Rosa* plants and non-dormant cuttings be treated (dipped or sprayed until dripping) with a broad range systemic fungicide suitable for the treatment of rust fungi belonging to the Pucciniales order approved by the NPPO of the exporting country.

a) Additional declaration:

– "*The plants have been dipped or sprayed until dripping (insert chosen treatment method i.e. spray or dip) in (insert name of fungicide used and active ingredients) a broad range systemic fungicide at the rate of (insert rate) at least 48 hours prior to shipment".*

(98) The treatment can be recorded as a declaration or in the treatment section of the phytosanitary certificate.

(99) Whole plants or non-dormant *Rosa* nursery stock which have not been treated with a suitable fungicide prior to export may be treated on arrival in New Zealand at an MPI approved treatment facility with propiconizole at the specified label rate.

11 Feasibility & Practicality of Measures

(100) The New Zealand rose importers and growers would benefit from the measures implemented to mitigate the risk of importing new phytoplasmas, viruses, and fungi into New Zealand.

(101) It is not yet known whether Pest Free Area declarations could be supplied by all trading partners for the quarantine viruses. Declarations for Pest Free area for *Xylella fastidiosa* have successfully been sourced from the exporting countries for a number of years.

(102) In countries where area freedom declarations for pests are not possible, testing options have been provided.

(103) PCR tests for *Blackberry chlorotic ringspot virus* and *Raspberry ringspot virus* are established and can be integrated into the current *Rosa* requirements immediately.

(104) Universal primers are available for the detection of all currently known phytoplasmas.

(105) While additional testing will increase the cost of importing *Rosa* nursery stock into New Zealand, options have been provided for sourcing material from pest free areas, which may enable importers to keep costs to a minimum.

(106) Section 2.3.2.1 'Pre-determined testing' in the standard 155.02.06 "Importation of Nursery stock' allows for up to five samples from plants of the same species to be bulked together for testing by PCR. This will reduce the overall cost of testing.

12 Proposed IHS requirements

(107) It is proposed that the post entry quarantine requirements in the IHS 155.02.06: Importation of Nursery Stock, schedule of special entry conditions for *Rosa* from approved countries is updated as specified below (proposed conditions to the requirements are in the text box below). Proposed updated measures for the *Rosa* nursery stock schedule can be found in the appendix:

Organism	Measure
Xylella fastidiosa (these measures remain unchanged)	Whole plants and Non-dormant cuttings: 'Measures for *Xylella fastidiosa*' (section 2.2.1 of the IHS) Dormant cuttings: Additional declaration endorsed on the phytosanitary certificate by the exporting NPPO: "The plants have been sourced from a "Pest free area", free from *Xylella fastidiosa*" Tissue culture: No specific measure
Candidatus Phytoplasma - asteris - mali - aurantifolia - prunorum - rubi	Whole plants and Non-dormant cuttings; Dormant cuttings; Tissue culture: PCR (leaf material will be collected during mid to late Summer or in mid to late Summer-like conditions) Tissue cultures must be exflasked into a level 2 PEQ greenhouse in order to undergo sampling and pre-determined testing for the presence of phytoplasmas

Blackberry chlorotic ringspot virus	Whole plants and Non-dormant cuttings; Dormant cuttings: Pest free area declaration endorsed on the phytosanitary certificate: "The plants have been sourced from a 'Pest free area', free from *Blackberry chlorotic ringspot virus*" OR PCR testing of plants while in PEQ (leaf material will be collected during Spring or Spring-like conditions) Tissue cultures: No specific measures
Raspberry ringspot virus	Whole plants and Non-dormant cuttings; Dormant cuttings: Pest free area declaration endorsed on the phytosanitary certificate: "The plants have been sourced from a 'Pest free area', free from *Raspberry ringspot virus*" OR PCR testing of plants while in PEQ (leaf material will be collected during Spring or Spring-like conditions) Tissue cultures: No specific measures
Rose rosette virus	Whole plants and Non-dormant cuttings; Dormant cuttings: Pest free area declaration endorsed on the phytosanitary certificate: "The plants have been sourced from a 'Pest free area', free from *Rose rosette virus*" OR PCR testing of plants while in PEQ (leaf material will be collected during Spring or Spring-like conditions) Tissue cultures: No specific measures
Fungi belonging to the order *Pucciniales* or *Uredinales*	Whole plants and Non-dormant cuttings: treated (dipped or sprayed until dripping) with a broad range systemic fungicide suitable for the treatment of rust fungi belonging to the Pucciniales order approved by the NPPO of the exporting country OR Treatment on arrival in New Zealand with propiconazole (at the label rate) prior to entry into PEQ Dormant cuttings and Tissue Cultures: No specific measures

Appendix 1: Summary of Regulated Organisms associated with *Rosa* nursery stock

Risk Organism	Major hosts	Mechanisms for spread in environment	Geographic Distribution	Economic Impacts	Impact on *Rosa*	Proposed Risk Management measures
Phytoplasmas						
'Candidatus Phytoplasma asteris' Only Subgroup B and D were assessed for the IRA Rosa NS 2013 as they are specifically recorded as associated with *Rosa*	80 recorded hosts incl. food crops, trees, ornamentals and weeds alfalfa, apple, *Brassica*, carrot, grapevine, maize, olive, pear, and tomato.	Transmission by propagation or grafting of infected material. Transmission by phloem feeding insect vectors - leafhoppers belonging to the genera *Macrosteles*, *Euscelis*, *Scaphytopius* and *Aphrodes*	Subgroup B - France, Germany, Poland, Japan, North America, South America (Chile, Argentina), and Africa) Subgroup D - China, Taiwan, Japan and India	Main economic consequence on grape (wine), onions, potatoes (fresh and frozen), tomato, brassica, carrots, corn	Symptoms of infection fluctuate from severe to asymptomatic (symptoms can include abnormal root growth, stunting, flower phyllody and virescence, as well as a general decline that is sometimes fatal	Level 2 post entry quarantine for a minimum growing period of six months, and nested PCR or real time PCR using universal phytoplasma primers while in PEQ
'Candidatus Phytoplasma mali'	Apple, apricot, cherry, *Dahlia*, grape, hazelnut, *Lilium* pear and plum	Transmission by propagation or grafting of infected material and by natural root bridges. Transmission by phloem feeding insect vectors psyllid and leaf hopper - *Cacopsylla picta* and *Fieberiella florii*.	Found in most of Europe (eradicated from UK), Turkey and Syria	Main economic consequences on apple	Infection in *Rosa* may be exhibited by stunted growth, leaf and flower malformation, shoot and flower proliferation, infected plants may even be asymptomatic	Level 2 post entry quarantine for a minimum growing period of six months, and nested PCR or real time PCR using universal phytoplasma primers while in PEQ
'*Candidatus* Phytoplasma aurantifolia'	*Citrus*, grape, peach, sweet potato and tomato	Transmission by propagation and grafting of infected material, Transmission by phloem feeding insect vectors – leafhopper *Empoasca*	Australia, Bolivia, Cuba, Iran, New Caledonia, Japan, Tonga, United Arab Emirates, UK and Vanuatu	Main economic consequence on Citrus industry	Symptoms of little leaf and yellowing.	Level 2 post entry quarantine for a minimum growing period of six months, and nested PCR or real time PCR using universal phytoplasma primers while in PEQ

Risk Organism	Major hosts	Mechanisms for spread in environment	Geographic Distribution	Economic Impacts	Impact on *Rosa*	Proposed Risk Management measures
		decipiens, E. papaya, Hishimonus phycitis				
'*Candidatus* Phytoplasma prunorum' and '*Candidatus* Phytoplasma rubi'	*Rosa canina, Rubus spp.* and Stonefruit (apricot, peach, plum),	Transmission by propagation and grafting of infected material, Transmission by phloem feeding insect vectors psyllid *Cacopsylla pruni* and *Macropsis fuscula*.	Present in 15 out of 27 EU countries, and also Turkey, and Azerbajdzhan (present in important stone fruit production areas of Nth Europe	Main economic consequence on the stone and berry fruit industries	Has been reported on *Rosa canina*, but is symptomless	Level 2 post entry quarantine for a minimum growing period of six months, and nested PCR or real time PCR using universal phytoplasma primers while in PEQ
Viruses						
Blackberry chlorotic ringspot virus	Apple, blackberry, raspberry and *Rosa*	Transmission is by propagation or grafting of infected material and seed transmitted, possibly transmitted by pollen, which can therefore often be carried by thrips and bees.	USA (blackberry, raspberry , apple and *Rosa*) and Scotland (blackberry only)	Main economic consequence on the berry industry	Mild symptoms in tea rose, but is generally asymptomatic, however this virus has found to be an integral part of blackberry yellow vein disease and is widespread in rose plants affected by rose rosette disease	Listed as a regulated pest on the *Rosa* schedule, an Area freedom declaration required to be endorsed on the phytosanitary certificate by the NPPO of the exporting country OR PCR while in PEQ
Raspberry ringspot virus	Strawberry, stonefruit *(Prunus),* berryfruit *(Rubus)*, grapevine (*Vitis)*	Transmission is by propagation or by grafting of infected material, and seed transmitted (particularly by weeds), it is also transmitted plant to plant by nematodes belonging to the genus *Longidorus* and this virus may also have the capability of being transmitted by pollen.	Albania, Bulgaria, Czech republic, Finland, France, Germany, Greece, Ireland, Italy, Latvia, Luxembourg, Netherlands, Norway, Portugal, Russia, Serbia, Switzerland, Turkey, United Kingdom	Main economic consequence on the berry industry	Mosaic, chlorotic vein netting and stunting	Listed as a regulated pest on the *Rosa* schedule, an Area freedom declaration required to be endorsed on the phytosanitary certificate by the NPPO of the exporting country OR PCR while in PEQ

Risk Organism	Major hosts	Mechanisms for spread in environment	Geographic Distribution	Economic Impacts	Impact on *Rosa*	Proposed Risk Management measures
Rose rosette virus	*Rosa*	Transmission is by propagation or grafting of infected material and by insect transmission (eriophyid mite - (*Phyllocoptes fructiphilus* not PNZ).	Widespread in North central, South central and South East USA	With the absence of a natural vector in New Zealand, transmission would be limited to mechanical transmission. Harm and economic loss would occur	A range of symptoms culminating in death of affected plants within one to five years.	Listed as a regulated pest on the *Rosa* schedule, an Area freedom declaration required to be endorsed on the phytosanitary certificate by the NPPO of the exporting country OR PCR while in PEQ

Appendix 2: Proposed updated measures for *Rosa* nursery stock schedule

Rosa

Note: The entry conditions in this schedule only apply to species in the Plants Biosecurity Index listed under Import Specifications for Nursery Stock as "see 155.02.06 under *Rosa*", and are additional to those specified in sections 1, 2 and 3 of the import health standard..

Approved Countries: Australia, Austria, Belgium, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Japan, Luxembourg, The Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom.

1. **Type of Rosa nursery stock approved for entry into New Zealand**
   Whole plants (including non-dormant cuttings), cuttings (dormant), plants in tissue culture

2. **Quarantine pests:** Pucciniales; *Xylella fastidiosa; Blackberry chlorotic ringspot virus; Raspberry ringspot virus; Rose rosette virus; Candidatus* Phytoplasma asteris; *Candidatus* Phytoplasma aurantifolia; *Candidatus* Phytoplasma mali; *Candidatus* Phytoplasma prunorum; *Candidatus* Phytoplasma rubi.

Entry Conditions for:

A. For Whole Plants and Rooted cuttings:
PEQ: Level 2
Minimum Period: 6 months
Additional declaration(s):

1. "The plants have been dipped or sprayed until dripping (insert chosen treatment method i.e. spray or dip) in (insert name of fungicide used and active ingredients) a broad range systemic fungicide suitable for treating rust fungi from the *Pucciniales* order at the rate of (insert rate) at least 48 hours prior to shipment".
   OR
   Treatment with propiconazole at the label rate on arrival in New Zealand prior to entry into post entry quarantine.

2. Conditions for *Xylella fastidiosa* (section 2.2.1.12, part i)

3. "The plants have been sourced from a 'Pest free area', free from *Blackberry chlorotic ringspot virus*."
   OR
   The plants will be tested by PCR while in post entry quarantine in New Zealand

4. The plants have been sourced from a 'Pest free area', free from *Raspberry ringspot virus*"
   OR
   The plants will be tested by PCR while in post entry quarantine in New Zealand

5. "The plants have been sourced from a 'Pest free area', free from *Rose rosette virus*."

OR
The plants will be tested by PCR while in post entry quarantine in New Zealand

B. For Non-dormant cuttings:
PEQ: Level 2
Minimum Period: 6 months
Additional declaration(s):

1. "The plants have been dipped or sprayed until dripping (insert chosen treatment method i.e. spray or dip) in (insert name of fungicide used and active ingredients) a broad range systemic fungicide suitable for treating rust fungi from the *Pucciniales* order at the rate of (insert rate) at least 48 hours prior to shipment".
   OR
   Treatment with propiconazole at the label rate on arrival in New Zealand prior to entry into post entry quarantine.

2. Conditions for *Xylella fastidiosa* (section 2.2.1.12, part i)

3. "The plants have been sourced from a 'Pest free area', free from *Blackberry chlorotic ringspot virus*."
   OR
   The plants will be tested by PCR while in post entry quarantine in New Zealand

4. The plants have been sourced from a 'Pest free area', free from *Raspberry ringspot virus*"
   OR
   The plants will be tested by PCR while in post entry quarantine in New Zealand

5. "The plants have been sourced from a 'Pest free area', free from *Rose rosette virus*."
   OR
   The plants will be tested by PCR while in post entry quarantine in New Zealand

C. For Cuttings (dormant)
PEQ: Level 2
Minimum Period: 6 months
Additional Declaration(s):

1. Conditions for *Xylella fastidiosa* (section 2.2.1.12, part i)

2. "The plants have been sourced from a 'Pest free area', free from *Blackberry chlorotic ringspot virus."*
   OR
   The plants will be tested by PCR while in post entry quarantine in New Zealand.

3. The plants have been sourced from a 'Pest free area', free from *Raspberry ringspot virus.*"
   OR
   The plants will be tested by PCR while in post entry quarantine in New Zealand.

4. "The plants have been sourced from a 'Pest free area', free from *Rose rosette virus*."
   OR
   The plants will be tested by PCR while in post entry quarantine in New Zealand.

D. For Tissue cultures

PEQ: Level 2

Minimum period: 6 months

The quarantine period begins when tissue cultures are deflasked into the PEQ greenhouse.

The plants will be tested by PCR while in post entry quarantine in New Zealand
Refer to the 'Inspection, Testing and Treatment requirements for *Rosa'*

Guidance:

- Six months is an indicative minimum quarantine period and this period may be extended if material is slow growing, pests are detected, or further treatment/testing is required.

Inspection, Testing and Treatment Requirements for *Rosa**

ORGANISM TYPES	MPI ACCEPTABLE METHODS	Comments
Fungus		
Pucciniales	Treatment as per part A of *Rosa* schedule	For whole plants and non-dormant cuttings
Bacterium		
Xylella fastidiosa	Declaration as per section 2.2.1.12 'Measures for *Xylella fastidiosa*'	For whole plants and dormant and non-dormant cuttings
Virus		
Blackberry chlorotic ringspot virus	Area freedom declaration **OR** PCR in PEQ	For whole plants, dormant and non-dormant cuttings
Raspberry ringspot virus	Area freedom declaration **OR** PCR in PEQ	For whole plants, dormant and non-dormant cuttings
Rose rosette virus	Area freedom declaration **OR** PCR in PEQ	For whole plants, dormant and non-dormant cuttings
Phytoplasma		
'*Candidatus* Phytoplasma asteris'	Nested or real-time PCR using universal phytoplasma primers	For all nursery stock (incl. tissue cultures) while in PEQ
'*Candidatus* Phytoplasma aurantifolia'	Nested or real-time PCR using universal phytoplasma primers	For all nursery stock (incl. tissue cultures) while in PEQ
'*Candidatus* Phytoplasma mali'	Nested or real-time PCR using universal phytoplasma primers	For all nursery stock (incl. tissue cultures) while in PEQ
'*Candidatus* Phytoplasma prunorum'	Nested or real-time PCR using universal phytoplasma primers	For all nursery stock (incl. tissue cultures) while in PEQ
'*Candidatus* Phytoplasma rubi'	Nested or real-time PCR using universal phytoplasma primers	For all nursery stock (incl. tissue cultures) while in PEQ

* Country freedom is accepted as equivalence to a treatment.

Notes:

1. The unit for testing is defined in section 2.3.2.1.
2. Sample collection: Plants must be sampled from at least two positions on every stem including a young, fully expanded leaf at the top of each stem and an older leaf from a midway position.

3. Time of testing: PCR for virus testing must be carried out using the new season's growth in the spring or spring-like conditions. Testing for phytoplasmas must be carried out during mid to late summer or during mid to late summer-like conditions.
4. With prior notification, MPI will accept other internationally recognised testing methods.

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