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Pest categorisation of non-EU viruses and viroids of *Prunus* L.

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Abstract

Following a request from the EU Commission, the Panel on Plant Health addressed the pest categorisation of the viruses and viroids of *Prunus* L. determined as being either non-EU or of undetermined standing in a previous EFSA opinion. These infectious agents belong to different genera and are heterogeneous in their biology. With the exclusion of Ilarvirus S1 and Ilarvirus S2, for which very limited information exists, the pest categorisation was completed for 26 viruses and 1 viroid having acknowledged identities and available detection methods. All these viruses are efficiently transmitted by vegetative plant propagation techniques, with plants for planting representing the major pathway for long-distance dispersal and thus considered as the major pathway for entry. Depending on the virus, additional pathway(s) can also be *Prunus* seeds, pollen and/or vector(s). Most of the viruses categorised here are known to infect only one or few plant genera, but some of them have a wide host range, thus extending the possible entry pathways. Apple scar skin viroid, American plum line pattern virus, cherry mottle leaf virus, cherry rasp leaf virus, cherry rosette virus, cherry rusty mottle-associated virus, cherry twisted leaf-associated virus, peach enation virus, peach mosaic virus, peach rosette mosaic virus, tobacco ringspot virus and tomato ringspot virus meet all the criteria evaluated by EFSA to qualify as potential Union quarantine pests (QPs). With the exception of impact in the EU territory, on which the Panel was unable to conclude, apricot vein clearing virus, Asian prunus virus 1, Asian prunus virus 2, Asian prunus virus 3, Caucasus prunus virus, cherry virus B, Mume virus A, nectarine stem pitting-associated virus, nectarine virus M, peach chlorotic mottle virus, peach leaf pitting-associated virus, peach virus D, prunus virus F and prunus virus T satisfy all the other criteria to be considered as potential Union QPs. Prunus geminivirus A does not meet the criterion of having negative impact in the EU. For several viruses, especially those recently discovered, the categorisation is associated with high uncertainties mainly because of the absence of data on their biology, distribution and impact. Since this opinion addresses specifically the non-EU viruses, in general these viruses do not meet the criteria assessed by EFSA to qualify as potential Union regulated non-quarantine pests.

Keywords: European Union, pest risk, plant health, plant pest, quarantine, peach virus, peach viroid, plum virus, plum viroid, apricot virus, apricot viroid, almond virus, almond viroid, cherry virus, cherry viroid, nectarine virus, nectarine viroid

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1. Introduction

1.1. Background and Terms of Reference as provided by the requestor

1.1.1. Background

Council Directive 2000/29/EC[1] on protective measures against the introduction into the Community of organisms harmful to plants or plant products and against their spread within the Community establishes the present European Union plant health regime. The Directive lays down the phytosanitary provisions and the control checks to be carried out at the place of origin on plants and plant products destined for the Union or to be moved within the Union. In the Directive's 2000/29/EC annexes, the list of harmful organisms (pests) whose introduction into or spread within the Union is prohibited, is detailed together with specific requirements for import or internal movement.

Following the evaluation of the plant health regime, the new basic plant health law, Regulation (EU) 2016/2031[2] on protective measures against pests of plants, was adopted on 26 October 2016 and will apply from 14 December 2019 onwards, repealing Directive 2000/29/EC. In line with the principles of the above mentioned legislation and the follow-up work of the secondary legislation for the listing of EU regulated pests, EFSA is requested to provide pest categorizations of the harmful organisms included in the annexes of Directive 2000/29/EC, in the cases where recent pest risk assessment/pest categorisation is not available.

1.1.2. Terms of Reference

EFSA is requested, pursuant to Article 22(5.b) and Article 29(1) of Regulation (EC) No 178/2002[3], to provide scientific opinion in the field of plant health.

EFSA is requested to prepare and deliver a pest categorisation (step 1 analysis) for each of the regulated pests included in the appendices of the annex to this mandate. The methodology and template of pest categorisation have already been developed in past mandates for the organisms listed in Annex II Part A Section II of Directive 2000/29/EC. The same methodology and outcome is expected for this work as well.

The list of the harmful organisms included in the annex to this mandate comprises 133 harmful organisms or groups. A pest categorisation is expected for these 133 pests or groups and the delivery of the work would be stepwise at regular intervals through the year as detailed below. First priority covers the harmful organisms included in Appendix 1, comprising pests from Annex II Part A Section I and Annex II Part B of Directive 2000/29/EC. The delivery of all pest categorisations for the pests included in Appendix 1 is June 2018. The second priority is the pests included in Appendix 2, comprising the group of *Cicadellidae* (non-EU) known to be vector of Pierce's disease (caused by *Xylella fastidiosa*), the group of *Tephritidae* (non-EU), the group of potato viruses and virus-like organisms, the group of viruses and virus-like organisms of *Cydonia* Mill., *Fragaria* L., *Malus* Mill., *Prunus* L., *Pyrus* L., *Ribes* L., *Rubus* L. and *Vitis* L.. and the group of *Margarodes* (non-EU species). The delivery of all pest categorisations for the pests included in Appendix 2 is end 2019. The pests included in Appendix 3 cover pests of Annex I part A section I and all pests categorisations should be delivered by end 2020.

For the above mentioned groups, each covering a large number of pests, the pest categorisation will be performed for the group and not the individual harmful organisms listed under "such as" notation in the Annexes of the Directive 2000/29/EC. The criteria to be taken particularly under consideration for these cases, is the analysis of host pest combination, investigation of pathways, the damages occurring and the relevant impact.

Finally, as indicated in the text above, all references to 'non-European' should be avoided and replaced by 'non-EU' and refer to all territories with exception of the Union territories as defined in Article 1 point 3 of Regulation (EU) 2016/2031.

[1] Council Directive 2000/29/EC of 8 May 2000 on protective measures against the introduction into the Community of organisms harmful to plants or plant products and against their spread within the Community. OJ L 169/1, 10.7.2000, p. 1–112.

[2] Regulation (EU) 2016/2031 of the European Parliament of the Council of 26 October 2016 on protective measures against pests of plants. OJ L 317, 23.11.2016, p. 4–104.

[3] Regulation (EC) No 178/2002 of the European Parliament and of the Council of 28 January 2002 laying down the general principles and requirements of food law, establishing the European Food Safety Authority and laying down procedures in matters of food safety. OJ L 31/1, 1.2.2002, p. 1–24.

1.1.2.1. Terms of Reference: Appendix 1

List of harmful organisms for which pest categorisation is requested. The list below follows the annexes of Directive 2000/29/EC.

Annex IIAI

(a) Insects, mites and nematodes, at all stages of their development

Aleurocantus spp.
Anthonomus bisignifer (Schenkling)
Anthonomus signatus (Say)
Aschistonyx eppoi Inouye
Carposina niponensis Walsingham
Enarmonia packardi (Zeller)
Enarmonia prunivora Walsh
Grapholita inopinata Heinrich
Hishomonus phycitis
Leucaspis japonica Ckll.
Listronotus bonariensis (Kuschel)
Numonia pyrivorella (Matsumura)
Oligonychus perditus Pritchard and Baker
Pissodes spp. (non-EU)
Scirtothrips aurantii Faure
Scirtothrips citri (Moultex)
Scolytidae spp. (non-EU)
Scrobipalpopsis solanivora Povolny
Tachypterellus quadrigibbus Say
Toxoptera citricida Kirk.
Unaspis citri Comstock

(b) Bacteria

Citrus variegated chlorosis
Erwinia stewartii (Smith) Dye
Xanthomonas campestris pv. *oryzae* (Ishiyama) Dye and pv. *oryzicola* (Fang. et al.) Dye

(c) Fungi

Alternaria alternata (Fr.) Keissler (non-EU pathogenic isolates)
Anisogramma anomala (Peck) E. Müller
Apiosporina morbosa (Schwein.) v. Arx
Ceratocystis virescens (Davidson) Moreau
Cercoseptoria pini-densiflorae (Hori and Nambu) Deighton
Cercospora angolensis Carv. and Mendes
Elsinoe spp. Bitanc. and Jenk. Mendes
Fusarium oxysporum f. sp. *albedinis* (Kilian and Maire) Gordon
Guignardia piricola (Nosa) Yamamoto
Puccinia pittieriana Hennings
Stegophora ulmea (Schweinitz: Fries) Sydow & Sydow
Venturia nashicola Tanaka and Yamamoto

(d) Virus and virus-like organisms

Beet curly top virus (non-EU isolates)
Black raspberry latent virus
Blight and blight-like
Cadang-Cadang viroid
Citrus tristeza virus (non-EU isolates)
Leprosis
Little cherry pathogen (non- EU isolates)
Naturally spreading psorosis
Palm lethal yellowing mycoplasm
Satsuma dwarf virus
Tatter leaf virus
Witches' broom (MLO)

Annex IIB

(a) Insect mites and nematodes, at all stages of their development

Anthonomus grandis (Boh.)
Cephalcia lariciphila (Klug)
Dendroctonus micans Kugelan
Gilphinia hercyniae (Hartig)
Gonipterus scutellatus Gyll.
Ips amitinus Eichhof
Ips cembrae Heer
Ips duplicatus Sahlberg
Ips sexdentatus Börner
Ips typographus Heer
Sternochetus mangiferae Fabricius

(b) Bacteria

Curtobacterium flaccumfaciens pv. flaccumfaciens (Hedges) Collins and Jones

(c) Fungi

Glomerella gossypii Edgerton
Gremmeniella abietina (Lag.) Morelet
Hypoxylon mammatum (Wahl.) J. Miller

1.1.2.2. Terms of Reference: Appendix 2

List of harmful organisms for which pest categorisation is requested per group. The list below follows the categorisation included in the annexes of Directive 2000/29/EC.

Annex IAI

(a) Insects, mites and nematodes, at all stages of their development

Group of Cicadellidae (non-EU) known to be vector of Pierce's disease (caused by *Xylella fastidiosa*), such as:

1) *Carneocephala fulgida* Nottingham
2) *Draeculacephala minerva* Ball
3) *Graphocephala atropunctata* (Signoret)

Group of Tephritidae (non-EU) such as:

1) *Anastrepha fraterculus* (Wiedemann)
2) *Anastrepha ludens* (Loew)
3) *Anastrepha obliqua* Macquart
4) *Anastrepha suspensa* (Loew)
5) *Dacus ciliatus* Loew
6) *Dacus curcurbitae* Coquillet
7) *Dacus dorsalis* Hendel
8) *Dacus tryoni* (Froggatt)
9) *Dacus tsuneonis* Miyake
10) *Dacus zonatus* Saund.
11) *Epochra canadensis* (Loew)
12) *Pardalaspis cyanescens* Bezzi
13) *Pardalaspis quinaria* Bezzi
14) *Pterandrus rosa* (Karsch)
15) *Rhacochlaena japonica* Ito
16) *Rhagoletis completa* Cresson
17) *Rhagoletis fausta* (Osten-Sacken)
18) *Rhagoletis indifferens* Curran
19) *Rhagoletis mendax* Curran
20) *Rhagoletis pomonella* Walsh
21) *Rhagoletis suavis* (Loew)

(c) Viruses and virus-like organisms

Group of potato viruses and virus-like organisms such as:

1) Andean potato latent virus
2) Andean potato mottle virus
3) Arracacha virus B, oca strain
4) Potato black ringspot virus
5) Potato virus T
6) non-EU isolates of potato viruses A, M, S, V, X and Y (including Yo, Yn and Yc) and Potato leafroll virus

Group of viruses and virus-like organisms of *Cydonia* Mill., *Fragaria* L., *Malus* Mill., *Prunus* L., *Pyrus* L., *Ribes* L., *Rubus* L. and *Vitis* L., such as:

1) Blueberry leaf mottle virus
2) Cherry rasp leaf virus (American)
3) Peach mosaic virus (American)
4) Peach phony rickettsia
5) Peach rosette mosaic virus
6) Peach rosette mycoplasm
7) Peach X-disease mycoplasm
8) Peach yellows mycoplasm
9) Plum line pattern virus (American)
10) Raspberry leaf curl virus (American)
11) Strawberry witches' broom mycoplasma
12) Non-EU viruses and virus-like organisms of *Cydonia Mill., Fragaria L., Malus Mill., Prunus L., Pyrus L., Ribes L., Rubus L.* and *Vitis L.*

Annex IIAI

(a) Insects, mites and nematodes, at all stages of their development

Group of *Margarodes* (non-EU species) such as:

1) *Margarodes vitis* (Phillipi)
2) *Margarodes vredendalensis* de Klerk
3) *Margarodes prieskaensis* Jakubski

1.1.2.3. Terms of Reference: Appendix 3

List of harmful organisms for which pest categorisation is requested. The list below follows the annexes of Directive 2000/29/EC.

Annex IAI

(a) Insects, mites and nematodes, at all stages of their development

Acleris spp. (non-EU)
Amauromyza maculosa (Malloch)
Anomala orientalis Waterhouse
Arrhenodes minutus Drury
Choristoneura spp. (non-EU)
Conotrachelus nenuphar (Herbst)
Dendrolimus sibiricus Tschetverikov
Diabrotica barberi Smith and Lawrence
Diabrotica undecimpunctata howardi Barber
Diabrotica undecimpunctata undecimpunctata Mannerheim
Diabrotica virgifera zeae Krysan & Smith
Diaphorina citri Kuway
Heliothis zea (Boddie)
Hirschmanniella spp., other than *Hirschmanniella gracilis* (de Man) Luc and Goodey
Liriomyza sativae Blanchard
Longidorus diadecturus Eveleigh and Allen
Monochamus spp. (non-EU)
Myndus crudus Van Duzee
Nacobbus aberrans (Thorne) Thorne and Allen
Naupactus leucoloma Boheman
Premnotrypes spp. (non-EU)
Pseudopityophthorus minutissimus (Zimmermann)
Pseudopityophthorus pruinosus (Eichhoff)
Scaphoideus luteolus (Van Duzee)
Spodoptera eridania (Cramer)
Spodoptera frugiperda (Smith)
Spodoptera litura (Fabricus)
Thrips palmi Karny
Xiphinema americanum Cobb *sensu* lato (non-EU populations)
Xiphinema californicum Lamberti and Bleve-Zacheo

(b) Fungi

Ceratocystis fagacearum (Bretz) Hunt
Chrysomyxa arctostaphyli Dietel
Cronartium spp. (non-EU)
Endocronartium spp. (non-EU)
Guignardia laricina (Saw.) Yamamoto and Ito
Gymnosporangium spp. (non-EU)
Inonotus weirii (Murril) Kotlaba and Pouzar
Melampsora farlowii (Arthur) Davis
Mycosphaerella larici-leptolepis Ito et al.
Mycosphaerella populorum G. E. Thompson
Phoma andina Turkensteen
Phyllosticta solitaria Ell. and Ev.
Septoria lycopersici Speg. var. *malagutii* Ciccarone and Boerema
Thecaphora solani Barrus
Trechispora brinkmannii (Bresad.) Rogers

(c) Viruses and virus-like organisms

Tobacco ringspot virus
Tomato ringspot virus
Bean golden mosaic virus
Cowpea mild mottle virus
Lettuce infectious yellows virus
Pepper mild tigré virus
Squash leaf curl virus
Euphorbia mosaic virus
Florida tomato virus

(d) Parasitic plants

Arceuthobium spp. (non-EU)

Annex IAII

(a) Insects, mites and nematodes, at all stages of their development

Meloidogyne fallax Karssen
Popillia japonica Newman
Rhizoecus hibisci Kawai and Takagi

(b) Bacteria

Clavibacter michiganensis (Smith) Davis et al. ssp. *sepedonicus* (Spieckermann and Kotthoff) Davis et al.
Ralstonia solanacearum (Smith) Yabuuchi et al.

(c) Fungi

Melampsora medusae Thümen

Synchytrium endobioticum (Schilbersky) Percival

Annex I B

(a) Insects, mites and nematodes, at all stages of their development

Leptinotarsa decemlineata Say

Liriomyza bryoniae (Kaltenbach)

(b) Viruses and virus-like organisms

Beet necrotic yellow vein virus

1.2. Interpretation of the Terms of Reference

Non-EU viruses and virus-like organisms of *Cydonia* Mill., *Fragaria* L., *Malus* Mill., *Prunus* L., *Pyrus* L., *Ribes* L., *Rubus* L. and *Vitis* L. are pests listed in the Appendices to the Terms of Reference (ToR) to be subject to pest categorisation to determine whether they fulfil the criteria of quarantine pests or those of regulated non-quarantine pests for the area of the EU excluding Ceuta, Melilla and the outermost regions of Member States (MSs) referred to in Article 355(1) of the Treaty on the Functioning of the European Union (TFEU), other than Madeira and the Azores.

The EFSA PLH panel decided to address the pest categorisation of this large group of infectious agents in several steps, the first of which has been to list non-EU viruses and viroids (viruses and viroids, although different biological categories, are summarised together as 'viruses' in the rest of this opinion) of *Cydonia* Mill., *Fragaria* L., *Malus* Mill., *Prunus* L., *Pyrus* L., *Ribes* L., *Rubus* L. and *Vitis* L. (EFSA PLH Panel, 2019a).

The process has been detailed in a recent Scientific Opinion (EFSA PLH Panel, 2019a), in which it has been also clarified that *In the process, three groups of viruses were distinguished: non-EU viruses, viruses with significant presence in the EU (known to occur in several MSs, frequently reported in the EU, widespread in several MSs) or so far reported only from the EU, and viruses with undetermined standing for which available information did not readily allow to allocate to one or the other of the two above groups. A non-EU virus is defined by its geographical origin outside of the EU territory. As such, viruses not reported from the EU and occurring only outside of the EU territory are considered as non-EU viruses. Likewise, viruses occurring outside the EU and having only a limited presence in the EU (reported in only one or few MSs, with restricted distribution, outbreaks) are also considered as non-EU. This opinion provides the methodology and results for this classification which precedes but does not prejudice the actual pest categorisation linked with the present mandate. This means that the Panel will then perform pest categorisations for the non-EU viruses and for those with undetermined standing. The viruses with significant presence in the EU or so far reported only from the EU will also be listed, but they will be excluded from the current categorisation efforts. The Commission at any time may present a request to EFSA to categorise some or all the viruses excluded from the current EFSA categorisation.* The same statements and definitions reported above also apply to the current opinion.

Due to the high number of viruses to be categorised and their heterogeneity in terms of biology, host range and epidemiology, the EFSA PLH Panel established the need of finalising the pest categorisation in separate opinions by grouping non-EU viruses and viruses with undetermined standing according to the host crops. This strategy has the advantage of reducing the number of infectious agents to be considered in each opinion and appears more convenient for the stakeholders that will find grouped in a single opinion the categorisation of the non-EU viruses and those with undetermined standing infecting one or few specific crops. According to this decision, the current opinion covers the pest categorisation of the viruses and viroids of *Prunus* that have been listed as non-EU viruses or as viruses with undetermined standing in the previous EFSA scientific opinion (EFSA PLH Panel, 2019a).

In the process of preparing the present opinion, new data have been evaluated resulting in the identification of Mume Virus A (MuVA, Marais et al., 2018) and prunus geminivirus A (PrGVA, Al Rwahnih et al., 2018) as additional recently discovered viruses of potential interest in the frame of the present mandate. MuVA can be considered as a non-EU virus because it has been reported only in Japan and is not known to occur in the EU. PrGVA has been discovered in the USA in several accessions of a germplasm collection, including accessions originally from worldwide geographical regions. Although these viruses are associated with relevant uncertainties on distribution and biology, mainly due to their very recent identification, the Panel decided to include them in the current pest categorisation.

The viruses categorised in the current opinion are listed in Table 1.

Table 1: Non-EU viruses and viruses with undetermined standing of *Prunus*

Non-EU	American plum line pattern virus (APLPV), Asian prunus virus 1 (APV-1), Asian prunus virus 2 (APV-2), Asian prunus virus 3 (APV-3), Caucasus prunus virus (CPrV), cherry rasp leaf virus (CRLV), cherry rosette virus (CRV), cherry rusty mottle associated virus (CRMaV), cherry twisted leaf associated virus (CTLaV), cherry virus B (CVB), ilarvirus S1 (Ilarvirus-S1), ilarvirus S2 (Ilarvirus-S2), Mume virus A (MuVA), nectarine virus M (NeVM), peach chlorotic mottle virus (PeCMV), peach enation nepovirus (PEV), peach leaf pitting-associated virus (PLPaV), peach mosaic virus (PcMV), peach rosette mosaic virus (PRMV), peach virus D (PeVD), tobacco ringspot virus (TRSV), tomato ringspot virus (ToRSV)
Undetermined standing	Apple scar skin viroid (ASSVd), apricot vein clearing-associated virus (AVCaV), cherry mottle leaf virus (CMLV), Prunus geminivirus A (PrGVA), nectarine stem pitting-associated virus (NSPaV), Prunus virus F (PrVF), Prunus virus T (PrVT)

Some of the viruses of *Prunus* addressed here (ASSVd, CRLV, PRMV, TRSV, ToRSV) are also able to infect *Malus, Pyrus*, *Cydonia* and/or *Vitis* and have therefore also been addressed previously in the pest categorisation on non-EU viruses and viroids of *Cydonia*, *Malus* and *Pyrus* (EFSA PLH Panel, 2019b) and *Vitis* (EFSA PLH Panel, 2019c). Non-EU viruses of *Fragaria* L., *Ribes* L. and *Rubus* L. will be addressed in other opinions.

Virus-like diseases of unknown aetiology or diseases caused by phytoplasmas and other graft-transmissible bacteria are not addressed in this opinion.

2. Data and methodologies

2.1. Data

2.1.1. Literature search

Literature search on viruses of *Prunus* was conducted at the beginning of the categorisation in the ISI Web of Science bibliographic database, using the scientific name of the pest as search term. Relevant papers were reviewed and further references and information were obtained from experts, as well as from citations within the references and grey literature. When the collected information was considered sufficient to perform the virus categorisation, the literature search was not further extended; as a consequence the data provided here for each virus is not necessarily exhaustive.

2.1.2. Database search

Pest information, on the host(s) and distribution, was retrieved from the European and Mediterranean Plan Protection Organization (EPPO) Global Database (EPPO, 2019) and relevant publications. When the information from these sources was limited, it has been integrated with data from CABI crop protection compendium (CABI, 2019; https://www.cabi.org/cpc/). The database Fauna Europaea (de Jong et al., 2014; https://fauna-eu.org) has been used to search for additional information on the distribution of vectors, especially when data were not available in EPPO and/or CABI.

Data about the import of commodity types that could potentially provide a pathway for a pest to enter the EU and about the area of hosts grown in the EU were obtained from EUROSTAT (Statistical Office of the European Communities).

The Europhyt database was consulted for pest-specific notifications on interceptions and outbreaks. Europhyt is a web-based network run by the Directorate General for Health and Food Safety (DG SANTÉ) of the European Commission, and is a subproject of PHYSAN (Phyto-Sanitary Controls) specifically concerned with plant health information. The Europhyt database manages notifications of interceptions of plants or plant products that do not comply with EU legislation, as well as notifications of plant pests detected in the territory of the MS and the phytosanitary measures taken to eradicate or avoid their spread.

Information on the taxonomy of viruses and viroids was gathered from the Virus Taxonomy: 2018 Release (https://talk.ictvonline.org/taxonomy/), an updated official classification by the International Committee on Taxonomy of Viruses (ICTV). Information on the taxonomy of viruses not yet included in that ICTV classification was gathered from the primary literature source describing them. According to

ICTV rules (https://talk.ictvonline.org/information/w/faq/386/how-to-write-a-virus-name), names of viruses are not italicised in the present opinion.

2.2. Methodologies

The Panel performed the pest categorisation for viruses of *Prunus*, following guiding principles and steps presented in the EFSA guidance on quantitative pest risk assessment (EFSA PLH Panel, 2018a) and as defined in the International Standard for Phytosanitary Measures No 11 (FAO, 2013) and No 21 (FAO, 2004).

This work was initiated following an evaluation of the EU plant health regime. Therefore, to facilitate the decision-making process, in the conclusions of the pest categorisation, the Panel addresses explicitly each criterion for a Union quarantine pest and for a Union regulated non-quarantine pest in accordance with Regulation (EU) 2016/2031 on protective measures against pests of plants, and includes additional information required in accordance with the specific terms of reference received by the European Commission. In addition, for each conclusion, the Panel provides a short description of its associated uncertainty.

Table 2 presents the Regulation (EU) 2016/2031 pest categorisation criteria on which the Panel bases its conclusions. All relevant criteria have to be met for the pest to potentially qualify either as a quarantine pest or as a regulated non-quarantine pest. If one of the criteria is not met, the pest will not qualify. A pest that does not qualify as a quarantine pest may still qualify as a regulated non-quarantine pest that needs to be addressed in the opinion. For the pests regulated in the protected zones only, the scope of the categorisation is the territory of the protected zone; thus, the criteria refer to the protected zone instead of the EU territory.

It should be noted that the Panel's conclusions are formulated respecting its remit and particularly with regard to the principle of separation between risk assessment and risk management (EFSA founding regulation (EU) No 178/2002); therefore, instead of determining whether the pest is likely to have an unacceptable impact, the Panel will present a summary of the observed pest impacts. Economic impacts are expressed in terms of yield and quality losses and not in monetary terms, whereas addressing social impacts is outside the remit of the Panel.

Table 2: Pest categorisation criteria under evaluation, as defined in Regulation (EU) 2016/2031 on protective measures against pests of plants (the number of the relevant sections of the pest categorisation is shown in brackets in the first column)

Criterion of pest categorisation	Criterion in Regulation (EU) 2016/2031 regarding Union quarantine pest	Criterion in Regulation (EU) 2016/2031 regarding protected zone quarantine pest (articles 32–35)	Criterion in Regulation (EU) 2016/2031 regarding Union regulated non-quarantine pest
Identity of the pest (Section 3.1)	Is the identity of the pest established, or has it been shown to produce consistent symptoms and to be transmissible?	Is the identity of the pest established, or has it been shown to produce consistent symptoms and to be transmissible?	Is the identity of the pest established, or has it been shown to produce consistent symptoms and to be transmissible?
Absence/ presence of the pest in the EU territory (Section 3.2)	Is the pest present in the EU territory? If present, is the pest widely distributed within the EU? Describe the pest distribution briefly!	Is the pest present in the EU territory? If not, it cannot be a protected zone quarantine organism	Is the pest present in the EU territory? If not, it cannot be a regulated non-quarantine pest. (A regulated non-quarantine pest must be present in the risk assessment area)
Regulatory status (Section 3.3)	If the pest is present in the EU but not widely distributed in the risk assessment area, it should be under official control or expected to be under official control in the near future	The protected zone system aligns with the pest free area system under the International Plant Protection Convention (IPPC). The pest satisfies the IPPC definition of a quarantine pest that is not present in the risk assessment area (e.g. protected zone)	Is the pest regulated as a quarantine pest? If currently regulated as a quarantine pest, are there grounds to consider its status could be revoked?

Criterion of pest categorisation	Criterion in Regulation (EU) 2016/2031 regarding Union quarantine pest	Criterion in Regulation (EU) 2016/2031 regarding protected zone quarantine pest (articles 32–35)	Criterion in Regulation (EU) 2016/2031 regarding Union regulated non-quarantine pest
Pest potential for entry, establishment and spread in the EU territory (Section 3.4)	Is the pest able to enter into, become established in, and spread within, the EU territory? If yes, briefly list the pathways!	Is the pest able to enter into, become established in, and spread within, the protected zone areas? Is entry by natural spread from EU areas where the pest is present possible?	Is spread mainly via specific plants for planting, rather than via natural spread or via movement of plant products or other objects? Clearly state if plants for planting is the main pathway!
Potential for consequences in the EU territory (Section 3.5)	Would the pests' introduction have an economic or environmental impact on the EU territory?	Would the pests' introduction have an economic or environmental impact on the protected zone areas?	Does the presence of the pest on plants for planting have an economic impact, as regards the intended use of those plants for planting?
Available measures (Section 3.6)	Are there measures available to prevent the entry into, establishment within or spread of the pest within the EU such that the risk becomes mitigated?	Are there measures available to prevent the entry into, establishment within or spread of the pest within the protected zone areas such that the risk becomes mitigated? Is it possible to eradicate the pest in a restricted area within 24 months (or a period longer than 24 months where the biology of the organism so justifies) after the presence of the pest was confirmed in the protected zone?	Are there measures available to prevent pest presence on plants for planting such that the risk becomes mitigated?
Conclusion of pest categorisation (Section 4)	A statement as to whether (1) all criteria assessed by EFSA above for consideration as a potential quarantine pest were met and (2) if not, which one(s) were not met	A statement as to whether (1) all criteria assessed by EFSA above for consideration as potential protected zone quarantine pest were met, and (2) if not, which one(s) were not met	A statement as to whether (1) all criteria assessed by EFSA above for consideration as a potential regulated non-quarantine pest were met, and (2) if not, which one(s) were not met

The Panel will not indicate in its conclusions of the pest categorisation whether to continue the risk assessment process, but following the agreed two-step approach, will continue only if requested by the risk managers. However, during the categorisation process, experts may identify key elements and knowledge gaps that could contribute significant uncertainty to a future assessment of risk. It would be useful to identify and highlight such gaps so that potential future requests can specifically target the major elements of uncertainty, perhaps suggesting specific scenarios to examine.

3. Pest categorisation

3.1. Identity and biology of the pests

3.1.1. Identity and taxonomy

Is the identity of the pests established, or have they been shown to produce consistent symptoms and to be transmissible? (Yes or No)

Yes, The viruses of *Prunus* categorised in the present opinion, with the exception of Ilarvirus-S1 and Ilarvirus-S2, are either classified as species in the official ICTV classification scheme, or if not yet officially classified, have been proposed as tentative new species based on their molecular and/or biological features.

No, for Ilarvirus-S1 and Ilarvirus-S2

In Table 3, the information on the identity of the viruses categorised in the present opinion is reported. Most of them (APLPV, ASSVd, AVCaV, APV-1, APV-2, CPrV, CMLV, CRLV, CRMaV, CTLaV, NeVM, PcMV, PLPaV, PRMV, PeVD, PrVF, PrVT, TRSV, ToRSV) are included in the ICTV official classification scheme and therefore no uncertainty is associated with their identity. APV-3, CRV, CVB, MuVA, PrGVA, PEV have not been officially classified yet, mainly because they have been recently discovered and/or available information on their classification is not conclusive. However, molecular and/or biological features of these viruses allowed proposing their tentative classification as novel species in established genera, thus recognising them as infectious entities different from those previously reported. Therefore, also for viruses belonging to tentative species there is no uncertainty on their identity, although a limited uncertainty remains on their final taxonomic assignment.

Ilarvirus-S1 and Ilarvirus-S2 have been identified as ilarvirus-like RNA2 sequences (870 and 271 nt, respectively) by generic amplicon deep sequencing (Kinoti et al., 2017b) and proposed to be fragments of the genome of two potential novel ilarviruses. However, attempts of identifying additional genomic viral sequences or components of these hypothetical viruses were unsuccessful. Therefore, the possibility that the identified sequences are derived from endogenous viral elements (EVE) and not from infectious viruses was not excluded (Kinoti et al., 2017b). Due to the large uncertainty associated at this stage with the identity of Ilarvirus-S1 and Ilarvirus-S2 as potential new ilarviruses infecting *Prunus,* the Panel decided to exclude both viruses from further categorisation.

Table 3: Identity of viruses and viroids categorised in the present opinion

VIRUS/VIROID name[(a)]	Is the identity of the pest established, or has it been shown to produce consistent symptoms and to be transmissible?	Justification[(b)]
Apple scar skin viroid (ASSVd)	Yes	Approved species in the genus *Apscaviroid*, family *Pospiviroidae*
American plum line pattern virus (APLPV)	Yes	Approved species in the genus *Ilarvirus*, family *Bromoviridae*
Apricot vein clearing-associated virus (AVCaV)	Yes	Approved species in the genus *Prunevirus,* family *Betaflexiviridae*
Asian prunus virus 1 (APV-1)	Yes	Approved species in the genus *Foveavirus,* family *Betaflexiviridae*
Asian prunus virus 2 (APV-2)	Yes	Approved species in the genus *Foveavirus,* family *Betaflexiviridae*
Asian prunus virus 3 (APV-3)	Yes	Tentative species in the genus *Foveavirus,* family *Betaflexiviridae* (Candresse et al., 2011; Marais et al., 2016)
Caucasus prunus virus (CPrV)	Yes	Approved species in the genus *Prunevirus,* family *Betaflexiviridae*
Cherry mottle leaf virus (CMLV)	Yes	Approved species in the genus *Trichovirus,* family *Betaflexiviridae*

VIRUS/VIROID name[(a)]	Is the identity of the pest established, or has it been shown to produce consistent symptoms and to be transmissible?	Justification[(b)]
Cherry rasp leaf virus (CRLV)	Yes	Approved species in the genus *Cheravirus*, family *Secoviridae*
Cherry rosette virus (CRV)	Yes	Tentative species in the genus *Nepovirus*, family *Secoviridae* (Kunz, 1988)
Cherry rusty mottle-associated virus (CRMaV)	Yes	Approved species in the genus *Robigovirus,* family *Betaflexiviridae*
Cherry twisted leaf associated virus (CTLaV)	Yes	Approved species in the genus *Robigovirus,* family *Betaflexiviridae*
Cherry virus B (CVB)	Yes	Tentative species in the genus *Foveavirus*, family *Betaflexiviridae* (GenBank full length genome: LC373513)
Ilarvirus S1 (Ilarvirus-S1)	No	Only identified as a short virus-like sequence (870 nt) by generic amplicon deep sequencing (Kinoti et al., 2017b). It is not known whether a complete genome exists. Therefore, the identity as a virus is questionable and the Panel decided not to pursue the categorisation of this agent
Ilarvirus S2 (Ilarvirus-S2)	No	Only identified as a very short virus-like sequence (271 nt) by generic amplicon deep sequencing (Kinoti et al., 2017b). It is not known whether a complete genome exists. Therefore, the identity as a virus is questionable and the Panel decided not to pursue the categorisation of this agent
Mume virus A (MuVA)	Yes	Tentative species in the genus *Capillovirus*, family *Betaflexiviridae* (Marais et al., 2018)
Nectarine stem pitting-associated virus (NSPaV)	Yes	Tentative species in the genus *Luteovirus*, family *Luteoviridae* (Bag et al., 2015)
Nectarine virus M (NeVM)	Yes	Approved species in the genus *Marafivirus,* family *Tymoviridae*
Peach chlorotic mottle virus (PeCMV)	Yes	Approved species in the genus *Foveavirus*, family *Betaflexiviridae*
Peach enation nepovirus (PEV)	Yes	Tentative species in the genus *Nepovirus*, family *Secoviridae* (Kishi et al., 1973)
Peach leaf pitting-associated virus (PLPaV)	Yes	Tentative species in the genus *Fabavirus*, family *Secoviridae* (He et al., 2017)
Peach mosaic virus (PcMV)	Yes	Approved species in the genus *Trichovirus*, family *Betaflexiviridae*
Peach rosette mosaic virus (PRMV)	Yes	Approved species in the genus *Nepovirus*, family *Secoviridae*
Peach virus D (PeVD)	Yes	Approved species in the genus *Marafivirus*, family *Tymoviridae*
Prunus geminivirus A (PrGVA)	Yes	Tentative species in the genus *Grablovirus*, family *Geminiviridae* (Al Rwahnih et al., 2018)
Prunus virus F (PrVF)	Yes	Approved species in the genus *Fabavirus*, family *Secoviridae*
Prunus virus T (PrVT)	Yes	Approved species in the genus *Tepovirus*, family *Betaflexiviridae*

VIRUS/VIROID name[(a)]	Is the identity of the pest established, or has it been shown to produce consistent symptoms and to be transmissible?	Justification[(b)]
Tobacco ringspot virus (TRSV)	Yes	Approved species in the genus *Nepovirus*, family *Secoviridae*
Tomato ringspot virus (ToRSV)	Yes	Approved species in the genus *Nepovirus*, family *Secoviridae*

(a): According to ICTV rules (https://talk.ictvonline.org/information/w/faq/386/how-to-write-a-virus-name), names of viruses are not italicised.
(b): Tentative species refers to a proposed novel virus/viroid species not yet approved by ICTV.

3.1.2. Biology of the pest

All the viruses considered in the present pest categorisation are efficiently transmitted by vegetative propagation techniques. Some of them may possibly be mechanically transmitted by contaminated tools and/or injuries but this process is generally considered to be at best inefficient in woody hosts, such as *Prunus* species (Hadidi et al., 2011). Some of these agents have additional natural transmission mechanisms as outlined in Table 4.

Table 4: Seed-, pollen- and vector-mediated transmission of the categorised viruses with the associated uncertainty

VIRUS/ VIROID name	Seed transmission	Seed transmission uncertainty (refs)	Pollen transmission	Pollen transmission uncertainty (refs)	Vector transmission	Vector transmission uncertainty (refs)
Apple scar skin viroid (ASSVd)	Yes	Conflicting reports (Hadidi et al., 2017) generate uncertainty on this statement	No	Not known for ASSVd and apscaviroids are not reported to be pollen-transmitted	Cannot be excluded	Uncertainty derives from one report documenting ASSVd transmission between experimental herbaceous hosts mediated by *Trialeurodes vaporariorum* (Walia et al., 2015). Transmission of ASSVd to its natural woody hosts has never been documented and would appear unlikely
American plum line pattern virus (APLPV)	Cannot be excluded	Not known for APLPV but other ilarviruses are known to be seed-transmitted. (Pallas et al., 2013)	Cannot be excluded	Not known for APLPV but other ilarviruses are known to be pollen-transmitted. (Fulton, 1984; Mink, 1995; Myrta et al., 2011; Pallas et al., 2013)	No	Not known for APLPV however transmission of some other ilarviruses is reported to be facilitated by thrips (Greber et al., 1992; Sdoodee and Teakle, 1993; Klose et al., 1996)

VIRUS/ VIROID name	Seed transmission	Seed transmission uncertainty (refs)	Pollen transmission	Pollen transmission uncertainty (refs)	Vector transmission	Vector transmission uncertainty (refs)
Apricot vein clearing-associated virus (AVCaV)	No	Not known for AVCaV and betaflexiviruses are generally not known to be seed-transmitted (Martelli et al., 2007)	No	Not known for AVCaV and betaflexiviruses are generally not reported to be pollen-transmitted (Mink, 1995; Card et al., 2007; EFSA PLH Panel, 2013)	Cannot be excluded	Not known for AVCaV, but some betaflexiviruses are known to be transmitted by arthropod vectors (Martelli et al., 2007)
Asian prunus virus 1 (APV-1)	No	Not known for APV-1 and foveaviruses are generally not known to be seed-transmitted (Martelli et al., 2007)	No	Not known for APV-1 and foveaviruses are not known to be pollen-transmitted (Mink, 1995; Card et al., 2007; EFSA PLH Panel, 2013)	No	Not known vector for APV-1 and foveaviruses are not known to be transmitted by vectors (Adams et al., 2012)
Asian prunus virus 2 (APV-2)	No	Not known for APV-2 and foveaviruses are generally not known to be seed-transmitted (Martelli et al., 2007)	No	Not known for APV-2 and foveaviruses are not known to be pollen-transmitted (Mink, 1995; Card et al., 2007; EFSA PLH Panel, 2013)	No	Not known vector for APV-2 and foveaviruses are not known to be transmitted by vectors (Adams et al., 2012)
Asian prunus virus 3 (APV-3)	No	Not known for APV-3 and foveaviruses are generally not known to be seed-transmitted (Martelli et al., 2007)	No	Not known for APV-3 and foveaviruses are not known to be pollen-transmitted (Mink, 1995; Card et al., 2007; EFSA PLH Panel, 2013)	No	Not known vector for APV-3 and foveaviruses are not known to be transmitted by vectors (Adams et al., 2012)
Caucasus prunus virus (CPrV)	No	Not known for CPrV and betaflexiviruses are generally not known to be seed-transmitted (Martelli et al., 2007)	No	Not known for CPrV and betaflexiviruses are generally not reported to be pollen-transmitted (Mink, 1995; Card et al., 2007; EFSA PLH Panel, 2013)	Cannot be excluded	Not known for CPrV, but some betaflexiviruses are known to be transmitted by arthropod vectors (Martelli et al., 2007)

VIRUS/ VIROID name	Seed transmission	Seed transmission uncertainty (refs)	Pollen transmission	Pollen transmission uncertainty (refs)	Vector transmission	Vector transmission uncertainty (refs)
Cherry mottle leaf virus (CMLV)	No	Not known for CMLV and trichoviruses are generally not reported to be seed-transmitted	No	Not known for CMLV and trichoviruses are not reported to be pollen-transmitted	Yes	No uncertainty. Efficiently transmitted by the mite *Eriophyes inaequalis* (Oldfield, 1970; James, 2011a)
Cherry rasp leaf virus (CRLV)	Cannot be excluded	Seed transmission reported in some herbaceous hosts but not in woody hosts (James, 2011b; EFSA PLH Panel, 2013)	Cannot be excluded	Pollen transmission reported in herbaceous hosts but not in woody hosts (James, 2011b; EFSA PLH Panel, 2013)	Yes	No uncertainty. Known to be transmitted by *Xiphinema americanum* sensu lato (including *X. americanum* sensu stricto, *X. californicum* and *X. rivesi*) (Brown et al., 1993; James, 2011c; EFSA PLH Panel et al., 2018b)
Cherry rosette virus (CRV)	Cannot be excluded	Not known for CRV but other nepoviruses are known to be seed-transmitted in some hosts (Martelli and Uyemoto, 2011)	Cannot be excluded	Not known for CRV but other nepoviruses are known to be pollen-transmitted in some hosts (Martelli and Uyemoto, 2011)	Yes	Known to be transmitted by *Longidorus arthensis* (Brown et al., 1994)
Cherry rusty mottle-associated virus (CRMaV)	No	Not known for CRMaV and betaflexiviruses are in general not known to be seed-transmitted (Martelli et al., 2007; Rott and Jelkmann, 2011)	No	Not known for CRMaV and betaflexiviruses are not known to be pollen-transmitted (Rott and Jelkmann, 2011)	Cannot be excluded	No known vector for CRMaV (Rott and Jelkmann, 2011), but some betaflexiviruses are known to be transmitted by arthropod vectors (Martelli et al., 2007)
Cherry twisted leaf associated virus (CTLaV)	No	Not known for CTLaV and betaflexiviruses are generally not known to be seed-transmitted (Rott and Jelkmann, 2011)	No	Not known for CTLaV and betaflexiviruses are not known to be pollen-transmitted (James, 2011a)	Cannot be excluded	No known vector for CTLaV, but involvement of insect vector has been proposed (James, 2011a). Some betaflexiviruses are known to be transmitted by arthropod vectors (Martelli et al., 2007)

VIRUS/ VIROID name	Seed transmission	Seed transmission uncertainty (refs)	Pollen transmission	Pollen transmission uncertainty (refs)	Vector transmission	Vector transmission uncertainty (refs)
Cherry virus B (CVB)	No	Not known for CVB and foveaviruses are not known to be seed-transmitted (Martelli et al., 2007)	No	Not known for CVB and foveaviruses are not known to be pollen-transmitted (Adams et al., 2012)	No	No known vector for CVB and foveaviruses are not known to be transmitted by vectors (Martelli et al., 2007)
Mume virus A (MuVA)	Cannot be excluded	Not known for MuVA but the type member of the genus *Capillovirus* is known to be seed-transmitted in herbaceous hosts (Yoshikawa, 2000)	No	Not known for MuVA and capilloviruses are not known to be pollen-transmitted (Mink, 1995; Card et al., 2007; EFSA PLH Panel, 2013)	No	Not known for MuVA and capilloviruses are not known to have natural vectors (Adams et al., 2012)
Nectarine stem pitting-associated virus (NSPaV)	No	Not known for NSPaV, and luteoviruses are generally not reported to be seed-transmitted (Mink, 1993)	No	Not known for NSPaV, and luteoviruses are generally not reported to be pollen-transmitted (Mink, 1993)	Cannot be excluded	Not known for NSPaV, but luteoviruses are generally transmitted by aphids (Gray and Gildow, 2003)
Nectarine virus M (NeVM)	No	Not known for NeVM and no marafivirus has been reported to be seed-transmitted (Dreher et al., 2012)	No	Not known for NeVM and no marafivirus has been reported to be pollen-transmitted (Mink, 1995; Card et al., 2007; EFSA PLH Panel, 2013)	Cannot be excluded	Not known for NeVM, but some marafiviruses are transmitted by leafhoppers in a persistent-propagative manner (Dreher et al., 2012)
Peach chlorotic mottle virus (PeCMV)	No	Not known for PeCMV and foveaviruses are not known to be seed-transmitted (Martelli et al., 2007)	No	Not known for PeCMV and foveaviruses are not known to be pollen-transmitted (Adams et al., 2012)	No	No known vector for PeCMV foveaviruses are not known to be transmitted by vectors (James, 2011a)
Peach enation nepovirus (PEV)	Cannot be excluded	Not known for PEV but other nepoviruses are known to be seed-transmitted in some hosts (Martelli and Uyemoto, 2011)	Cannot be excluded	Not known for PEV but other nepoviruses are known to be pollen-transmitted in some hosts (Martelli and Uyemoto, 2011)	Cannot be excluded	No vector known for PEV but most nepoviruses are known to be transmitted by nematodes (Martelli and Uyemoto, 2011)

VIRUS/ VIROID name	Seed transmission	Seed transmission uncertainty (refs)	Pollen transmission	Pollen transmission uncertainty (refs)	Vector transmission	Vector transmission uncertainty (refs)
Peach leaf pitting-associated virus (PLPaV)	No	Not known for PLPaV and fabaviruses are generally not known to be seed-transmitted (Lisa and Boccardo, 1996)	No	Not known for PLPaV and fabaviruses are generally not known to be pollen-transmitted (Lisa and Boccardo, 1996)	Cannot be excluded	Not known for PLPaV but fabaviruses are commonly transmitted by aphids (Lisa and Boccardo, 1996; Sanfaçon et al., 2012)
Peach mosaic virus (PcMV)	No	Not transmitted by seeds (Hutchins et al., 1951) and trichoviruses are not known to be seed-transmitted	No	Not transmitted by pollen (Larsen and James, 2011) and trichoviruses are not known to be pollen-transmitted (Mink, 1995; Card et al., 2007; EFSA PLH Panel, 2013)	Yes	No uncertainty. PcMV is transmitted by the eriophyid mite *Eriophyes insidiosus* (Keifer and Wilson, 1955)
Peach rosette mosaic virus (PRMV)	Cannot be excluded	Seed transmission reported in some herbaceous hosts but not reported in woody hosts (Martelli and Uyemoto, 2011; EFSA PLH Panel, 2013)	Cannot be excluded	Pollen transmission reported in herbaceous hosts but not reported in woody hosts (Martelli and Uyemoto, 2011; EFSA PLH Panel, 2013)	Yes	Known to be vectored by North American nematode species: *X. americanum* sensu lato, *Longidorus diadecturus, L. elongatus* (Martelli and Uyemoto, 2011; EFSA PLH Panel, 2013)
Peach virus D (PeVD)	No	Not known for PeVD and marafiviruses are not known to be seed-transmitted (Dreher et al., 2012)	No	Not known for PeVD and marafiviruses are not known to be pollen-transmitted (Dreher et al., 2012)	Cannot be excluded	Not known for PeVD, but transmission by leafhoppers in a persistent-propagative manner was reported for some other marafiviruses (Adams et al., 2012)
Prunus geminivirus A (PrGVA)	No	Not known for PrGVA and geminiviruses are generally not reported to be seed-transmitted	No	Not known for PrGVA and geminiviruses are generally not reported as pollen-transmitted (Mink, 1995; Card et al., 2007; EFSA PLH Panel, 2013)	Cannot be excluded	Not known for PrGVA, but *Geminiviridae* are generally transmitted by insects (Rojas et al., 2018)

VIRUS/ VIROID name	Seed transmission	Seed transmission uncertainty (refs)	Pollen transmission	Pollen transmission uncertainty (refs)	Vector transmission	Vector transmission uncertainty (refs)
Prunus virus F (PrVF)	No	Not known for PrVF and fabaviruses are generally not known to be seed-transmitted (Lisa and Boccardo, 1996)	No	Not known for PrVF and fabaviruses are generally not known to be pollen-transmitted (Lisa and Boccardo, 1996)	Cannot be excluded	Not known for PrVF but fabaviruses are commonly transmitted by aphids (Lisa and Boccardo, 1996; Sanfaçon et al., 2012)
Prunus virus T (PrVT)	Cannot be excluded	Not known for PrVT but potato virus T, the type member of the tepoviruses is known to be seed-transmitted in a range of hosts (Salazar and Harrison, 1978)	Cannot be excluded	Not known for PrVT but potato virus T, the type member of the tepoviruses is known to be pollen-transmitted in some hosts (Salazar and Harrison, 1978)	No	No known vector for PrVT or in the *Tepovirus* genus (Salazar and Harrison, 1978)
Tobacco ringspot virus (TRSV)	Cannot be excluded	Reported in herbaceous hosts, but not reported in woody hosts (EFSA PLH Panel, 2013; Rowhani et al., 2017; http://sdb.im.ac.cn/vide/descr809.htm)	Cannot be excluded	Reported in herbaceous hosts, but not reported in woody hosts (EFSA PLH Panel, 2013; http://sdb.im.ac.cn/vide/descr809.htm)	Yes	Known to be transmitted by *Xiphinema americanum* sensu lato (including *X. americanum* sensu stricto, *X. californicum*, *X. rivesi*, *X. intermedium*, *X. tarjanense*) (EFSA PLH Panel, 2018b)
Tomato ringspot virus (ToRSV)	Cannot be excluded	Reported in herbaceous hosts, and occasionally in grape (EPPO, 2019; Sanfaçon and Fuchs, 2011; EFSA PLH Panel, 2013)	Cannot be excluded	Reported in herbaceous hosts, but not reported in woody hosts (Sanfaçon and Fuchs, 2011; EFSA PLH Panel, 2013; http://sdb.im.ac.cn/vide/descr836.htm)	Yes	Known to be transmitted by *Xiphinema americanum* sensu lato (including *X. americanum* sensu stricto, *X. californicum*, *X. rivesi*, *X. intermedium*, *X. inaequale*, *X. bricolense*, *X. tarjanense*) (EFSA PLH Panel et al., 2018b)

3.1.3. Intraspecific diversity

Viruses generally exist as quasi-species, which means that they accumulate in a single host as a cluster of closely related sequence variants slightly differing from each other (Andino and Domingo, 2015). This is likely due to competition among the diverse genomic variants generated as a consequence of the error-prone viral replication system (higher in RNA than in DNA viruses) and the ensuing selection of the most fit variant distributions in a given environment (Domingo et al., 2012). This is also true for

viroids (Di Serio et al., 2017). This means that a certain level of intraspecific diversity is expected for all viruses. This genetic variability may interfere with the efficiency of detection methods, especially when they are based on the amplification of variable genomic viral sequences, thus generating uncertainties on the reliability and/or sensitivity of the detection for all the existing viral variants. As an example, high intraspecific divergence has been observed in the X4 domain of the ToRSV RNA2 among different virus strains (Jafarpour and Sanfaçon, 2009; Rivera et al., 2016).

Highlighting intraspecific diversity of AVCaV, Marais et al. (2015b) characterised three non-EU isolates (from sources outside EU) with a longer genome than the Italian isolate (Elbeaino et al., 2014) due to an insertion in the RdRp coding sequence. The impact of these mutations on the biology or even on the infectivity of the Italian isolate remains to be evaluated.

An extreme case of intraspecific diversity is illustrated by the situation of Asian prunus virus 3. The identity of Asian prunus viruses 1 and 2 was clarified by Marais et al. (2016) while the incongruent phylogenetic position of different APV-3 genes and their divergence levels close to the species demarcation criteria has blocked a clear decision on whether APV-3 represents a distinct species or should be considered a divergent strain of one of the other viruses.

3.1.4. Detection and identification of the pest

Are detection and identification methods available for the pest?

Yes, the viruses of *Prunus* categorised in the present opinion can be detected by molecular methods. Moreover, serological and biological methods are also available for some of them.

For all the categorised viruses, molecular and/or serological detection methods are available. However, in the absence or near absence of information on the genetic variability of these agents, it is not possible to guarantee the specificity of the available detection methods and wether they can detect the majority of the strains of that particular virus. This is particularly true in the case of detection methods based on polymerase chain reaction (PCR) because one or a few mutations in the binding sites of primers may be sufficient to abolish amplification of a particular variant. For some of the categorised viruses, biological methods based on bioassays are also available. It must be also stressed that diagnostics in woody host plants are sometimes difficult because of the uneven virus distribution, low virus titres or presence of inhibitors in the extracts to be tested. In Table 5, the information on the availability of detection and identification methods for each categorised virus is summarised together with the associated uncertainty.

Table 5: Available detection and identification methods of the categorised viruses with the associated uncertainty

VIRUS/VIROID name	Are detection and identification methods available for the pest?	Justification (key references)	Uncertainties
Apple scar skin viroid (ASSVd)	Yes	Hadidi et al. (2017)	No uncertainty
American plum line pattern virus (APLPV)	Yes	Myrta et al. (2011)	No uncertainty
Apricot vein clearing-associated virus (AVCaV)	Yes	Elbeaino et al. (2014); Marais et al. (2015b)	Uncertainty (absence of a proven protocol)[(a)]
Asian prunus virus 1 (APV-1)	Yes	Marais et al. (2006, 2015b)	Uncertainty (absence of a proven protocol)[(a)]
Asian prunus virus 2 (APV-2)	Yes	Marais et al. (2006)	Uncertainty (absence of a proven protocol)[(a)]
Asian prunus virus 3 (APV-3)	Yes	Marais et al. (2006)	Uncertainty (absence of a proven protocol)[(a)]
Caucasus prunus virus (CPrV)	Yes	Marais et al. (2015b)	Uncertainty (absence of a proven protocol)[(a)]
Cherry mottle leaf virus (CMLV)	Yes	James (2011a)	Uncertainty (absence of a proven protocol)[(a)]

VIRUS/VIROID name	Are detection and identification methods available for the pest?	Justification (key references)	Uncertainties
Cherry rasp leaf virus (CRLV)	Yes	James (2011c); Osman et al. (2017)	Uncertainty (absence of a proven protocol)[(a)]
Cherry rosette virus (CRV)	Yes	Kunz (1988)	Indexing is available, but uncertainties exist on the availability of serological detection. No molecular detection method is available
Cherry rusty mottle-associated virus (CRMaV)	Yes	Villamor et al. (2015)	Uncertainty (absence of a proven protocol)[(a)]
Cherry twisted leaf associated virus (CTLaV)	Yes	Villamor et al. (2015)	Uncertainty (absence of a proven protocol)[(a)]
Cherry virus B (CVB)	Yes	(GenBank LC373513)	Uncertainty (absence of a proven protocol)[(b)]
Mume virus A (MuVA)	Yes	Marais et al. (2018)	Uncertainty (absence of a proven protocol)[(a)]
Nectarine stem pitting-associated virus (NSPaV)	Yes	Bag et al. (2015); Villamor et al. (2016)	Uncertainty (absence of a proven protocol)[(a)]
Nectarine virus M (NeVM)	Yes	Villamor et al. (2016)	Uncertainty (absence of a proven protocol)[(a)]
Peach chlorotic mottle virus (PeCMV)	Yes	James et al. (2007)	Uncertainty (absence of a proven protocol)[(a)]
Peach enation nepovirus (PEV)	Yes	Kishi et al. (1973)	Indexing is available, but uncertainties exist on the availability of serological detection. No molecular detection method is available
Peach leaf pitting-associated virus (PLPaV)	Yes	He et al. (2017)	High uncertainty (absence of a proven protocol)[(a)]
Peach mosaic virus (PcMV)	Yes	Larsen and James (2011)	No uncertainty
Peach rosette mosaic virus (PRMV)	Yes	Ho et al. (2018)	No uncertainty
Peach virus D (PeVD)	Yes	Igori et al. (2017)	Uncertainty (absence of a proven protocol)[(a)]
Prunus geminivirus A (PrGVA)	Yes	Al Rwahnih et al. (2018)	Uncertainty (absence of a proven protocol)[(a)]
Prunus virus F (PrVF)	Yes	Villamor et al. (2016)	Uncertainty (absence of a proven protocol)[(a)]
Prunus virus T (PrVT)	Yes	Marais et al. (2015a)	Uncertainty (absence of a proven protocol)[(a)]
Tobacco ringspot virus (TRSV)	Yes	EPPO Diagnostic protocol PM 7/2; (Rowhani et al., 2017)	No uncertainty
Tomato ringspot virus (ToRSV)	Yes	EPPO Diagnostic protocol PM 7/49; (Rowhani et al., 2017)	No uncertainty

(a): For this virus, a detection assay has been developed. However, there is very limited information as to whether this assay allows the detection of a wide range of isolates of the agent.
(b): For this virus only genomic (complete or partial) sequence is available, but no primers to specifically detect the virus by RT-PCR and no serological assays are available.

3.2. Pest distribution

3.2.1. Pest distribution outside the EU

The viruses of *Prunus* categorised here have been reported in Africa, America, Asia, Oceania and non-EU European countries. Their distribution outside the EU is reported in Table 6, which was prepared using data from the EPPO and/or CABI databases (accessed from 14 December 2018 to 14 January 2019), and, when not available in these sources, from extensive literature searches. For some viruses, data from EPPO and CABI are not consistent; these cases have been highlighted by superscript numbers in Table 6. Available distribution maps are provided in Appendix A.

Table 6: Distribution outside the EU of the categorised viruses of *Prunus*

VIRUS/VIROID name	Distribution according to EPPO and/or CABI crop protection compendium databases	Additional information (refs)
Apple scar skin viroid (ASSVd)	**ASIA:** China[(a)], India[(a)], Iran[(a)], Japan[(a)], Republic of Korea[(a)], Turkey[(a)]. **AMERICA:** Canada[(a)], USA[(a)], Argentina[(a)]. (Map: Appendix A.1)	
American plum line pattern virus (APLPV)	**AMERICA:** Argentina, Canada, USA **ASIA:** Japan, Republic of Korea, Lebanon **EUROPE (non-EU):** Albania **OCEANIA:** Australia[(a)], New Zealand (Map: Appendix A.2)	
Apricot vein clearing-associated virus (AVCaV)	na[(b)]	**ASIA:** China, Iran (Marais et al., 2015b) **OCEANIA:** Australia (Kinoti et al., 2017a);
Asian prunus virus 1 (APV-1)	na[(b)]	**AMERICA:** USA (Marini et al., 2009) **ASIA:** South Korea (GenBank KX962059)[(c)]; China, Japan (Marais et al., 2006)
Asian prunus virus 2 (APV-2)	na[(b)]	**AMERICA:** USA (GenBank KR998049)[(c)] **ASIA:** South Korea (Jo et al., 2017b), Japan, China (Marais et al., 2016)
Asian prunus virus 3 (APV-3)	na[(b)]	**AMERICA:** USA (GenBank KR998051)[(c)] **ASIA:** China (Marais et al., 2006)
Caucasus prunus virus (CPrV)	na[(b)]	**ASIA:** Azerbaijan (Marais et al., 2015b)
Cherry mottle leaf virus (CMLV)	na[(b)]	**AMERICA:** Canada (Su et al., 2016), USA (James, 2011b) **ASIA:** China (Ma et al., 2014)
Cherry rasp leaf virus (CRLV)	**AMERICA:** Canada, USA. ASIA: China[(d)]. (Map: Appendix A.3)	
Cherry rosette virus (CRV)	na[(b)]	**EUROPE (non-EU):** Switzerland (Kunz, 1988)
Cherry rusty mottle-associated virus (CRMaV)	na[(b)]	**AMERICA:** Canada (GenBank KP258176)[(c)], USA (Villamor et al., 2013)
Cherry twisted leaf associated virus (CTLaV)	na[(b)]	**AMERICA:** Canada (Genbank KP258177)[(c)], USA (Villamor and Eastwell, 2013)
Cherry virus B (CVB)	na[(b)]	**ASIA:** Japan (GenBank LC373513)[(c)]
Mume virus A (MuVA)	na[(b)]	**ASIA**: Japan (Marais et al., 2018)
Nectarine stem pitting-associated virus (NSPaV)	na[(b)]	**AMERICA:** USA (Bag et al., 2015) **ASIA**: China (Lu et al., 2017), Korea (Jo et al., 2017a), Japan (Candresse et al., 2017a)

VIRUS/VIROID name	Distribution according to EPPO and/or CABI crop protection compendium databases	Additional information (refs)
Nectarine virus M (NeVM)	na[(b)]	**AMERICA:** USA (Villamor et al., 2016)
Peach chlorotic mottle virus (PeCMV)	na[(b)]	**AMERICA:** USA (James et al., 2007)
Peach enation nepovirus (PEV)	na[(b)]	**ASIA**: Japan (Kishi et al., 1973)
Peach leaf pitting-associated virus (PLPaV)	na[(b)]	**ASIA**: China (He et al., 2017)
Peach mosaic virus (PcMV)	**AMERICA:** Mexico, USA, (Map: Appendix A.4)	**AMERICA:** Canada (Foissac et al., 2005)
Peach rosette mosaic virus (PRMV)	**AFRICA:** Egypt **AMERICA:** Canada, USA **EUROPE (non-EU):** Turkey (Map: Appendix A.5)	
Peach virus D (PeVD)	na[(b)]	**ASIA**: South Korea (Igori et al., 2017)
Prunus geminivirus A (PrGVA)	na[(b)]	**AMERICA:** USA (Al Rwahnih et al., 2018)
Prunus virus F (PrVF)	na[(b)]	**AMERICA:** Canada (James et al., 2018), USA (Villamor et al., 2017)
Prunus virus T (PrVT)	na[(b)]	**ASIA:** Azerbaijan (Marais et al., 2015a)
Tobacco ringspot virus (TRSV)	**AFRICA:** Democratic republic of the Congo, Egypt, Malawi, Morocco, Nigeria, Zambia[(a)]; **AMERICA:** Brazil, Canada, Chile, Cuba, Dominican Republic, Mexico, Peru[(a)], USA, Uruguay, Venezuela; **ASIA:** China, India, Indonesia, Iran, Japan, DPR Korea[(a)], Kyrgyzstan, Oman[(a)], Saudi Arabia, Sri Lanka, Taiwan; **EUROPE (non-EU):** Georgia, Russia, Serbia (&Montenegro), Turkey, Ukraine; **OCEANIA**: Australia, New Zealand, Papua New Guinea (Map: Appendix A.6)	
Tomato ringspot virus (ToRSV)	**AFRICA:** Egypt, Togo; **AMERICA:** Brazil, Canada, Chile, Colombia, Mexico, Peru, Puerto Rico, USA, Venezuela; **ASIA:** China, India, Iran, Japan, Jordan, Republic OF Korea, Oman, Pakistan, Taiwan[(d)]; **EUROPE (non-EU):** Belarus, Russia, Serbia, Turkey; **OCEANIA:** Fiji, New Zealand (Map: Appendix A.7)	

(a): Record found in CABI but not in EPPO.
(b): No information available.
(c): Information retrieved from GenBank.
(d): Record found in EPPO but not in CABI.

3.2.2. Pest distribution in the EU

Are the pests present in the EU territory? If present, are the pests widely distributed within the EU?

Yes, for ASSVd, APLPV, AVCaV, CMLV, CTLaV, NSPaV, PcMV, PrVF, PrVT, TRSV and ToRSV. However, none of them is reported to be widely present in the EU.

No, for APV-1, APV-2, APV-3, CPrV, CRLV, CRV, CRMaV, CVB, MuVA, NeVM, PeCMV, PEV, PLPaV, PRMV, PeVD, PrGVA, which have not been reported in the EU

Only some of the viruses of *Prunus* categorised here have been reported in the EU (Table 7), where they are considered to have a restricted distribution or a transient status. Given their restricted distribution, the Panel considers that these viruses fulfil the definition of non-EU viruses used in the present categorisation efforts.

As discussed in a previous EFSA opinion (EFSA PLH Panel, 2019b), *In the case of ASSVd, that has been reported to be present in several MSs by CABI cpc (Table 7), the quoted references are out dated (prior than the discovery of ASSVd as the agent of apple scar skin disease) and are doubtful because the viroid actual presence was not ascertained. The report of widespread presence of ASSVd in Greece (Kyriakopoulou* et al.*, 2001) is also doubtful because it is based on detection methods lacking appropriate controls (possible cross-hybridization of specific cRNA probe with other apscaviroids was not excluded) and the infecting ASSVd variants were not sequenced. However, the presence of ASSVd in Greece has been confirmed by appropriate approaches (Kaponi* et al.*, 2012, 2013). Overall, the Panel considers that ASSVd presence in several EU MSs is doubtful but that it should be considered present in Greece [. . .]. In the case of TRSV and ToRSV, the viruses have been sporadically detected in some MSs, but the reports, generally old, have not been followed by extensive spread, thus suggesting that the virus remains restricted. Moreover, identification of these viruses has been followed by eradication efforts therefore TRSV and ToRSV detected in MSs are generally under eradication or have been already eradicated (e.g. TRSV in Czech Republic and ToRSV in Italy in 2018, EPPO, 2018a,b; TRSV and ToRSV in the Netherlands, EPPO 2018b). In addition, some reports on the presence of these viruses in the EU MSs are likely incorrect or have been rectified by further publications [e.g. TRSV in Italy (Sorrentino et al., 2013) and ToRSV in France (EPPO, 2018a,b)]. Taking this into account, the presence of TRSV and ToRSV in the EU MSs is considered rare and, in any case, restricted and under official control.*

AVCaV was initially reported in Italy (Elbeaino et al., 2014) and then in Asia (Marais et al., 2015b) and Oceania (Kinoti et al., 2017a). In Italy the spread of the virus was investigated in 190 cultivars of stone fruit species and 20 different rootstocks from a germplasm collection of the University of Bari (Southern Italy), with only three plum cultivars (Angeleno, Autumn Giant and Stanley) and one apricot cultivar (Jameloppis) testing positive (Abou Kubaa et al., 2014).

For several viruses, some reports of presence in the EU are either very old and based on incompletely reliable biological approaches (and unconfirmed by molecular data) or correspond to detection in the USA on imported EU materials. In all cases, these reports are considered unreliable by the Panel, in the first instance because they have not been confirmed by molecular data (CMLV, CTLaV, PcMV), in the second instance because the materials may have become infected in the USA before the discovery of the viruses (PrVF, NSPaV).

For the viruses not reported occurring in the EU, uncertainties on their possible presence derives from the lack of specific surveys and/or from their recent discovery. Table 7 reports the currently known EU distribution of the viruses of *Prunus* considered in the present opinion.

Table 7: EU distribution of non-EU viruses or viruses with undetermined standing of *Prunus* (those viruses not reported in the EU are excluded from this table)

VIRUS/VIROID name	EU MSs from which the pest is reported
Apple scar skin viroid (ASSVd)*	Greece (Widespread)[(a)], UK (Present)[(a)], Italy (Present)[(a)], Poland (Present)[(a)], Denmark (Present)[(a)], France (Restricted distribution)[(a)]
American plum line pattern virus (APLPV)	Italy (Present, few occurrences). Eradicated in at least two instances according to expert knowledge
Apricot vein clearing-associated virus (AVCaV)	Italy (Elbeaino et al., 2014); France (Germplasm collection; Marais et al., 2015b)
Cherry mottle leaf virus (CMLV)	Spain[(b)]; There are old reports of presence in Italy, Poland, Czech Republic, Belgium, former Yugoslavia (James, 2011a), however these were based on biological observations of limited discriminating power and none of these findings has been confirmed by molecular techniques
Cherry twisted leaf associated virus (CTLaV)	Spain[(b)]; There are old reports of presence in Denmark and Romania (James, 2011c), however these were based on biological observations of limited discriminating power and none of these findings has been confirmed by molecular techniques
Nectarine stem pitting-associated virus (NSPaV)	Hungary (Krizbai et al., 2017), Czech Republic (Candresse et al., 2017b). The virus has been discovered in the USA from field grown materials that were imported from the EU, however they may have become infected in the USA
Peach mosaic virus (PcMV)	PcMV has been reported in Italy and Greece (Nemeth, 1986), however at that time there was a confusion between peach mosaic virus and peach latent mosaic viroid. The presence of PcMV in the EU has not been confirmed so far (Larsen and James, 2011) and is therefore doubtful
Prunus virus F (PrVF)	Czech Republic (Safarova et al., 2017). The virus has been discovered in the USA on material imported from The Netherlands and Germany. However, it is not possible to assess from the publication how long the materials were grown in the field in the USA before being tested and the plants may have become infected in the USA. Therefore, there is uncertainty about the presence of PrVF in The Netherlands and Germany
Prunus virus T (PrVT)	Italy (Marais et al., 2015a)
Tobacco ringspot virus (TRSV)*	Czech Republic (Transient, under eradication)[(a),(c)], Hungary (Present, restricted distribution), Italy (present few occurrences), Poland (Present), Lithuania (Present), United Kingdom (Present, few occurrences), Netherlands (Transient, actionable, under eradication)[(d),(e)], Slovakia (Present)[(a)]
Tomato ringspot virus (ToRSV)*	Croatia (Present, few occurrences), France (Present), Germany (Transient, under eradication), Italy (Transient, under eradication)[(c)], Lithuania (Present), Netherlands (Transient, actionable, under eradication)[(e),] Poland (Present), Slovakia (Present, restricted distribution), Slovenia (Restricted distribution)[(a)]

*: See discussion on presence and prevalence in the EU MSs above.
(a): Record found in CABI but not in EPPO.
(b): Information provided by Member State during commenting phase.
(c): Declared eradicated (EPPO, 2018b).
(d): Record found in EPPO but not in CABI
(e): EPPO Reporting Service November 2018 (EPPO, 2018b).

3.3. Regulatory status

3.3.1. Council Directive 2000/29/EC

Non-EU viruses of *Prunus* are included in the Annex I, Part A of the Council Directive 2000/29 as listed in Table 8.

Table 8: Non-EU viruses of *Prunus* in the Council Directive 2000/29

Annex I, Part A	**Harmful organisms whose introduction into, and spread within, all Member States shall be banned**
Section I	**Harmful organisms not known to occur in any part of the community and relevant for the entire community**
(d)	Viruses and virus-like organisms
3.	Tobacco ringspot virus
4.	Tomato ringspot virus
5.	Viruses and virus-like organisms of *Cydonia* Mill., *Fragaria* L., *Malus* Mill., *Prunus* L., *Pyrus* L., *Ribes* L., *Rubus* L. and *Vitis* L., such as: (b) Cherry rasp leaf virus (American)
	(c) Peach mosaic virus (American)
	(e) Peach rosette mosaic virus
	(i) Plum line pattern virus (American)
	(n) Non-European viruses and virus-like organisms of *Cydonia* Mill., *Fragaria* L., *Malus* Mill., *Prunus* L., *Pyrus* L., *Ribes* L., *Rubus* L. and *Vitis* L.

3.3.2. Legislation addressing the hosts of non-EU viruses and viroids of *Prunus*

Hosts of the viruses categorised here are regulated in the Directive 2000/29/EC. The legislation addressing *Prunus* is presented in Table 9. Several non-EU viruses of *Prunus* may also infect other hosts or have a wide host range, with the related legislation reported in Section 3.4.1, Table 10. In addition, several organisms categorised here (APLPV, CRLV, PcMV, PRMV, TRSV, ToRSV) are also mentioned under the directive 2008/61/EC, establishing the conditions under which certain harmful organisms, plants, plant products and other objects listed in Annexes I to V to Council Directive 2000/29/EC may be introduced into or moved within the Community or certain protected zones thereof, for trial or scientific purposes and for work on varietal selections. Several non-EU viruses of Prunus may also infect other hosts or have wide host range, with the related legislation for these other hosts being reported in Section 3.4.1.

Table 9: Regulations applying to *Prunus* hosts and commodities that may involve the viruses categorised in the present opinion in Annexes III, IV and V of Council Directive 2000/29/EC

Annex III, Part A	**Plants, plant products and other objects the introduction of which shall be prohibited in all Member States**	
	Description	Country of origin
9.	Plants of *Chaenomeles* Ldl., *Cydonia* Mill., *Crateagus* L., *Malus* Mill., *Prunus* L., *Pyrus* L., and *Rosa* L., intended for planting, other than dormant plants free from leaves, flowers and fruit	Non-European countries
18.	Plants of *Cydonia* Mill., *Malus* Mill., *Prunus* L. and *Pyrus* L. and their hybrids, and *Fragaria* L., intended for planting, other than seeds	Without prejudice to the prohibitions applicable to the plants listed in Annex III A (9), where appropriate, non-European countries, other than Mediterranean countries, Australia, New Zealand, Canada, the continental states of the USA
Annex IV, Part A	**Special requirements which must be laid down by all Member States for which the introduction and movement of plants, plant products and other objects into and within all Member States**	
Section I	**Plants, plant products and other objects originating from outside the community**	

7.4	Whether or not listed among the CN codes in Part B of Annex V, wood of *Amelanchier* Medik., *Aronia* Medik., *Cotoneaster* Medik., *Crataegus* L., *Cydonia* Mill., *Malus* Mill., *Prunus* L., *Pyracantha* M. Roem., *Pyrus* L. and *Sorbus* L., other than in the form of: — chips, sawdust and shavings, obtained in whole or part from these plants, — wood packaging material, in the form of packing cases, boxes, crates, drums and similar packings, pallets, box pallets and other load boards, pallet collars, dunnage, whether or not actually in use in the transport of objects of all kinds, except dunnage supporting consignments of wood, which is constructed from wood of the same type and quality as the wood in the consignments and which meets the same Union phytosanitary requirements as the wood in the consignment, but including that which has not kept its natural round surface, originating in Canada and the USA	Official statement that the wood: (a) originates in an area free from *Saperda candida* Fabricius, established by the national plant protection organisation in the country of origin, in accordance with the relevant International Standards for Phytosanitary Measures, which is mentioned on the certificates referred to in Article 13(1)(ii) under the rubric 'Additional declaration', or (b) has undergone an appropriate heat treatment to achieve a minimum temperature of 56 °C for a minimum duration of 30 continuous minutes throughout the entire profile of the wood, which is to be indicated on the certificates referred to in Article 13(1)(ii), or (c) has undergone an appropriate ionising radiation to achieve a minimum absorbed dose of 1 kGy throughout the wood, to be indicated on the certificates referred to in Article 13(1)(ii).
7.5	Whether or not listed among the CN codes in Part B of Annex V, wood in the form of chips obtained in whole or part from *Amelanchier* Medik., *Aronia* Medik., *Cotoneaster* Medik., *Crataegus* L., *Cydonia* Mill., *Malus* Mill., *Prunus* L., *Pyracantha* M. Roem., *Pyrus* L. and *Sorbus* L., originating in Canada and the USA.	Official statement that the wood: (a) originates in an area established by the national plant protection organisation in the country of origin as being free from Saperda candida Fabricius in accordance with the relevant International Standards for Phytosanitary Measures, which is mentioned on the certificates referred to in Article 13(1)(ii) under the rubric 'Additional declaration', or (b) has been processed into pieces of not more than 2,5 cm thickness and width, or (c) has undergone an appropriate heat treatment to achieve a minimum temperature of 56 °C for a minimum duration of 30 minutes throughout the entire profile of the chips, which is to be indicated on the certificates referred to in Article 13(1)(ii).
14.1	Plants intended for planting, other than scions, cuttings, plants in tissue culture, pollen and seeds, of *Amelanchier* Medik., *Aronia* Medik., *Cotoneaster* Medik., *Crataegus* L., *Cydonia* Mill., *Malus* Mill., *Prunus* L., *Pyracantha* M. Roem., *Pyrus* L. and *Sorbus* L. originating in Canada and the USA	Without prejudice to the provisions applicable to the plants in Annex III(A)(9) and (18), Annex III(B)(1), (2) or Annex IV(A)(I), (17), (19.1), (19.2), (20), (22.1), (22.2), (23.1) and (23.2) where appropriate, official statement that the plants: (a) have been grown throughout their life in an area free from *Saperda candida* Fabricius, established by the national plant protection organisation in the country of origin, in accordance with relevant International Standards for Phytosanitary Measures, which is mentioned on the certificates referred to in Article 13(1)(ii), under the rubric 'Additional declaration',

		or (b) have been grown during a period of at least two years prior to export, or in the case of plants which are younger than two years have been grown throughout their life, in a place of production established as free from *Saperda candida* Fabricius in accordance with relevant International Standards for Phytosanitary Measures: (i) which is registered and supervised by the national plant protection organisation in the country of origin, and (ii) which has been subjected annually to two official inspections for any signs of *Saperda candida* Fabricius carried out at appropriate times, and (iii) where the plants have been grown in a site: — with complete physical protection against the introduction of *Saperda candida* Fabricius, or — with the application of appropriate preventive treatments and surrounded by a buffer zone with a width of at least 500 m where the absence of *Saperda candida* Fabricius was confirmed by official surveys carried out annually at appropriate times, and (iv) immediately prior to export the plants have been subjected to a meticulous inspection for thepresence of *Saperda candida* Fabricius, in particular in the stems of the plant, including, where appropriate, destructive sampling.
16.6	Fruits of *Capsicum* (L.), *Citrus* L., other than *Citrus limon* (L.) Osbeck. and *Citrus aurantiifolia* (Christm.) Swingle, *Prunus persica* (L.) Batsch and *Punica granatum* L. originating in countries of the African continent, Cape Verde, Saint Helena, Madagascar, La Reunion, Mauritius and Israel	Without prejudice to the provisions applicable to the fruits in Annex IV(A)(I)(16.1), (16.2), (16.3), (16.4), (16.5) and (36.3), official statement that the fruits: (a) originate in a country recognised as being free of *Thaumatotibia leucotreta* (Meyrick) in accordance with relevant International Standards for Phytosanitary Measures, or (b) originate in an area established by the national plant protection organisation in the country of origin as being free from *Thaumatotibia leucotreta* (Meyrick), in accordance with the relevant International Standards for Phytosanitary Measures, which is mentioned on the certificates referred to in Article 13(1)(ii) under the rubric 'Additional declaration', or (c) originate in a place of production established by the national plant protection organisation in the country of origin as being free from Thaumatotibia leucotreta (Meyrick) in accordance with relevant International Standards for Phytosanitary Measures and information on traceability is included in the certificates referred to in the Article 13(1)(ii), and official inspections have been carried out in the place

		of production at appropriate times during the growing season, including a visual examination on representative samples of fruit, shown to be free from *Thaumatotibia leucotreta* (Meyrick), or (d) have been subjected to an effective cold treatment to ensure freedom from *Thaumatotibia leucotreta* (Meyrick) or another effective treatment to ensure freedom from *Thaumatotibia leucotreta* (Meyrick) and the treatment data should be indicated on the certificates referred to in Article 13(1)(ii), provided that the treatment method has been communicated in advance in writing by the national plant protection organisation of the third country concerned to the Commission.
19.2	Plants of *Cydonia* Mill., *Fragaria* L., *Malus* Mill., *Prunus* L., *Pyrus* L., *Ribes* L., *Rubus* L. intended for planting, other than seeds, originating in countries where the relevant harmful organisms are known to occur on the genera Concerned The relevant harmful organisms are [. . .] — on *Prunus* L.: — Apricot chlorotic leafroll mycoplasm, — *Xanthomonas arboricola* pv. *pruni* (Smith) Vauterin et al. — on *Prunus persica* (L.) Batsch: — *Pseudomonas syringae* pv. *persicae* (Prunier et al.) Young et al.; [. . .] — on all species: non-European viruses and viruslike organisms.	Without prejudice to the provisions applicable to the plants where appropriate listed in Annex III(A)(9) and (18), and Annex IV(A)(I)(15) and (17), official statement that no symptoms of diseases caused by the relevant harmful organisms have been observed on the plants at the place of production since the beginning of the last complete cycle of vegetation.
23.1	Plants of following species of *Prunus* L., intended for planting, other than seeds, originating in countries where Plum pox virus is known to occur: — *Prunus amygdalus* Batsch, — *Prunus armeniaca* L., — *Prunus blireiana* Andre, — *Prunus brigantina* Vill., — *Prunus cerasifera* Ehrh., — *Prunus cistena* Hansen, — *Prunus curdica* Fenzl and Fritsch., — *Prunus domestica* ssp. domestica L., — *Prunus domestica* ssp. insititia (L.) C.K. Schneid., — *Prunus domestica* ssp. italica (Borkh.) Hegi., — *Prunus glandulosa* Thunb., — *Prunus holosericea* Batal., — *Prunus hortulana* Bailey, — *Prunus japonica* Thunb., — *Prunus mandshurica* (Maxim.) Koehne,	Without prejudice to the provisions applicable to the plants, listed in Annex III(A)(9) and (18), and Annex IV(A)(I)(15) and (19.2), official statement that: (a) the plants, other than those raised from seed, have been: — either officially certified under a certification scheme requiring them to be derived in direct line from material which has been maintained under appropriate conditions and subjected to official testing for, at least, Plum pox virus using appropriate indicators or equivalent methods and has been found free, in these tests, from that harmful organism, or — derived in direct line from material which is maintained under appropriate conditions and has been subjected, within the last three complete cycles of vegetation, at least once, to official testing for at least Plum pox virus using appropriate indicators or equivalent methods and has been found free, in these tests, from that harmful organism; (b) no symptoms of disease caused by Plum pox virus have been observed on plants at the place of

	— *Prunus maritima* Marsh., — *Prunus mume* Sieb and Zucc., — *Prunus nigra* Ait., — *Prunus persica* (L.) Batsch, — *Prunus salicina* L., — *Prunus sibirica* L., — *Prunus simonii* Carr., — *Prunus spinosa* L., — *Prunus tomentosa* Thunb., — *Prunus triloba* Lindl., — other species of *Prunus* L. susceptible to Plux pox virus.	production or on susceptible plants in its immediate vicinity, since the beginning of the last three complete cycles of vegetation; (c) plants at the place of production which have shown symptoms of disease caused by other viruses or virus-like pathogens, have been rogued out.
23.2	Plants of *Prunus* L., intended for planting (a) originating in countries where the relevant harmful organisms are known to occur on *Prunus* L. (b) other than seeds, originating in countries where the relevant harmful organisms are known to occur (c) other than seeds, originating in non-European countries where the relevant harmful organisms are known to occur The relevant harmful organisms are: — for the case under (a): — Tomato ringspot virus; — or the case under (b): — Cherry rasp leaf virus (American), — Peach mosaic virus (American), — Peach phony rickettsia, — Peach rosette mycoplasm, — Peach yellows mycoplasm, — Plum line pattern virus (American), — Peach X-disease mycoplasm; — or the case under (c): — Little cherry pathogen	Without prejudice to the provisions applicable to the plants, where appropriate listed in Annex III(A)(9) and (18) or Annex IV(A)(I)(15), (19.2) and (23.1), official statement that (a) the plants have been: — either officially certified under a certification scheme requiring them to be derived in direct line from material which has been maintained under appropriate conditions and subjected to official testing for at least the relevant harmful organisms using appropriate indicators or equivalent methods and has been found free, in these tests, from those harmful organisms, or — derived in direct line from material which is maintained under appropriate conditions and has been subjected, within the last three complete cycles of vegetation, at least once, to official testing for at least the relevant harmful organisms using appropriate indicators or equivalent methods and has been found free, in these tests, from those harmful organisms, (b) no symptoms of diseases caused by the relevant harmful organisms have been observed on plants at the place of production or on susceptible plants in its immediate vicinity, since the beginning of the last three complete cycles of vegetation.
Section II	**Plants, plant products and other objects originating in the Community**	
12.	Plants of *Fragaria* L., *Prunus* L. and *Rubus* L., intended for planting, other than seeds	Official statement that: (a) the plants originate in areas known to be free from the relevant harmful organisms; or (b) no symptoms of diseases caused by the relevant harmful organisms have been observed on plants at the place of production since the beginning of the last complete cycle of vegetation. The relevant harmful organisms are: — on *Fragaria* L.: — *Phytophthora fragariae* Hickman var. fragariae — Arabis mosaic virus

		— Raspberry ringspot virus — Strawberry crinkle virus — Strawberry latent ringspot virus — Strawberry mild yellow edge virus — Tomato black ring virus — Xanthomonas fragariae Kennedy and King — on *Prunus* L.: — Apricot chlorotic leafroll mycoplasm — *Xanthomonas arboricola* pv. *pruni* (Smith) Vauterin et al. — on *Prunus persica* (L.) Batsch: *Pseudomonas syringae* pv. *persicae* (Prunier et al.) Young et al., — on *Rubus* L.: — Arabis mosaic virus — Raspberry ringspot virus — Strawberry latent ringspot virus — Tomato black ring virus.
16.	Plants of the following species of *Prunus* L., intended for planting, other than seeds: — *Prunus amygdalus* Batsch, — *Prunus armeniaca* L., — *Prunus blireiana* Andre, — *Prunus brigantina* Vill., — *Prunus cerasifera* Ehrh., — *Prunus cistena* Hansen, — *Prunus curdica* Fenzl and Fritsch., — *Prunus domestica* ssp. *domestica* L., — *Prunus domestica* ssp. *Insititia* (L.) C.K. Schneid, — *Prunus domestica* ssp. *italica* (Borkh.) Hegi., — *Prunus glandulosa* Thunb., — *Prunus holosericea* Batal., — *Prunus hortulana* Bailey, — *Prunus japonica* Thunb., — *Prunus mandshurica* (Maxim.) Koehne, — *Prunus maritima* Marsh., — *Prunus mume* Sieb. And Zucc., — *Prunus nigra* Ait., — *Prunus persica* (L.) Batsch, — *Prunus salicina* L., — *Prunus sibirica* L., — *Prunus simonii* Carr., — *Prunus spinosa* L., — *Prunus tomentosa* Thunb., — *Prunus triloba* Lindl. Other species of *Prunus* L. susceptible to Plum pox virus	Without prejudice to the requirements applicable to the plants listed in Annex IV(A)(II)(12), official statement that: (a) the plants originate in areas known to be free from Plum pox virus; or (b) (aa) the plants, other than those raised from seed, have been: — either officially certified under a certification scheme requiring them to be derived in direct line from material which has been maintained under appropriate conditions and subjected to official testing for, at least, plum pox virus using appropriate indicators or equivalent methods and has been found, in these tests, free from that harmful organism, or — derived in direct line from material which is maintained under appropriate conditions and has been subjected within the last three complete cycles of vegetation, at least once, to official testing for at least Plum pox virus using appropriate indicators for equivalent methods and has been found, in these tests, free from that harmful organism; bb) no symptoms of disease caused by Plum pox virus have been observed on plants at the place of production or on the susceptible plants in its immediate vicinity, since the beginning of the last three complete cycles of vegetation; cc) plants at the place of production which have shown symptoms of disease caused by other viruses or virus-like pathogens, have been rogued out.

Annex IV, Part B	**Special requirements which shall be laid down by all Member States for the introduction and movement of plants, plant products and other objects into and within certain protected zones**	
Plant, plant products and other objects	Special requirements	Protected zone(s)
20.5 Plants of *Prunus* L. intended for planting, other than seeds	Without prejudice to the provisions applicable to the plants listed in Annex III(A)(9) and (18) or Annex IV(A)(I)(19.2), (23.1) and (23.2) or Annex IV(A)(II)(12) and (16), official statement that: (a) the plants have been grown throughout their life in places of production in countries where *Xanthomonas arboricola* pv. *pruni* (Smith) Vauterin et al. is not known to occur, or (b) the plants have been grown throughout their life in an area free from *Xanthomonas arboricola* pv. *pruni* (Smith) Vauterin et al. established by the national plant protection organisation in accordance with relevant International Standards for Phytosanitary Measures, or (c) the plants have been derived in direct line from mother plants which have shown no symptoms of *Xanthomonas arboricola* pv. *pruni* (Smith) Vauterin et al. during the last complete cycle of vegetation, and no symptoms of *Xanthomonas arboricola* pv. *pruni* (Smith) Vauterin et al. have been observed on the plants at the place of production since the beginning of the last complete cycle of vegetation, or (d) for plants of *Prunus laurocerasus* L. and *Prunus lusitanica* L. for which there shall be evidence by their packing or by other means that they are intended for sale to final consumers not involved in professional plant production no symptoms of *Xanthomonas arboricola* pv. *pruni* (Smith) Vauterin et al. have been observed on plants at the place of production since the beginning of the last complete growing season.	UK

Annex V	**Plants, plant products and other objects which must be subject to a plant health inspection (at the place of production if originating in the Community, before being moved within the Community – in the country of origin or the consignor country, if originating outside the Community) before being permitted to enter the Community**
Part A	**Plants, plant products and other objects originating in the Community**
I.	**Plants, plant products and other objects which are potential carriers of harmful organisms of relevance for the entire Community and which must be accompanied by a plant passport**
1.1	Plants, intended for planting, other than seeds, of *Amelanchier* Med., *Chaenomeles* Lindl., *Cotoneaster* Ehrh., *Crataegus* L., *Cydonia* Mill., *Eriobotrya* Lindl., *Malus* Mill., Mespilus L., *Photinia davidiana* (Dcne.) Cardot, *Prunus* L., other than *Prunus laurocerasus* L. and *Prunus lusitanica* L., *Pyracantha* Roem., *Pyrus* L. and *Sorbus* L.
2.1	Plants intended for planting, other than seeds, of the genera *Abies* Mill., *Apium graveolens* L., *Argyranthemum* spp., *Asparagus officinalis* L., *Aster* spp., *Brassica* spp., *Castanea* Mill., *Cucumis* spp., *Dendranthema* (DC.) Des Moul., *Dianthus* L. and hybrids, *Exacum* spp., *Fragaria* L., *Gerbera* Cass., *Gypsophila* L., all varieties of New Guinea hybrids of *Impatiens* L., *Lactuca* spp., *Larix* Mill., *Leucanthemum* L., *Lupinus* L., *Pelargonium* l'Hérit. Ex Ait., *Picea* A. Dietr., *Pinus* L., *Platanus* L., *Populus* L., *Prunus laurocerasus* L., *Prunus lusitanica* L., *Pseudotsuga* Carr., *Quercus* L., *Rubus* L., *Spinacia* L., *Tanacetum* L., *Tsuga* Carr., *Ulmus* L., *Verbena* L. and other plants of herbaceous species, other than plants of the family *Gramineae*, intended for planting, and other than bulbs, corms, rhizomes, seeds and tubers.
II.	**Plants, plant products and other objects which are potential carriers of harmful organisms of relevance for certain protected zones, and which must be accompanied by a plant passport valid for the appropriate zone when introduced into or moved within that zone**
1.2	Plants intended for planting, other than seeds, of *Beta vulgaris* L., *Platanus* L., *Populus* L., *Prunus* L. and *Quercus* spp., other than *Quercus suber* and *Ulmus* L.
Part B	**Plants, plant products and other objects originating in territories, other than those territories referred to in Part A**
I.	**Plants, plant products and other objects which are potential carriers of harmful organisms of relevance for the entire Community**
1.	Plants, intended for planting, other than seeds but including seeds of *Cruciferae*, *Gramineae*, *Trifolium* spp., originating in Argentina, Australia, Bolivia, Chile, New Zealand and Uruguay, genera *Triticum*, *Secale* and X *Triticosecale* from Afghanistan, India, Iran, Iraq, Mexico, Nepal, Pakistan, South Africa and the USA, *Citrus* L., *Fortunella* Swingle and *Poncirus* Raf., and their hybrids, *Capsicum* spp., *Helianthus annuus* L., *Solanum lycopersicum* L., *Medicago sativa* L., *Prunus* L., *Rubus* L., *Oryza* spp., *Zea mays* L., *Allium ascalonicum* L., *Allium cepa* L., *Allium porrum* L., *Allium schoenoprasum* L. and *Phaseolus* L.
2.	Parts of plants, other than fruits and seeds, of: — *Castanea* Mill., *Dendranthema* (DC.) Des Moul., *Dianthus* L., *Gypsophila* L., *Pelargonium* l'Herit. ex Ait, *Phoenix* spp., *Populus* L., *Quercus* L., *Solidago* L. and cut flowers of *Orchidaceae*, — conifers (*Coniferales*), — *Acer saccharum* Marsh., originating in the USA and Canada, — *Prunus* L., originating in non-European countries, — Cut flowers of *Aster* spp., *Eryngium* L., *Hypericum* L., *Lisianthus* L., *Rosa* L. and *Trachelium* L., originating in non-European countries, — Leafy vegetables of *Apium graveolens* L., *Ocimum* L., *Limnophila* L. and *Eryngium* L., — Leaves of *Manihot esculenta* Crantz, — Cut branches of *Betula* L. with or without foliage, — Cut branches of *Fraxinus* L., *Juglans ailantifolia* Carr., *Juglans mandshurica* Maxim., *Ulmus davidiana* Planch. and *Pterocarya rhoifolia* Siebold & Zucc., with or without foliage, originating in Canada, China, Democratic People's Republic of Korea, Japan, Mongolia, Republic of Korea, Russia, Taiwan and USA, — *Amyris* P. Browne, *Casimiroa* La Llave, *Citropsis* Swingle & Kellerman, *Eremocitrus* Swingle, *Esenbeckia* Kunth., *Glycosmis* Corrêa, *Merrillia* Swingle, *Naringi* Adans., *Tetradium* Lour., *Toddalia* Juss. and *Zanthoxylum* L.

3.	Fruits of: — *Annona* L., *Cydonia* Mill., *Diospyros* L., *Malus* Mill., *Mangifera* L., *Passiflora* L., *Prunus* L., *Psidium* L., *Pyrus* L., *Ribes* L. *Syzygium* Gaertn., and *Vaccinium* L., originating in non-European countries,
6.	Wood within the meaning of the first subparagraph of Article 2(2), where it: (a) has been obtained in whole or part from one of the order, genera or species as described hereafter, except wood packaging material defined in Annex IV, Part A, Section I, Point 2: [. . .] — *Amelanchier* Medik., *Aronia* Medik., *Cotoneaster* Medik., *Crataegus* L., *Cydonia* Mill., *Malus* Mill., *Prunus* L., *Pyracantha* M. Roem., *Pyrus* L. and *Sorbus* L., including wood which has not kept its natural round surface, except sawdust or shavings, originating in Canada or the USA

3.3.3. Legislation addressing the organisms that vector the viruses of *Prunus* categorised in the present opinion (Directive 2000/29/EC)

The nematode vectors of PRMV, TRSV and ToRSV and possibly of other viruses belonging to the genera *Nepovirus* and *Cheravirus* are listed in Directive 2000/29/EC:

- *Longidorus diadecturus* L. is listed in Annex I, AI, position (a) 13.
- *Xiphinema americanum* sensu lato is listed in Annex I, AI, position (a) 26.
- *Xiphinema americanum* sensu lato is also listed in Annex IV, AI:

– 31 – Plants of *Pelargonium* L'Herit. ex Ait., intended for planting, other than seeds, originating in countries where Tomato ringspot virus is known to occur:

a) where *Xiphinema americanum* Cobb sensu lato (non-European populations) or other vectors of Tomato ringspot virus are not known to occur;
b) where *Xiphinema americanum* Cobb sensu lato (non-European populations) or other vectors of Tomato ringspot virus are known to occur

- *Xiphinema californicum* is listed in Annex I, AI, position (a) 27.
- *Xiphinema californicum* is also listed in Annex IV, AI:

– 31. Plants of *Pelargonium* L'Herit ex Ait., intended for planting, other than seeds, originating in countries where Tomato ringspot virus is known to occur:

a) where *Xiphinema americanum* Cobb sensu lato (non-European populations) or other vectors of Tomato ringspot virus are not known to occur;
b) where *Xiphinema americanum* Cobb sensu lato (non-European populations) or other vectors of Tomato ringspot virus are known to occur.

Two eriophyid mites (Prostigmata: Eriophyidae), *Eriophyes inaequalis* Wilson & Oldfield*, and E. insidiosus* Keifer & Wilson, and one nematode (*Longidorus arthensis*) identified as vectors of some viruses of *Prunus* categorised here are not explicitly listed in the Directive 2000/29/EC.

3.4. Entry, establishment and spread in the EU

3.4.1. Host range

While most viruses categorised in the present opinion have been reported only from *Prunus* (APLPV, AVCaV, APV-1, APV-2, APV-3, CPrV, CMLV, CRV, CRMaV, CTLaV, CVB, MuVA, NSPaV, NeVM, PcMV, PEV, PLPaV, PcMV, PeVD, PrGVA, PrVF, PrVT), some other viruses have a host range including many (CRLV, ToRSV and TRSV) or few non-*Prunus* species (ASSVd and PRMV). For each one of these viruses, Table 10 integrates data from the previous Scientific Opinion (EFSA PLH Panel, 2019a) with additional information on their natural hosts besides *Prunus* spp. However, it must be considered that for all the listed viruses, there is uncertainty about the possible existence of additional natural hosts that have not been reported so far. These uncertainties are of course even higher for recently discovered viruses.

Table 10: Non-*Prunus* natural hosts of the viruses categorised in the present opinion, together with their regulatory status and the associated uncertainties

VIRUS/ VIROID name	Other hosts (refs)	Regulation addressing other hosts[(a)]	Uncertainties
Apple scar skin viroid (ASSVd)	*Malus* spp., *Pyrus* spp. *Cydonia*, *Sorbus*, *Chaenomeles*, *Pyronia* (graft-inoculation) (Hadidi et al., 2017)	*Malus* sp.: IIIA 9, 18; IIIB 1; IVAI 7.4, 7.5, 14.1, 17, 19.2, 22.1, 22.2; IVAII 9, 15; IVB 21; VAI 1.1; VAII 1.3, 1.4; VBI 3, 6; VBII 3, 4; *Pyrus* sp.: IIIA 9, 18; IIIB 1; IVAI 7.4, 7.5, 14.1, 17, 19.2, 20; IVAII 9, 13; IVB 21; VAI 1.1, VAII 1.3, 1.4; VBI 3, 6; VBII 3, 4; *Cydonia* sp.: IIIA 9, 18; IIIB 1; IVAI 7.4, 7.5, 14.1, 17, 19.2, 20; IVAII 9, 13; IVB 21; VAI 1.1, VAII 1.3, 1.4; VBI 3, 6; VBII 3, 4; *Sorbus* sp.: IIIB 1; IVAI 7.4, 7.5, 14.1, 17; IVAII 9, IVB 21; VAI 1.1, VAII 1.3, 1.4; VBI 6; VBII 3,4; *Chaenomeles* sp.: IIIA 9; IIIB 1; IVAI 17; IVAII 9; IVB 21; VAI 1.1; VAII 1.3, 1.4; VBII 3, 4.	Experimental hosts in different botanical families. Additional natural hosts may exist
American plum line pattern virus (APLPV)	No other known natural hosts		Experimental hosts in different botanical families. Additional natural hosts may exist
Apricot vein clearing-associated virus (AVCaV)	No other known natural hosts		Recently described virus (Elbeaino et al., 2014). Woody host-infecting betaflexiviruses generally have narrow host ranges so that the existence of natural hosts outside of the *Prunus* genus is considered unlikely
Asian prunus virus 1 (APV-1)	No other known natural hosts		Recently described virus (Marais et al., 2006; Candresse et al., 2011). Woody host-infecting betaflexiviruses generally have narrow host ranges so that the existence of natural hosts outside of the *Prunus* genus is considered unlikely
Asian prunus virus 2 (APV-2)	No other known natural hosts		Recently described virus (Marais et al., 2006; Candresse et al., 2011). Woody host-infecting betaflexiviruses generally have narrow host ranges so that the existence of natural hosts outside of the *Prunus* genus is considered unlikely
Asian prunus virus 3 (APV-3)	No other known natural hosts		Recently described virus (Candresse et al., 2011; Marais et al., 2016). Woody host-infecting betaflexiviruses generally have narrow host ranges so that the existence of natural hosts outside of the *Prunus* genus is considered unlikely

VIRUS/ VIROID name	Other hosts (refs)	Regulation addressing other hosts[(a)]	Uncertainties
Caucasus prunus virus (CPrV)	No other known natural hosts		Recently described virus (Marais et al., 2015b). Woody host-infecting betaflexiviruses generally have narrow host ranges so that the existence of natural hosts outside of the *Prunus* genus is considered unlikely
Cherry mottle leaf virus (CMLV)	No other known natural hosts		Experimental hosts in different botanical families however woody host-infecting betaflexiviruses generally have narrow host ranges so that the existence of natural hosts outside of the *Prunus* genus is considered unlikely
Cherry rasp leaf virus (CRLV)	EPPO gd: MINOR: *Malus* spp., *Sambucus nigra*; INCIDENTAL: *Rubus idaeus*; WILD/WEED: *Malva* spp., *Plantago lanceolata*, *Taraxacum* spp. *Balsamorhiza sagittata*, *Taraxacum officinale*, *Plantago major*, *Convolvulus alvensis*, *Solanum tuberosum* (James, 2011c)	*Malus* sp.: IIIA 9, 18; IIIB 1; IVAI 7.4, 7.5, 14.1, 17, 19.2, 22.1, 22.2; IVAII 9, 15; IVB 21; VAI 1.1; VAII 1.3, 1.4; VBI 3, 6; VBII 3, 4; *Rubus* sp.: IVAI 19.2, 24; IVAII 12; VA 2.1; VBI 1; *Fraxinus* sp.: IVAI 2.3, 2.4, 2.5, 11.4; VBI 2, 5, 6; *Solanum tuberosum*: IIIA 10, 11, 12; IVAI 25.1, 25.2, 25.3, 25.4, 25.4.1, 25.4.2, 25.5; IVAII 18.1,18.1.1, 18.2, 18.3, 18.3.1, 18.4, 18.5, 18.6; IVBI 20.1, 20.2; VAI 1.3; VAII 1.5; VBI 4.	CRLV has been experimentally transmitted to numerous herbaceous hosts in several botanical families (EPPO, 2019). Additional natural hosts may exist
Cherry rosette virus (CRV)	No other known natural hosts		Poorly described virus (Kunz, 1988). Nepoviruses frequently have wide host ranges so that additional natural hosts may exist
Cherry rusty mottle-associated virus (CRMaV)	No other known natural hosts		Recently described virus (Villamor et al., 2015). Woody host-infecting betaflexiviruses generally have narrow host ranges so that the existence of natural hosts outside of the *Prunus* genus is considered unlikely
Cherry twisted leaf associated virus (CTLaV)	No other known natural hosts		Recently described virus (Villamor et al., 2015). Woody host-infecting betaflexiviruses generally have narrow host ranges so that the existence of natural hosts outside of the *Prunus* genus is considered unlikely
Cherry virus B (CVB)	No other known natural hosts		Poorly described virus (present only in GenBank LC373513). Woody host-infecting betaflexiviruses generally have narrow host ranges so that the existence of natural hosts outside of the *Prunus* genus is considered unlikely

VIRUS/ VIROID name	Other hosts (refs)	Regulation addressing other hosts[(a)]	Uncertainties
Mume virus A (MuVA)	No other known natural hosts		Recently poorly described virus (Marais et al., 2018). Woody host-infecting betaflexiviruses generally have narrow host ranges so that the existence of natural hosts outside of the *Prunus* genus is considered unlikely
Nectarine stem pitting-associated virus (NSPaV)	No other known natural hosts		Recently described virus (Bag et al., 2015). Additional natural hosts may exist
Nectarine virus M (NeVM)	No other known natural hosts		Recently described virus (Villamor et al., 2016). Additional natural hosts may exist
Peach chlorotic mottle virus (PeCMV)	No other known natural hosts		Woody host-infecting betaflexiviruses generally have narrow host ranges so that the existence of natural hosts outside of the *Prunus* genus is considered unlikely
Peach enation nepovirus (PEV)	No other known natural hosts		Poorly described virus (Kishi et al., 1973). Nepoviruses frequently have wide host ranges so that additional natural hosts may exist
Peach leaf pitting-associated virus (PLPaV)	No other known natural hosts		Recently described virus (He et al., 2017). Additional natural hosts may exist
Peach mosaic virus (PcMV)	No other known natural hosts		Woody host-infecting betaflexiviruses generally have narrow host ranges so that the existence of natural hosts outside of the *Prunus* genus is considered unlikely
Peach rosette mosaic virus (PRMV)	EPPO gd: MAJOR: *Vitis labrusca* MINOR: *Vitis vinifera* WILD/WEED: *Rumex crispus, Solanum carolinense, Taraxacum officinale* CABI cpc: *Taraxacum officinale, Vaccinium corymbosum* *Taraxacum officinale, Solanum carilonense, Rumex crispus, Acer rubrum* (Martelli and Uyemoto, 2011)	*Vitis* sp.: IIIA 15, IVAII 17, IVB 21.1, 21.2, 32; VAI 1.4, VAII 1.3, 1.9, 6a; *Solanum carolinense*: IVAI 25.5, 25.6 *Vaccinium* sp.: VBI 3; *Acer* sp.: IIIA 7, IVAI 2.1, 2.2, 7.1.1, VBI 2, 5, 6.	Natural hosts belong to different families (EPPO, 2019). Additional natural hosts may exist
Peach virus D (PeVD)	No other known natural hosts		Recently described virus (Igori et al., 2017). Additional natural hosts may exist
Prunus geminivirus A (PrGVA)	No other known natural hosts		Recently described virus (Al Rwahnih et al., 2018). Additional natural hosts may exist

VIRUS/ VIROID name	Other hosts (refs)	Regulation addressing other hosts[(a)]	Uncertainties
Prunus virus F (PrVF)	No other known natural hosts		Recently described virus (Villamor et al., 2016). Additional natural hosts may exist
Prunus virus T (PrVT)	No other known natural hosts		Recently described virus (Marais et al., 2015a). Woody host-infecting betaflexiviruses generally have narrow host ranges so that the existence of natural hosts outside of the *Prunus* genus is considered unlikely
Tobacco ringspot virus (TRSV)	EPPO gd: MAJOR: *Glycine max, Nicotiana tabacum* MINOR: *Cucurbita pepo, Cucurbitaceae, Vaccinium, Vaccinium corymbosum*, woody plants INCIDENTAL: *Anemone, Capsicum, Carica papaya, Cornus, Fraxinus, Gladiolus, Iris, Lupinus, Malus domestica, Mentha; Narcissus pseudonarcissus, Pelargonium, Petunia, Phlox subulata, Prunus avium, Pueraria montana, Rubus fruticosus, Sambucus, Solanum melongena, Sophora microphylla*	*Capsicum sp.:* IVAI 16.6, 25.7, 36.3, IVAII 18.6.1, 18.7; VBI 1,3; *Fraxinus* sp.: IVAI 2.3, 2.4, 2.5, 11.4; VBI 1, 2, 5, 6; *Gladiolus* sp.: IVAII 24.1, VAI 3; *Lupinus* sp.: VAI 2.1; *Narcissus* sp.: IVAI 30, IVAII 22, 24.1; VAI 3; *Vaccinium* sp.: VBI 3 *Iris* sp.: IVAII 24.1, VAI 3; *Pelargonium* sp.: IVAI 27.1, 27.2, 31; IVAII 20, VAI 2.1; VBI 2; *Rubus* sp.: IVAI 19.2, 24; IVAII 12; VAI 2.1; VBI 1; *Solanum melongena*: IVAI 25.5, 25.6, 25.7, 25.7.1, 25.7.2; IVAII 18.6, 18.6.1, 18.7; VBI 3; *Vitis* sp.: IIIA 15; IVAII 17, IVB 21.1, 21.2, 32; VAI 1.4, VAII 1.3, 1.9, 6a.	This virus has a large natural host range; it is unlikely that all natural hosts have been identified
Tomato ringspot virus (ToRSV)	EPPO gd: MAJOR: *Pelargonium x hortorum, Rubus idaeus* MINOR: *Fragaria x ananassa, Gladiolus, Hydrangea macrophylla, Pelargonium, Punica granatum, Ribes nigrum, Ribes uva-crispa, Rosa, Rubus, Rubus fruticosus, Vaccinium corymbosum,* woody plants INCIDENTAL: *Fraxinus americana, Malus, Rubus laciniatus, Solanum lycopersicum, Solanum tuberosum* WILD/WEED: *Stellaria media, Taraxacum officinale Cydonia* (EFSA PLH Panel et al., 2019b)	*Pelargonium* sp.: IVAI 27.1, 27.2, 31; IVAII 20, VAI 2.1; VBI 2; *Rubus* sp.: IVAI 19.2, 24; IVAII 12; VAI 2.1; VBI 1; *Fraxinus* sp.: IVAI 2.3, 2.4, 2.5, 11.4; VBI 2, 6; *Gladiolus* sp.: IVAII 24.1, VAI 3; *Vaccinium* sp.: VBI 3 *Fragaria* sp.: IIIA 18; IVAI 19.2, 21.1,21.2, 21.3; IVAII 12, 14, 24.1; IVB 2.1; *Narcissus* sp.: IIBII 4; IVAI 30; IVAII 22, 24.1; IVB 3; *Punica* sp.: IVAI 16.6; IVB 3; VBI 3 *Ribes* sp.: IVAI 19.2; VBI 3; *Malus* sp.: IIIAI 9, 18; IIIB 1; IVAI 7.4, 7.5, 14.1, 17, 19.2, 22.1, 22.2; IVAII 9, 15; IVB 21; VAI 1.1; VAII 1.3, 1.4; VBI 3, 6; VBII 3, 4; *Rosa* sp.: IIIA 9, IVAI 44,	This virus has a large natural host range; it is unlikely that all natural hosts have been identified

VIRUS/ VIROID name	Other hosts (refs)	Regulation addressing other hosts[(a)]	Uncertainties
		45.2; VBI 2; *Solanum* sp.: IIIA 10,11,12; IVAI 25.1, 25.2, 25.3, 25.4, 25.4.1, 25.4.2, 25.5, 25.6, 25.7, 25.7.1, 25.7.2, 28.1, 36.2, 45.3, 48; IVAII 18.1, 18.1.1, 18.2, 18.3, 18.3.1, 18.4, 18.5, 18.6, 18.6.1, 18.7, 26.1, 27; IVBI 20.1, 20.2; VAI 1.3, 2.4; VAII 1.5; VBI 1, 3, 4. *Cydonia* sp.: IIIAI 9, 18; IIIB 1; IVAI 7.4, 7.5, 14.1, 17, 19.2, 20; IVAII 9, 13; IVB 21; VAI 1.1; VAII 1.3, 1.4; VBI 3, 6; VBII 3, 4;	

(a): Numbers reported in this column refer to articles from Council Directive 2000/29/EC.

Twenty-two non-EU viruses of *Prunus* (APLPV, AVCaV, APV-1, APV-2, APV-3, CPrV, CMLV, CRV, CRMaV, CTLaV, CVB, MuVA, NSPaV, NeVM, PcMV, PEV, PLPaV, PeCMV, PeVD, PrGVA, PrVF, PrVT) have not been reported from natural hosts other than *Prunus*, although some of them can infect some or many experimental herbaceous hosts. The major host of ASSVd are pome fruit species. This viroid has been reported to infect several other host species. A wide natural host range has been reported for the nematode-transmitted viruses CRLV, PRMV, TRSV, ToRSV.

The legislation detailed in Sections 3.3.2 and 3.4.1 regulates the main host (*Prunus*) and several other natural hosts (e.g. *Malus, Pyrus, Cydonia, Sorbus, Chaenomeles, Rubus, Fraxinus, Solanum, Vitis, Vaccinium, Acer, Capsicum, Gladiolus, Lupinus, Narcissus, Iris, Pelargonium, Fragaria, Punica, Ribes, Rosa*) of the viruses categorised here. However, especially for those viruses with a wide host range (e.g. CRLV, PRMV, TRSV, ToRSV), the legislation imposes relatively weak requirements for non-*Prunus* hosts. Thus, plants for planting originating from non-EU European or Mediterranean countries are not subjected to specific requirements (even if in some countries those viruses have been reported) while plants for planting, excluding seeds, from other Third Countries are only required to be produced in nurseries and to be free from symptoms of harmful organisms (Annex IV.A.I, points from 39 to 42). Consequently, for those viruses the current legislation of non-*Prunus* hosts does not completely close the corresponding potential entry pathways (see Section 3.4.2 below).

3.4.2. Entry

Are the pests able to enter into the EU territory? (Yes or No) If yes, identify and list the pathways

Yes, for the viruses of *Prunus* categorised here. These agents may enter EU territory with infected plants for planting. Some of them have additional pathways including plants for planting of other natural hosts, seeds, pollen and/or vectors.

All the viruses of *Prunus* categorised here can be transmitted by vegetative propagation materials. Therefore, plants for planting of *Prunus* must be considered as the most important entry pathway. Moreover, some of these viruses have additional natural hosts that are also vegetatively propagated (e.g. *Cydonia* spp., *Malus* spp., *Pyrus* spp., *Rubus* spp., *Rosa* spp., *Vaccinium* spp.), thus providing additional entry pathways. Some viruses of *Prunus* categorised here can also be transmitted by seeds, and/or pollen, and/or vectors (Table 4) that may also provide entry pathways. Information on seed, pollen and vector transmission are limited for some of the categorised viruses, especially for those recently discovered. Uncertainties on the transmission mechanisms for these viruses generate uncertainties on the possible pathways. Major entry pathways for the viruses here categorised are summarised in Table 11.

Current legislation prohibits entry in the EU of plants for planting (the definition of which includes pollen) of *Prunus* from non-EU countries (Annex IIIAI 9 and 18), but introduction of dormant plants (free

from leaves, flowers and fruit) is permitted from Mediterranean countries, Australia, New Zealand, Canada and the continental states of the USA (Annex IIIAI 18). This means that the entry pathway regarding plants for planting is only partially regulated for those viruses present in the above mentioned countries. However, restrictions applying to plants for planting – in general (e.g. Annex IVAI 33, 36.1, 39, 40, 43, 46) or specifically referring to *Prunus* (e.g. annex IVAI 14.1, 19.2, 23.1 and 23.2) in relation to other harmful organisms may contribute to restrict the areas from which plants for planting of *Prunus* can be imported as dormant plants or the areas where such material can be planted.

Although not specifically stated in the regulation, pollen for pollination is considered as dormant plants for planting (EFSA PLH Panel, 2013), thus import of pollen of *Prunus* for pollination from Mediterranean countries, Australia, New Zealand, Canada and the continental states of the USA, without prejudice to other provisions, is also permitted, with the exception of *Erwinia amylovora* Protected Zones (EFSA PLH Panel, 2013). However, as already stated in a previous EFSA opinion (EFSA PLH Panel, 2013): *It should be stressed that the current legislation is complex and difficult to understand and that its interpretation when it comes to the specific case of pollen for pollination purposes is far from obvious.*

As noted above in Section 3.4.1, the current legislation regulates several non-*Prunus* hosts (e.g. *Malus, Pyrus, Cydonia, Sorbus, Chaenomeles, Rubus, Fraxinus, Solanum, Vitis, Vaccinium, Acer, Capsicum, Gladiolus, Lupinus, Narcissus, Iris, Pelargonium, Fragaria, Punica, Ribes, Rosa*) of the viruses categorised here. Import from non-EU countries of plants for planting of some of these hosts (e.g. *Cydonia*, *Malus*, *Pyrus*, *Rosa* and/or *Vitis*) is also banned (Annex IIIAI 9, 15 and 18), but introduction of dormant plants (free from leaves, flowers and fruit) of *Cydonia*, *Malus* and *Pyrus* and their hybrids is permitted from Mediterranean countries, Australia, New Zealand, Canada the continental states of the USA (Annex IIIAI 18). This means that the entry pathway of plants for planting of these host genera is only partially regulated for those viruses present in the above-mentioned countries. Requirements applying to plants for planting – in general (e.g. Annex IVAI 33, 36.1, 39, 40, 43, 46) or specifically referring to *Vitis* and other hosts (e.g. Annex IVB 21.1, 21.2, 32) in relation to other harmful organisms may contribute to restrict the areas from which plants for planting can be imported as dormant plants or the areas where such material can be planted. However these requirements have likely a minor effect to mitigate virus entry in the EU.

Import of seeds of *Prunus* is regulated (VBI 1), while seeds from other hosts are currently either prohibited from third countries other than Switzerland (*Vitis*) or, in most cases, not regulated (e.g. *Cydonia*, *Malus* and *Pyrus*).

Fruits of *Prunus* imported from non-European countries must be accompanied by a phytosanitary certificate. This measure mostly targets the potential import of fruit flies in consignments and its relevance for viruses categorised here is unclear. It is noteworthy for those agents that may be seed transmitted, although fruit import is unlikely to represent a pathway of major relevance.

Although Annex IVAI, at point 19.2, requires *official statement that no symptoms of diseases caused by the relevant harmful organisms* (e.g. non-European viruses and virus-like organisms) *have been observed on the plants at the place of production since the beginning of last complete cycle of vegetation*, this measure is considered to have limited impact in preventing import of infected plants of *Prunus* intended for planting. This is because symptoms in the infected plants are often not obvious. Similarly, Annex IVAI point 23.2, applies to *plants of Prunus L.. intended for planting, originating in countries where the relevant harmful organisms (e.g. APLPV, CRLV, PcMV, and ToRSV) are known to occur on Prunus L.* and determines requirements for testing and certification. Also in this case, the certification and testing requirements for plants for planting are limited to only some of the viruses of *Prunus* categorised here, thus closing only partially the related entry pathways. Similar requirements, without prejudice to other provisions (e.g. Annex I and III), are established in Annex IV with respect to plants of *Malus* and *Rubus* intended for planting (Annex IVAI 22.1 and 24, respectively) for which certification excluding the presence of some viruses categorised here (CRLV and ToRSV for *Malus*, ToRSV for *Rubus*) is requested. The Panel also notes that this legislation is complex, which may create interpretation problems, and that it does not completely eliminate the risk of introduction on the plant for planting pathway for at least some of the viruses categorised here.

Annex V (BI 1 and BII 3) establishes that plant for plantings, pollen and/or part of plants of several host species (*Cydonia, Malus, Pyrus, Prunus, Rosa and Rubus*) concerned must be accompanied by a valid phytosanitary certificate in order to be introduced in the EU. Seeds of *Prunus* and several other host species (*Rubus* sp., *Solanum lycopersicum*) of viruses categorised here are also regulated (VBI 1) and a phytosanitary certificate is requested. In particular, requirements for *Prunus* consist of production in certified field and/or tested mother plants. Although this measure may impair introduction of viruses explicitly mentioned in Annex IAI (TRSV, ToRSV, CRLV) it might not be as efficient for the other viruses

categorised here, which are not explicitly mentioned, and are only covered by the general and possibly difficult to interpret term of *Non-European viruses and virus-like organisms*.

Annex VA lists all the potential hosts which must be checked and accompanied by a plant passport. This measure may impair the spread of viruses on *Prunus* and other species that are regulated in the EU (such as *Cydonia*, *Malus* and *Pyrus*.), but has no effect on the dissemination of viruses on non-regulated host plants.

Some viruses of *Prunus* categorised here are transmitted by nematodes (CRLV, CRV, PRMV, TRSV, ToRSV). Viruliferous nematodes entering the EU may introduce the associated viruses. The main entry pathway for nematodes are soil and growing media from areas where the nematodes occur. These pathways are closed by current legislation (Annex IIIA 14 of EU Directive 2000/29/EC). According to a previous EFSA pest categorisation of *Xiphinema americanum* sensu lato (EFSA PLH Panel, 2018b), only *Soil and growing media attached to plants (hosts or non-host plants) from areas where the nematode occurs* is a major entry pathway for nematodes vectoring viruses. *This pathway is not closed as plants may be imported with soil or growing media attached to sustain their live*. In the same opinion *soil and growing media attached to (agricultural) machinery, tools, packaging materials* has been identified as an entry pathway, but it *is not considered an important pathway* (EFSA PLH Panel, 2018b).

PcMV and CMLV are transmitted by *E. insidiosus* and *E. inaequalis.* As for other eriophyid mites, they can be associated with dormant plants, in particular dormant buds (Oldfield, 1996). In the case of *Prunus*, this pathway is only partially regulated.

In summary, the current legislation closes the plants for planting (and pollen) entry pathway for some of the viruses categorised here. While for other ones, this pathway is only partially regulated. In addition, for other natural hosts of some of these viruses special requirements do not apply, leaving open potential entry pathways. Finally, the import of seeds of *Prunus* is regulated but that of other hosts is generally not regulated. Moreover, pathways regarding vectors are not completely closed.

Table 11: Major potential entry pathways identified for the viruses of *Prunus* under categorisation and the respective regulatory status

Virus name	***Prunus*** **plants for planting[(a)]**	***Prunus*** **pollen[(a)]**	***Prunus*** **seeds[(a)]**	**Plants for planting/ seeds/pollen of other hosts[(a)]**	**Viruliferous vectors[(a)]**	**Uncertainty factors**
Apple scar skin viroid (ASSVd)	Pathway partially regulated (viroid present in Canada and the USA)[(b)]	Not a pathway: ASSVd is not known to be pollen-transmitted	Pathway possibly open: conflicting reports on seed transmission	Pathway partially regulated for *Malus* spp., *Pyrus* spp., *Cydonia*, (viroid present in Canada and the USA)[(b)]. In addition other natural hosts may exist	Pathway possibly open: unknown vector(s) may exist.	- Geographic distribution - Existence and relevance of vectors - Seed transmission - Existence of other natural hosts
American plum line pattern virus (APLPV)	Pathway partially regulated (virus present in Canada, the USA, New Zealand)[(b)]	Pathway possibly open: pollen transmission may exist	Pathway possibly open: seed transmission may exist	Not a pathway: APLPV is not known to have other natural host(s)	Not a pathway: APLPV is not known to have vector(s)	- Geographic distribution - Pollen, seed and vector transmission - Existence of other natural hosts
Apricot vein clearing-associated virus (AVCaV)	Pathway partially regulated (virus present in Australia)[(b)]	Not a pathway: AVCaV is not known to be pollen-transmitted	Not a pathway: AVCaV is not known to be seed-transmitted	Not a pathway: AVCaV is not known to have other natural host(s)	Pathway possibly open: unknown vector(s) may exist.	- Geographic distribution - Seed, pollen and vector transmission - Existence of other natural hosts

Virus name	*Prunus* plants for planting[(a)]	*Prunus* pollen[(a)]	*Prunus* seeds[(a)]	Plants for planting/ seeds/pollen of other hosts[(a)]	Viruliferous vectors[(a)]	Uncertainty factors
Asian prunus virus 1 (APV-1)	Pathway partially regulated (virus present in USA)[(b)]	Not a pathway: APV-1 is not known to be pollen-transmitted	Not a pathway: APV-1 is not known to be seed-transmitted	Not a pathway: APV-1 is not known to have other natural host(s)	Not a pathway: APV-1 is not known to have vector (s)	- Geographic distribution - Pollen, seed and vector transmission - Existence of other natural hosts
Asian prunus virus 2 (APV-2)	Pathway partially regulated (virus present in USA)[(b)]	Not a pathway: APV-2 is not known to be pollen-transmitted	Not a pathway: APV-2 is not known to be seed-transmitted	Not a pathway: APV-2 is not known to have other natural host(s)	Not a pathway: APV-2 is not known to have vector (s)	- Geographic distribution - Pollen, seed and vector transmission - Existence of other natural hosts
Asian prunus virus 3 (APV-3)	Pathway partially regulated (virus present in USA)[(b)]	Not a pathway: APV-3 is not known to be pollen-transmitted	Not a pathway: APV-3 is not known to be seed-transmitted	Not a pathway: APV-3 is not known to have other natural host(s)	Not a pathway: APV-3 is not known to have vector (s)	- Geographic distribution - Pollen, seed and vector transmission - Existence of other natural hosts
Caucasus prunus virus (CPrV)	Pathway closed by existing legislation	Not a pathway: CPrV is not known to be pollen-transmitted	Not a pathway: CPrV is not known to be seed-transmitted	Not a pathway: CPrV is not known to have other natural host(s)	Pathway possibly open: unknown vector(s) may exist.	- Geographic distribution - Pollen, seed and vector transmission - Existence of other natural hosts
Cherry mottle leaf virus (CMLV)	Pathway partially regulated (virus present in Canada)[(b)]	Not a pathway: CMLV is not known to be pollen-transmitted	Not a pathway: CMLV is not known to be seed-transmitted	Not a pathway: CMLV is not known to have other natural host(s)	Pathway open (*Eriophyes inaequalis* is present in Canada and USA and can be associated with dormant *Prunus*)	- Geographic distribution - Pollen and seed transmission - Existence of other natural hosts
Cherry rasp leaf virus (CRLV)	Pathway partially regulated (virus present in Canada, USA)[(b)]	Pathway possibly open: pollen transmission may exist	Pathway possibly open: seed transmission may exist	Pathway partially regulated: because of the wide range of regulated and unregulated hosts	Pathway partially regulated: viruliferous nematodes can enter with the soil and growing media still attached to plants	- Geographic distribution - Seed and pollen transmission in woody hosts
Cherry rosette virus (CRV)	Pathway partially regulated (virus present in Switzerland)[(b)]	Pathway possibly open: pollen transmission may exist	Pathway possibly open: seed transmission may exist	Pathway possibly open: other natural hosts may exist	Pathway partially regulated: viruliferous nematodes can enter with the	- Geographic distribution - Pollen and seed transmission - Existence of

Virus name	*Prunus* plants for planting[(a)]	*Prunus* pollen[(a)]	*Prunus* seeds[(a)]	Plants for planting/ seeds/pollen of other hosts[(a)]	Viruliferous vectors[(a)]	Uncertainty factors
					soil and growing media still attached to plants	other natural hosts
Cherry rusty mottle-associated virus (CRMaV)	Pathway partially regulated (virus present in Canada and USA)[(b)]	Not a pathway: CRMaV is not known to be pollen-transmitted	Not a pathway: CRMaV is not known to be seed-transmitted	Not a pathway: CRMaV is not known to have other natural host(s)	Pathway possibly open: unknown vector(s) may exist	- Geographic distribution - Seed, pollen and vector transmission - Existence of other natural hosts
Cherry twisted leaf-associated virus (CTLaV)	Pathway partially regulated (virus present in Canada and USA)[(b)]	Not a pathway: CTLaV is not known to be pollen-transmitted	Not a pathway: CTLaV is not known to be seed-transmitted	Not a pathway: CTLaV is not known to have other natural host(s)	Pathway possibly open: unknown vector(s) may exist	- Geographic distribution - Seed, pollen and vector transmission - Existence of other natural hosts
Cherry virus B (CVB)	Pathway closed by existing legislation (virus only present in Japan)	Not a pathway: CVB is not known to be pollen-transmitted	Not a pathway: CVB is not known to be seed-transmitted	Not a pathway: CVB is not known to have other natural host(s)	Not a pathway: CVB is not known to have vector (s)	- Geographic distribution - Seed, pollen and vector transmission - Existence of other natural hosts
Mume virus A (MuVA)	Pathway closed by existing legislation (virus only present in Japan)	Not a pathway: MuVA is not known to be pollen-transmitted	Pathway possibly open: seed transmission may exist	Not a pathway: MuVA is not known to have other natural host(s)	Not a pathway: MuVA is not known to have vector(s)	- Geographic distribution - Seed, pollen and vector transmission - Existence of other natural hosts
Nectarine stem pitting-associated virus (NSPaV)	Pathway partially regulated (virus present in USA)[(b)]	Not a pathway: NSPaV is not known to be pollen-transmitted	Not a pathway: NSPaV is not known to be seed-transmitted	Pathway possibly open: other natural hosts may exist	Pathway possibly open: unknown vector(s) may exist	- Geographic distribution - Seed, pollen and vector transmission - Existence of other natural hosts
Nectarine virus M (NeVM)	Pathway partially regulated (virus present in USA)[(b)]	Not a pathway: NeVM is not known to be pollen-transmitted	Not a pathway: NeVM is not known to be seed-transmitted	Pathway possibly open: other natural hosts may exist	Pathway possibly open: unknown vector(s) may exist	- Geographic distribution - Seed, pollen and vector transmission - Existence of other natural hosts
Peach chlorotic mottle virus (PeCMV)	Pathway partially regulated (virus present in USA)[(b)]	Not a pathway: PeCMV is not known to be	Not a pathway: PeCMV is not known to be	Not a pathway: PeCMV is not known to have	Not a pathway: PeCMV is not known to have vector(s)	- Geographic distribution - Seed, pollen and vector transmission

Virus name	*Prunus* plants for planting[(a)]	*Prunus* pollen[(a)]	*Prunus* seeds[(a)]	Plants for planting/ seeds/pollen of other hosts[(a)]	Viruliferous vectors[(a)]	Uncertainty factors
		pollen-transmitted	seed-transmitted	other natural host(s)		- Existence of other natural hosts
Peach enation nepovirus (PEV)	Pathway closed by existing legislation (virus only present in Japan)	Pathway closed by existing legislation (virus only present in Japan)	Pathway closed by existing legislation (virus only present in Japan)	Pathway possibly open: other natural hosts may exist	Pathway possibly open: unknown vector(s) may exist	- Geographic distribution - Pollen, seed and vector transmission - Existence of other natural hosts
Peach leaf pitting-associated virus (PLPaV)	Pathway closed by existing legislation (virus only present in China)	Not a pathway: PLPaV is not known to be pollen-transmitted	Not a pathway: PLPaV is not known to be seed-transmitted	Pathway possibly open: other natural hosts may exist	Pathway possibly open: unknown vector(s) may exist	- Geographic distribution - Seed, pollen and vector transmission - Existence of other natural hosts
Peach mosaic virus (PcMV)	Pathway partially regulated (virus present in Canada and USA)[(b)]	Not a pathway: PcMV is not known to be pollen-transmitted	Not a pathway: PcMV is not known to be seed-transmitted	Not a pathway: PcMV is not known to have other natural host(s)	Pathway open (*Eriophyes insidiosus* is present in USA, Mexico, China, Chile and Morocco and can be associated with dormant *Prunus*)[(b)]	- Geographic distribution - Pollen and seed transmission - Existence of other natural hosts
Peach rosette mosaic virus (PRMV)	Pathway partially regulated (virus present in Canada, USA)[(b)]	Pathway possibly open: pollen transmission may exist	Pathway possibly open: seed transmission may exist	Pathway partially regulated: because of the wide range of regulated and unregulated hosts	Pathway partially regulated: viruliferous nematodes can enter with the soil and growing media still attached to plants	- Geographic distribution - Seed transmission in woody hosts - Pollen transmission in woody hosts
Peach virus D (PeVD)	Pathway closed by existing legislation (virus present in Korea)	Not a pathway: PeVD is not known to be pollen-transmitted	Not a pathway: PeVD is not known to be seed-transmitted	Pathway possibly open: other natural hosts may exist	Pathway possibly open: unknown vector(s) may exist	- Geographic distribution - Seed, pollen and vector transmission - Existence of other natural hosts
Prunus geminivirus A (PrGVA)	Pathway partially regulated (virus present in USA)[(b)]	Not a pathway: PrGVA is not known to be pollen-transmitted	Not a pathway: PrGVA is not known to be seed-transmitted	Pathway possibly open: other natural hosts may exist	Pathway possibly open: unknown vector(s) may exist	- Geographic distribution - Seed, pollen and vector transmission - Existence of other natural hosts

Virus name	*Prunus* plants for planting[(a)]	*Prunus* pollen[(a)]	*Prunus* seeds[(a)]	Plants for planting/ seeds/pollen of other hosts[(a)]	Viruliferous vectors[(a)]	Uncertainty factors
Prunus virus F (PrVF)	Pathway partially regulated (virus present in Canada and USA)[(b)]	Not a pathway: PrVF is not known to be pollen-transmitted	Not a pathway: PrVF is not known to be seed-transmitted	Pathway possibly open: other natural hosts may exist	Pathway possibly open: unknown vector(s) may exist	- Geographic distribution - Seed, pollen and vector transmission - Existence of other natural hosts
Prunus virus T (PrVT)	Pathway closed by existing legislation (virus present in Azerbaijan)	Pathway closed by existing legislation (virus present in Azerbaijan)	Pathway closed by existing legislation (virus present in Azerbaijan)	Not a pathway: PrVT is not known to have other natural host(s)	Not a pathway: PrVT is not known to have vector (s)	- Geographic distribution - Pollen, seed and vector transmission - Existence of other natural hosts
Tobacco ringspot virus (TRSV)	Pathway partially regulated (virus present in Australia, Canada, New Zealand, USA)[(b)]	Pathway possibly open: pollen transmission may exist	Pathway possibly open: seed transmission may exist	Pathway partially regulated: because of the wide range of regulated and unregulated hosts	Pathway partially regulated: viruliferous nematodes can enter with the soil and growing media still attached to plants	- Geographic distribution - Seed and pollen transmission in woody hosts
Tomato ringspot virus (ToRSV)	Pathway partially regulated (virus present in Australia, Canada, New Zealand, USA)[(b)]	Pathway possibly open: pollen transmission may exist	Pathway possibly open: seed transmission may exist	Pathway partially regulated: because of the wide range of regulated and unregulated hosts	Pathway partially regulated: viruliferous nematodes can enter with the soil and growing media still attached to plants	- Geographic distribution - Seed and pollen transmission in woody hosts

(a): Pathway open: only applicable if the pathway exists, open means that there is no regulation or ban that prevents entry via this pathway;
Pathway closed: opposite of 'pathway open': there is a ban that completely prevents entry via the pathway;
Pathway possibly open: the existence of the pathway, which is not closed by current legislation, is not supported by direct evidence regarding the biology of that virus. However, based on comparisons with the biology of closely related viruses (in the same genus or in the same family), the existence of the pathway cannot be excluded;
Not a pathway: there is no evidence supporting the existence of the pathway;
Pathway regulated: regulations exist that limit the probability of entry along the pathway, but there is not a complete ban on imports;
Pathway partially regulated: the legislation does not cover all the possible paths (e.g. regulations exist for some hosts, but not for others; a ban exists for some non-EU MSs but not for all).
(b): Import not banned from the listed country(ies).

There is no data in Eurostat on imports of dormant host plants for planting from third countries into the EU territory (Source: Eurostat, search done on 17 January 2019).

Interceptions of non-EU viruses of *Prunus* were searched in Europhyt database on 24 January 2019 (EUROPHYT, 2019). Only 6 and 5 interceptions of TRSV and ToRSV were reported, respectively, mainly from ornamental hosts. They date back to more than 10 years ago (Table 12). No interception was registered in the case of APLPV, ASSVd, AVCaV, APV-2, APV-3, CPrV, CMLV, CRLV, CRMaV, CTLaV, NSPaV, NeVM, PeCMV, PEV, PcMV, PRMV, PrVF and PrVT. NeVM and PEV are registered in EUROPHYT as nectarine marafivirus M and peach enation virus, respectively. APV-1, CRV, CVB, MuVA, PLPaV, PeVD and PrGVA are not listed in Europhyt.

Table 12: Interceptions of TRSV and ToRSV in the EU (Source: Europhyt, search done on 24 January 2019)

VIRUS/VIROID name	Europhyt interception	Year of interception	Origin	Plant species on which it has been intercepted
Tobacco ringspot virus (TRSV)	6	2000	Portugal	*Pelargonium* sp.
		2001	Israel	*Bacopa* sp.
		2001	UK	*Pelargonium* sp.
		2008	Israel	*Impatiens* sp.
		2008	Israel	*Impatiens* sp.
		2008	Israel	*Impatiens* New Guinea hybrids
Tomato ringspot virus (ToRSV)	5	1997	Israel	*Pelargonium* sp.
		1997	Israel	*Pelargonium* sp
		1999	USA	*Pelargonium* sp
		1999	France	*Pelargonium* × *hortorum*
		2008	Italy	*Malus* sp.

The analysis of entry pathways is affected by uncertainties coming from limited information on a) the transmission biology and host range of the agents and b) the geographical distribution of the agents.

In summary, the only pathways the Panel considered relevant for the entry of the viruses categorised here are:

- Entry pathway involving plants for planting of *Prunus,* other than seeds: this pathway is closed by legislation for CPrV, CVB, MuVA, PEV, PLPaV, PeVD, PrVT and partially regulated for ASSVd, APLPV, AVCaV, APV-1, APV-2, APV-3, CMLV, CRLV, CRV, CRMaV, CTLaV, NSPaV, NeVM, PeCMV, PcMV, PRMV, PrGVA, PrVF, TRSV, ToRSV because the viruses are present in countries from which import of dormant plants for planting is allowed.
- Entry pathway involving pollen of *Prunus*: this pathway is possibly open for APLPV, CRLV, CRV, PRMV, TRSV, ToRSV. The pathway is closed by legislation for PEV and PrVT. For all other viruses there is no evidence supporting the existence of this pathway, with uncertainties, because they are not reported to be pollen transmitted.
- Entry pathway involving seeds of *Prunus*: this pathway is possibly open for ASSVd, APLPV, CRLV, CRV, MuVA, PEV, PRMV, TRSV, ToRSV and PrVT. The pathway is closed by legislation for PEV and PrVT. For the other viruses, this is not considered a pathway, sometimes with uncertainty, because they are not reported to be seed-transmitted.
- Entry pathway involving non-*Prunus* hosts. This pathways is considered:
    - partially regulated for ASSVd, CRLV, PRMV, TRSV and ToRSV;
    - possibly open for CRV, NSPaV, NeVM, PEV, PLPaV, PeVD, PrGVA and PrVF because other natural unregulated hosts may exist;
    - not to be a pathway for APLPV, AVCaV, APV-1, APV-2, APV-3, CPrV, CMLV, CRMaV, CTLaV, CVB, MuVA, PeCMV, PcMV, PrVT (because they have a narrow host range, likely restricted to *Prunus*).
- Entry pathway involving vectors: this pathway refers to:
    - nematode-transmitted viruses (CRLV, CRV, PEV, PRMV, TRSV, ToRSV). In accordance with the current legislation, the nematode vector pathway (independent of the considered species) is partially regulated. In fact, although import of soil and growing media in the EU is banned, nematodes can still enter in the EU with the soil and growing media attached to plants for planting imported from countries in which these vectors are present. Moreover, these viruses may have hosts other than *Prunus* that may be not regulated or partially regulated. In the specific case of PEV this analysis is associated with uncertainty because the potential nematode vector(s) are not known.
    - arthropod-transmitted viruses, the vector of which is known (CMLV, PcMV) and viruses potentially transmitted by arthropods, but the vector of which, if any, has not been identified yet (ASSVd, AVCaV, CPrV, NSPaV, NeVM, PLPaV, PeVD, PrGVA, PrVF). For CMLV and PcMV, the pathway is considered open, but likely with a minor significance

because the retention of the viruses in the eriophyid vectors is reported to be limited to a few days (Stenger et al., 2016). For the other viruses the pathway is considered possibly open, with uncertainty, because in the absence of information on the identity of the vector(s) it is not possible to evaluate precisely the potential association of vector(s) with traded commodities.

3.4.3. Establishment

Are the pests able to become established in the EU territory? (Yes or No)

Yes, natural hosts of the viruses under categorisation are widespread in the EU and climatic conditions are appropriate for their establishment wherever their hosts may grow in the EU

3.4.3.1. EU distribution of main host plants

Prunus widely occur in EU as commercial crops as well as wild plants. Details on the area of *Prunus* production in individual EU Member States are provided in Table 13.

Table 13: Stone fruit Area (cultivation/harvested/production) (1000 ha). Date of extraction 17/01/2019. 'na' stands for data not available

EU country/Year	2013	2014	2015	2016	2017
Belgium	na	1.31	1.35	1.35	1.43
Bulgaria	na	na	22.28	22.68	23.67
Czechia	6.29	6.16	5.79	5.61	5.34
Denmark	na	na	1.21	0.85	0.72
Germany (until 1990 former territory of the FRG)	11.77	11.71	11.55	11.49	13.13
Estonia	0	0	0	0	0
Ireland	0	0	0	0	0
Greece	66.69	70.35	69.58	67.54	67.45
Spain	na	na	148.11	148.12	148.32
France	49.71	48.62	46.77	46.69	46.74
Croatia	9.11	9.93	10.07	9.54	9.13
Italy	na	na	125.74	129.9	125.34
Cyprus	1.36	1.38	1.52	1.29	1.23
Latvia	0.3	0.2	0.2	0.2	0.6
Lithuania	1.63	1.64	1.57	1.47	1.47
Luxembourg	na	na	0.03	0.04	0.04
Hungary	na	33.7	33.28	33.28	34.09
Malta	0	0	0	0	0
Netherlands	0.99	1.04	1.11	1.1	1.1
Austria	1.44	1.38	1.31	1.38	1.38
Poland	70	68.9	56.5	53.42	52.84
Portugal	12.04	12.07	12.54	12.75	12.76
Romania	79.96	77.78	76.35	75.24	76.58
Slovenia	na	na	0.59	0.59	0.59
Slovakia	na	na	na	na	1.26
Finland	0.04	0.04	0	0	0
Sweden	0.1	0.08	0.07	0.07	0.07
United Kingdom	na	1	0	1.4	1.3

3.4.3.2. Climatic conditions affecting establishment

Except for those affecting the hosts, no eco-climatic constraints for the viruses categorised here exist. Therefore, it is expected that these viruses are able to establish wherever their hosts may live. *Prunus* is largely cultivated in the EU. The Panel therefore considers that climatic conditions will not impair the ability of viruses addressed here to establish in the EU. However, it must be taken into consideration that virus accumulation and distribution within natural hosts, especially in woody plants, are largely dependent on environmental conditions. The same applies to symptom expression and severity that may be affected by climatic conditions (e.g. temperature and light).

3.4.4. Spread

Is the pest able to spread within the EU territory following establishment? (Yes or No) How?

Yes, all of the categorised viruses can spread through the trade of plants for planting. Some of them are also spread by vectors and/or seeds and pollen

Regulated non-quarantine pest (RNQPs): Is spread mainly via specific plants for planting, rather than via natural spread or via movement of plant products or other objects?

Yes, all the categorised viruses are spread mainly by plants for planting

Long distance spread of the viruses infecting *Prunus* categorised here is mainly due to human activities (e.g. movement of plant for planting). Some of these viruses have also natural spread mediated by vectors that are mainly involved in short distance movement of the pests.

3.4.4.1. Vectors and their distribution in the EU (if applicable)

No vectors are known for many of the viruses categorised here (Table 4). For some of them (APLPV, APV-1, APV-2, APV-3, CVB, MuVA, PeCMV, PrVT), the existence of vectors is not known and the biology of related agents would suggest the absence of potential vectors. In the case of ASSVd, AVCaV, CPrV, CRMaV, CTLaV, NSPaV, NeVM, PEV, PLPaV, PeVD, PrGVA, PrVF, based on the biology of related viruses or on transmission between experimental hosts (i.e. for ASSVd), the existence of vector (s) appears possible, but has not been proven (Table 4).

For CMLV and PcMV, the identified vectors are the eriophyid mites *E. inaequalis* and *E. insidiosus,* respectively. *E. inaequalis* has been reported in Canada and USA (Oldfield and Proeseler, 1996). *E. insidiosus* is known to occur in USA, Mexico (Oldfield and Proeseler, 1996), China (Hong and Zhang, 1996), Chile (Gonzalez, 1985) and Morocco (El-Jaouani, 1988). In the case of CRLV, CRV, PRMV, TRSV and ToRSV nematode transmission has been demonstrated.

Nematode species *Longidorus diadecturus* (Figure 1), *X. americanum* sensu stricto, *Xiphinema americanum* sensu lato (i.e. *X. bricolense*, *X. californicum*, *X. inaequale, X. tarjanense*) transmitting TRSV, ToRSV and/or PRMV have not been recorded in the EU. One (*X. intermedium*) has been reported in Portugal (https://fauna-eu.org/; de Jong et al., 2014), but without any reference to a specific publication. *X. rivesi* has been reported in six EU MSs [France, Germany, Italy, Portugal, Slovenia, Spain, Figure 3 (EFSA PLH Panel, 2018b)]. Although under experimental conditions the ability of EU populations of *X. rivesi* to transmit ToRSV and TRSV has been demonstrated, they have never been associated with the spread of the corresponding viral diseases under field conditions in the EU (EFSA PLH Panel, 2018b). *L. elongatus*, which can be a vector of PRMV, is widespread in Europe (Figure 4). *L. arthensis* has been reported in Switzerland (https://fauna-eu.org/; de Jong et al., 2014).

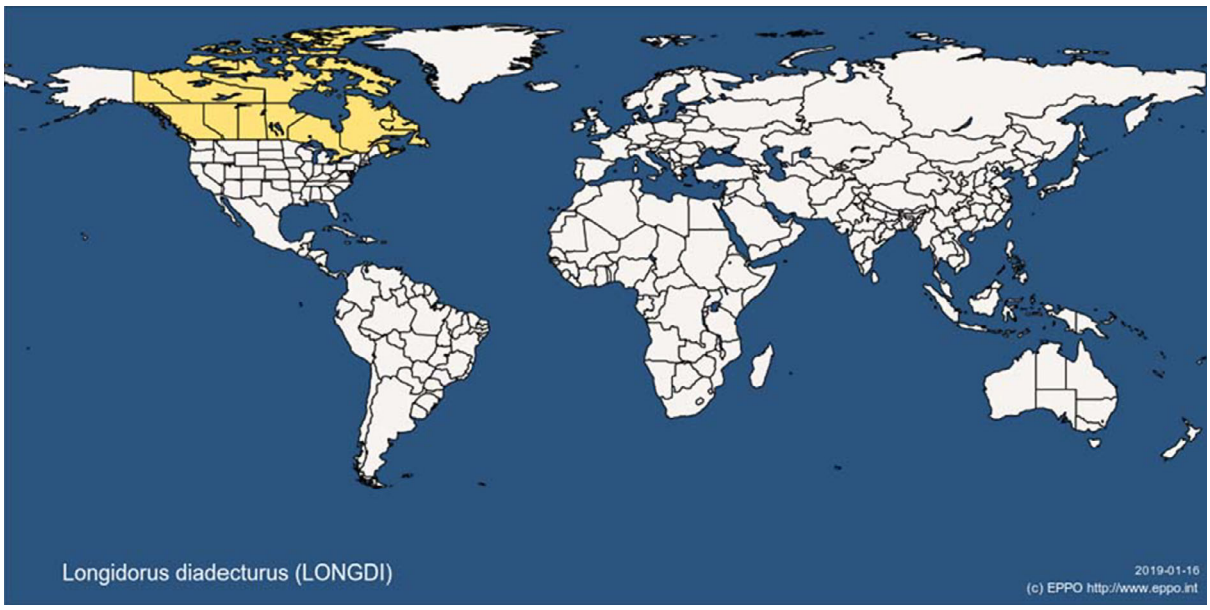

Figure 1: Global distribution map for *Longidorus diadecturus* (extracted from the EPPO Global Database accessed on 16 January 2019)

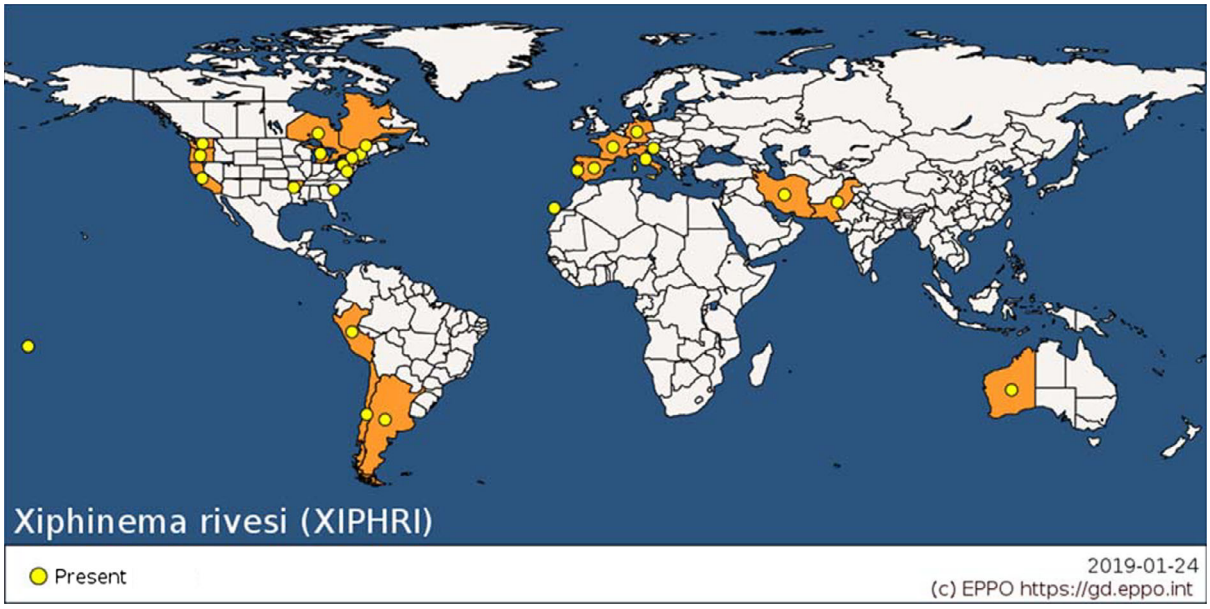

Figure 2: Global distribution map for *Xiphinema rivesi* (extracted from the EPPO Global Database accessed on 24 January 2019)

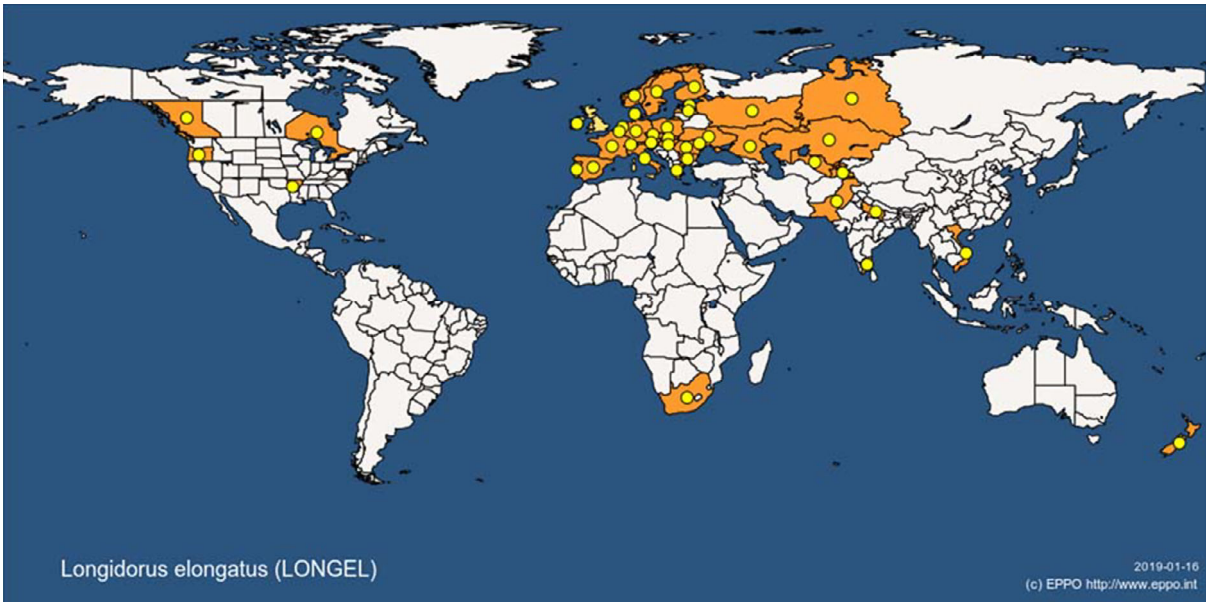

Figure 3: Global distribution map for *Longidorus elongatus* (extracted from the EPPO Global Database accessed on 16 January 2019)

3.5. Impacts

Would the pests' introduction have an economic or environmental impact on the EU territory?

Yes, for ASSVd, APLPV, CMLV, CRLV, CRV, CRMaV, CTLaV, PEV, PcMV, PRMV, TRSV and ToRSV, which may induce severe disease in economically relevant crops.

No, for PrGVA, since it has not been associated clearly with symptoms in *Prunus* or other hosts.

For AVCaV, APV-1, APV-2, APV-3, CPrV, CVB, MuVA, NSPaV, NeVM, PeCMV, PLPaV, PeVD, PrVF and PrVT, because of lack of conclusive data, the Panel was **unable to come to a conclusion** on their association with symptoms.

RNQPs: Does the presence of the pest on plants for planting have an economic impact, as regards the intended use of those plants for planting?[4]

Yes, for ASSVd, APLPV, CMLV, CRLV, CRV, CRMaV, CTLaV, PEV, PcMV, PRMV, TRSV and ToRSV. Given the severity of the symptoms they may cause in *Prunus* their presence in plants for planting would severely impact their intended use. In addition, some of these agents may also have an impact on plants for planting of other hosts.

No, for PrGVA. In the absence of a clear link to a symptomatology, PrGVA is not expected to impact the intended use of *Prunus* plants for planting, except possibly under some specific situations (susceptibility of specific cultivars, mixed infections).

For AVCaV, APV-1, APV-2, APV-3, CPrV, CVB, MuVA, NSPaV, NeVM, PeCMV, PLPaV, PeVD, PrVF and PrVT the Panel was **unable to come to a conclusion** because of lack of conclusive data on the association with symptoms

Mixed infection by several viruses is quite common in *Prunus,* making a straightforward association between a putative causal agent and a symptomatology extremely difficult. This situation may generate uncertainty on the specific role of a particular virus in the elicitation of certain diseases. However, the close association of an infectious agent with a specific symptomatology allows considering it as a harmful organism.

Many viruses categorised here (ASSVd, APLPV, CMLV, CRLV, CRV, CRMaV, CTLaV, PEV, PcMV, PRMV, TRSV and ToRSV) cause symptoms in *Prunus*, thus impacting fruit yield and/or quality. Some of them may also infect and cause severe diseases in other hosts (ASSVd, CRLV, PRMV, TRSV, ToRSV) (Table 14).

[4] See Section 2.1 on what falls outside EFSA's remit.

In many case, the link between some of the other categorised agents and symptoms is at best tenuous. This is mostly true for recently discovered agents for which very little information is available. In addition, uncertainties may exist on this aspect because for most of these viruses the susceptibility has not been tested on a range of cultivars of each host species nor has the potential for detrimental synergistic interactions with other viral agents been investigated.

Table 14: Expected impact in the EU territory of the categorised viruses

VIRUS/VIROID name	Would the pests' introduction have an economic or environmental impact on the EU territory?	Reasoning and uncertainties with relevant references	RNQPs: Does the presence of the pest on plants for planting have an economic impact, as regards the intended use of those plants for planting?
Apple scar skin viroid (ASSVd)	Yes	ASSVd has been reported to naturally infect peach, apricot, sweet cherry and Himalayan wild cherry, without causing any disease in these hosts (Hadidi et al., 2017). In apple, depending on the sequence variant and/or the apple cultivar, ASSVd causes scar skin or dapple apple diseases, with consequent severe economic losses. In pear cv. Niitaka and Yoshimo, ASSVd symptoms consist of dimple fruit disorder (Japanese pear fruit disease), but in most pear cvs. ASSVd is commonly symptomless. Thus, latently infected pome and stone fruit trees could represent a source of inoculum for susceptible apple trees. Other fruit disorders (pear rusty skin, pear fruit crinkle diseases, scarred, cracked or russeted pear fruits) have been associated with ASSVd, but conclusive proofs of the viroid involvement are lacking (Di Serio et al., 2018)	Yes
American plum line pattern virus (APLPV)	Yes	Symptoms on peach leaves consist of fine, pale green, irregular bands or confluent ringspots, vein banding, oak-leaf or golden net patterns, which usually disappear in summer. Oak-leaf together with yellow or white patterns are also found in sweet cherry and *P. serrulata* infections. Leaf borders show as chlorotic. Infected Japanese plum trees infection starts with chlorotic rings, then oak-leaf and yellow vein banding appear. On this host, symptoms are maintained in summer, but new leaves are symptomless. In addition, APLPV could have a synergistic effect with other viruses (Myrta et al., 2011)	Yes
Apricot vein clearing-associated virus (AVCaV)	Unable to conclude because of lack of information	The virus was detected in apricot plants showing vein clearing symptoms. However, the association of AVCaV with this symptomatology is not straightforward, since it has been found to occur in mixed infections with plum bark necrosis stem pitting-associated virus (PBNSPaV) (Elbeaino et al., 2014)	Unable to conclude because of lack of information
Asian prunus virus 1 (APV-1)	Unable to conclude because of lack of information	Little and conflicting information is available for all Asian prunus viruses (APV-1, APV-2, APV-3), both on symptomatology and impact. These viruses have been found in mixed infections with other viruses, making it difficult to evaluate their association, if any, with specific symptoms (Candresse et al., 2011)	Unable to conclude because of lack of information

VIRUS/VIROID name	Would the pests' introduction have an economic or environmental impact on the EU territory?	Reasoning and uncertainties with relevant references	RNQPs: Does the presence of the pest on plants for planting have an economic impact, as regards the intended use of those plants for planting?
Asian prunus virus 2 (APV-2)	Unable to conclude because of lack of information	Little and conflicting information is available for all Asian prunus viruses (APV-1, APV-2, APV-3), both on symptomatology and impact. These viruses have been found in mixed infections with other viruses, making it difficult to evaluate their association, if any, with specific symptoms (Candresse et al., 2011)	Unable to conclude because of lack of information
Asian prunus virus 3 (APV-3)	Unable to conclude because of lack of information	Little and conflicting information is available for all Asian prunus viruses (APV-1, APV-2, APV-3), both on symptomatology and impact. These viruses have been found in mixed infections with other viruses, making it difficult to evaluate their association, if any, with specific symptoms (Candresse et al., 2011)	Unable to conclude because of lack of information
Caucasus prunus virus (CPrV)	Unable to conclude because of lack of information	Virus was recently described by HTS. The association of the virus with chlorotic spots symptoms along the veins and reddening of young leaves has not been demonstrated. The virus has a very limited spread (Marais et al., 2015b)	Unable to conclude because of lack of information
Cherry mottle leaf virus (CMLV)	Yes	Symptoms consist of leaf chlorotic mottling and distortion, on stunted trees. Cherry leaf mottle disease induced by CMLV on cherry, peach and apricot, can be very severe on some cherry cultivars, affecting fruit quality and quantity. Fruits can be small, with no flavour, and ripening is often delayed (James, 2011a)	Yes
Cherry rasp leaf virus (CRLV)	Yes	In infected peach and cherry trees, CRLV symptoms consist of leaf enations, deformed leaves with depressions, reduction of fruit production and death of spurs and branches associated with stunting and decline in the most susceptible plants. In addition, in cherry, shortened internodes, fruit deformation and increased sensitivity to frost have been reported (James, 2011b). Symptoms on *Malus* spp. are severe fruit deformation and reduction of the tree vigour and longevity (James, 2011b). There are uncertainties on the efficiency of vector-mediated spread and overall impact under European condition (James, 2011b)	Yes
Cherry rosette virus (CRV)	Yes	Infected cherry trees have stunted shoots with apical rosettes of leaves, which are deformed and exhibit enations and chlorotic spots (Martelli and Uyemoto, 2011). CRV-infected trees may also die	Yes
Cherry rusty mottle associated virus (CRMaV)	Yes	The symptomatology associated with the virus on different *P. avium* cultivars consists of yellow mottle on leaves, with a bronze overtone (Villamor and Eastwell, 2013). Symptoms of leaf mottling, vein clearing and line patterns on suckers growing from a *P. avium* rootstock were described, whereas the *P. serrulata* scion was symptomless (Poudel and	Yes

VIRUS/VIROID name	Would the pests' introduction have an economic or environmental impact on the EU territory?	Reasoning and uncertainties with relevant references	RNQPs: Does the presence of the pest on plants for planting have an economic impact, as regards the intended use of those plants for planting?
		Scott, 2017). Despite the frequent presence of multiple infectious agents in naturally infected trees, a correlation seems established between the presence of CRMaV and rusty mottle disease symptoms (Villamor et al., 2015)	
Cherry twisted leaf-associated virus (CTLaV)	Yes	The typical symptom consists in banding of the midrib of the leaves, causing the twisting of the leaf, leaf-distortion and curling. Shorter internodes, stunting and fruit abnormalities are also associated with the virus infections. Symptoms depend on the virus isolate and are more severe on older plants (Villamor and Eastwell, 2013). Despite the frequent presence of multiple infectious agents in naturally infected trees, a correlation seems established between the presence of CTLaV and cherry twisted leaf or apricot ringpox diseases symptoms (Villamor et al., 2015)	Yes
Cherry virus B (CVB)	Unable to conclude because of lack of information	The little information available (no published data about symptom association and mixed infections in virus source) does not allow to draw any firm conclusion about potential impact	Unable to conclude because of lack of information
Mume virus A (MuVA)	Unable to conclude because of lack of information	Virus was recently described by HTS from one plant showing diffuse chlorotic spots on leaves (Marais et al., 2018). The virus is graft-transmissible, but grafted indicator peach plants were symptomless. Because of mixed infection, the association of the original symptoms with the virus is uncertain	Unable to conclude because of lack of information
Nectarine stem pitting-associated virus (NSPaV)	Unable to conclude because of lack of information	The virus was initially detected in plants showing stunting and stem pitting (Bag et al., 2015). Further studies established the presence of the virus in both symptomatic and symptomless plants (Villamor et al., 2016) often in co-infection with NeVM or with other viruses. Currently it is not possible to separate between several hypothesis linking symptoms to varietal susceptibility to NSPaV, to mixed infections involving NSPaV or, alternatively, to other viruses	Unable to conclude because of lack of information
Nectarine virus M (NeVM)	Unable to conclude because of lack of information	Only limited information is available. Stem pitting symptoms have been observed in some infected trees but other ones were symptomless (Villamor et al., 2016). Currently it is not possible to separate between several hypothesis linking symptoms to varietal susceptibility to NSPaV, to mixed infections involving NSPaV or, alternatively, to other viruses.	Unable to conclude because of lack of information
Peach chlorotic mottle virus (PeCMV)	Unable to conclude because of lack of information	Only reported from *Prunus* material in mixed infection so that it is not possible to conclude on association of PeCMV and symptoms	Unable to conclude because of lack of information

VIRUS/VIROID name	Would the pests' introduction have an economic or environmental impact on the EU territory?	Reasoning and uncertainties with relevant references	RNQPs: Does the presence of the pest on plants for planting have an economic impact, as regards the intended use of those plants for planting?
Peach enation nepovirus (PEV)	Yes	Symptoms reported on peach (enations on undersurface and veinal disorder on upper lamina) could be reproduced by back inoculation after isolation on herbaceous host (Kishi et al., 1973)	Yes
Peach leaf pitting-associated virus (PLPaV)	Unable to conclude because of lack of information	Smaller and cracked fruits are observed. Additional symptoms may be leaf pitting, chlorosis, calico along leaf veins, or dark violet colour of petioles, veins or edges (He et al., 2017). However, the original infected peach source showed a coinfection with two known viroids (HSVd and PLMVd) and two known viruses (ACLSV and PBNSPaV) so that it is not possible to draw firm conclusion on an association between PLPaV and the symptoms	Unable to conclude because of lack of information
Peach mosaic virus (PcMV)	Yes	The symptomatology depends on the virus strain, the infected host and the co-infection with other viruses. Main symptoms on peach and nectarine are: blossom colour-breaking, delayed foliation and harvest, leaf and fruit deformation. Symptoms on fruit are more severe in yellow-fleshed cultivars, such that they are unmarketable because of reduced size and abnormal shape. Japanese and European plums display leaf symptoms only. Also apricot production is lower (Larsen and James, 2011)	Yes
Peach rosette mosaic virus (PRMV)	Yes	PRMV induces delayed bud break, leaf mosaic, rosettes on stunted shoots in peach (Martelli and Uyemoto, 2011). In *P. domestica* virus infection causes leaf deformation, such as strap-shaped to dwarf-thickened leaves; in *P. salicina* x *P. simonii* symptoms are small leaves and shoot rosette (Martelli and Uyemoto, 2011). In *Vitis*, the virus causes a decline disease and delayed bud burst, leaf malformation and mottling, poor fruit set and plant death in cv. Concord. Berry taste is also affected (Mannini and Digiaro, 2017) Symptoms on *Vaccinium corymbosum* are mainly on the leaves, which are strap-like (Ramsdell and Gillet, 1998)	Yes
Peach virus D (PeVD)	Unable to conclude because of lack of information	Virus was recently described by HTS from a plant showing symptoms of leaf yellowing and mottling. However, the possible association of the virus with the symptoms has not been further investigated (Igori et al., 2017)	Unable to conclude because of lack of information
Prunus geminivirus A (PrGVA)	No	Virus was recently described by HTS from one symptomless plum (*P. domestica*) variety, named FT7, grafted onto Marianna 2624 rootstock (Al Rwahnih et al., 2018). No symptoms were observed after graft-transmission in several *Prunus* species and cultivars. The virus was quite widespread in plum, apricot and cherry trees in the NCGR collection without causing any visible symptom (Al Rwahnih et al., 2018)	No

VIRUS/VIROID name	Would the pests' introduction have an economic or environmental impact on the EU territory?	Reasoning and uncertainties with relevant references	RNQPs: Does the presence of the pest on plants for planting have an economic impact, as regards the intended use of those plants for planting?
Prunus virus F (PrVF)	Unable to conclude because of lack of information	The virus may be part of sweet cherry decline complex, but little or no information are available on its symptomatology, pathogenicity or impact (Safarova et al., 2017; Villamor et al., 2017)	Unable to conclude because of lack of information
Prunus virus T (PrVT)	Unable to conclude because of lack of information	No clear association with symptoms due to the identification of the virus in plants infected also by other viruses (Marais et al., 2015a)	Unable to conclude because of lack of information
Tobacco ringspot virus (TRSV)	Yes	TRSV induced foliar symptoms (chlorotic spots, rings or areas surrounded by necrotic tissues) in infected stone fruit trees, together with lower fruit quality (Martelli and Uyemoto, 2011). TRSV causes significant disease in soybeans (*Glycine max*), tobacco (*Nicotiana tabacum*), *Vaccinium* spp., especially *V. corymbosum*, and *Cucurbitaceae*. Infected grapevine develop symptoms of decline with shortened internodes, small and distorted leaves (Rowhani et al., 2017) and decreased berry yield (EPPO, 2001). No uncertainty on the impact on the individual plant, however there are uncertainties on the efficiency of vector-mediated spread and overall impact under European condition	Yes
Tomato ringspot virus (ToRSV)	Yes	ToRSV symptoms in stone fruit trees consist of stem pitting and decline (in peach and cherry), yellow bud mosaic (in peach and almond), brown line and decline (in plum). Symptoms often depend also on the virus strain and may cause plant death (Martelli and Uyemoto, 2011). ToRSV infecting grapevine induces stunted shoot growth, shortened internodes, leaf ringspot and mottling, reduced size of fruit clusters and abortion of many berries (Yang et al., 1986) as well as thickened, spongy phloem tissue with numerous necrotic pits. In *Malus,* ToRSV causes union necrosis, woody pitting and decline, with tree mortality of 90% and 40% for Red delicious and Spartan varieties, respectively (Sanfaçon and Fuchs, 2011). ToRSV is one of the most economically important virus diseases of red raspberry in North America (Stace-Smith and Converse, 1987), with some cultivars showing decline in vigour, stunting and significant fruit yield and quality reduction. Infected *Rubus* plants often die 4 to 5 years after infection (Pinkerton et al., 2008). No uncertainty on the impact on the individual plant, however there are uncertainties on the efficiency of vector-mediated spread and overall impact under European condition	Yes

HTS: high-throughput screening.

3.6. Availability and limits of mitigation measures

Are there measures available to prevent the entry into, establishment within or spread of the pest within the EU such that the risk becomes mitigated?

Yes, measures are already in place (see Section 3.3) and additional measures could be implemented to further regulate the identified pathways or to limit entry, establishment, spread or impact

RNQPs: Are there measures available to prevent pest presence on plants for planting such that the risk becomes mitigated?

Yes, certification and testing to exclude infection by some of the viruses here categorised is already requested. Extension of these measures to the viruses not yet covered by certification may help mitigate the risks associated with infection of plants for plantings

3.6.1. Identification of additional measures

Phytosanitary measures are currently applied to *Prunus* (see Section 3.3). Potential additional measures to mitigate the risk of entry of the viruses and viroids categorised here may include:

- extension of phytosanitary measures to specifically include hosts other than *Prunus*,
- banning import of plants for planting (including pollen) of hosts (e.g. *Prunus, Malus, Pyrus, Cydonia*) that can be imported from some non-EU countries where some viruses (TRSV, ToRSV, PRMV) are reported to be present,
- extension of certification schemes and testing requirements to all natural hosts,
- extension of phytosanitary certificate to specifically include hosts other than *Prunus*,

Some of the viruses may also enter into the EU through viruliferous nematodes or arthropods. In agreement with a recent EFSA scientific opinion (EFSA PLH Panel et al., 2018b) an additional measure could be the regulation of soil and growing media attached to imported plants. Additional measures against arthropods may include mechanical, physical or chemical treatments of consignments identified as potential entry pathways.

3.6.1.1. Additional control measures

Additional control measures in Table 15 were selected from a longer list of possible control measures reported in EFSA PLH Panel (2018a). Additional control measures are organisational measures or procedures that directly affect pest abundance.

Table 15: Selected additional control measures to consider to reduce the likelihood of pest entry, establishment and/or spread of the categorised viruses

Information sheet title (with hyperlink to information sheet if available)	Control measure summary	Risk component (entry/ establishment/ spread/impact)	Agent(s)
Growing plants in isolation	Description of possible exclusion conditions that could be implemented to isolate the crop from pests and if applicable relevant vectors. E.g. a dedicated structure such as glass or plastic greenhouses In the case of viruses categorised here, insect-proof greenhouses may isolate plants for planting from vectors. Isolation from natural soil may prevent infestation by viruliferous nematodes	Spread	CMLV, CTLaV, PcMV and possibly ASSVd, APLPV, AVCaV, CRMaV, NSPaV, NeVM, PLPaV, PeVD, PrGVA, PrVF (insect-proof greenhouses); CRLV, CRV, PRMV, TRSV, ToRSV and possibly PEV (isolation from soil)

Information sheet title (with hyperlink to information sheet if available)	Control measure summary	Risk component (entry/ establishment/ spread/impact)	Agent(s)
Chemical treatments on consignments or during processing	Use of chemical compounds that may be applied to plants or to plant products after harvest, during process or packaging operations and storage. The treatments addressed in this information sheet are: a) fumigation; b) spraying/dipping pesticides; c) surface disinfectants; d) process additives; e) protective compounds The points b) and c) could apply to remove viruliferous arthropods that may transmit some of the viruses categorised here	Entry	CMLV, CTLaV, PcMV and possibly ASSVd, APLPV, AVCaV, CRMaV, NSPaV, NeVM, PLPaV, PeVD, PrGVA, PrVF
Cleaning and disinfection of facilities, tools and machinery	The physical and chemical cleaning and disinfection of facilities, tools, machinery, transport means, facilities and other accessories (e.g. boxes, pots, pallets, palox, supports, hand tools). The measures addressed in this information sheet are washing, sweeping and fumigation These measures may remove viruliferous nematodes and arthropods	Spread	CMLV, CTLaV, PcMV, CRLV, CRV, PRMV, TRSV, ToRSV and possibly ASSVd, APLPV, AVCaV, CRMaV, NSPaV, NeVM, PLPaV, PeVD, PrGVA, PrVF, PEV
Physical treatments on consignments or during processing	This information sheet deals with the following categories of physical treatments: irradiation/ionisation; mechanical cleaning (brushing, washing); sorting and grading, and; removal of plant parts (e.g. debarking wood). This information sheet does not address heat and cold treatment (information sheet 1.14); roguing and pruning (information sheet 1.12) Mechanical cleaning and removal of plant parts (e.g. leaves from fruit consignments may remove viruliferous insects	Entry	CMLV, CTLaV, PcMV and possibly ASSVd, APLPV, AVCaV, CRMaV, NSPaV, NeVM, PLPaV, PeVD, PrGVA, PrVF
Roguing and pruning	Removal of infested plants is extremely efficient for all categorised viruses, especially for those not transmitted by vectors. Identification of infected plants in the field may be difficult when exclusively based on visual inspection. Pruning is not effective to remove viruses from infected plants Removal of infested plants is extremely efficient for all categorised viruses, especially for those not transmitted by vectors. Identification of infected plants in the field may be difficult when exclusively based on visual inspection. Pruning is not effective to remove viruses from infected plants	Establishment and Spread	All viruses categorised here
Heat and cold treatments	Controlled temperature treatments aimed to kill or inactivate pests without causing any unacceptable prejudice to the treated material itself. The measures addressed in this information sheet are: autoclaving; steam; hot water; hot air; cold treatment Hot water treatments to remove viruliferous arthropods	Entry	CMLV, CTLaV, PcMV and possibly ASSVd, APLPV, AVCaV, CRMaV, NSPaV, NeVM, PLPaV, PeVD, PrGVA, PrVF

Information sheet title (with hyperlink to information sheet if available)	Control measure summary	Risk component (entry/ establishment/ spread/impact)	Agent(s)
Chemical treatments on crops including reproductive material	Chemical treatments on crops may prevent infestations by viruliferous arthropods	Spread	CMLV, CTLaV, PcMV and possibly ASSVd, APLPV, AVCaV, CRMaV, NSPaV, NeVM, PLPaV, PeVD, PrGVA, PrVF
Post-entry quarantine and other restrictions of movement in the importing country	This information sheet covers post-entry quarantine of relevant commodities; temporal, spatial and end-use restrictions in the importing country for import of relevant commodities; Prohibition of import of relevant commodities into the domestic country Relevant commodities are plants, plant parts and other materials that may carry pests, either as infection, infestation or contamination Identifying virus-infected plants limits the risks of entry, establishment and spread in the EU	Entry, Establishment and Spread	All viruses categorised here

3.6.1.2. Additional supporting measures

Potential supporting measures are listed in Table 16. They were selected from a list of possible control measures reported in EFSA PLH Panel (2018a). Supporting measures are organisational measures or procedures supporting the choice of appropriate risk reduction options that do not directly affect pest abundance.

Table 16: Selected additional supporting measures to consider to reduce the likelihood of pest entry, and/or spread of the categorised viruses

Information sheet title (with hyperlink to information sheet if available)	Supporting measure summary	Risk component (entry/ establishment/ spread/impact)	Agent(s)
Laboratory testing	Examination, other than visual, to determine if pests are present using official diagnostic protocols. Diagnostic protocols describe the minimum requirements for reliable diagnosis of regulated pests Laboratory testing may identify viruses independently of the presence of symptoms in the host, even if for some agents proven or official diagnostic protocols are currently not available	Entry and Spread	All viruses categorised here
Certified and approved premises	Mandatory/voluntary certification/approval of premises is a process including a set of procedures and of actions implemented by producers, conditioners and traders contributing to ensure the phytosanitary compliance of consignments. It can be a part of a larger system maintained by a National Plant Protection Organization in order to guarantee the fulfilment of plant health requirements of plants and plant products intended for trade. A key property of certified or approved premises is the traceability of activities and tasks (and their components) inherent in the pursued phytosanitary objective. Traceability aims to provide access to any and	Entry and Spread	All viruses categorised here

Information sheet title (with hyperlink to information sheet if available)	Supporting measure summary	Risk component (entry/ establishment/ spread/impact)	Agent(s)
	all information that may help to prove the compliance of consignments with the phytosanitary requirements of importing countries Certified and approved premises may guarantee the absence of the harmful viruses from *Prunus* imported for research and/or breeding purposes, and from *Cydonia*, *Malus*, *Pyrus* imported as dormant plants for planting from countries allowed to export them into EU MSs		
Delimitation of Buffer zones	ISPM 5 defines a buffer zone as 'an area surrounding or adjacent to an area officially delimited for phytosanitary purposes in order to minimise the probability of spread of the target pest into or out of the delimited area, and subject to phytosanitary or other control measures, if appropriate' (ISPM 5). The objectives for delimiting a buffer zone can be to prevent spread from the outbreak area and to maintain a pest free production place, site or area A buffer zone may contribute to reduce the spread of non-EU viruses of *Prunus* after entry into the EU	Spread	Only for viruses with efficient spread mechanism besides plants for planting (e.g. viruses vectored y nematodes and insects)
Phytosanitary certificate and plant passport	An official paper document or its official electronic equivalent, consistent with the model certificates of the IPPC, attesting that a consignment meets phytosanitary import requirements (ISPM 5) a) export certificate (import into the EU) b) plant passport (EU internal trade)	Entry and Spread	All viruses categorised here
Certification of reproductive material (voluntary/ official)	Certification of reproductive material, when not already implemented, would contribute to reduce the risks associated with entry or spread	Entry and Spread	All viruses categorised here
Surveillance	Official surveillance may contribute to early detection of the viruses categorised here, enabling immediate adoption of control measures if the agents are found to have became established	Spread	All viruses categorised here

3.6.1.3. Biological or technical factors limiting the feasibility and effectiveness of measures to prevent the entry, establishment and spread of the pest

- Explicitly list in the legislation the viruses that are only mentioned under the general term of '*Non-European viruses*';
- Latent infection status for some viruses (PrGVA) and uncertain association with symptoms for others (AVCaV, APV-1, APV-2, APV-3, CPrV, CVB, MuVA, NSPaV, NeVM, PeCMV, PLPaV, PeVD, PrVF, PrVT);
- Asymptomatic phase of virus infection renders visual detection unreliable;
- Low concentration and uneven distribution in the woody hosts impairs reliable detection;
- Absence of proven detection protocol for newly described agents;
- Wide host range for some agents (ASSVd, CRLV, PRMV, TRSV, ToRSV);
- Difficulties to control vectors for soil-borne viruses (CRLV, PRMV, TRSV, ToRSV);
- Lack of information on potential vector(s) for some agents;
- Difficulties to control pollen-mediated transmission for some agents (CRLV, PRMV, TRSV, ToRSV).

3.7. Uncertainty

In the present opinion, viruses for which very different levels of information are available have been analyzed in parallel, including recently described agents for which very limited information is available. The main areas of uncertainty affecting the present categorisation concern:

- biological information on the categorised viruses, especially those described recently based on HTS data;
- distribution, both in the EU and outside the EU, of the viruses, in particular but not only for the recently described ones;
- volume of imported plants for planting, seeds and pollen of hosts;
- interpretation of the legislation;
- pathogenicity of some agents and, for others, the extent to which they would efficiently spread and have impact under conditions prevailing in the EU;
- reliability of available detection methods, which is mainly due to (i) the absence of information on the intraspecific variability of several agents (especially those recently reported) and (ii) the lack of proven detection protocols for a range of viruses.

For each virus, the specific uncertainties identified during the categorisation process are reported in the conclusion tables below.

4. Conclusions

The Panel's conclusions on Pest categorisation of non-EU viruses and viroids of *Prunus* are as follows:

ASSVd, APLPV, CMLV, CRLV, CRV, CRMaV, CTLaV, PEV, PcMV, PRMV, TRSV, ToRSV meet all the criteria evaluated by EFSA to qualify as potential Union quarantine pests. PrGVA does not meet the criterion of having negative impact in the EU and therefore it does not meet all the criteria evaluated by EFSA to qualify as potential Union quarantine pest.

For AVCaV, APV-1, APV-2, APV-3, CPrV, CVB, MuVA, NSPaV, NeVM, PeCMV, PLPaV, PeVD, PrVF, PrVT, the Panel was unable to conclude on the potential consequences in the EU territory. However all these agents meet all the other criteria evaluated by EFSA to qualify as Union quarantine pests.

All the viruses categorised in the current opinion do not meet the criteria evaluated by EFSA to qualify as potential RNQPs because they are non-EU viruses explicitly mentioned or considered as regulated in Annex IAI of Directive 2000/29/EC. The Panel wishes to stress that these conclusions are associated with particularly high uncertainty in the case of viruses discovered only recently and for which the information on distribution, biology and epidemiology are extremely scarce. As a consequence, the categorisation presented here for particular viruses could significantly change with the development of novel information.

The Panel conclusions are summarised in Table 17 and reported in detail in Tables 18.1–18.10. Viruses belonging to the same family/genus and with similar evaluation were grouped as follows:

– Table 18.3 groups the betaflexiviruses of the genera *Prunevirus, Foveavirus, Capillovirus* and *Tepovirus* for which the Panel was unable to conclude on their impact (AVCaV, APV-1, APV-2, APV-3, CPrV, CVB, MuVA, PeCMV, PrVT).
– Table 18.4 groups the betaflexiviruses of the genera *Trichovirus* and *Robigovirus* (CMLV, CRMaV, CTLaV, PcMV) for which the Panel concluded that their introduction and spread is expected to have an impact in the EU.
– Table 18.5 groups nepoviruses (family *Secoviridae*, CRLV, CRV, PRMV, TRSV, ToRSV) with known nematode vectors and for which the Panel concluded on their expected impact.
– Table 18.7 groups marafiviruses (family *Tymoviridae*, NeVM, PeVD) for which the Panel was unable to conclude on expected impact.
– Table 18.9 groups fabaviruses (family *Secoviridae*, PLPaV, PrVF) for which the Panel was unable to conclude on expected impact.

Table 17: Summary table of Panel's conclusions on pest categorisation of non-EU viruses and viroids of *Prunus*

VIRUS/VIROID name	All the criteria evaluated to qualify as potential Union quarantine pest are met	Panel unable to conclude on impact, all the other criteria to qualify as potential Union quarantine pest are met	Criteria evaluated to qualify as potential Union regulated non-quarantine pest	Conclusion table nr
Apple scar skin viroid (ASSVd)	**Yes**		No	18.1
American plum line pattern virus (APLPV)	**Yes**		No	18.2
Apricot vein clearing-associated virus (AVCaV)		**Yes**	No	18.3
Asian prunus virus 1 (APV-1)		**Yes**	No	18.3
Asian prunus virus 2 (APV-2)		**Yes**	No	18.3
Asian prunus virus 3 (APV-3)		**Yes**	No	18.3
Caucasus prunus virus (CPrV)		**Yes**	No	18.3
Cherry mottle leaf virus (CMLV)	**Yes**		No	18.4
Cherry rasp leaf virus (CRLV)	**Yes**		No	18.5
Cherry rosette virus (CRV)	**Yes**		No	18.5
Cherry rusty mottle-associated virus (CRMaV)	**Yes**		No	18.4
Cherry twisted leaf associated virus (CTLaV)	**Yes**		No	18.4
Cherry virus B (CVB)		**Yes**	No	18.3
Mume virus A (MuVA)		**Yes**	No	18.3
Nectarine stem pitting-associated virus (NSPaV)		**Yes**	No	18.6
Nectarine virus M (NeVM)		**Yes**	No	18.7
Peach chlorotic mottle virus (PeCMV)		**Yes**	No	18.3
Peach enation nepovirus (PEV)	**Yes**		No	18.8
Peach leaf pitting-associated virus (PLPaV)		**Yes**	No	18.9
Peach mosaic virus (PcMV)	**Yes**		No	18.4
Peach rosette mosaic virus (PRMV)	**Yes**		No	18.5
Peach virus D (PeVD)		**Yes**	No	18.7
Prunus geminivirus A (PrGVA)			No	18.10
Prunus virus F (PrVF)		**Yes**	No	18.9
Prunus virus T (PrVT)		**Yes**	No	18.3
Tobacco ringspot virus (TRSV)	**Yes**		No	18.5
Tomato ringspot virus (ToRSV)	**Yes**		No	18.5

Table 18: The Panel's conclusions on the pest categorisation criteria defined in Regulation (EU) 2016/2031 on protective measures against pests of plants (the number of the relevant sections of the pest categorisation is shown in brackets in the first column)

Table 18.1: APPLE SCAR SKIN VIROID (ASSVd)

Criterion of pest categorisation	Panel's conclusions against criterion in Regulation (EU) 2016/2031 regarding Union quarantine pest	Panel's conclusions against criterion in Regulation (EU) 2016/2031 regarding Union regulated non-quarantine pest	Key uncertainties
Identity of the pest (Section 3.1)	The identity of ASSVd is established and diagnostic techniques are available	The identity of ASSVd is established and diagnostic techniques are available	No uncertainty
Absence/presence of the pest in the EU territory (Section 3.2)	ASSVd has been reported from several MSs (Greece, UK, Italy, Poland, Denmark, France) but, with the possible exception of Greece, its presence is restricted and/or under eradication	ASSVd has been reported from several MSs (Greece, UK, Italy, Poland, Denmark, France) but, with the possible exception of Greece, its presence is restricted and/or under eradication	More widespread and unreported presence in the EU
Regulatory status (Section 3.3)	ASSVd can be considered as regulated in Annex IAI as 'Non-European viruses and virus-like organisms of *Cydonia* Mill., *Fragaria* L., *Malus* Mill., *Prunus* L., *Pyrus* L., *Ribes* L., *Rubus* L. and *Vitis* L.'	ASSVd can be considered as regulated in Annex IAI as 'Non-European viruses and virus-like organisms of *Cydonia* Mill., *Fragaria* L., *Malus* Mill., *Prunus* L., *Pyrus* L., *Ribes* L., *Rubus* L. and *Vitis* L'	ASSVd not explicitly mentioned in Directive 2000/29/EC
Pest potential for entry, establishment and spread in the EU territory (Section 3.4)	ASSVd is able to enter in the EU. The main pathway plants for planting of *Malus*, *Pyrus* and *Prunus* spp. is only partially regulated by existing legislation. The seed pathway is also open for the same host genera. If ASSVd were to enter the EU territory, it could become established and spread	Plants for planting constitute the main means of spread for ASSVd	- Geographic distribution - Existence and relevance of vectors - Seed transmission - Existence of other natural hosts
Potential for consequences in the EU territory (Section 3.5)	Introduction and spread of ASSVd would have a negative impact on the EU *Prunus* industry	The presence of ASSVd on plants for planting of stone fruits would have a negative impact on their intended use	Magnitude of the impact of under EU conditions
Available measures (Section 3.6)	Phytosanitary measures are available to reduce the likelihood of entry and spread in the EU	Certification of planting materials of susceptible hosts is, by far, the most efficient control method	No uncertainty
Conclusion on pest categorisation (Section 4)	ASSVd meets all the criteria evaluated by EFSA to qualify as a potential Union quarantine pest	ASSVd is a non-EU viroid (considered as regulated in Annex IAI of Directive 2000/29/EC as 'Non-European viruses and virus-like organisms of *Cydonia* Mill., *Fragaria* L., *Malus* Mill., *Prunus* L., *Pyrus* L., *Ribes* L., *Rubus* L. and *Vitis* L.'), and as such does not meet the EFSA criterion to qualify as a potential Union RNQP	

Criterion of pest categorisation	Panel's conclusions against criterion in Regulation (EU) 2016/2031 regarding Union quarantine pest	Panel's conclusions against criterion in Regulation (EU) 2016/2031 regarding Union regulated non-quarantine pest	Key uncertainties
Aspects of assessment to focus on/ scenarios to address in future if appropriate	The main knowledge gaps or uncertainties identified concern: - More widespread and unreported presence in the EU; - Biology (host range, seed and vector transmission); - Magnitude of the impact under EU conditions		

Table 18.2: AMERICAN PLUM LINE PATTERN VIRUS (APLPV)

Criterion of pest categorisation	Panel's conclusions against criterion in Regulation (EU) 2016/2031 regarding Union quarantine pest	Panel's conclusions against criterion in Regulation (EU) 2016/2031 regarding Union regulated non-quarantine pest	Key uncertainties
Identity of the pest (Section 3.1)	The identity of APLPV is established and diagnostic techniques are available	The identity of APLPV is established and diagnostic techniques are available	No uncertainty
Absence/ presence of the pest in the EU territory (Section 3.2)	APLPV has been reported in one MS (Italy) with only restricted distribution	APLPV has been reported in one MS (Italy) with only restricted distribution	More widespread and unreported presence in the EU
Regulatory status (Section 3.3)	APLPV can be considered as regulated in Annex IAI as 'Plum line pattern virus (American)'	APLPV can be considered as regulated in Annex IAI as 'Plum line pattern virus (American)'	No uncertainty
Pest potential for entry, establishment and spread in the EU territory (Section 3.4)	APLPV is able to enter in the EU. The main pathway plants for planting of *Prunus* spp. is only partially regulated by existing legislation. If APLPV were to enter the EU territory, it could become established and spread	Plants for planting constitute the main means for spread for APLPV	- Geographical distribution - Pollen, seed and vector transmission
Potential for consequences in the EU territory (Section 3.5)	Introduction and spread of APLPV would have a negative impact on the EU *Prunus* industry	The presence of APLPV on plants for planting of stone fruits would have a negative impact on their intended use	Magnitude of the impact of under EU conditions
Available measures (Section 3.6)	Phytosanitary measures are available to reduce the likelihood of spread into the EU	Certification of planting material for susceptible hosts is, by far, their most efficient control method	No uncertainty
Conclusion on pest categorisation (Section 4)	APLPV meets all the criteria evaluated by EFSA to qualify as a potential Union quarantine pest	APLPV is a non-EU virus (considered as regulated in Annex IAI of Directive 2000/29/EC), and as such does not meet the EFSA criterion to qualify as a potential Union RNQP	

Criterion of pest categorisation	Panel's conclusions against criterion in Regulation (EU) 2016/2031 regarding Union quarantine pest	Panel's conclusions against criterion in Regulation (EU) 2016/2031 regarding Union regulated non-quarantine pest	Key uncertainties
Aspects of assessment to focus on/ scenarios to address in future if appropriate	The main knowledge gaps or uncertainties identified concern: - More widespread and unreported presence in the EU; - Biology (pollen, seed and vector transmission); - Magnitude of the impact under EU conditions.		

Table 18.3: APRICOT VEIN CLEARING-ASSOCIATED VIRUS (AVCaV), ASIAN PRUNUS VIRUS 1 (APV-1), ASIAN PRUNUS VIRUS 2 (APV-2), ASIAN PRUNUS VIRUS 3 (APV-3), CAUCASUS PRUNUS VIRUS (CPrV), CHERRY VIRUS B (CVB), MUME VIRUS A (MuVA), PEACH CHLOROTIC MOTTLE VIRUS (PeCMV), PRUNUS VIRUS T (PrVT)

Criterion of pest categorisation	Panel's conclusions against criterion in Regulation (EU) 2016/2031 regarding Union quarantine pest	Panel's conclusions against criterion in Regulation (EU) 2016/2031 regarding Union regulated non-quarantine pest	Key uncertainties
Identity of the pest (Section 3.1)	The identity of AVCaV, APV-1, APV-2, APV-3, CPrV, CVB, MuVA, PeCMV and PrVT is established and diagnostic techniques are available	The identity of AVCaV, APV-1, APV-2, APV-3, CPrV, CVB, MuVA, PeCMV and PrVT is established and diagnostic techniques are available	Absence of a proven diagnostic protocol
Absence/ presence of the pest in the EU territory (Section 3.2)	APV-1, APV-2, APV-3, CPrV, CVB, MuVA, PeCMV and PrVT are not known to be present in the EU. AVCaV has been reported from two MSs (France and Italy) but its presence is considered restricted.	APV-1, APV-2, APV-3, CPrV, CVB, MuVA, PeCMV and PrVT are not known to be present in the EU. AVCaV has been reported from two MSs (France and Italy) but its presence is considered restricted.	Possible unreported presence (APV-1, APV-2, APV-3, CPrV, CVB, MuVA, PeCMV and PrVT) or more widespread presence (AVCaV) in the EU
Regulatory status (Section 3.3)	AVCaV, APV-1, APV-2, APV-3, CPrV, CVB, MuVA, PeCMV and PrVT can be considered as regulated in Annex IAI as 'Non-European viruses and virus-like organisms of *Cydonia* Mill., *Fragaria* L., *Malus* Mill., *Prunus* L., *Pyrus* L., *Ribes* L., *Rubus* L. and *Vitis* L.'	AVCaV, APV-1, APV-2, APV-3, CPrV, CVB, MuVA, PeCMV and PrVT can be considered as regulated in Annex IAI as 'Non-European viruses and virus-like organisms of *Cydonia* Mill., *Fragaria* L., *Malus* Mill., *Prunus* L., *Pyrus* L., *Ribes* L., *Rubus* L. and *Vitis* L.'	AVCaV, APV-1, APV-2, APV-3, CPrV, CVB, MuVA, PeCMV and PrVT not explicitly mentioned in Directive 2000/29/EC.
Pest potential for entry, establishment and spread in the EU territory (Section 3.4)	AVCaV, APV-1, APV-2, APV-3, CPrV, CVB, MuVA, PeCMV and PrVT are able to enter in the EU. The main pathway plants for planting of *Prunus* spp. is partially regulated (AVCaV, APV-1, APV-2, APV-3, PeCMV) or is closed (CPrV, CVB, MuVA, PrVT) by existing legislation. Additional pathways associated with viruliferous vectors may exist for AVCaV and CPrV. If these viruses were to enter the EU territory, they could become established and spread	Plants for planting constitute the main means of spread for AVCaV, APV-1, APV-2, APV-3, CPrV, CVB, MuVA, PeCMV and PrVT	- Geographical distribution - Existence of other host species - Seed, pollen and vector transmission - Efficiency of natural spread under EU conditions

Criterion of pest categorisation	Panel's conclusions against criterion in Regulation (EU) 2016/2031 regarding Union quarantine pest	Panel's conclusions against criterion in Regulation (EU) 2016/2031 regarding Union regulated non-quarantine pest	Key uncertainties
Potential for consequences in the EU territory (Section 3.5)	Due to the limited information, the Panel is unable to conclude on the potential consequences of these viruses in the EU territory	Due to the limited information, the Panel is unable to conclude whether the presence of these viruses on *Prunus* plants for planting would impact their intended use	–
Available measures (Section 3.6)	Phytosanitary measures are available to reduce the likelihood of entry and spread into the EU	Certification of planting material for susceptible hosts is, by far, the most efficient control method	No uncertainty
Conclusion on pest categorisation (Section 4)	With the exception of the criterion regarding the potential for consequences in the EU territory, for which the Panel is unable to conclude (see Section 3.5), AVCaV, APV-1, APV-2, APV-3, CPrV, CVB, MuVA, PeCMV and PrVT meet all the other criteria evaluated by EFSA to qualify as a potential Union quarantine pest	AVCaV, APV-1, APV-2, APV-3, CPrV, CVB, MuVA, PeCMV and PrVT are a non-EU viruses (considered as regulated in Annex IAI of Directive 2000/29/EC as 'Non-European viruses and virus-like organisms of *Cydonia* Mill., *Fragaria* L., *Malus* Mill., *Prunus* L., *Pyrus* L., *Ribes* L., *Rubus* L. and *Vitis* L.'), and as such do not meet the EFSA criterion to qualify as a potential Union RNQP	
Aspects of assessment to focus on/ scenarios to address in future if appropriate	The main knowledge gaps or uncertainties identified concern: - Potential consequences in the EU territory, on which the Panel was unable to conclude due to the limited information; - Possible unreported presence in the EU; - Biology (host range, pollen, seed and vector transmission); - Efficiency of natural spread under EU conditions. Given the very limited available information on these very recently described viruses, the development of a full PRA will not allow to resolve the uncertainties attached to the present categorisation until more data become available		

Table 18.4: CHERRY MOTTLE LEAF VIRUS (CMLV), CHERRY RUSTY MOTTLE–ASSOCIATED VIRUS (CRMaV), CHERRY TWISTED LEAF-ASSOCIATED VIRUS (CTLaV), PEACH MOSAIC VIRUS (PcMV)

Criterion of pest categorisation	Panel's conclusions against criterion in Regulation (EU) 2016/2031 regarding Union quarantine pest	Panel's conclusions against criterion in Regulation (EU) 2016/2031 regarding Union regulated non-quarantine pest	Key uncertainties
Identity of the pest (Section 3.1)	The identity of CMLV, CRMaV, CTLaV and PcMV is established and diagnostic techniques are available	The identity of CMLV, CRMaV, CTLaV and PcMV is established and diagnostic techniques are available	Absence of a proven diagnostic protocol for CMLV, CRMaV and CTLaV. No uncertainty for PcMV
Absence/ presence of the pest in the EU territory (Section 3.2)	CRMaV is not known to be present in the EU. CMLV and CTLaV have been reported from Spain. Old reports based on biological observations of CMLV, CTLaV and PcMV presence in some MSs are considered unreliable because	CRMaV is not known to be present in the EU. CMLV and CTLaV have been reported from Spain. Old reports based on biological observations of CMLV, CTLaV and PcMV presence in some MSs are considered unreliable because	Possible unreported presence (CRMaV) or more widespread presence (CMLV, CTLaV and PcMV) in the EU

Criterion of pest categorisation	Panel's conclusions against criterion in Regulation (EU) 2016/2031 regarding Union quarantine pest	Panel's conclusions against criterion in Regulation (EU) 2016/2031 regarding Union regulated non-quarantine pest	Key uncertainties
	they were never confirmed by molecular techniques. All four viruses are therefore considered to be absent or to have only restricted distribution in the EU	they were never confirmed by molecular techniques	
Regulatory status (Section 3.3)	CMLV, CRMaV, CTLaV and PcMV are currently regulated in Annex IAI as 'Non-European viruses and virus-like organisms of *Cydonia* Mill., *Fragaria* L., *Malus* Mill., *Prunus* L., *Pyrus* L., *Ribes* L., *Rubus* L. and *Vitis* L.'	CMLV, CRMaV, CTLaV and PcMV are currently regulated in Annex IAI as 'Non-European viruses and virus-like organisms of *Cydonia* Mill., *Fragaria* L., *Malus* Mill., *Prunus* L., *Pyrus* L., *Ribes* L., *Rubus* L. and *Vitis* L.'	No uncertainty
Pest potential for entry, establishment and spread in the EU territory (Section 3.4)	CMLV, CRMaV, CTLaV and PcMV are able to enter or further enter in the EU. The *Prunus* plant for planting pathway is partially regulated by existing legislation. The vectors of CMLV and PcMV, respectively, *Eriophyes inaequalis* and *E. insidiosus* are not regulated by current legislation, therefore the vector pathway is open. If these viruses were to enter in the EU territory, they could become established and spread	Plants for planting constitute the main means for long distance spread for these viruses	- Geographical distribution - Existence of other natural hosts - Pollen and seed transmission - Vector transmission for CRMaV and CTLaV - Efficiency of natural spread under EU conditions
Potential for consequences in the EU territory (Section 3.5)	Introduction and spread of CMLV, CRMaV, CTLaV and PcMV would have a negative impact on the EU stone fruit industry	The presence of CMLV, CRMaV, CTLaV and PcMV on plants for planting would have a negative impact on their intended use	Magnitude of the impact of CMLV, CRMaV, CTLaV and PcMV under EU conditions
Available measures (Section 3.6)	Phytosanitary measures are available to reduce the likelihood of entry and spread into the EU	Certification of planting material for susceptible hosts is, by far, the most efficient control method	No uncertainty
Conclusion on pest categorisation (Section 4)	CMLV, CRMaV, CTLaV and PcMV meet all the criteria evaluated by EFSA to qualify as a potential Union quarantine pests	CMLV, CRMaV, CTLaV and PcMV are non-EU viruses (considered as regulated in Annex IAI of Directive 2000/29/EC as 'Non-European viruses and virus-like organisms of *Cydonia* Mill., *Fragaria* L., *Malus* Mill., *Prunus* L., *Pyrus* L., *Ribes* L., *Rubus* L. and *Vitis* L.'), and as such do not meet the EFSA criterion to qualify as a potential Union RNQP	

Criterion of pest categorisation	Panel's conclusions against criterion in Regulation (EU) 2016/2031 regarding Union quarantine pest	Panel's conclusions against criterion in Regulation (EU) 2016/2031 regarding Union regulated non-quarantine pest	Key uncertainties
Aspects of assessment to focus on/ scenarios to address in future if appropriate	The main knowledge gaps or uncertainties identified concern: - Possible unreported presence (CRMaV) or more widespread presence (CMLV, CTLaV and PcMV) in the EU; - Biology (host range, pollen and seed transmission, vector transmission for CRMaV and CTLaV); - Efficiency of natural spread under EU conditions; - Magnitude of the impact of CMLV, CRMaV, CTLaV and PcMV under EU conditions		

Table 18.5: CHERRY RASP LEAF VIRUS (CRLV), CHERRY ROSETTE VIRUS (CRV), PEACH ROSETTE MOSAIC VIRUS (PRMV), TOBACCO RINGSPOT VIRUS (TRSV), TOMATO RINGSPOT VIRUS (ToRSV)

Criterion of pest categorisation	Panel's conclusions against criterion in Regulation (EU) 2016/2031 regarding Union quarantine pest	Panel's conclusions against criterion in Regulation (EU) 2016/2031 regarding Union regulated non-quarantine pest	Key uncertainties
Identity of the pest (Section 3.1)	The identity of CRLV, CRV, PRMV, TRSV and ToRSV is established and diagnostic techniques are available	The identity of CRLV, CRV, PRMV, TRSV and ToRSV is established and diagnostic techniques are available	No uncertainty
Absence/ presence of the pest in the EU territory (Section 3.2)	CRLV, CRV and PRMV are not known to be present in the EU. TRSV and ToRSV have been sporadically and transiently reported from several MSs but their presence is restricted and/or under eradication	CRLV, CRV and PRMV are not known to be present in the EU, therefore do not meet this criterion to qualify for RNQPs. TRSV and ToRSV have been sporadically and transiently reported from several MSs in EU but their presence is restricted and/or under eradication,	Possible unreported presence (CRLV, CRV and PRMV) or more widespread presence (TRSV or ToRSV) in the EU
Regulatory status (Section 3.3)	CRLV, CRV, PRMV, TRSV and ToRSV are currently regulated in Annex IAI	CRLV, CRV, PRMV, TRSV and ToRSV are currently regulated in Annex IAI	No uncertainty
Pest potential for entry, establishment and spread in the EU territory (Section 3.4)	CRLV, CRV, PRMV, TRSV and ToRSV are able to enter or further enter, become established and spread within the EU. The *Prunus* plant for planting pathway is partially regulated by existing legislation. Entry is also possible on plants for planting of other hosts, on seeds of herbaceous hosts and with viruliferous nematodes. If these viruses were to enter the EU territory, they could become established and spread	Plants for planting constitute the main means for long distance spread for these viruses	- Geographical distribution - Existence of other natural hosts for CRLV, CRV - Seed and pollen transmission in woody hosts - Efficiency of natural spread under EU conditions - Origin and trade volumes of plants for planting of unregulated host species - Significance of the seed and pollen pathway given the absence of information on the volume of imported seeds and pollen of non-*Prunus* hosts

Criterion of pest categorisation	Panel's conclusions against criterion in Regulation (EU) 2016/2031 regarding Union quarantine pest	Panel's conclusions against criterion in Regulation (EU) 2016/2031 regarding Union regulated non-quarantine pest	Key uncertainties
Potential for consequences in the EU territory (Section 3.5)	Introduction and spread of CRLV, CRV, PRMV, TRSV and ToRSV would have a negative impact on the EU stone fruit industry and on other crops	The presence of CRLV, CRV, PRMV, TRSV and ToRSV on plants for planting would have a negative impact on their intended use	Magnitude of the impact under EU conditions
Available measures (Section 3.6)	Phytosanitary measures are available to reduce the likelihood of entry and spread into the EU	Certification of planting material for susceptible hosts is, by far, the most efficient control method	No uncertainty
Conclusion on pest categorisation (Section 4)	CRLV, CRV, PRMV, TRSV and ToRSV meet all the criteria evaluated by EFSA to qualify as a potential Union quarantine pests	CRLV, CRV, PRMV, TRSV and ToRSV are non-EU viruses (considered as regulated in Annex IAI of Directive 2000/29/EC; CRV as 'Non-European viruses and virus-like organisms of *Cydonia* Mill., *Fragaria* L., *Malus* Mill., *Prunus* L., *Pyrus* L., *Ribes* L., *Rubus* L. and *Vitis* L.'), and as such do not meet the EFSA criterion to qualify as a potential Union RNQP	
Aspects of assessment to focus on/ scenarios to address in future if appropriate	The main knowledge gaps or uncertainties identified concern: - Possible presence (CRLV, CRV and PRMV) or more widespread presence (TRSV or ToRSV) in the EU; - Biology (host range, seed and pollen transmission in woody hosts); - Efficiency of natural spread under EU conditions; - Origin and trade volumes of plants for planting, seeds and pollen of unregulated host species; - Significance of the seed and pollen pathway given the absence of information on the volume of imported seeds and pollen of other hosts; - Magnitude of the impact under EU conditions		

Table 18.6: NECTARINE STEM PITTING-ASSOCIATED VIRUS (NSPaV)

Criterion of pest categorisation	Panel's conclusions against criterion in Regulation (EU) 2016/2031 regarding Union quarantine pest	Panel's conclusions against criterion in Regulation (EU) 2016/2031 regarding Union regulated non-quarantine pest	Key uncertainties
Identity of the pest (Section 3.1)	The identity of NSPaV is established and diagnostic techniques are available	The identity of NSPaV is established and diagnostic techniques are available	Absence of a proven diagnostic protocol
Absence/ presence of the pest in the EU territory (Section 3.2)	NSPaV has been reported in two MSs (Czech Republic and Hungary) but its presence is considered restricted	NSPaV has been reported in two MSs (Czech Republic and Hungary) but its presence is considered restricted	More widespread and unreported presence in the EU
Regulatory status (Section 3.3)	NSPaV can be considered as regulated in Annex IAI as 'Non-European viruses and virus-like organisms of *Cydonia* Mill., *Fragaria* L., *Malus* Mill., *Prunus* L., *Pyrus* L., *Ribes* L., *Rubus* L. and *Vitis* L.'	NSPaV can be considered as regulated in Annex IAI as 'Non-European viruses and virus-like organisms of *Cydonia* Mill., *Fragaria* L., *Malus* Mill., *Prunus* L., *Pyrus* L., *Ribes* L., *Rubus* L. and *Vitis* L.'	NSPaV not explicitly mentioned in Directive 2000/29/EC.

Criterion of pest categorisation	Panel's conclusions against criterion in Regulation (EU) 2016/2031 regarding Union quarantine pest	Panel's conclusions against criterion in Regulation (EU) 2016/2031 regarding Union regulated non-quarantine pest	Key uncertainties
Pest potential for entry, establishment and spread in the EU territory (Section 3.4)	NSPaV may enter in the EU. The main pathway *Prunus* plants for planting is partially regulated by existing legislation. If NSPaV were to enter the EU territory, it could become established and spread	Plants for planting constitute the main means of spread for NSPaV	- Geographical distribution - Existence of other host species - Pollen, seed and vector transmission
Potential for consequences in the EU territory (Section 3.5)	Due to the limited, information the Panel is unable to conclude on the potential consequences in the EU territory	Due to the limited information, the Panel is unable to conclude whether the presence of this virus on *Prunus* plants for planting would impact their intended use	–
Available measures (Section 3.6)	Phytosanitary measures are available to reduce the likelihood of entry and spread into the EU	Certification of planting material for susceptible hosts is, by far, the most efficient control method	No uncertainty
Conclusion on pest categorisation (Section 4)	With the exception of the criterion regarding the consequences in the EU territory, for which the Panel is unable to conclude (Section 3.5), NSPaV meets all the criteria evaluated by EFSA to qualify as a potential Union quarantine pest	NSPaV is a non-EU virus (considered as regulated in Annex IAI of Directive 2000/29/EC as 'Non-European viruses and virus-like organisms of *Cydonia* Mill., *Fragaria* L., *Malus* Mill., *Prunus* L., *Pyrus* L., *Ribes* L., *Rubus* L. and *Vitis* L.'), and as such does not meet the EFSA criterion to qualify as a potential Union RNQP	
Aspects of assessment to focus on/ scenarios to address in future if appropriate	The main knowledge gaps or uncertainties identified concern: - Potential consequences in the EU territory, on which the Panel was unable to conclude due to the limited information; - More widespread and unreported presence in the EU; - Biology (pollen, seed and vector transmission). Given the very limited available information on this very recently described virus, the development of a full PRA will not allow to resolve the uncertainties attached to the present categorisation until more data become available		

Table 18.7: NECTARINE VIRUS M (NeVM), PEACH VIRUS D (PeVD)

Criterion of pest categorisation	Panel's conclusions against criterion in Regulation (EU) 2016/2031 regarding Union quarantine pest	Panel's conclusions against criterion in Regulation (EU) 2016/2031 regarding Union regulated non-quarantine pest	Key uncertainties
Identity of the pest (Section 3.1)	The identity of NeVM and PeVD is established and diagnostic techniques are available	The identity of NeVM and PeVD is established and diagnostic techniques are available	Absence of a proven diagnostic protocol
Absence/ presence of the pest in the EU territory (Section 3.2)	NeVM and PeVD are not known to be present in the EU	NeVM and PeVD are not known to be present in the EU and therefore they do not meet this criterion to qualify as potential Union RNQPs	Possible unreported presence in the EU

Criterion of pest categorisation	Panel's conclusions against criterion in Regulation (EU) 2016/2031 regarding Union quarantine pest	Panel's conclusions against criterion in Regulation (EU) 2016/2031 regarding Union regulated non-quarantine pest	Key uncertainties
Regulatory status (Section 3.3)	NeVM and PeVD can be considered as regulated in Annex IAI as 'Non-European viruses and virus-like organisms of *Cydonia* Mill., *Fragaria* L., *Malus* Mill., *Prunus* L., *Pyrus* L., *Ribes* L., *Rubus* L. and *Vitis* L.'	NeVM and PeVD can be considered as regulated in Annex IAI as 'Non-European viruses and virus-like organisms of *Cydonia* Mill., *Fragaria* L., *Malus* Mill., *Prunus* L., *Pyrus* L., *Ribes* L., *Rubus* L. and *Vitis* L.'	NeVM and PeVD not explicitly mentioned in Directive 2000/29/EC.
Pest potential for entry, establishment and spread in the EU territory (Section 3.4)	NeVM and PeVD may enter in the EU. The main pathway *Prunus* plants for planting is partially regulated (NeVM) or closed (PeVD) by existing legislation. If NeVM and PeVD were to enter the EU territory, they could become established and spread	Plants for planting constitute the main means of spread for NeVM and PeVD	- Geographical distribution - Existence of other host species - Pollen, seed and vector transmission
Potential for consequences in the EU territory (Section 3.5)	Due to the limited information, the Panel is unable to conclude on the potential consequences in the EU territory	Due to the limited information, the Panel is unable to conclude whether the presence of these viruses on *Prunus* plants for planting would impact their intended use	–
Available measures (Section 3.6)	Phytosanitary measures are available to reduce the likelihood of entry and spread into the EU	Certification of planting material for susceptible hosts is, by far, the most efficient control method	No uncertainty
Conclusion on pest categorisation (Section 4)	With the exception of the criterion regarding the consequences in the EU territory, for which the Panel is unable to conclude (Section 3.5), NeVM and PeVD meet all the criteria evaluated by EFSA to qualify as a potential Union quarantine pest	NeVM and PeVD are a non-EU viruses (considered as regulated in Annex IAI of Directive 2000/29/EC as 'Non-European viruses and virus-like organisms of *Cydonia* Mill., *Fragaria* L., *Malus* Mill., *Prunus* L., *Pyrus* L., *Ribes* L., *Rubus* L. and *Vitis* L.'), and as such do not meet the EFSA criterion to qualify as a potential Union RNQP	
Aspects of assessment to focus on/ scenarios to address in future if appropriate	The main knowledge gaps or uncertainties identified concern: - Potential consequences in the EU territory, on which the Panel was unable to conclude due to the limited information; - Possible unreported presence in the EU; - Biology (pollen, seed and vector transmission). Given the very limited available information on these very recently described viruses, the development of a full PRA will not allow to resolve the uncertainties attached to the present categorisation until more data become available		

Table 18.8: PEACH ENATION NEPOVIRUS (PEV)

Criterion of pest categorisation	Panel's conclusions against criterion in Regulation (EU) 2016/2031 regarding Union quarantine pest	Panel's conclusions against criterion in Regulation (EU) 2016/2031 regarding Union regulated non-quarantine pest	Key uncertainties
Identity of the pest (Section 3.1)	The identity of PEV is established and diagnostic techniques are available	The identity of PEV is established and diagnostic techniques are available	For PEV biological indexing but no molecular detection is available. Uncertainties exist on the reliability of serological detection
Absence/ presence of the pest in the EU territory (Section 3.2)	PEV is not known to be present in the EU	PEV is not known to be present in the EU and therefore it does not meet this criterion to qualify as potential Union RNQP	Possible unreported presence in the EU
Regulatory status (Section 3.3)	PEV is currently regulated in Annex IAI as 'Non-European viruses and virus-like organisms of *Cydonia* Mill., *Fragaria* L., *Malus* Mill., *Prunus* L., *Pyrus* L., *Ribes* L., *Rubus* L. and *Vitis* L.'	PEV is currently regulated in Annex IAI as 'Non-European viruses and virus-like organisms of *Cydonia* Mill., *Fragaria* L., *Malus* Mill., *Prunus* L., *Pyrus* L., *Ribes* L., *Rubus* L. and *Vitis* L.'	No uncertainty
Pest potential for entry, establishment and spread in the EU territory (Section 3.4)	PEV may enter in the EU. The main pathway plants for planting of *Prunus*, is closed by current legislation. Pathways associated with other potential hosts and with potential viruliferous nematode vectors are possibly open. If PEV were to enter the EU territory, it could become established and spread	Plants for planting constitute the main means for long distance spread for PEV	- Geographical distribution - Existence of other natural hosts - Pollen and seed transmission
Potential for consequences in the EU territory (Section 3.5)	Introduction and spread of PEV would have a negative impact on the EU stone fruit industry	The presence of PEV on plants for planting would have a negative impact on their intended use	Magnitude of the impact of PEV under EU conditions
Available measures (Section 3.6)	Phytosanitary measures are available to reduce the likelihood of entry and spread into the EU	Certification of planting material for susceptible hosts is, by far, the most efficient control method	No uncertainty
Conclusion on pest categorisation (Section 4)	PEV meets all the criteria evaluated by EFSA to qualify as a potential Union quarantine pests	PEV is a non-EU virus (considered as regulated in Annex IAI of Directive 2000/29/EC as 'Non-European viruses and virus-like organisms of *Cydonia* Mill., *Fragaria* L., *Malus* Mill., *Prunus* L., *Pyrus* L., *Ribes* L., *Rubus* L. and *Vitis* L.'), and as such does not meet the EFSA criterion to qualify as a potential Union RNQP	

Criterion of pest categorisation	Panel's conclusions against criterion in Regulation (EU) 2016/2031 regarding Union quarantine pest	Panel's conclusions against criterion in Regulation (EU) 2016/2031 regarding Union regulated non-quarantine pest	Key uncertainties
Aspects of assessment to focus on/ scenarios to address in future if appropriate	The main knowledge gaps or uncertainties identified concern: - Possible unreported presence in the EU; - Biology (host range, vector, pollen and seed transmission); - Efficiency of natural spread and magnitude of the impact under EU conditions. Given the very limited available information on this virus, the development of a full PRA will not allow to resolve the uncertainties attached to the present categorisation until more data become available		

Table 18.9: PEACH LEAF PITTING-ASSOCIATED VIRUS (PLPaV) AND PRUNUS VIRUS F (PrVF)

Criterion of pest categorisation	Panel's conclusions against criterion in Regulation (EU) 2016/2031 regarding Union quarantine pest	Panel's conclusions against criterion in Regulation (EU) 2016/2031 regarding Union regulated non-quarantine pest	Key uncertainties
Identity of the pest (Section 3.1)	The identity of PLPaV and PrVF is established and diagnostic techniques are available	The identity of PLPaV and PrVF is established and diagnostic techniques are available	Absence of a proven diagnostic protocol
Absence/ presence of the pest in the EU territory (Section 3.2)	PLPaV is not known to be present in the EU. PrVF has been reported in one MS (Czech Republic) but its presence is considered restricted.	PLPaV is not known to be present in the EU. PrVF has been reported in one MS (Czech Republic) but its presence is considered restricted.	Possible unreported presence (PLPaV) or more widespread presence (PrVF) in the EU
Regulatory status (Section 3.3)	PLPaV and PrVF can be considered as regulated in Annex IAI as 'Non-European viruses and virus-like organisms of *Cydonia* Mill., *Fragaria* L., *Malus* Mill., *Prunus* L., *Pyrus* L., *Ribes* L., *Rubus* L. and *Vitis* L.'	PLPaV and PrVF can be considered as regulated in Annex IAI as 'Non-European viruses and virus-like organisms of *Cydonia* Mill., *Fragaria* L., *Malus* Mill., *Prunus* L., *Pyrus* L., *Ribes* L., *Rubus* L. and *Vitis* L.'	PLPaV and PrVF not explicitly mentioned in Directive 2000/29/EC
Pest potential for entry, establishment and spread in the EU territory (Section 3.4)	PLPaV and PrVF may enter in the EU. The main pathway *Prunus* plants for planting is partially regulated (PrVF) or closed (PLPaV) by existing legislation. Other potential pathways (other hosts, vectors) may possibly be open. If PrVF and PLPaV were to enter the EU territory, they could become established and spread	Plants for planting constitute the main means of spread for PLPaV and PrVF	- Geographical distribution - Existence of other host species - Pollen, seed and vector transmission
Potential for consequences in the EU territory (Section 3.5)	Due to the limited information the Panel is unable to conclude on the potential consequences in the EU territory	Due to the limited information, the Panel is unable to conclude whether the presence of these viruses on *Prunus* plants for planting would impact their intended use	-

Criterion of pest categorisation	Panel's conclusions against criterion in Regulation (EU) 2016/2031 regarding Union quarantine pest	Panel's conclusions against criterion in Regulation (EU) 2016/2031 regarding Union regulated non-quarantine pest	Key uncertainties
Available measures (Section 3.6)	Phytosanitary measures are available to reduce the likelihood of entry and spread into the EU	Certification of planting material for susceptible hosts is, by far, the most efficient control method	No uncertainty
Conclusion on pest categorisation (Section 4)	With the exception of the criterion regarding the consequences in the EU territory, for which the Panel is unable to conclude (Section 3.5), PLPaV and PrVF meet all the criteria evaluated by EFSA to qualify as a potential Union quarantine pest	PLPaV and PrVF are non-EU viruses (considered as regulated in Annex IAI of Directive 2000/29/EC as 'Non-European viruses and virus-like organisms of *Cydonia* Mill., *Fragaria* L., *Malus* Mill., *Prunus* L., *Pyrus* L., *Ribes* L., *Rubus* L. and *Vitis* L.'), and as such do not meet the EFSA criterion to qualify as a potential Union RNQP	
Aspects of assessment to focus on/ scenarios to address in future if appropriate	The main knowledge gaps or uncertainties identified concern: - Potential consequences in the EU territory, on which the Panel was unable to conclude due to the limited information; - Possible unreported presence (PLPaV) or more widespread presence (PrVF) in the EU; - Biology (pollen, seed and vector transmission). Given the very limited available information on these very recently described viruses, the development of a full PRA will not allow to resolve the uncertainties attached to the present categorisation until more data become available		

Table 18.10: PRUNUS GEMINIVIRUS A (PrGVA)

Criterion of pest categorisation	Panel's conclusions against criterion in Regulation (EU) 2016/2031 regarding Union quarantine pest	Panel's conclusions against criterion in Regulation (EU) 2016/2031 regarding Union regulated non-quarantine pest	Key uncertainties
Identity of the pest (Section 3.1)	The identity of PrGVA is established and diagnostic techniques are available	The identity of PrGVA is established and diagnostic techniques are available	Absence of a proven diagnostic protocol
Absence/ presence of the pest in the EU territory (Section 3.2)	PrGVA is not known to be present in the EU	PrGVA is not known to be present in the EU and therefore it does not meet this criterion to qualify as potential Union RNQP	Possible unreported presence in the EU
Regulatory status (Section 3.3)	PrGVA can be considered as regulated in Annex IAI as 'Non-European viruses and virus-like organisms of *Cydonia* Mill., *Fragaria* L., *Malus* Mill., *Prunus* L., *Pyrus* L., *Ribes* L., *Rubus* L. and *Vitis* L.'	PrGVA can be considered as regulated in Annex IAI as 'Non-European viruses and virus-like organisms of *Cydonia* Mill., *Fragaria* L., *Malus* Mill., *Prunus* L., *Pyrus* L., *Ribes* L., *Rubus* L. and *Vitis* L.'	PrGVA not explicitly mentioned in Directive 2000/29/EC.
Pest potential for entry, establishment and spread in the EU territory (Section 3.4)	PrGVA is able to enter in the EU. The *Prunus* plant for planting pathway is partially regulated by existing legislation. Other potential pathways (other hosts, vectors) may possibly be	Plants for planting constitute the main means of spread for PrGVA	- Geographical distribution - Existence of other host species - Seed, pollen and vector transmission - Efficiency of natural spread under EU conditions

Criterion of pest categorisation	Panel's conclusions against criterion in Regulation (EU) 2016/2031 regarding Union quarantine pest	Panel's conclusions against criterion in Regulation (EU) 2016/2031 regarding Union regulated non-quarantine pest	Key uncertainties
	open. If PrGVA were to enter the EU territory, it could become established and spread		
Potential for consequences in the EU territory (Section 3.5)	Potential consequences are likely nil or very limited since no symptoms in *Prunus* have been associated with PrGVA infection. Therefore, PrGVA does not meet this criterion to qualify as a potential Union quarantine pest	The presence of PrGVA on plants for planting of *Prunus* is not expected to impact their intended use. Therefore, PrGVA does not meet the corresponding criterion to qualify as a potential Union RNQP	-
Available measures (Section 3.6)	Phytosanitary measures are available to reduce the likelihood of entry and spread into the EU	Certification of planting material for susceptible hosts is, by far, the most efficient control method	No uncertainty
Conclusion on pest categorisation (Section 4)	PrGVA does not meet one of the criteria evaluated by EFSA to qualify as a potential Union quarantine pest: it is not known to cause economic or environmental damage	PrGVA does not meet two of the criteria evaluated by EFSA to qualify as a potential Union RNQP: 1) it is not present in the EU and can be considered as regulated in Annex IAI as 'Non-European viruses and virus-like organisms of *Cydonia* Mill., *Fragaria* L., *Malus* Mill., *Prunus* L., *Pyrus* L., *Ribes* L., *Rubus* L. and *Vitis* L.'; 2) it is not expected to impact the intended use of *Prunus* plants for planting	
Aspects of assessment to focus on/ scenarios to address in future if appropriate	The main knowledge gaps or uncertainties identified concern: - Possible unreported presence in the EU; - Biology (host range, vector transmission); - Efficiency of natural spread under EU conditions. Given the very limited available information on this very recently described virus, the development of a full PRA will not allow to resolve the uncertainties attached to the present categorisation until more data become available		

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Glossary

Containment (of a pest)	Application of phytosanitary measures in and around an infested area to prevent spread of a pest (FAO, 1995, 2017)
Control (of a pest)	Suppression, containment or eradication of a pest population (FAO, 1995, 2017)
Entry (of a pest)	Movement of a pest into an area where it is not yet present, or present but not widely distributed and being officially controlled (FAO, 2017)
Eradication (of a pest)	Application of phytosanitary measures to eliminate a pest from an area (FAO, 2017)
Establishment (of a pest)	Perpetuation, for the foreseeable future, of a pest within an area after entry (FAO, 2017)
Impact (of a pest)	The impact of the pest on the crop output and quality and on the environment in the occupied spatial units
Introduction (of a pest)	The entry of a pest resulting in its establishment (FAO, 2017)
Measures	Control (of a pest) is defined in ISPM 5 (FAO 2017) as 'Suppression, containment or eradication of a pest population' (FAO, 1995). Control measures are measures that have a direct effect on pest abundance. Supporting measures are organisational measures or procedures supporting the choice of appropriate Risk Reduction Options that do not directly affect pest abundance.
Pathway	Any means that allows the entry or spread of a pest (FAO, 2017)
Phytosanitary measures	Any legislation, regulation or official procedure having the purpose to prevent the introduction or spread of quarantine pests, or to limit the economic impact of regulated non-quarantine pests (FAO, 2017)
Protected zones (PZ)	A Protected zone is an area recognised at EU level to be free from a harmful organism, which is established in one or more other parts of the Union.
Quarantine pest	A pest of potential economic importance to the area endangered thereby and not yet present there, or present but not widely distributed and being officially controlled (FAO, 2017)
Regulated non-quarantine pest	A non-quarantine pest whose presence in plants for planting affects the intended use of those plants with an economically unacceptable impact and which is therefore regulated within the territory of the importing contracting party (FAO, 2017)
Risk reduction option (RRO)	A measure acting on pest introduction and/or pest spread and/or the magnitude of the biological impact of the pest should the pest be present. A RRO may become a phytosanitary measure, action or procedure according to the decision of the risk manager
Spread (of a pest)	Expansion of the geographical distribution of a pest within an area (FAO, 2017)

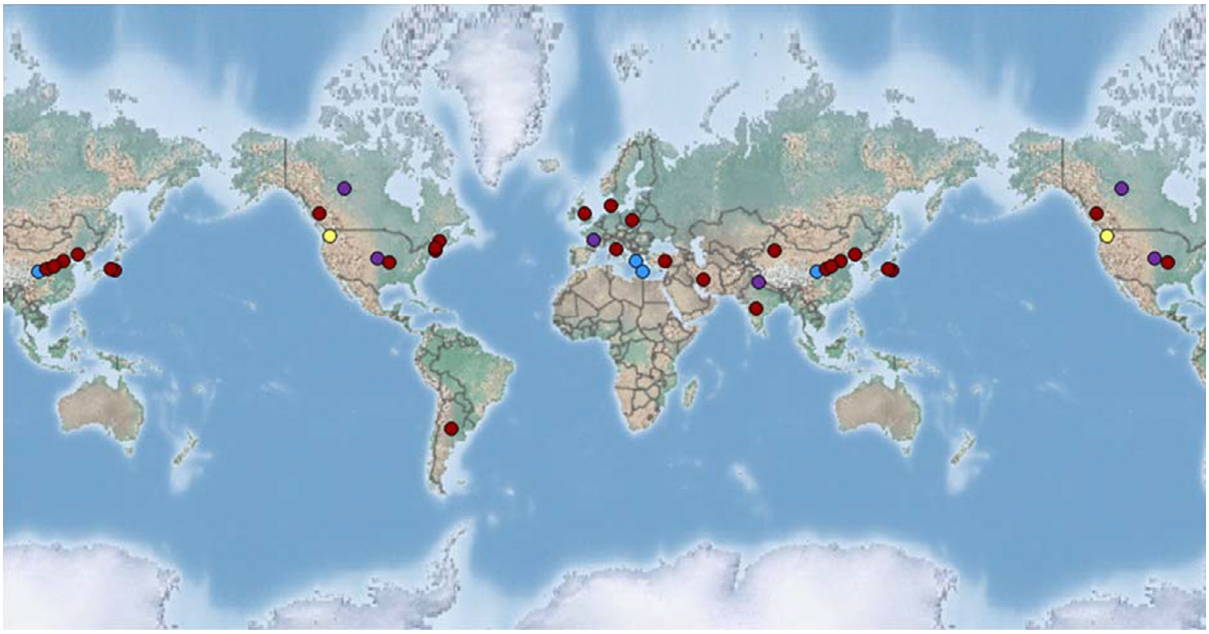
Abbreviations

DG SANTÉ	Directorate General for Health and Food Safety
EPPO	European and Mediterranean Plant Protection Organization
EVE	endogenous viral element
FAO	Food and Agriculture Organization
HTS	high-throughput sequencing
ICTV	International Committee on Taxonomy of Viruses
IPPC	International Plant Protection Convention
ISPM	International Standards for Phytosanitary Measures
MS	Member State
PCR	polymerase chain reaction
PLH	EFSA Panel on Plant Health

PZ	Protected Zone
QP	quarantine pest
RNQP	Regulated non-quarantine pest
TFEU	Treaty on the Functioning of the European Union
ToR	Terms of Reference

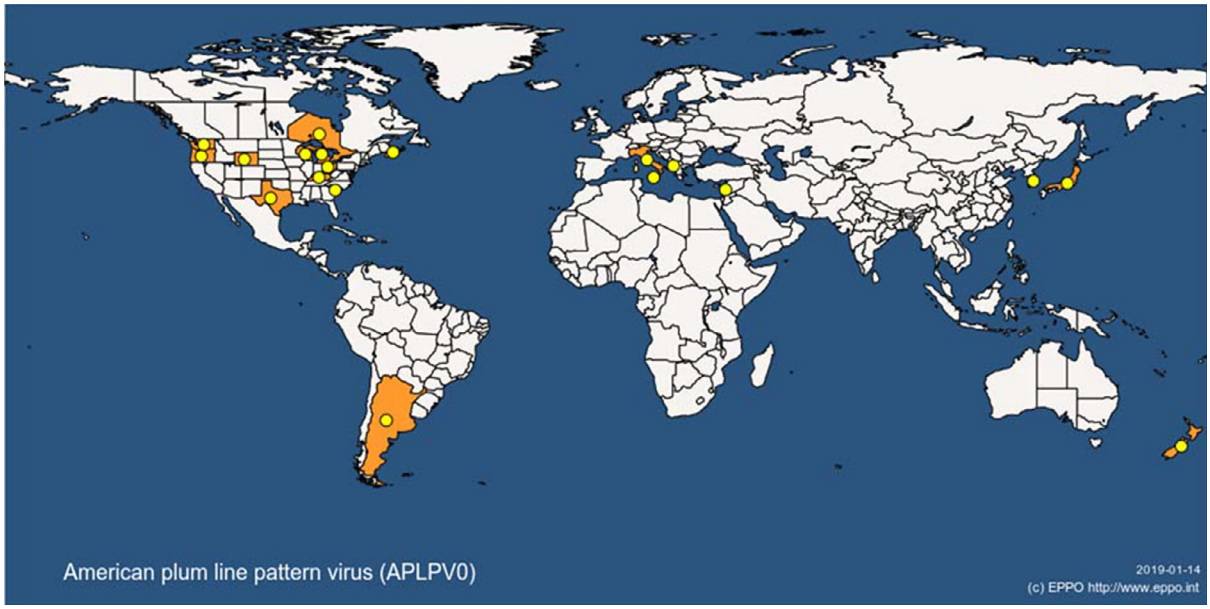
Appendix A – Distribution maps of viruses

A.1. Distribution map of Apple scar skin viroid (CABI, 2019)



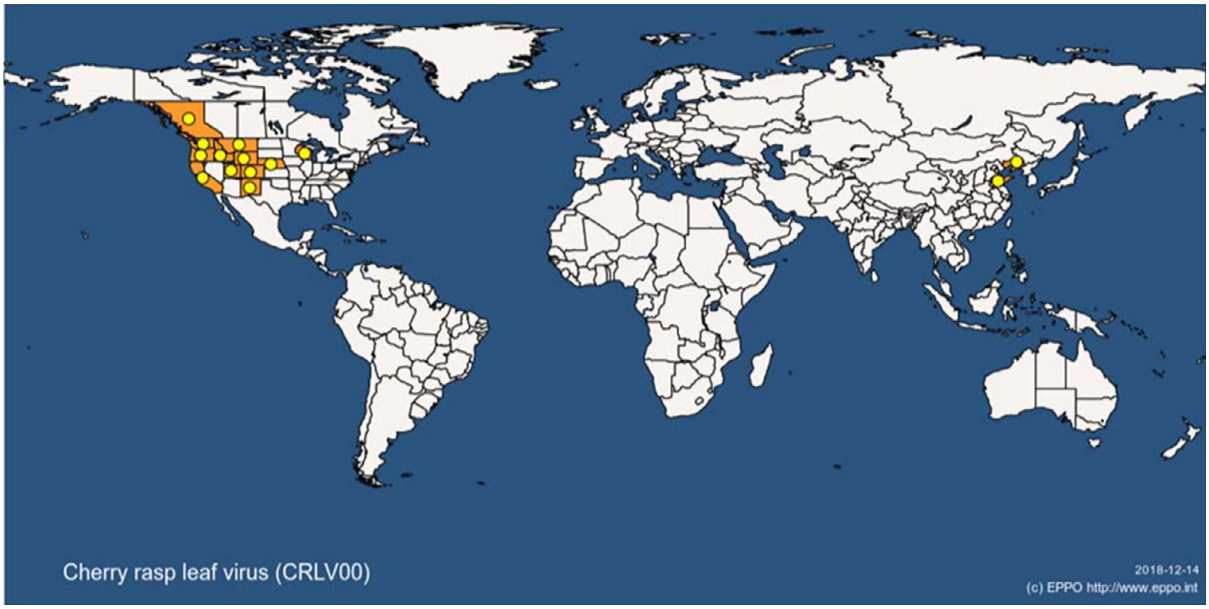
A.2. Distribution map of American plum line pattern virus (EPPO, 2019)

Colour code: Yellow and orange indicate reported presence and purple stands for reported transient presence of the pest.



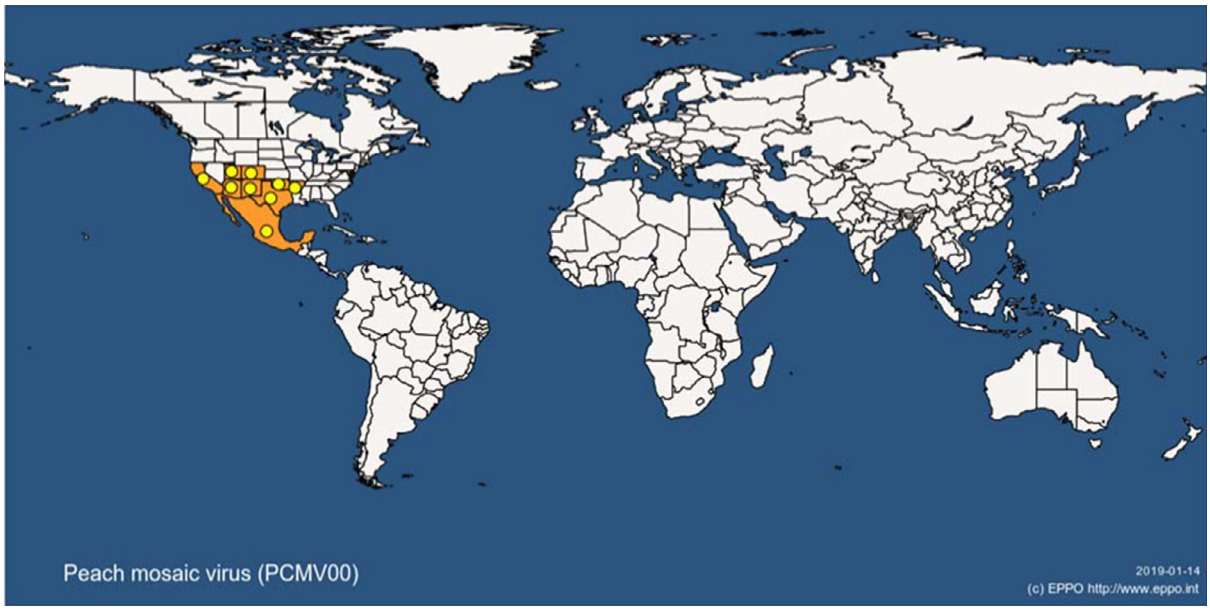
A.3. Distribution map of Cherry rasp leaf virus (EPPO, 2019)

Colour code: Yellow and orange indicate reported presence.



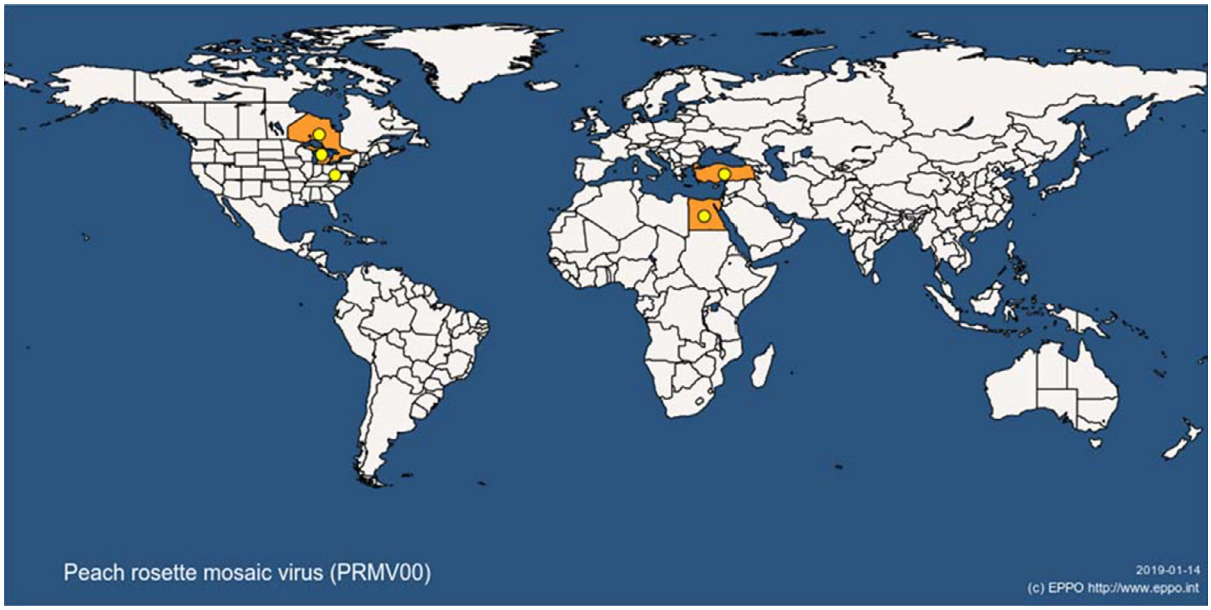
A.4. Distribution map of Peach mosaic virus (EPPO, 2019)

Colour code: Yellow and orange indicate reported presence.



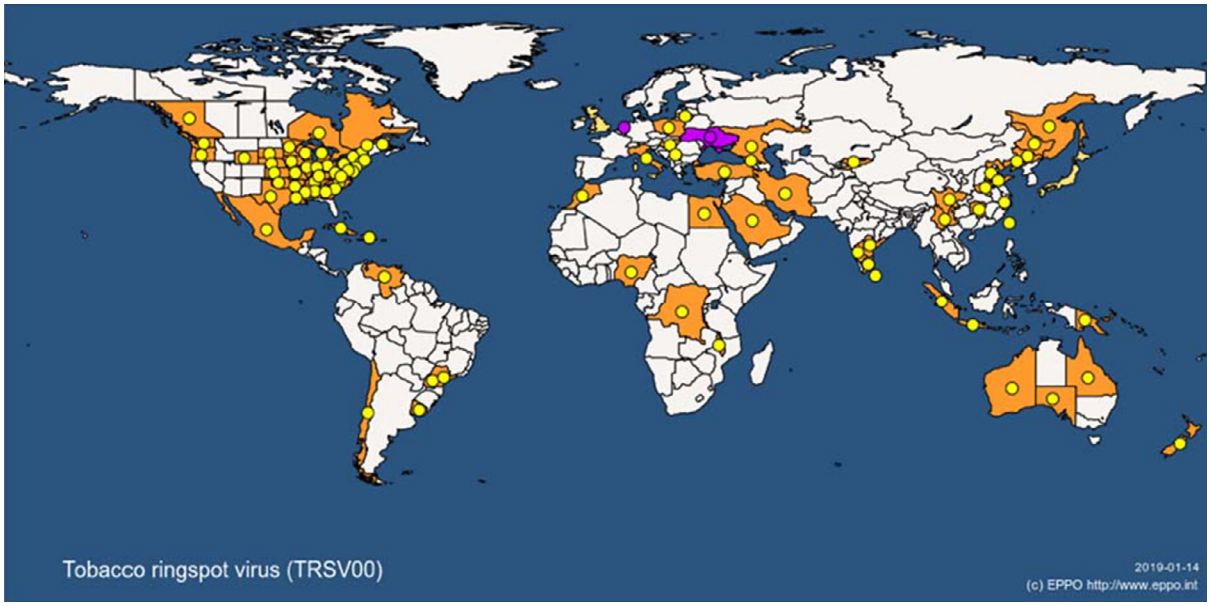
A.5. Distribution map of Peach rosette mosaic virus (EPPO, 2019)

Colour code: Yellow and orange indicate reported presence.



A.6. Distribution map of Tobacco ringspot virus (EPPO, 2019)

Colour code: Yellow and orange indicate reported presence and purple stands for reported transient presence of the pest.



A.7. Distribution map of Tomato ringspot virus (EPPO, 2019)

Colour code: Yellow and orange indicate reported presence and purple stands for reported transient presence of the pest.