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Pest categorisation of non-EU viruses of *Ribes* L.

EFSA Panel on Plant Health (PLH),

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Abstract

Following a request from the EU Commission, the Panel on Plant Health addressed the pest categorisation of the viruses of *Ribes* 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. Alaska vitivirus 1 and Ribes virus F were excluded from categorisation because these are very poorly characterised viruses. The pest categorisation was completed for seven viruses with clear identity and for which detection methods are available. All these viruses are efficiently transmitted by vegetative 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 *Ribes* seeds, pollen and/or vector(s). Most of the viruses categorised here are known to infect only one or few plant genera, but tomato ringspot virus (ToRSV) has a wide host range, thus extending the possible entry pathways. ToRSV meets all the criteria evaluated by EFSA to qualify as potential Union quarantine pest (QP). With the exception of impact in the EU territory, on which the Panel was unable to conclude, Actinidia virus X, blackcurrant leaf chlorosis-associated virus, blackcurrant leafroll-associated virus, black currant-associated rhabdovirus, blackcurrant waikavirus A and Ribes americanum virus A satisfy all the other criteria to be considered as potential Union QPs. 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.

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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/EC¹ 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) 2016/2031² 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 categorisations 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 178/2002³, 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 pest 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

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

(b) Bacteria

Citrus variegated chlorosis	<i>Xanthomonas campestris</i> pv. <i>oryzae</i> (Ishiyama)
<i>Erwinia stewartii</i> (Smith) Dye	Dye and pv. <i>oryzicola</i> (Fang, et al.) Dye

(c) Fungi

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

(d) Virus and virus-like organisms

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

Annex IIB

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

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

(b) Bacteria

Curtobacterium flaccumfaciens pv. *flaccumfaciens* (Hedges) Collins and Jones

(c) Fungi

Glomerella gossypii Edgerton

Hypoxyton mammatum (Wahl.) J. Miller

Gremmeniella abietina (Lag.) Morelet

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) <i>Carneocephala fulgida</i> Nottingham | 3) <i>Graphocephala atropunctata</i> (Signoret) |
| 2) <i>Draeculacephala minerva</i> Ball | |

Group of Tephritidae (non-EU) such as:

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

(c) Viruses and virus-like organisms

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

- | | |
|----------------------------------|--|
| 1) Andean potato latent virus | 4) Potato black ringspot virus |
| 2) Andean potato mottle virus | 5) Potato virus T |
| 3) Arracacha virus B, oca strain | 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 | 8) Peach yellows mycoplasma |
| 2) Cherry rasp leaf virus (American) | 9) Plum line pattern virus (American) |
| 3) Peach mosaic virus (American) | 10) Raspberry leaf curl virus (American) |
| 4) Peach phony rickettsia | 11) Strawberry witches' broom mycoplasma |
| 5) Peach rosette mosaic virus | 12) Non-EU viruses and virus-like organisms of <i>Cydonia</i> Mill., <i>Fragaria</i> L., <i>Malus</i> Mill., <i>Prunus</i> L., <i>Pyrus</i> L., <i>Ribes</i> L., <i>Rubus</i> L. and <i>Vitis</i> L. |
| 6) Peach rosette mycoplasma | |
| 7) Peach X-disease mycoplasma | |

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

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

(b) Fungi

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

(c) Viruses and virus-like organisms

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

(d) Parasitic plants

Arceuthobium spp. (non-EU)

Annex I A I I**(a) Insects, mites and nematodes, at all stages of their development**

Meloidogyne fallax Karssen

Rhizoecus hibisci Kawai and Takagi

Popillia japonica Newman

(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 (RNQPs) 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, herein called viruses, 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 of *Ribes* 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 *Ribes americanum* virus A (RAVA, Thekke-Veetil et al., 2018) and blackcurrant waikavirus A (BCWVA, Thekke-Veetil et al., 2017a,b). RAVA, a recently discovered virus falls in the scope of the present mandate and it will be categorised because it can be considered as a non-EU virus, since it has been identified only in an American blackcurrant plant maintained in the USDA National Clonal Germplasm Repository at Corvallis (OR, USA). BCWVA was initially identified as a potential novel waikavirus by Ho and Tzanetakis (2014) in the frame of a study to develop a diagnostic tool based on next generation sequencing, with additional molecular data reported in a meeting abstract, without details (Thekke-Veetil et al., 2017a,b). Since BCWVA has been included in the ICTV Taxonomy: 2018 Release as a related, but still unclassified virus in the genus *Waikavirus* in the family *Secoviridae*, and it may be of potential interest in the frame of the present mandate, the Panel decided to include BCWVA in the present categorisation. BCWVA was reported only in plants grown in the USA; therefore, it has to be considered as a non-EU virus.

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

Table 1: Non-EU viruses and viruses with undetermined standing of *Ribes* L.

Non-EU	Actinidia virus X (AVX), Alaska vitivirus (AIV), blackcurrant leaf chlorosis associated virus (BCLCaV), black currant-associated rhabdovirus (BCaRV), blackcurrant waikavirus A (BCWVA), <i>Ribes americanum</i> virus A (RAVA), <i>Ribes</i> virus F (RVF), tomato ringspot virus (ToRSV)
Undetermined standing	Blackcurrant leafroll associated virus 1 (BCLRaV-1)

One of the viruses of *Ribes* addressed here (ToRSV) is also able to infect *Malus*, *Pyrus*, *Cydonia*, *Fragaria*, *Prunus* and/or *Vitis* and has therefore also been addressed previously in the pest categorisation on non-EU viruses and viroids of *Cydonia*, *Malus* and *Pyrus* (EFSA PLH Panel, 2019b), *Vitis* (EFSA PLH Panel, 2019c), *Prunus* (EFSA PLH Panel, 2019d) and *Fragaria* (EFSA PLH Panel, 2019e). Non-EU viruses of *Rubus* L. will be addressed in another opinion.

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 *Ribes* 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 are not necessarily exhaustive.

2.1.2. Database search

Pest information, on the host(s) and distribution, was retrieved from the European and Mediterranean Plant 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 Member States (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 *Ribes*, following guiding principles and steps presented in the EFSA guidance on quantitative pest risk assessment (EFSA PLH Panel, 2018b) 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 RNQP 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 RNQP. 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 RNQP 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?

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
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 (i.e. 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?
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 pest

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, except for AIV and RVF, the viruses of *Ribes* categorised in the present opinion are either classified as species in the official ICTV classification scheme, or if not yet officially classified, unambiguously represent tentative new species of clear identity.

No, for AIV and RVF, which are excluded from further categorisation, because of uncertainties on their identity and, for RVF, of uncertainties on its status as a *Ribes*-infecting virus.

In Table 3, the information on the identity of the viruses categorised in the present opinion is reported. Some of them (AVX and ToRSV) are included in the ICTV official classification scheme and therefore no uncertainty is associated with their identity. BCLCaV, BCLRaV-1, BCaRV, BCWVA and RAVA have not been yet officially classified, 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 (BCLCaV, BCLRaV-1, BCaRV and BCWVA) or in a new genus (RAVA), thus recognising them as unique infectious entities distinct 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.

There are large uncertainties on the identity of AIV. The only available information on this potential virus is a short sequence of a 200 bp obtained by reverse transcription polymerase chain reaction (RT-PCR) (Robertson et al., 2012). As a consequence, the Panel decided to exclude AIV from further categorisation. There are also large uncertainties concerning RVF, for which only a partial 1,048-nt-long sequence is available. Based on the sequence data, RVF was suggested to be a possible species in the family *Totiviridae*. However, members of the family *Totiviridae* have only been so far reported from fungi or protozoa. Therefore, whether RVF is indeed a *Ribes*-infecting virus, instead of a virus infecting another organism associated with currant, remains an open question. In addition, biological information about RVF is scanty (Cox et al., 2000). As a consequence, the Panel decided to exclude it from further categorisation.

Table 3: Identity of viruses categorised in the present opinion

VIRUS name ^(a)	Is the identity of the pest established, or has it been shown to produce consistent symptoms and to be transmissible?	Justification ^(b)
Actinidia virus X (AVX)	Yes	Approved species in the genus <i>Potexvirus</i> , family <i>Alphaflexiviridae</i>
Alaska vitivirus (AIV)	No	Information limited to an RT-PCR amplified fragment of a 200 bp showing homology with <i>Vitivirus</i> species (Robertson et al., 2012), the identity is uncertain and the virus is excluded from further categorisation

VIRUS name ^(a)	Is the identity of the pest established, or has it been shown to produce consistent symptoms and to be transmissible?	Justification ^(b)
Blackcurrant leaf chlorosis-associated virus (BCLCaV)	Yes	Tentative species in the unassigned genus <i>Idaeovirus</i> (James and Phelan, 2017). The virus is also known with the name of blackcurrant ideaovirus (BCIV) (Thekke-Veetil and Tzanetakis, 2017) and blackcurrant leaf chlorosis virus ^(c) (EFSA PLH Panel, 2019a)
Blackcurrant leafroll-associated virus 1 (BCLRaV-1)	Yes	Tentative species in the genus <i>Closterovirus</i> , family <i>Closteroviridae</i> (Koloniuk et al., 2018; Zheng et al., 2018). An alternative name blackcurrant closterovirus 1 (BCCV-1) has been recently proposed (ICTV taxonomic proposal 2019.007P)
Black currant-associated rhabdovirus (BCaRV)	Yes	Tentative species in the genus <i>Nucleorhabdovirus</i> , family <i>Rhabdoviridae</i> (Wu et al., 2018)
Blackcurrant waikavirus A (BCWVA)	Yes	Tentative species in the genus <i>Waikavirus</i> , family <i>Secoviridae</i> (Ho and Tzanetakis, 2014; Thekke-Veetil et al., 2017a)
Ribes americanum virus A (RAVA)	Yes	Tentative species in the tentative new genus <i>Ravavirus</i> in the family <i>Betaflexiviridae</i> (Thekke-Veetil et al., 2018)
Ribes virus F (RVF)	No	Due to the limited available information on this poorly characterised RNA virus, based only on a partial sequence of 1048 nt available at https://www.ncbi.nlm.nih.gov/nuccore/EU495331.1 , the identity is uncertain. In addition, there are uncertainties as to whether this virus infects <i>Ribes</i> plants or a <i>Ribes</i> -associated organism (Cox et al., 2000). Therefore, the virus is excluded from further categorisation
Tomato ringspot virus (ToRSV)	Yes	Approved species in the genus <i>Nepovirus</i> , family <i>Secoviridae</i>

(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 species not yet approved by ICTV.

(c): The name 'blackcurrant leaf chlorosis virus' was used in a previous EFSA opinion (EFSA PLH Panel, 2019a)

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 be mechanically transmitted by contaminated tools and/or injuries, but this process is generally considered to be at best inefficient in hosts such as *Ribes* species. 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 name	Seed transmission	Seed transmission uncertainty (refs)	Pollen transmission	Pollen transmission uncertainty (refs)	Vector transmission	Vector transmission uncertainty (refs)
Actinidia virus X (AVX)	Cannot be excluded	Not known for AVX, but some members of genus <i>Potexvirus</i> are reported to be seed-transmitted at a low rate (Koenig and Lesemann, 1978)	No	Not known for AVX and members of genus <i>Potexvirus</i> are not reported to be pollen-transmitted	No	Not known for AVX and members of genus <i>Potexvirus</i> are not reported to be vector-transmitted

VIRUS name	Seed transmission	Seed transmission uncertainty (refs)	Pollen transmission	Pollen transmission uncertainty (refs)	Vector transmission	Vector transmission uncertainty (refs)
Blackcurrant leaf chlorosis-associated virus (BCLCaV)	Cannot be excluded	Not known for BCLCaV, but ideoviruses are reported to be seed-transmitted (MacFarlane, 2012)	Cannot be excluded	Not known for BCLCaV, but ideoviruses are reported to be pollen-transmitted (MacFarlane, 2012)	No	Not known for BCLCaV and ideoviruses are not reported to be vector-transmitted (MacFarlane, 2012)
Blackcurrant leafroll associated virus 1 (BCLRaV-1)	No	Not known for BCLRaV-1 and closteroviruses are not reported to be seed-transmitted (Martelli et al., 2012)	No	Not known for BCLRaV-1 and closteroviruses are not reported to be pollen-transmitted (Martelli et al., 2012)	Cannot be excluded	Not known for BCLRaV-1, but closteroviruses are reported to be transmitted by aphids (Martelli et al., 2012)
Black currant-associated rhabdovirus (BCaRV)	No	Not known for BCaRV and nucleorhabdoviruses are not reported to be seed-transmitted	No	Not known for BCaRV and nucleorhabdoviruses are not reported to be pollen-transmitted	Cannot be excluded	Not known for BCaRV, but nucleorhabdoviruses are reported to be transmitted by aphids, planthoppers or leafhoppers (Walker et al., 2018)
Blackcurrant waikavirus A (BCWVA)	No	Not known for BCWVA and waikaviruses are not reported to be seed-transmitted (Thompson et al., 2017)	No	Not known for BCWVA and waikaviruses are not reported to be pollen-transmitted (Thompson et al., 2017)	Cannot be excluded	Not known for BCWVA, but waikaviruses are reported to be transmitted by aphids or leafhoppers (Thompson et al., 2017)
Ribes americanum virus A (RAVA)	Transmission mechanisms cannot be readily evaluated. No information is available on transmission of RAVA and no close relatives exist which could be used to propose a tentative evaluation on the basis of similarity					
Tomato ringspot virus (ToRSV)	Cannot be excluded	Reported in herbaceous hosts, other than <i>Ribes</i> (Sanfaçon and Fuchs, 2011; EFSA PLH Panel, 2013; EPPO, 2019; http://sdb.im.ac.cn/vide/descr836.htm)	Cannot be excluded	Reported in herbaceous hosts, other than <i>Ribes</i> (Sanfaçon and Fuchs, 2011; EFSA PLH Panel, 2013; http://sdb.im.ac.cn/vide/descr836.htm)	Yes	No uncertainty. Known to be transmitted by <i>Xiphinema americanum</i> sensu lato (including <i>X. americanum</i> sensu stricto, <i>X. bricolense</i> , <i>X. californicum</i> , <i>X. inaequale</i> , <i>X. intermedium</i> , <i>X. rivesi</i> , <i>X. tarjanense</i>) (EFSA PLH Panel, 2018a)

3.1.3. Intraspecific diversity

Viruses generally exist as quasi-species, which mean 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 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 PCR, 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 between different virus strains (Jafarpour and Sanfaçon, 2009; Rivera et al., 2016).

Very limited information is available on the intraspecific diversity of the categorised *Ribes* viruses. The AVX isolate characterised from *Ribes* has 79% nt identity with the isolate from *Actinidia* (James and Phelan, 2016). Koloniuk et al. (2018) sequenced and compared five different isolates of BCLRaV-1

from red and black currant accessions. The nucleotide divergence between the isolates reached a maximum of 39%. The black and red currant isolates showed divergence of 35% and 29% among them, respectively. Putative events of recombination were detected in two isolates, spanning large regions around ORF 1a/1b or up to the p6 gene.

Finally, a blackcurrant accession from France, kept at the USDA National Clonal Germplasm Repository (Oregon), tested positive by RT-PCR for BCaRV. A large amplicon (1,348 bp) from BCaRV (Wu et al., 2018) from this accession shared 80% sequence identity with the isolate previously detected in USA.

3.1.4. Detection and identification of the pest

Are detection and identification methods available for the pest?

Yes, For most viruses of *Ribes* categorised in the present opinion molecular methods are available. Moreover, serological and biological methods are also available for some of them.

For most of 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 whether they can detect the majority of the strains of that particular virus. This is particularly true in the case of detection methods based on PCR, because one or a few mutations in the binding sites of primers may be sufficient to abolish amplification of a particular variant. It must also be stressed that virus detection based on PCR or RT-PCR is sometimes difficult, because of uneven virus distribution, low virus titres or presence of inhibitors in the extracts to be tested. For some of the categorised viruses, only biological methods based on bioassays are available, which generates uncertainty on the reliability of detection. 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 name	Are detection and identification methods available for the pest?	Justification (key references)	Uncertainties
Actinidia virus X (AVX)	Yes	Blouin et al. (2013), James and Phelan (2016)	Uncertainty (absence of a proven protocol) ^(a)
Blackcurrant leaf chlorosis-associated virus (BCLCaV)	Yes	James and Phelan (2017), Thekke-Veetil and Tzanetakis (2017)	Uncertainty (absence of a proven protocol) ^(a)
Blackcurrant leafroll-associated virus 1 (BCLRaV-1)	Yes	Koloniuk et al. (2018), Zheng et al. (2018)	Uncertainty (absence of a proven protocol) ^(a)
Black currant-associated rhabdovirus (BCaRV)	Yes	Wu et al. (2018)	Uncertainty (absence of a proven protocol) ^(a)
Blackcurrant waikavirus A (BCWVA)	Yes	Thekke-Veetil et al. (2017a)	Uncertainty (absence of a proven protocol) ^(a)
Ribes americanum virus A (RAVA)	Yes	Thekke-Veetil et al. (2018)	Uncertainty (absence of a proven protocol) ^(a)
Tomato ringspot virus (ToRSV)	Yes	EPPO Diagnostic protocol PM 7/49	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.

3.2. Pest distribution

3.2.1. Pest distribution outside the EU

The viruses of *Ribes* 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 on 28 August 2019), and, when not available in these sources, from extensive literature searches. Available distribution maps are provided in Appendix A.

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

VIRUS name	Distribution according to EPPO and/or CABI databases	Additional information (refs)
Actinidia virus X (AVX)	na ^(a)	AMERICA: Canada (James and Phelan, 2016) OCEANIA: New Zealand (Blouin et al., 2013)
Blackcurrant leaf chlorosis associated virus (BCLCaV)	na ^(a)	AMERICA: Canada (James and Phelan, 2017), USA (Thekke-Veetil et al., 2017b)
Blackcurrant leafroll associated virus 1 (BCLRaV-1)	na ^(a)	EUROPE (non-EU): Switzerland (Besse et al., 2010), Bosnia and Herzegovina (MK511330) AMERICA: USA (Koloniuk et al., 2018)
Black currant-associated rhabdovirus (BCaRV)	na ^(a)	AMERICA: USA (Wu et al., 2018)
Blackcurrant waikavirus A (BCWVA)	na ^(a)	AMERICA: (Thekke-Veetil et al., 2017a)
Ribes americanum virus A (RAVA)	na ^(a)	AMERICA: USA (Thekke-Veetil et al., 2018)
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 EUROPE (non-EU): Belarus, Russia, Serbia, Turkey OCEANIA: Fiji, New Zealand (Map: Appendix A.1)	OCEANIA: Australia (Roberts et al., 2018)

(a): No information available.

3.2.2. Pest distribution in the EU

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

Yes, for BCLRaV, BCaRV and ToRSV, however they are not reported to be widely present in the EU.

No, for AVX, BCLCaV, BCWVA and RAVA.

Three viruses of *Ribes* categorised here (BCLRaV-1, BCaRV and ToRSV) 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 definitions of non-EU viruses used in the present categorisation efforts.

BCaRV was reported in one accession originating from France in a germplasm collection in the USA. However, it is unclear whether the material was already infected when it entered in the USA or it became infected while in collection in the USA.

With regard to ToRSV, as discussed in a previous EFSA opinion (EFSA PLH Panel, 2019b) '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 (...) ToRSV detected in MSs are generally under eradication or have been already eradicated (e.g. (...) ToRSV in Italy in 2018, EPPO, 2018a,b; (...) ToRSV in the Netherlands, EPPO, 2018). 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. (...) ToRSV in France (EPPO, 2018)]. Taking this into account, the presence of (...) ToRSV in the EU MSs is considered rare and, in any case, restricted and under official control!

Concerning BCLRaV-1, the presence in two MSs (the Czech Republic, Slovenia; Koloniuk et al., 2018) is considered restricted with uncertainties because the virus has been only recently discovered and there have been no specific survey targeting it. The same uncertainties apply to all the viruses categorised here not reported to occur in the EU. Table 7 reports the currently known EU distribution of the viruses of *Ribes* considered in the present opinion.

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

VIRUS name	EU MSs from which the pest is reported
Blackcurrant leafroll-associated virus 1 (BCLRaV-1)	Czech Republic, Slovenia (Koloniuk et al., 2018)
Black currant-associated rhabdovirus (BCaRV)	France (One accession originating from France in a germplasm collection in the USA) (Wu et al., 2018)
Tomato ringspot virus (ToRSV)*	Croatia (Present, few occurrences), France (Present, no details), Germany (Transient, under eradication), Lithuania (Present, no details), Netherlands (Transient, under eradication), Poland (Present, no details), Slovakia (Present, restricted distribution)

*: See discussion on presence and prevalence in the EU MSs above.

3.3. Regulatory status

3.3.1. Council Directive 2000/29/EC

Table 8: Non-EU viruses of *Ribes* 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
4.	Tomato ringspot virus
5.	Viruses and virus-like organisms of <i>Cydonia</i> Mill., <i>Fragaria</i> L., <i>Malus</i> Mill., <i>Prunus</i> L., <i>Pyrus</i> L., <i>Ribes</i> L., <i>Rubus</i> L. and <i>Vitis</i> L., such as: (n) Non-European viruses and virus-like organisms of <i>Cydonia</i> Mill., <i>Fragaria</i> L., <i>Malus</i> Mill., <i>Prunus</i> L., <i>Pyrus</i> L., <i>Ribes</i> L., <i>Rubus</i> L. and <i>Vitis</i> L.

3.3.2. Legislation addressing the hosts of non-EU viruses of *Ribes*

Hosts of the viruses categorised here are regulated in the Council Directive 2000/29/EC. The legislation addressing *Ribes* is presented in Table 9. Several non-EU viruses of *Ribes* may also infect other hosts or have a wide host range, with the related legislation reported in section 3.4.1.

Table 9: Regulations applying to *Ribes* 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 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	
19.2	Plants of <i>Cydonia</i> Mill., <i>Fragaria</i> L., <i>Malus</i> Mill., <i>Prunus</i> L., <i>Pyrus</i> L., <i>Ribes</i> L., <i>Rubus</i> 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 all species: non-European viruses and virus-like 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.
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 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	
3	Fruits of: [...] <i>Annona</i> L., <i>Cydonia</i> Mill., <i>Diospyros</i> L., <i>Malus</i> Mill., <i>Mangifera</i> L., <i>Passiflora</i> L., <i>Prunus</i> L., <i>Psidium</i> L., <i>Pyrus</i> L., <i>Ribes</i> L. <i>Syzygium</i> Gaertn., and <i>Vaccinium</i> L., originating in non-European countries, [...]	

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

The nematode vectors of ToRSV are listed in Directive 2000/29/EC:

- *Xiphinema americanum* sensu lato (not-European populations) 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.

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 *Ribes* spp. (BCLCaV, BCLRaV-1, BCaRV, BCWVA, RAVA), ToRSV has a wide host range and AVX infects at least one additional non-*Ribes* species. However, considering the biology of other members of the virus genera, existence of additional natural hosts cannot be excluded for RAVA, and is considered unlikely for BCLCaV, BCLRaV-1, BCaRV and BCWVA. Regulation addressing other natural hosts exists for ToRSV. It should be considered that for all viruses categorised here, additional natural hosts that have not been reported so far may exist. This uncertainty is even higher for recently discovered viruses (all categorised viruses with the exception of ToRSV).

Table 10: Natural hosts of the viruses categorised in the present opinion, together with the regulatory status of hosts other than *Ribes* and the associated uncertainties

VIRUS name	Other than <i>Ribes</i> hosts (refs)	Regulation addressing hosts other than <i>Ribes</i> ^(a)	Uncertainties
Actinidia virus X (AVX)	<i>Actinidia chinensis</i>	Not regulated in Directive 2000/29/EC	Experimental hosts belong to different families (Blouin et al., 2013). Additional natural hosts may exist
Blackcurrant leaf chlorosis associated virus (BCLCaV)	No other known natural hosts		The other ideoviruses are not known to have a wide natural host range. Therefore, existence of additional natural host is considered unlikely
Blackcurrant leafroll associated virus 1 (BCLRaV-1)	No other known natural hosts		Other closteroviruses are not known to have a wide natural host range. Therefore, existence of additional natural host is considered unlikely
Black currant-associated rhabdovirus (BCaRV)	No other known natural hosts		Other nucleorhabdoviruses are not known to have a wide natural host range. Therefore, existence of additional natural host is considered unlikely
Black currant waikavirus A (BCWVA)	No other known natural hosts		Other waikaviruses are not known to have a wide natural host range (Thompson et al., 2017). Therefore, existence of additional natural host is considered unlikely
Ribes americanum virus A (RAVA)	No other known natural hosts		Recently described virus. Additional natural host may exist

VIRUS name	Other than <i>Ribes</i> hosts (refs)	Regulation addressing hosts other than <i>Ribes</i> ^(a)	Uncertainties
Tomato ringspot virus (ToRSV)	EPPO: MAJOR: <i>Pelargonium x hortorum</i> , <i>Prunus persica</i> , <i>Rubus idaeus</i> MINOR: <i>Gladiolus</i> , <i>Hydrangea macrophylla</i> , <i>Pelargonium</i> , <i>Prunus</i> spp., <i>P. avium</i> , <i>P. domestica</i> , <i>P. dulcis</i> , <i>Punica granatum</i> , <i>Ribes nigrum</i> , <i>Ribes uva-crispa</i> , <i>Rosa</i> , <i>Rubus</i> , <i>Rubus fruticosus</i> , <i>Vaccinium corymbosum</i> , <i>Vitis vinifera</i> , woody plants INCIDENTAL: <i>Fraxinus americana</i> , <i>Malus</i> , <i>Rubus laciniatus</i> , <i>Solanum lycopersicum</i> , <i>Solanum tuberosum</i> WILD/WEED: <i>Stellaria media</i> , <i>Taraxacum officinale</i> <i>Cydonia</i> (EFSA PLH Panel, 2019b)	<i>Cydonia</i> 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; <i>Fraxinus</i> sp.: IVAI 2.3,2.4,2.5,11.4; VB 2, 5, 6; <i>Gladiolus</i> sp.: IVAII 24.1, VA 3; <i>Malus</i> 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; <i>Narcissus</i> sp.: IVAI 30; IVAII 22, 24.1; VA.I 3; <i>Pelargonium</i> sp.: IVAI 27.1, 27.2, 31; IVAII 20, VAI 2.1; VBI 2; <i>Prunus</i> sp.: IIIA 9,18; IVAI 7.4, 7.5, 14.1, 16.6, 19.2, 23.1, 23.2; IVAII 12, 16; IVB 20.5, VAI 1.1, 2.1, VAII 1.2, VBI 1, 2, 3, 6; <i>Punica</i> sp.: IVAI 16.6; VA3 <i>Ribes</i> sp.: IVAI 19.2; VB 3; <i>Rosa</i> sp.: IIIA 9, IVAI 44, 45.2; VBI 2. <i>Rubus</i> sp.: IVAI 19.2, 24; IVAII 12; VA 2.1; VBI 1; <i>Solanum</i> 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; VB 1,3,4 <i>Vaccinium</i> sp.: VB 3 <i>Vitis</i> 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

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

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 *Ribes* categorised here. These agents may enter the EU territory with infected *Ribes* plants for planting. Some of them have additional pathways including plants for planting of other natural hosts, seeds, pollen and/or vector(s).

All the viruses of *Ribes* categorised here can be transmitted by vegetative propagation material. Therefore, plants for planting of *Ribes* must be considered as potentially the most important entry pathway. AVX has at least one additional natural host (*Actinidia chinensis*) and ToRSV has a wide host range, including additional natural hosts that also are vegetatively propagated (e.g. *Cydonia* spp., *Malus* spp., *Pyrus* spp., *Rubus* spp., *Rosa* spp., *Vaccinium* spp.), thus providing additional entry pathways. Only for AVX, BCLCaV and ToRSV seed- and/or pollen-transmission in *Ribes* cannot be excluded because such a transmission has been proven in related viruses (in the same genus) and in some other hosts, respectively. Missing evidence on the transmission mechanisms for these viruses causes uncertainties on the possible pathways. Major entry pathways for the viruses categorised here are summarised in Table 11.

Current legislation does not prohibit entry in the EU of *Ribes* plants from non-EU countries. However, restrictions apply to plants for planting, in general (e.g. Annex IVAI, 33, 36.1, 39, 40, 43, 46), or specifically referring to *Ribes* (e.g. Annex IVAI 19.2). 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 virus-infected plants of *Ribes* intended for planting. This is because symptoms in the infected plants are often not obvious.

The import of *Ribes* fruits from non-European countries is currently regulated (Annex VAI 3), but the requirement (plant health inspection) has likely a minor effect to mitigate virus entry in the EU. This pathway is noteworthy for those agents that may be seed-transmitted (BCLRaV and ToRSV), although fruit import is unlikely to represent a pathway of major relevance.

As noted above in Section 3.4.1, the current legislation regulates several non-*Ribes* hosts of the viruses categorised here (e.g. *Cydonia*, *Fraxinus*, *Gladiolus*, *Malus*, *Narcissus*, *Pelargonium*, *Prunus*, *Punica*, *Ribes*, *Rosa*, *Rubus*, *Solanum*, *Vaccinium*, *Vitis*). 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 and 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, 46) or specifically referring to *Vitis* (e.g. Annex IVB 21.1, 21.2, 32) and other hosts 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.

The Panel also notes that this legislation is complex, which may create interpretation problems, and it does not completely eliminate the risk of introduction through the plants for planting pathway for at least some of the viruses categorised here.

Annex V (BI1 and BII3) establishes that plants for planting, pollen and/or part of plants of several host species (including *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 some of the non-*Ribes* hosts (*Rubus* sp., *Solanum lycopersicum*) of viruses categorised here (ToRSV) are regulated (VBI 1) and a phytosanitary certificate is requested.

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 *Ribes* and other species that are regulated in the EU (such as *Cydonia*, *Malus* and *Pyrus*), but has no effect on the dissemination of viruses of non-regulated host plants.

ToRSV is transmitted by nematodes and therefore may enter the EU with viruliferous nematodes. The main entry pathways 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, 2018a), 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, 2018a).

In summary, the current legislation only partially regulates the *Ribes* plants for planting (and pollen) entry pathway for the viruses categorised here. In addition, for plants for planting of many non-*Ribes* natural hosts of ToRSV there are no special requirements formulated, leaving open potential entry pathways.

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

Virus name	<i>Ribes</i> plants for planting ^(a)	<i>Ribes</i> pollen ^(a)	<i>Ribes</i> seeds ^(a)	Plants for planting/ seeds/ pollen of other hosts ^(a)	Viruliferous vectors ^(a)	Uncertainty factors
Actinidia virus X (AVX)	Pathway regulated but legislation considered of limited efficiency because it relies only on observation of symptoms	Not a pathway: AVX is not known to be pollen-transmitted	Pathway possibly open: seed transmission may exist	Pathway open for <i>Actinidia chinensis</i> plants for planting and possibly open for other potential hosts	Not a pathway: AVX is not known to have vector(s)	<ul style="list-style-type: none"> – Geographic distribution – Effectiveness of visual detection – Seed transmission – Existence of other natural hosts – Existence and volume of trade of <i>Ribes</i> seeds
Blackcurrant leaf chlorosis associated virus (BCLCaV)	Pathway regulated but legislation considered of limited efficiency because it relies only on observation of symptoms	Pathway possibly open: pollen transmission may exist	Pathway possibly open: seed transmission may exist	Not a pathway: BCLCaV is not known to have other natural host(s)	Not a pathway: BCLCaV is not known to have vector(s)	<ul style="list-style-type: none"> – Geographic distribution – Effectiveness of visual detection – Seed and pollen transmission – Existence of other natural hosts, which is however considered unlikely – Existence of vector(s)
Blackcurrant leafroll associated virus 1 (BCLRaV-1)	Pathway regulated but legislation considered of limited efficiency because it relies only on observation of symptoms	Not a pathway: BCLRaV-1 is not known to be pollen-transmitted	Not a pathway: BCLRaV-1 is not known to be seed-transmitted	Not a pathway: BCLRaV-1 is not known to have other natural host(s)	Pathway possibly open: unknown vector(s) may exist.	<ul style="list-style-type: none"> – Geographic distribution – Effectiveness of visual detection – Existence of other natural hosts, which is however considered unlikely – Existence of vector(s)
Black currant-associated rhabdovirus (BCaRV)	Pathway regulated but legislation considered of limited efficiency because it relies only on observation of symptoms	Not a pathway: BCaRV is not known to be pollen-transmitted	Not a pathway: BCaRV is not known to be seed-transmitted	Not a pathway: BCaRV is not known to have other natural host(s)	Pathway possibly open: unknown vector(s) may exist.	<ul style="list-style-type: none"> – Geographic distribution – Effectiveness of visual detection – Existence of other natural hosts, which is however considered unlikely – Existence of vector(s)
Black currant waikavirus A (BCWVA)	Pathway regulated but legislation considered of limited efficiency because it relies only on observation of symptoms	Not a pathway: BCWVA is not known to be pollen-transmitted	Not a pathway: BCWVA is not known to be seed-transmitted	Not a pathway: BCWVA is not known to have other natural host(s)	Pathway possibly open: unknown vector(s) may exist.	<ul style="list-style-type: none"> – Geographic distribution – Effectiveness of visual detection – Existence of other natural hosts, which is however considered unlikely – Existence of vector(s)

Virus name	<i>Ribes</i> plants for planting ^(a)	<i>Ribes</i> pollen ^(a)	<i>Ribes</i> seeds ^(a)	Plants for planting/ seeds/ pollen of other hosts ^(a)	Viruliferous vectors ^(a)	Uncertainty factors
Ribes americanum virus A (RAVA)	Pathway regulated but legislation considered of limited efficiency because it relies only on observation of symptoms	Panel unable to conclude on these pathways because virus biology is not known				<ul style="list-style-type: none"> – Geographic distribution – Effectiveness of visual detection – Seed and pollen transmission – Existence of other natural hosts – Existence of vector(s)
Tomato ringspot virus (ToRSV)	Pathway regulated but legislation considered of limited efficiency because it relies only on observation of symptoms	Pathway possibly open: pollen transmission may exist	Pathway possibly open: seed transmission may exist	Pathway partially regulated: existence of a wide range of regulated and unregulated hosts	Pathway partially regulated: viruliferous nematodes can enter with the soil and growing media still attached to plants	<ul style="list-style-type: none"> – Geographic distribution – Seed and pollen transmission in <i>Ribes</i>

(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).

Interceptions of non-EU viruses of *Ribes* were searched in the Europhyt database on 12 June 2019 (EUROPHYT, 2019). Only five interceptions of ToRSV were reported, mainly from ornamental hosts. They date back to more than 10 years ago (Table 12). No interception was registered in the case of AVX.

BCLCaV, BCLRaV-1, BCaRV, BCWVA and RAVA are not listed in Europhyt database.

Table 12: Interceptions of ToRSV in the EU (Source: Europhyt, search done on 12 June 2019)

VIRUS name	Europhyt interception	Year of interception	Origin	Plant species on which it has been intercepted
Tomato ringspot virus (ToRSV)	5	1997	Israel	<i>Pelargonium</i> sp.
		1997	Israel	<i>Pelargonium</i> sp.
		1999	USA	<i>Pelargonium</i> sp.
		1999	France	<i>Pelargonium x hortorum</i>
		2008	Italy	<i>Malus</i> sp.

The analysis of entry pathways is affected by uncertainties linked with the limited information available on (a) the transmission biology and host range of the categorised viruses and (b) their geographical distribution.

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 *Ribes*, other than seeds: this pathway is regulated for all the viruses categorised here, although the legislation is considered of limited efficiency because it relies only on observation of symptoms.
- Entry pathway involving pollen of *Ribes*: the pathway is possibly open for BCLCaV and ToRSV. For RAVA, the virus biology is unknown. 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. The risk associated with this pathway has been considered negligible in a previous EFSA opinion (EFSA PLH Panel, 2013).
- Entry pathway involving seeds of *Ribes*: this pathway is possibly open for AVX, BCLCaV and ToRSV. For the other viruses, this is not considered a pathway, sometimes with uncertainty, because they are not reported to be seed-transmitted. For RAVA, the virus biology is unknown.
- Entry pathway involving non-*Ribes* hosts. This pathway is considered:
 - open for AVX;
 - partially regulated for ToRSV;
 - not to be a pathway for BCLCaV, BCLRaV-1, BCaRV, BCWVA (because they have a narrow host range, likely restricted to *Ribes*);
 - virus biology unknown for RAVA.
- Entry pathway involving vectors: this pathway refers to:
 - nematode-transmitted viruses (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 the EU with 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 *Ribes* that may be not regulated or only partially regulated.
 - arthropod-transmitted viruses. For BCLRaV-1, BCaRV, BCWVA, the vector of which, if any, has not been identified yet, the pathway is considered possibly open. For the other agents (AVX and BCLCaV) this is not considered a pathway, with uncertainty.

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

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

Table 13: *Ribes* area (cultivation/harvested/production) (1000 ha). Date of extraction from Eurostat 24/05/2019. Data regarding redcurrants (*Ribes rubrum*, F3120), blackcurrants (*Ribes nigrum*; F3110) and gooseberries (*Ribes uva-crispa*; F3910) have been aggregated

EU country/year	2014	2015	2016	2017	2018
Austria	0.02	0.09	0.07	0.07	0.07
Belgium	0.04	0.00	0.00	0.00	0.00
Bulgaria	1.07	1.02	0.90	0.86	0.85
Croatia	1.53	1.20	0.69	0.63	0.59
Cyprus	2.46	2.40	2.33	2.34	2.25
Czechia	0.20	0.20	0.17	0.32	0.29
Denmark	0.04	0.04	0.04	0.04	0.04
Estonia	0.05	0.10	0.13	0.14	0.14
Finland	0.01	0.02	0.02	0.02	0.02
France	2.78	2.73	2.73	2.70	2.68

EU country/year	2014	2015	2016	2017	2018
Germany (until 1990 former territory of the FRG)	0.00	0.00	0.00	0.00	0.00
Greece	0.22	0.11	0.14	0.03	0.00
Hungary	0.00	0.00	0.00	0.00	0.00
Ireland	0.50	0.60	0.50	0.60	0.70
Italy	4.00	3.81	3.80	4.36	4.39
Latvia	0.00	0.00	0.00	0.00	0.00
Lithuania	1.62	1.16	1.19	1.18	1.10
Luxembourg	0.00	0.00	0.00	0.00	0.00
Malta	0.42	0.61	0.54	0.39	0.54
Netherlands	0.25	0.24	0.24	0.26	0.32
Poland	47.40	44.40	44.18	44.04	0.00
Portugal	0.07	0.11	0.11	0.12	0.12
Romania	0.20	0.16	0.14	0.15	0.02
Slovakia	0.00	0.00	0.00	0.00	0.00
Slovenia	0.22	0.31	0.23	0.19	0.24
Spain	1.46	1.38	1.66	1.74	1.74
Sweden	0.27	0.25	0.24	0.24	0.23
United Kingdom	3.00	3.00	2.50	2.55	2.55

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. *Ribes* 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 may be influenced by 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

Are the pests 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. ToRSV can also be spread by nematodes and, BCLRaV-1, BCaRV, BCWVA by vectors (not yet identified)

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 *Ribes* categorised here is mainly due to human activities (e.g. movement of plants for planting). Some of these viruses have also natural spread mediated by vectors that are mainly involved in short-distance movement.

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

Nematode species *X. americanum* sensu stricto and *X. americanum* sensu lato (i.e. *X. bricolense*, *X. californicum*, *X. inaequale*, *X. tarjanense*) transmitting ToRSV have not been recorded in the EU. One (*X. intermedium*) has been reported in Portugal (Fauna Europaea database), but without any reference to a specific publication. *X. rivesi* has been reported in six EU MSs (France, Germany, Italy, Portugal, Slovenia, Spain, see Figure 1) (EFSA PLH Panel, 2018a). Although under experimental condition the ability of EU populations of *X. rivesi* to transmit ToRSV has been demonstrated, they have never been associated with the spread of the corresponding viral diseases under field condition in the EU (EFSA PLH Panel, 2018a).

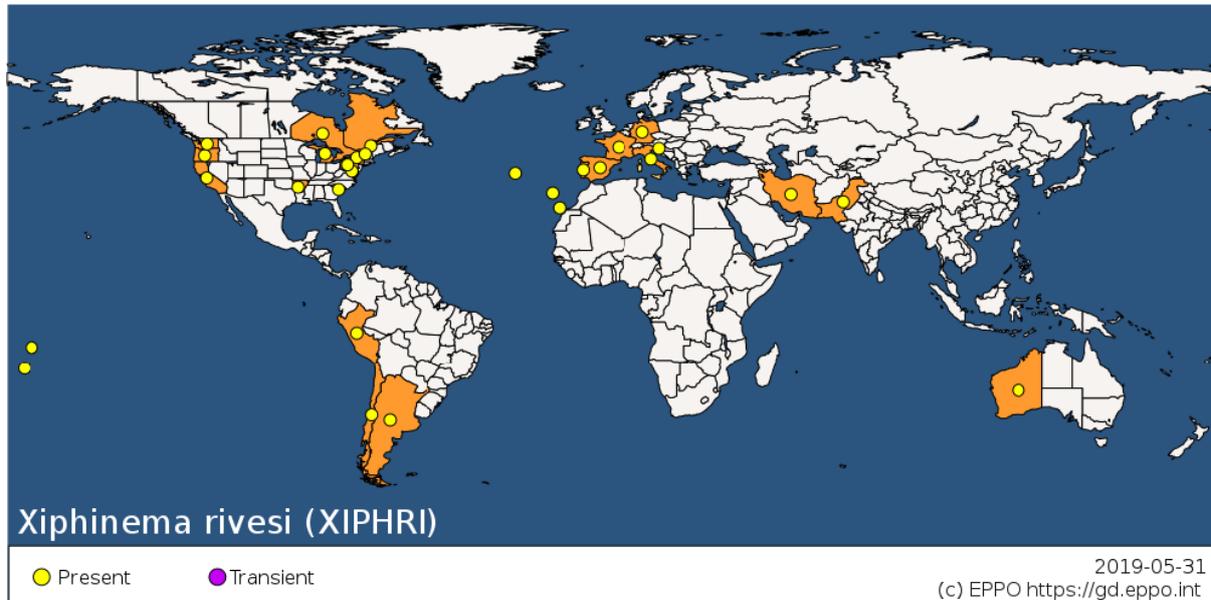


Figure 1: Global distribution map for *Xiphinema rivesi* (extracted from the EPPO Global Database accessed on 31 May 2019)

3.5. Impacts

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

Yes, for ToRSV, which may induce severe disease in economically relevant crops.

For AVX, BCLCaV, BCLRaV-1, BCaRV, BCWVA and RAVA, the Panel was **unable to come to a conclusion** because of lack of conclusive data on the 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 ToRSV. Given the severity of the symptoms this virus may cause in *Ribes*, its presence in plants for planting would impact their intended use. In addition, some of these viruses may also have an impact on plants for planting of other hosts.

For AVX, BCLCaV, BCLRaV-1, BCaRV, BCWVA and RAVA the Panel was **unable to come to a conclusion** because of lack of conclusive data on the association with symptoms.

Mixed infections by several viruses are quite common in *Ribes*, making a straightforward association between a putative causal agent and particular symptoms often 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. This raises the possibility that viruses with limited or no impact when present alone may have significant impact when in mixed infection, further complicating the present analysis and increasing the uncertainties.

In many cases, the link between some of the categorised agents and symptoms is at most 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 *Ribes* cultivars nor has the potential for detrimental synergistic interactions with other viruses been investigated. The impact of the viruses categorised is summarised in Table 14.

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

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

VIRUS name	Would the pests' introduction have an economic or environmental impact on the EU territory?	Reasoning and uncertainties with relevant references	<u>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?</u>
Actinidia virus X (AVX)	Unable to conclude because of lack of information in the case of <i>Ribes</i>	Detected once in symptomatic <i>Ribes nigrum</i> cv. Baldwin plants; however, there is no information as to whether those plants could have been infected with other viruses (James and Phelan, 2016). Association with symptoms is inconclusive AVX was detected both in symptomatic and asymptomatic <i>Actinidia chinensis</i> plants. It was in mixed infection with at least one more virus in the symptomatic plants (Blouin et al., 2013). Upon mechanical inoculation of <i>A. chinensis</i> seedlings symptoms were observed in inoculated leaves, but no symptoms were observed in upper uninoculated leaves (Blouin et al., 2013). Overall this virus does not seem to be associated with symptoms in <i>Actinidia</i>	Unable to conclude because of lack of information in the case of <i>Ribes</i>
Blackcurrant leaf chlorosis-associated virus (BCLCaV)	Unable to conclude because of lack of information	Virus recently described by NGS (Thekke-Veetil et al., 2017a,b; James and Phelan, 2017) from <i>Ribes</i> plants showing virus-like symptoms, mainly chlorosis. There is some evidence for a correlation between virus presence and symptoms of blackcurrant leaf chlorosis disease. However, the conclusion about the causal role of BCLCaV is associated with uncertainties, given the limited number of plants involved in this correlation analysis and the possible involvement of other agents	Unable to conclude because of lack of information
Blackcurrant leafroll-associated virus 1 (BCLRaV-1)	Unable to conclude because of lack of information	Association of symptoms (early defoliation and symptoms of leaf roll, together with interveinal reddening in summer and autumn) with virus infection cannot be ascertained, due to the possibility of mixed infections, and because of the presence of the virus in symptomless plants has been also reported (Koloniuk et al., 2018; Zheng et al., 2018; Besse et al., 2010)	Unable to conclude because of lack of information
Black currant-associated rhabdovirus (BCaRV)	Unable to conclude because of lack of information	This virus was recently described from both a symptomless plant and a symptomatic plant in association with another virus (Wu et al., 2018)	Unable to conclude because of lack of information

VIRUS name	Would the pests' introduction have an economic or environmental impact on the EU territory?	Reasoning and uncertainties with relevant references	<u>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?</u>
Black currant waikavirus A (BCWVA)	Unable to conclude because of lack of information	Recently described virus from a <i>Ribes nigrum</i> plant showing virus-like symptoms (Ho and Tzanetakis, 2014). No clear association with symptoms can be drawn, since the original source was simultaneously infected by BCWVA and another virus. Therefore, the Panel is unable to conclude on the pathogenicity and impact of BCWVA	Unable to conclude because of lack of information
Ribes americanum virus A (RAVA)	Unable to conclude because of lack of information	Recently described virus from an American blackcurrant plant showing ragged leaf margins and crinkling. No clear association with symptoms can be drawn, since the original source was simultaneously infected by BCWVA and RAVA (Thekke-Veetil et al., 2018). Therefore, the Panel is unable to conclude on the pathogenicity and impact of RAVA	Unable to conclude because of lack of information
Tomato ringspot virus (ToRSV)	Yes	ToRSV has been associated with symptoms in some <i>Ribes</i> varieties (Williams et al., 1987). In addition, this virus causes severe symptoms in many of its other hosts including <i>Prunus</i> spp., <i>Malus</i> spp., <i>Rubus</i> spp. and <i>Vitis</i> spp. (Yang et al., 1986; Stace-Smith and Converse, 1987; Pinkerton et al., 2008; Martelli and Uyemoto, 2011; Sanfaçon and Fuchs, 2011)	Yes

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 excluding infection by some of the viruses categorised here 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 *Ribes* (see section 3.3). Potential additional measures to mitigate the risk of entry of the viruses categorised here may include:

- banning import of *Ribes* plants for planting (including pollen),
- for ToRSV, 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 the virus is reported to be present,

- extension of phytosanitary measures, to establish certification schemes or testing for *Ribes* plants for planting and other hosts other than *Ribes*.

Some of the viruses may also enter in the EU through viruliferous nematodes or, potentially, arthropods. In agreement with a recent EFSA scientific opinion (EFSA PLH Panel, 2018a) 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 treatment on 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 (2018b). Additional control measures are organisational measures or procedures that directly affect pest abundance.

Table 15: Selected control measures (a full list is available in EFSA PLH Panel, 2018a) for pest entry/establishment/spread/impact in relation to currently unregulated hosts and pathways. Control measures are measures that have a direct effect on pest abundance

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 potential vectors. Isolation from natural soil may prevent infestation by viruliferous nematodes	Spread	ToRSV (isolation from soil); Possibly BCLRaV, BCaRV, BCWVA, RAVA (insect-proof greenhouses)
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	Possibly BCLRaV, BCaRV, BCWVA, RAVA

Information sheet title (with hyperlink to information sheet if available)	Control measure summary	Risk component (entry/ establishment/ spread/impact)	Agent(s)
Cleaning and disinfection of facilities, tools and machinery	<p>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</p> <p>These measures may remove viruliferous nematodes and arthropods</p>	Spread	Possibly BCLRaV, BCaRV, BCWVA, RAVA
Physical treatments on consignments or during processing	<p>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)</p> <p>Mechanical cleaning and removal of plant parts (e.g. leaves from fruit consignments may remove viruliferous insects)</p>	Entry	Possibly BCLRaV, BCaRV, BCWVA, RAVA
Roguing and pruning	<p>Roguing is defined as the removal of infested plants and/or uninfested host plants in a delimited area, whereas pruning is defined as the removal of infested plant parts only, without affecting the viability of the plant</p> <p>Removal of infected plants is extremely efficient for all categorised viruses, especially for those not transmitted by vectors.</p> <p>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</p>	Establishment and Spread	All viruses categorised here
Chemical treatments on crops including reproductive material	<p>–</p> <p>Chemical treatments on crops may prevent infestations by viruliferous arthropods</p>	Spread	Possibly BCLRaV, BCaRV, BCWVA, RAVA

Information sheet title (with hyperlink to information sheet if available)	Control measure summary	Risk component (entry/ establishment/ spread/impact)	Agent(s)
Post-entry quarantine and other restrictions of movement in the importing country	<p>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</p> <p>Relevant commodities are plants, plant parts and other materials that may carry pests, either as infection, infestation, or contamination</p> <p>Identifying virus-infected plants limits the risks of entry, establishment and spread in the EU</p>	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 (2018b). 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 supporting measures (a full list is available in EFSA PLH Panel, 2018b) in relation to currently unregulated hosts and pathways. Supporting measures are organisational measures or procedures supporting the choice of appropriate risk reduction options that do not directly affect pest abundance

Information sheet title (with hyperlink to information sheet if available)	Supporting measure summary	Risk component (entry/ establishment/ spread/impact)	Agents
Laboratory testing	<p>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</p> <p>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</p>	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)	Agents
Certified and approved premises	<p>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. Key property of certified or approved premises is the traceability of activities and tasks (and their components) inherent the pursued phytosanitary objective. Traceability aims to provide access to all trustful pieces of information that may help to prove the compliance of consignments with phytosanitary requirements of importing countries</p> <p>Certified and approved premises may guarantee the absence of the harmful viruses from <i>Ribes</i> imported for research and/or breeding purposes, from countries allowed to export them in EU MSs</p>	Entry and Spread	All viruses categorised here
Delimitation of Buffer zones	<p>ISPM 5 defines a buffer zone as 'an area surrounding or adjacent to an area officially delimited for phytosanitary purposes in order to minimize 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</p> <p>A buffer zone may contribute to reduce the spread of non-EU viruses of <i>Ribes</i> after entry in the EU</p>	Spread	Only for viruses with efficient spread mechanism besides plants for planting (e.g. viruses vectored by nematodes and arthropods)

Information sheet title (with hyperlink to information sheet if available)	Supporting measure summary	Risk component (entry/ establishment/ spread/impact)	Agents
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) 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 here categorised favouring immediate adoption of control measures if the agents came to establish	Spread	All viruses categorised here

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

- Absence in the legislation of list of specific viruses that are only mentioned under the general term of '*Non-European viruses*';
- Uncertain association with symptoms for some viruses (AVX, BCLCaV, BCLRaV-1, BCLCaV, BCWVA and RAVA);
- 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 (ToRSV);
- Difficulties to control vectors for soil-borne viruses (ToRSV);
- Lack of information on potential vector(s) for some agents;
- Difficulties to control pollen-mediated transmission for some agents (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 efforts concern:

- biological information on the categorised viruses, especially those described recently based on HTS data, is often very limited;
- distribution, both in the EU and outside the EU, of the viruses categorised here, 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 of *Ribes* are as follows:

ToRSV meet all the criteria evaluated by EFSA to qualify as potential Union quarantine pests.

For AVX, BCLCaV, BCLRaV-1, BCaRV, BCWVA and RAVA, 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 one of 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. A consequence of this situation is that for particular viruses the results of the categorisation efforts presented here could be very significantly impacted by the development of novel information.

The Panel conclusions are summarised in Table 17 and reported in detail in Tables 18.1–18.7.

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

VIRUS 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
Actinidia virus X (AVX)		Yes	No	18.1
Blackcurrant leaf chlorosis associated virus (BCLCaV)		Yes	No	18.2
Blackcurrant leafroll associated virus 1 (BCLRaV-1)		Yes	No	18.3
Black currant-associated rhabdovirus (BCaRV)		Yes	No	18.4
Blackcurrant waikavirus A (BCWVA)		Yes	No	18.5
Ribes americanum virus A (RAVA)		Yes	No	18.6
Tomato ringspot virus (ToRSV)	Yes		No	18.7

Tables 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: Actinidia virus X (AVX)

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 AVX is established and diagnostic techniques are available	The identity of AVX 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)	AVX is not known to be present in the EU	AVX is not known to be present in the EU. Therefore, AVX does not meet this criterion to qualify as potential Union RNQP	Possible unreported presence in the EU
Regulatory status (Section 3.3)	AVX can be considered as regulated in Annex IAI as 'Non-European viruses and virus-like organisms of <i>Cydonia</i> Mill., <i>Fragaria</i> L., <i>Malus</i> Mill., <i>Prunus</i> L., <i>Pyrus</i> L., <i>Ribes</i> L., <i>Rubus</i> L. and <i>Vitis</i> L.'	AVX can be considered as regulated in Annex IAI as 'Non-European viruses and virus-like organisms of <i>Cydonia</i> Mill., <i>Fragaria</i> L., <i>Malus</i> Mill., <i>Prunus</i> L., <i>Pyrus</i> L., <i>Ribes</i> L., <i>Rubus</i> L. and <i>Vitis</i> L.'	AVX not explicitly mentioned in Directive 2000/29/EC
Pest potential for entry, establishment and spread in the EU territory (Section 3.4)	The main pathway, plants for planting of <i>Ribes</i> spp., is regulated but legislation considered of limited efficiency because it relies only on observation of symptoms. <i>Actinidia chinensis</i> plants for planting pathway open. Other potential pathways (seeds) may possibly be open. If AVX were to enter in the EU, it would be able to establish and spread	Plants for planting constitute the main means for long-distance spread for AVX	<ul style="list-style-type: none"> – Geographic distribution – Effectiveness of visual detection – Seed transmission – Existence of other natural hosts – Existence and volume of trade of <i>Ribes</i> seeds
Potential for consequences in the EU territory (Section 3.5)	Due to limited information, the Panel is unable to conclude on the potential consequences of AVX in the EU territory	Due to limited information, the Panel is unable to conclude whether the presence of AVX on <i>Ribes</i> 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 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), AVX meets all the other criteria evaluated by EFSA to qualify as potential Union quarantine pests	AVX is a non-EU virus (considered as regulated in Annex IAI as 'Non-European viruses and virus-like organisms of <i>Cydonia</i> Mill., <i>Fragaria</i> L., <i>Malus</i> Mill., <i>Prunus</i> L., <i>Pyrus</i> L., <i>Ribes</i> L., <i>Rubus</i> L. and <i>Vitis</i> L.')	

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	<p>The main knowledge gaps or uncertainties identified concern:</p> <ul style="list-style-type: none"> – 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 and seed transmission); – Existence and volume of trade of <i>Ribes</i> seeds. <p>Given the very limited information available 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</p>		

Table 18.2: Blackcurrant leaf chlorosis associated virus (BCLCaV)

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 BCLCaV is established and diagnostic techniques are available	The identity of BCLCaV 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)	BCLCaV is not known to be present in the EU	BCLCaV is not known to be present in the EU. Therefore, BCLCaV does not meet this criterion to qualify as potential Union RNQP	Possible unreported presence in the EU
Regulatory status (Section 3.3)	BCLCaV can be considered as regulated in Annex IAI as 'Non-European viruses and virus-like organisms of <i>Cydonia</i> Mill., <i>Fragaria</i> L., <i>Malus</i> Mill., <i>Prunus</i> L., <i>Pyrus</i> L., <i>Ribes</i> L., <i>Rubus</i> L. and <i>Vitis</i> L.'	BCLCaV can be considered as regulated in Annex IAI as 'Non-European viruses and virus-like organisms of <i>Cydonia</i> Mill., <i>Fragaria</i> L., <i>Malus</i> Mill., <i>Prunus</i> L., <i>Pyrus</i> L., <i>Ribes</i> L., <i>Rubus</i> L. and <i>Vitis</i> L.'	BCLCaV not explicitly mentioned in Directive 2000/29/EC
Pest potential for entry, establishment and spread in the EU territory (Section 3.4)	The main pathway, plants for planting of <i>Ribes</i> spp., is regulated but legislation considered of limited efficiency because it relies only on observation of symptoms. Other potential pathways (pollen, seeds) may possibly be open. If BCLCaV were to enter in the EU, it would be able to establish and spread	Plants for planting constitute the main means for long-distance spread for BCLCaV	<ul style="list-style-type: none"> – Geographic distribution – Effectiveness of visual detection – Seed and pollen transmission – Existence of other natural hosts – Existence of vector(s)
Potential for consequences in the EU territory (Section 3.5)	Due to limited information, the Panel is unable to conclude on the potential consequences of BCLCaV in the EU territory	Due to limited information, the Panel is unable to conclude whether the presence of BCLCaV on <i>Ribes</i> 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 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), BCLCaV meets all the other criteria evaluated by EFSA to qualify as potential Union quarantine pests	BCLCaV is a non-EU virus (considered as regulated in Annex IAI as "Non-European viruses and virus-like organisms of <i>Cydonia</i> Mill., <i>Fragaria</i> L., <i>Malus</i> Mill., <i>Prunus</i> L., <i>Pyrus</i> L., <i>Ribes</i> L., <i>Rubus</i> L. and <i>Vitis</i> L.) and, as such, it does not meet the corresponding criterion evaluated by EFSA to qualify as a potential Union RNQP	
Aspects of assessment to focus on/scenarios to address in future if appropriate	<p>The main knowledge gaps or uncertainties identified concern:</p> <ul style="list-style-type: none"> – 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, seed and pollen transmission); <p>Given the very limited information available 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</p>		

Table 18.3: Blackcurrant leafroll associated virus 1 (BCLRaV-1)

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 BCLRaV-1 is established and diagnostic techniques are available	The identity of BCLRaV-1 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)	BCLRaV-1 has been reported in 2 MSs (Czech Republic and Slovenia). However, its presence can be considered restricted	BCLRaV-1 has been reported in 2 MSs (Czech Republic and Slovenia). However, its presence can be considered restricted	More widespread and unreported presence in the EU
Regulatory status (Section 3.3)	BCLRaV-1 can be considered as regulated in Annex IAI as 'Non-European viruses and virus-like organisms of <i>Cydonia</i> Mill., <i>Fragaria</i> L., <i>Malus</i> Mill., <i>Prunus</i> L., <i>Pyrus</i> L., <i>Ribes</i> L., <i>Rubus</i> L. and <i>Vitis</i> L.'	BCLRaV-1 can be considered as regulated in Annex IAI as 'Non-European viruses and virus-like organisms of <i>Cydonia</i> Mill., <i>Fragaria</i> L., <i>Malus</i> Mill., <i>Prunus</i> L., <i>Pyrus</i> L., <i>Ribes</i> L., <i>Rubus</i> L. and <i>Vitis</i> L.'	BCLRaV-1 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)	The main pathway, plants for planting of <i>Ribes</i> spp., is regulated but legislation considered of limited efficiency because it relies only on observation of symptoms. The vector pathway may possibly be open. If BCLRaV-1 were to enter in the EU, it would be able to establish and spread	Plants for planting constitute the main means for long-distance spread for BCLRaV-1	<ul style="list-style-type: none"> – Geographic distribution – Effectiveness of visual detection – Existence of other natural hosts – Existence of vector(s)
Potential for consequences in the EU territory (Section 3.5)	Due to limited information, the Panel is unable to conclude on the potential consequences of BCLRaV-1 in the EU territory	Due to limited information, the Panel is unable to conclude whether the presence of BCLRaV-1 on <i>Ribes</i> 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 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), BCLRaV-1 meets all the other criteria evaluated by EFSA to qualify as potential Union quarantine pests	BCLRaV-1 is a non-EU virus (considered as regulated in Annex IAI as 'Non-European viruses and virus-like organisms of <i>Cydonia</i> Mill., <i>Fragaria</i> L., <i>Malus</i> Mill., <i>Prunus</i> L., <i>Pyrus</i> L., <i>Ribes</i> L., <i>Rubus</i> L. and <i>Vitis</i> L.') and, as such, it does not meet the corresponding criterion evaluated by EFSA to qualify as a potential Union RNQP	
Aspects of assessment to focus on/scenarios to address in future if appropriate	<p>The main knowledge gaps or uncertainties identified concern:</p> <ul style="list-style-type: none"> – 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 (host range and vector transmission). <p>Given the very limited information available 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</p>		

Table 18.4: Black currant-associated rhabdovirus (BCaRV)

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 BCaRV is established and diagnostic techniques are available	The identity of BCaRV 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)	BCaRV has been reported in material originally from 1 MS (France) but its presence is considered restricted	BCaRV has been reported in material originally from 1 MS (France) but its presence is considered restricted	More widespread and unreported presence in the EU
Regulatory status (Section 3.3)	BCaRV can be considered as regulated in Annex IAI as 'Non-European viruses and virus-like organisms of <i>Cydonia</i> Mill., <i>Fragaria</i> L., <i>Malus</i> Mill., <i>Prunus</i> L., <i>Pyrus</i> L., <i>Ribes</i> L., <i>Rubus</i> L. and <i>Vitis</i> L.'	BCaRV can be considered as regulated in Annex IAI as 'Non-European viruses and virus-like organisms of <i>Cydonia</i> Mill., <i>Fragaria</i> L., <i>Malus</i> Mill., <i>Prunus</i> L., <i>Pyrus</i> L., <i>Ribes</i> L., <i>Rubus</i> L. and <i>Vitis</i> L.'	BCaRV not explicitly mentioned in Directive 2000/29/EC
Pest potential for entry, establishment and spread in the EU territory (Section 3.4)	The main pathway, plants for planting of <i>Ribes</i> spp., is regulated but legislation considered of limited efficiency because it relies only on observation of symptoms. The vector pathway may possibly be open. If BCaRV were to enter in the EU, it would be able to establish and spread	Plants for planting constitute the main means for long-distance spread for BCaRV	<ul style="list-style-type: none"> – Geographic distribution – Effectiveness of visual detection – Existence of other natural hosts – Existence of vector(s)
Potential for consequences in the EU territory (Section 3.5)	Due to limited information, the Panel is unable to conclude on the potential consequences of BCaRV in the EU territory	Due to limited information, the Panel is unable to conclude whether the presence of BCaRV on <i>Ribes</i> 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 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), BCaRV meets all the other criteria evaluated by EFSA to qualify as potential Union quarantine pests	BCaRV is a non-EU virus (considered as regulated in Annex IAI as 'Non-European viruses and virus-like organisms of <i>Cydonia</i> Mill., <i>Fragaria</i> L., <i>Malus</i> Mill., <i>Prunus</i> L., <i>Pyrus</i> L., <i>Ribes</i> L., <i>Rubus</i> L. and <i>Vitis</i> L.') and, as such, it does not meet the corresponding criterion evaluated by EFSA 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	<p>The main knowledge gaps or uncertainties identified concern:</p> <ul style="list-style-type: none"> – 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 (host range and vector transmission). <p>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</p>		

Table 18.5: Blackcurrant waikavirus A (BCWVA)

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 BCWVA is established and diagnostic techniques are available	The identity of BCWVA 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)	BCWVA is not known to be present in the EU	BCWVA is not known to be present in the EU. Therefore, BCWVA does not meet this criterion to qualify as potential Union RNQP	Possible unreported presence in the EU
Regulatory status (Section 3.3)	BCWVA can be considered as regulated in Annex IAI as 'Non-European viruses and virus-like organisms of <i>Cydonia</i> Mill., <i>Fragaria</i> L., <i>Malus</i> Mill., <i>Prunus</i> L., <i>Pyrus</i> L., <i>Ribes</i> L., <i>Rubus</i> L. and <i>Vitis</i> L.'	BCWVA can be considered as regulated in Annex IAI as 'Non-European viruses and virus-like organisms of <i>Cydonia</i> Mill., <i>Fragaria</i> L., <i>Malus</i> Mill., <i>Prunus</i> L., <i>Pyrus</i> L., <i>Ribes</i> L., <i>Rubus</i> L. and <i>Vitis</i> L.'	BCWVA not explicitly mentioned in Directive 2000/29/EC
Pest potential for entry, establishment and spread in the EU territory (Section 3.4)	The main pathway, plants for planting of <i>Ribes</i> spp., is regulated but legislation considered of limited efficiency because it relies only on observation of symptoms. The vector pathway may possibly be open. If BCWVA were to enter in the EU, it would be able to establish and spread	Plants for planting constitute the main means for long-distance spread for BCWVA	<ul style="list-style-type: none"> – Geographic distribution – Effectiveness of visual detection – Existence of other natural hosts – Existence of vector(s)
Potential for consequences in the EU territory (Section 3.5)	Due to limited information, the Panel is unable to conclude on the potential consequences of BCWVA in the EU territory	Due to limited information, the Panel is unable to conclude whether the presence of BCWVA on <i>Ribes</i> 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 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), BCWVA meets all the other criteria evaluated by EFSA to qualify as potential Union quarantine pests	BCWVA is a non-EU virus (considered as regulated in Annex IAI as 'Non-European viruses and virus-like organisms of <i>Cydonia</i> Mill., <i>Fragaria</i> L., <i>Malus</i> Mill., <i>Prunus</i> L., <i>Pyrus</i> L., <i>Ribes</i> L., <i>Rubus</i> L. and <i>Vitis</i> L.') and, as such, it does not meet the corresponding criterion evaluated by EFSA to qualify as a potential Union RNQP	
Aspects of assessment to focus on/scenarios to address in future if appropriate	<p>The main knowledge gaps or uncertainties identified concern:</p> <ul style="list-style-type: none"> – 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 and vector transmission). <p>Given the very limited information available 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</p>		

Table 18.6: Ribes americanum virus A (RAVA)

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 RAVA is established and diagnostic techniques are available	The identity of RAVA 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)	RAVA is not known to be present in the EU	RAVA is not known to be present in the EU. Therefore, RAVA does not meet this criterion to qualify as potential Union RNQP	Possible unreported presence in the EU
Regulatory status (Section 3.3)	RAVA can be considered as regulated in Annex IAI as 'Non-European viruses and virus-like organisms of <i>Cydonia</i> Mill., <i>Fragaria</i> L., <i>Malus</i> Mill., <i>Prunus</i> L., <i>Pyrus</i> L., <i>Ribes</i> L., <i>Rubus</i> L. and <i>Vitis</i> L.'	RAVA can be considered as regulated in Annex IAI as 'Non-European viruses and virus-like organisms of <i>Cydonia</i> Mill., <i>Fragaria</i> L., <i>Malus</i> Mill., <i>Prunus</i> L., <i>Pyrus</i> L., <i>Ribes</i> L., <i>Rubus</i> L. and <i>Vitis</i> L.'	RAVA 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)	The main pathway, plants for planting of <i>Ribes</i> spp., is regulated but legislation considered of limited efficiency because it relies only on observation of symptoms. If RAVA were to enter in the EU, it would be able to establish and spread	Plants for planting constitute the main means for long-distance spread for RAVA	<ul style="list-style-type: none"> – Geographic distribution – Effectiveness of visual detection – Virus biology unknown
Potential for consequences in the EU territory (Section 3.5)	Due to limited information, the Panel is unable to conclude on the potential consequences of RAVA in the EU territory	Due to limited information, the Panel is unable to conclude whether the presence of RAVA on <i>Ribes</i> 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 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), RAVA meets all the other criteria evaluated by EFSA to qualify as potential Union quarantine pests	RAVA is a non-EU virus (considered as regulated in Annex IAI as 'Non-European viruses and virus-like organisms of <i>Cydonia</i> Mill., <i>Fragaria</i> L., <i>Malus</i> Mill., <i>Prunus</i> L., <i>Pyrus</i> L., <i>Ribes</i> L., <i>Rubus</i> L. and <i>Vitis</i> L.') and, as such, it does not meet the corresponding criterion evaluated by EFSA to qualify as a potential Union RNQP	
Aspects of assessment to focus on/scenarios to address in future if appropriate	<p>The main knowledge gaps or uncertainties identified concern:</p> <ul style="list-style-type: none"> – 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; – Virus biology unknown. <p>Given the very limited information available 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</p>		

Table 18.7: 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 ToRSV is established and diagnostic techniques are available	The identity of ToRSV is established and diagnostic techniques are available	No uncertainty

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
Absence/presence of the pest in the EU territory (Section 3.2)	ToRSV has been sporadically and transiently reported from several MSs but its presence is restricted and/or under eradication	ToRSV has been sporadically and transiently reported from several MSs but its presence is restricted and/or under eradication. Therefore, ToRSV does not meet this criterion to qualify as a potential Union RNQP	More widespread presence in the EU
Regulatory status (section 3.3)	ToRSV is currently regulated in Annex IAI	ToRSV is currently regulated in Annex IAI	No uncertainty
Pest Potential For Entry, Establishment And Spread In The EU Territory (Section 3.4)	ToRSV is able to enter or further enter, become established and spread in the EU. The <i>Ribes</i> plants for planting pathway is regulated but legislation considered of limited efficiency because it relies only on observation of symptoms. Entry is also possible on plants for planting of other hosts, on seeds of herbaceous hosts and with viruliferous nematodes	Plants for planting constitute the main means for long-distance spread for ToRSV	<ul style="list-style-type: none"> – Geographical distribution; – 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-<i>Ribes</i> hosts
Potential for consequences in the EU territory (Section 3.5)	Introduction and spread of ToRSV would have a negative impact on the EU <i>Ribes</i> industry and on other crops	The presence of ToRSV on <i>Ribes</i> 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 the most efficient control method	No uncertainty
Conclusion on pest categorisation (Section 4)	ToRSV meets all the criteria evaluated by EFSA to qualify as a potential Union quarantine pest	ToRSV is a non-EU virus (regulated in Annex IAI) and, as such, it does not meet the corresponding criterion evaluated by EFSA to qualify as a potential Union RNQP	
Aspects of assessment to focus on/scenarios to address in future if appropriate	<p>The main knowledge gaps or uncertainties identified concern:</p> <ul style="list-style-type: none"> – More widespread presence 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 		

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Abbreviations

EPPO	European and Mediterranean Plant Protection Organization
FAO	Food and Agriculture Organization
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
RT-PCR	reverse transcription polymerase chain reaction
TFEU	Treaty on the Functioning of the European Union
ToR	Terms of Reference

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)

Appendix A – Distribution maps of viruses

A.1. Distribution map of Tomato ringspot virus (EPPO, 2019)

