

## SCIENTIFIC OPINION

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# Pest categorisation of naturally-spreading psorosis

EFSA Panel on Plant Health (PLH),

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### Abstract

The EFSA Panel on Plant Health performed a pest categorisation of naturally-spreading psorosis of citrus for the European Union. Naturally-spreading psorosis is poorly defined, because the status of both the disease and its causal agent(s) is uncertain. However, *Citrus psorosis virus* (CPSV) is a well-characterised *Ophiovirus* that is systematically associated with the psorosis disease and therefore considered to be its causal agent. Efficient diagnostics are available for CPSV. It is present in at least three EU MS. Naturally-spreading psorosis is currently regulated by Directive 2000/29/EC, while CPSV is not explicitly mentioned in this Directive. CPSV has the potential to enter, establish and spread in the EU territory. However, the main pathway for entry is closed by the existing legislation so that entry is only possible through minor alternative pathways. Plants for planting are the major means of spread while there are uncertainties on the existence and efficiency of a natural spread mechanism. CPSV introduction and spread in the EU would have negative consequences on the EU citrus industry. Of the criteria evaluated by EFSA to qualify as a Union quarantine pest or as a Union regulated non-quarantine pest (RNQP), Naturally-spreading psorosis does not meet the criterion of being a well characterised pest or disease. As it is not explicitly mentioned in the legislation, it is unclear whether CPSV meets the criterion of being currently regulated or under official control. It meets, however, all the RNQP criteria. The key uncertainties of this categorisation concern: (1) the causal role of CPSV in the psorosis disease as well as elements of its biology and epidemiology, (2) the exact nature of the Naturally-spreading psorosis syndrome and the identity of its causal agent and, consequently, (3) whether CPSV should be considered as being covered by the current legislation.

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**Keywords:** *Citrus psorosis virus*, citrus ringspot, psorosis, naturally-spreading psorosis, European Union, pest risk, quarantine

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## 1. Introduction

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

#### 1.1.1. Background

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

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

#### 1.1.2. Terms of Reference

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

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

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

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

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

<sup>1</sup> 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.

<sup>2</sup> 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.

<sup>3</sup> 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> (Moultext)
<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> Kugelán	<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>Carneiocephala 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 pruinosus</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> (Fabricius)
<i>Heliothis zea</i> (Boddie)	<i>Thrips palmi</i> Karny
<i>Hirschmanniella</i> spp., other than	<i>Xiphinema americanum</i> Cobb <i>sensu lato</i> (non-EU populations)
<i>Hirschmanniella gracilis</i> (de Man) Luc and Goodey	<i>Xiphinema californicum</i> Lamberti and Bleve-Zacheo
<i>Liriomyza sativae</i> Blanchard	

### **(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

Naturally-spreading psorosis is one of a number of pests listed in the Appendices to the Terms of Reference (ToR) to be subject to pest categorisation, to determine whether it fulfils the criteria of a quarantine pest or those of a regulated non-quarantine pest (RNQP) for the area of the European Union (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.

Psorosis is a bark scaling disorder in citrus that may have various causes. Over the years, a number of psorosis or psorosis-like syndromes have been described, generating a lot of confusion in the literature. It is presently not known with certainty to which syndrome the term 'naturally-spreading psorosis' refers. However, the *Ophiovirus Citrus psorosis virus* (CPsV) has been characterised starting from the 1980s. CPsV is now assumed to be the causal agent of the psorosis disease of citrus because of its constant association with plants showing typical psorosis symptoms. This pest categorisation therefore focuses on CPsV, taking into account the various names and synonyms given in the past to the postulated causal agent and to the citrus psorosis disease, including the naturally-spreading psorosis one.

## 2. Data and methodologies

### 2.1. Data

#### 2.1.1. Literature search

A literature search on CPsV was conducted at the beginning of the categorisation in the ISI Web of Science bibliographic database, using the scientific and synonymous names of the virus as well as the commonly used disease names as search term. Relevant papers were reviewed, and further references and information were obtained from experts, from citations within the references and grey literature.

#### 2.1.2. Database search

Pest information, on host(s) and distribution, was retrieved from the EPPO Global Database (EPPO, 2017).



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

The Europhyt database was consulted for pest-specific notifications on interceptions and outbreaks. Europhyt is a web-based network launched by the Directorate General for Health and Consumers (DG SANCO), 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 MSs and the phytosanitary measures taken to eradicate or avoid their spread.

## 2.2. Methodologies

The Panel performed the pest categorisation for naturally-spreading psorosis following guiding principles and steps presented in the EFSA guidance on the harmonised framework for pest risk assessment (EFSA PLH Panel, 2010) and as defined in the International Standard for Phytosanitary Measures No 11 (FAO, 2013) and No 21 (FAO, 2004).

In accordance with the guidance on a harmonised framework for pest risk assessment in the EU (EFSA PLH Panel, 2010), this work was initiated following an evaluation of the EU's 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 as per 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 1 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. Note that a pest that does not qualify as a quarantine pest may still qualify as a RNQP which 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 regards 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, while addressing social impacts is outside the remit of the Panel, in agreement with EFSA guidance on a harmonised framework for pest risk assessment (EFSA PLH Panel, 2010).

**Table 1:** 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
<b>Identity of the pest (Section 3.1)</b>	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?
<b>Absence/presence of the pest in the EU territory (Section 3.2)</b>	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).

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
<b>Regulatory status (Section 3.3)</b>	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?
<b>Pest potential for entry, establishment and spread in the EU territory (Section 3.4)</b>	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!
<b>Potential for consequences in the EU territory (Section 3.5)</b>	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?
<b>Available measures (Section 3.6)</b>	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?
<b>Conclusion of pest categorisation (Section 4)</b>	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 pest established, or has it been shown to produce consistent symptoms and to be transmissible? (Yes or No)*

YES, if 'naturally-spreading psorosis' is interpreted as *Citrus psorosis virus* (CPsV)

There are doubts about the nature of the specific citrus syndrome and pathogen(s) covered by the term 'naturally-spreading psorosis'. However, CPsV is a well characterised virus that is systematically associated with the psorosis disease and therefore assumed to be its causal agent.

As recently reviewed in Achachi et al. (2014) and Moreno et al. (2015), the psorosis disease of citrus was first reported by Swingle and Webber (1896) as a bark scaling disorder of citrus trees and it was the first citrus disease proven to be graft transmissible (Fawcett, 1933, 1934). For many years, it was one of the citrus diseases considered of recalcitrant aetiology (Derrick and Timmer, 2000) and only in 1986 virus-like particles were found in tissues of diseased plants (Derrick et al., 1988; da Graça et al., 1991).

The most reliable diagnostic symptom of psorosis is the bark scaling that gave its name to the disease. In addition, foliar symptoms are also frequently observed (Roistacher, 1981). The bark scaling symptoms are observed in the trunk and branches with gum production and wood discoloration below the bark lesions. Sometimes, young leaves show chlorotic patterns (flecking, blotching, or ring spots) and some new shoots may show a shock reaction. The fruits may have depressed spots or rings in the rind with discoloured tissue (Achachi et al., 2014; Moreno et al., 2015).

Because the bark scaling or leaf symptoms associated with psorosis may also have other causes<sup>4</sup> psorosis was often confused with other diseases (Roistacher, 1981; Malaguti and Knorr, 1961; Knorr, 1981), which were therefore collectively referred to as the 'psorosis group'. In addition, two versions of the psorosis disease differing in severity have been described, psorosis A (PsA) and psorosis B (PsB) (Fawcett and Klotz, 1938), further adding to confusion in the literature. PsA and PsB were later considered as caused by strains of the same agent because PsA isolates cross protect plants against inoculation with PsB (Wallace, 1957; Velázquez et al., 2012). This cross protection also allowed to differentiate PsB and its causal agent from other diseases with seemingly similar symptoms (Folimonova et al., 2010).

In PsA, bark scaling first appears in some areas of the stem and main branches. Old leaves are usually symptomless but the young ones may show chlorotic flecks. There may be sparse foliage, dieback and reduced yield (Moore and Nauer, 1957). In the more aggressive PsB, bark-scaling affects even thin branches, sloughing large strips of bark. Chlorotic patterns may appear in the young leaves, while some new shoots may show a necrotic reaction. The old leaves often show chlorotic blotches in the upper side with gum impregnated brownish eruptions in the underside. The PsB-affected trees may have depressed spots or rings in fruit rind with discoloured tissue or grooves (Moreno et al., 2015). The frequency and severity of symptoms may depend on the variety and the temperature (Roistacher, 1981, 1991, 1993).<sup>5</sup>

In the EPPO global database (accessed in October 2017), this very complex situation is reflected in two entries, PsA (or citrus scaly bark or psorosis of citrus, associated with *Citrus psorosis ophiiovirus*) and PsB (or naturally-spreading psorosis or necrotic ringspot, associated with a so-called *Citrus ringspot ophiiovirus*).

However, partial virus purification and serological assays have provided evidence that citrus ringspot virus and the virus isolates associated with PsA and PsB symptoms are likely strains/isolates of the

<sup>4</sup> Visual observation may at times confuse psorosis bark scaling with scaling around the edge of healing induced by frost or sunburn, or with bark shelling and gumming associated to Rio Grande gummosis or with shell bark reported on lemon (Roistacher 1991). A 'false psorosis' disclosing bark scaling was described by Malaguti and Knorr in Venezuela (1961). Leprosis scaling may at times be confused with psorosis (Knorr, 1981).

<sup>5</sup> In Europe, psorosis-associated bark scaling has been reported mostly on 'navel' oranges and very rarely on local varieties. In Sicily, only on few trees of Sanguinello (Salerno and Majorana, 1960) and Tarocco sweet orange (Tessitori et al., 2002) and some clones of 'navel group' and Clementine are affected by psorosis. However, psorosis-like foliar symptoms observed in some regions are not associated with bark scaling symptoms and represent another disease.

same viral entity (Navas-Castillo and Moreno, 1995). Complete genomes of several viral isolates from Florida and Spain associated with citrus psorosis disease were later obtained (Sánchez de la Torre et al., 1998; Sanches de la Torre et al., 2002; Naum-Onganía et al., 2003; Martín et al., 2005), providing evidence that a single virus with a segmented genome comprising three RNA molecules of negative polarity was implicated in these various syndromes.

Thus, citrus ringspot and citrus psorosis are names given to different syndromes that are associated with the same virus, which is today the type member of the *Ophiovirus* genus in the family Ophioviridae and was given the name CPsV.<sup>6</sup> PsA and PsB have been associated with particular RNA2 sequence variants of CPsV (Velazquez et al., 2015), revealing that 'subisolate' sequence variants can be present in the same host and may induce more or less severe symptoms depending on their prevalence/predominance.

Overall, CPsV is the name of a well-characterised virus that is constantly associated with various syndromes of the psorosis disease, a disease characterised by bark scaling in trunk and branches (with gum production and wood discoloration below the bark lesions) and, frequently, with foliar ringspot or discoloration symptoms. Because infection of citrus plants with purified preparations of CPsV has not been accomplished to fulfil Koch's postulates (Moreno et al., 2015), the assumption that CPsV is the causal agent of the citrus psorosis disease still retains some level of uncertainty. This uncertainty is, however, mitigated by the constant association of CPsV with the disease.

Uncertainty, however, prevails on (the) exact syndrome(s) covered by the term 'naturally-spreading psorosis', which likely was used to discriminate a particular etiological situation corresponding to a progressing psorosis disease, as was for example reported in Argentina (Beñatena and Portillo, 1984) and Texas (Timmer and Garnsey, 1980). The finding that variants of CPsV are associated with most if not all versions of the citrus psorosis disease suggests that CPsV was likely also involved with naturally-spreading psorosis, but with high uncertainty.

### 3.1.2. Biology of the pest

CPsV infections are systemic in citrus hosts and phloem-associated cells as well as parenchymatic tissues are invaded. The main and probably the only pathway of virus dissemination and spread is by vegetative propagation (Moreno et al., 2015). Because of the long period needed for bark symptoms to develop, with scaling appearing only after 10–15 years (Roistacher, 1981), psorosis-infected trees could be inadvertently selected in the past as budwood sources. This resulted in a high incidence of the disease and its gradual development may have been confused with its spread, possibly leading to the concept of naturally-spreading psorosis (Bridges et al., 1965; Pujol and Benatena, 1965; Childs and Johnson, 1966; Pujol, 1966; Campiglia et al., 1976).

There are a few reports of seed transmission of CPsV, particularly in trifoliate orange and Carrizo or Troyer citrange. However, there are still uncertainties about the validity of these reports (reviewed in Moreno et al., 2015). Some observations suggested natural spread of psorosis by a vector in Texas and in Argentina but all attempts to identify insects or fungi as potential vectors have been unsuccessful (Timmer, 1974; Timmer and Garnsey, 1980). An apparent natural spread of the psorosis disease in citrus orchards (Timmer and Garnsey, 1980; Beñatena and Portillo, 1984) led to the isolation of *Olpidium* sp. zoospores from roots of psorosis-infected trees (Palle et al., 2005). CPsV presence in or on these zoospores was tentatively detected using polymerase chain reaction (PCR). Since other ophioviruses have been demonstrated to be transmitted by soil *Olpidium* species (Rochon et al., 2004), transmission of CPsV by this soil-borne vector is possible. However, it is still unclear whether *Olpidium* is a vector of CPsV.

### 3.1.3. Intraspecific diversity

There is evidence that specific CPsV isolates, often in mixed infection, may be associated with more or less severe psorosis symptoms (Velázquez et al., 2012), but the inability to separate these isolates and evaluate independently their pathogenicity adds uncertainty to this assessment.

Sequence comparison based on CP genes (encoded on genomic RNA3) of CPsV isolates from diverse geographical origin showed that different virus phylogroups exist; one including isolates from Spain, Italy, California and Florida, another comprising isolates from Argentina. A CPsV isolate (CPV-4) included in the analysis clustered separately, suggesting the existence of a third phylogroup (Alioto et al., 2003; Martín et al., 2006).

<sup>6</sup> <https://talk.ictvonline.org/files/master-species-lists/m/msl/6776>

In addition, the use of monoclonal antibodies has revealed significant epitopic variation in CPsV (Alioto et al., 1999; Djelouah et al., 2000; Martín et al., 2002, 2004).

### 3.1.4. Detection and identification of the pest

*Are detection and identification methods available for the pest?*

**YES**, detection methods are available for *Citrus psorosis virus* (CPsV)

Biological indexing on young sweet orange seedlings was initially used to detect citrus psorosis. This was complemented by a cross protection assay to differentiate PsA and PsB (Roistacher, 1993). With the identification and characterisation of CPsV, other more reliable and less time-consuming detection techniques became available. Specific antisera and monoclonal antibodies are available for virus detection by ELISA (García et al., 1997; Alioto et al., 1999; D'Onghia et al., 2001; Loconsole et al., 2006).

Complete genome sequences of a number of CPsV isolates are available for comparison and a number of molecular tests, hybridisation assays and reverse transcription polymerase chain reaction (RT-PCR) protocols allow a reliable detection of CPsV (García et al., 1997; Barthe et al., 1998; Rosa et al., 2007; Osman et al., 2015). A real-time RT-PCR-based assay for simultaneous detection of several citrus viruses, including CPsV, has been developed (Loconsole et al., 2010).

Reliable detection methods are available for CPsV. On the other hand, due to the uncertainties associated with its nature, there are no reliable detection techniques for naturally-spreading psorosis.

## 3.2. Pest distribution

### 3.2.1. Pest distribution outside the EU

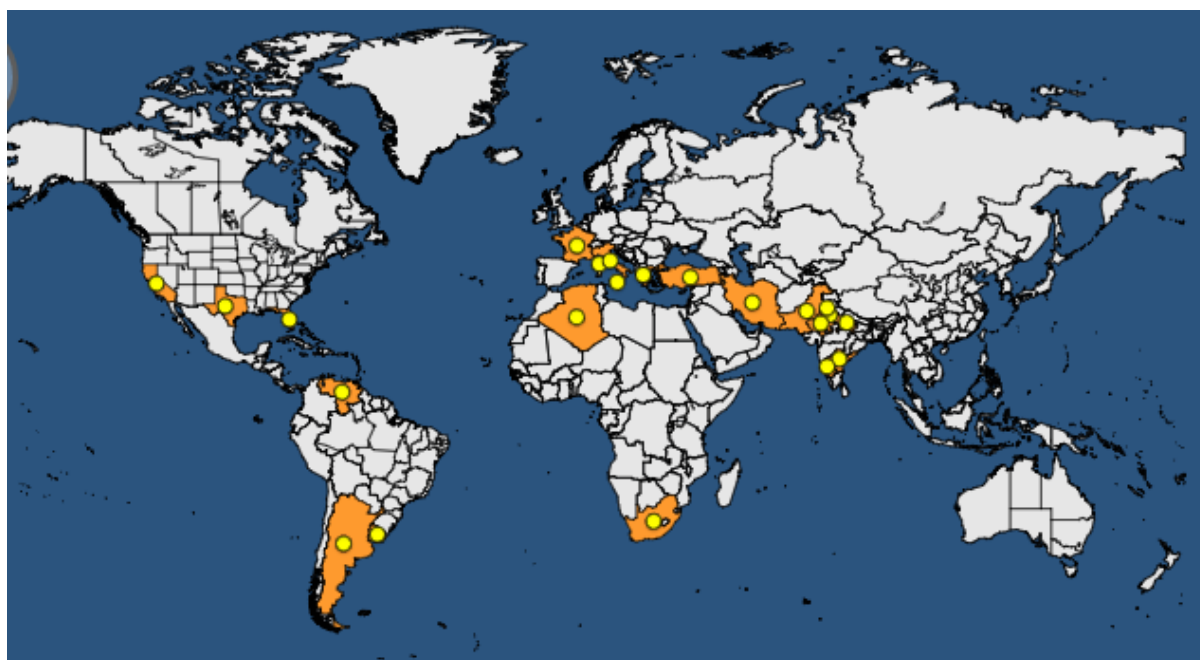
CPsV has been reported from several countries in the Americas, Asia and Africa (Table 2, Figure 1).

**Table 2:** Global distribution of Psorosis B<sup>(a)</sup> (indicated as citrus ringspot virus in the EPPO Global Database) (accessed on the 3 October 2017)

Continent	Country	Status
<b>Africa</b>	Algeria	Present, no details
<b>Africa</b>	South Africa	Present, no details
<b>America</b>	Argentina	Present, no details
<b>America</b>	United States of America	Present, restricted distribution/no details
<b>America</b>	Uruguay	Present, no details
<b>America</b>	Venezuela	Present, no details
<b>Asia</b>	India	Present, widespread
<b>Asia</b>	Iran	Present, no details
<b>Asia</b>	Pakistan	Present, no details
<b>Europe</b>	France	Present, restricted distribution/no details (Corse)
<b>Europe</b>	Greece	Present, no details
<b>Europe</b>	Italy	Present, no details
<b>Europe</b>	Netherlands	Absent, confirmed by survey
<b>Europe</b>	Slovenia	Absent, no pest record
<b>Europe</b>	Spain	Absent, pest no longer present
<b>Europe</b>	Turkey	Present, no details

(a): Of the two Psorosis entries in the EPPO Global Database, Psorosis B is the only one for which distribution data is available.





**Figure 1:** Global distribution of psorosis B (indicated as citrus ringspot virus in the EPPO Global Database) (accessed on the 3 October 2017)

### 3.2.2. Pest distribution in the EU

*Is the pest present in the EU territory? If present, is the pest widely distributed within the EU?*

**YES**

CPsV is reported to be present in Italy (present, no details), in France (present, restricted distribution, except for Corsica: present, no details) and Greece (present, no details). It is reported as 'Absent, pest no longer present' in Spain, likely as a consequence of the broad scale certification program in that country. The CPsV status in other citrus-growing countries is uncertain.

### 3.3. Regulatory status

#### 3.3.1. Council Directive 2000/29/EC

Naturally-spreading psorosis is currently regulated in Directive 2000/29 EC. CPsV not formally listed as such in Directive 2000/29. Given the uncertainty on the exact nature of the naturally-spreading psorosis syndrome, it is unclear whether CPsV should be considered as being covered by the current legislation.

Naturally-spreading psorosis is listed in Council Directive 2000/29/EC. Details are presented in Tables 3 and 4.

**Table 3:** Naturally-spreading psorosis in Council Directive 2000/29/EC

<b>Annex II, Part A</b>	<b>Harmful organisms whose introduction into, and spread within, all member states shall be banned if they are present on certain plants or plant products</b>	
<b>Section I</b>	<b>Harmful organisms not known to occur in the community and relevant for the entire community</b>	
(d)	Virus and virus-like organisms	
	Species	Subject of contamination
10.	Naturally-spreading psorosis	Plants of <i>Citrus</i> L., <i>Fortunella</i> Swingle, <i>Poncirus</i> Raf., and their hybrids, other than fruit and seeds



### 3.3.2. Legislation addressing plants and plant parts on which naturally-spreading psorosis is regulated

**Table 4:** Regulated hosts and commodities that may involve naturally-spreading psorosis in Annexes III, IV and V of Council Directive 2000/29/EC

<b>Annex III, Part A</b>	<b>Plants, plant products and other objects the introduction of which shall be prohibited in all member states</b>
<b>Description</b>	Country of origin
16. Plants of <i>Citrus</i> L., <i>Fortunella</i> Swingle, <i>Poncirus</i> Raf., and their hybrids, other than fruit and seeds	Third countries
<b>Annex IV, Part A</b>	<b>Special requirements which must be laid down by all member states for the introduction and movement of plants, plant products and other objects into and within all member states</b>
<b>Section I</b>	Plants, plant products and other objects originating outside the community
Plants, plant products and other objects	Special requirements
16.1 Fruits of <i>Citrus</i> L., <i>Fortunella</i> Swingle, <i>Poncirus</i> Raf., and their hybrids, originating in third countries	The fruits shall be free from peduncles and leaves and the packaging shall bear an appropriate origin mark.
<b>Section II</b>	Plants, plant products and other objects originating in the community
Plants, plant products and other objects	Special requirements
30.1 Fruits of <i>Citrus</i> L., <i>Fortunella</i> Swingle, <i>Poncirus</i> Raf., and their hybrids	The packaging shall bear an appropriate origin mark
<b>Annex V</b>	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
<b>Part B</b>	Plants, plant products and other objects originating in territories, other than those territories referred to in part A.
	I. Plants, plant products and other objects which are potential carriers of harmful organisms of relevance for the entire Community
	1. Plants, intended for planting, other than seeds but including seeds of ... <i>Citrus</i> L., <i>Fortunella</i> Swingle and <i>Poncirus</i> Raf., and their hybrids ...
	3. Fruits of: - <i>Citrus</i> L., <i>Fortunella</i> Swingle, <i>Poncirus</i> Raf., and their hybrids. ...

## 3.4. Entry, establishment and spread in the EU

### 3.4.1. Host range

The main natural hosts of CPsV are sweet orange, mandarin and grapefruit which may show symptoms of bark scaling and decline. Many citrus species may show only leaf symptoms (not distinctive of psorosis, being associated to many other syndromes) and may harbour psorosis virus without scaly bark (Roistacher, 1981). *Poncirus* and *Fortunella* are also hosts (Moreno et al., 2015). Different varieties and species react either with strong symptoms or remain symptomless (e.g. *Fortunella hindsii*, Velazquez et al., 2015). Others show resistance to virus inoculation. However, when those tolerant or apparently resistant varieties or species are grafted on CPsV-infected sweet orange (an indicator host for CPsV), a severe bud union disorder was observed (Velazquez et al., 2016).

Experimental inoculations demonstrated that some citrus relatives, such as *Microcitrus*, *Atalantia*, *Afraegle*, *Clausena*, *Eremocitrus*, *Pleiospermium*, *Severinia*, *Swinglea*, are also symptomatic hosts of CPsV (Velazquez et al., 2016). Among those, *Microcitrus inodora* show asymptomatic infection. There are, however, uncertainties about whether these hosts may be infected under natural conditions.

Aside from citrus and their relatives, the known host range of CPsV is limited and *Chenopodium quinoa* and *Gomphrena globosa*, which are used as indicators, are among the few known experimental non-rutaceous host. Transmission to herbaceous hosts was achieved either by dodder (Price, 1965; Desjardins et al., 1969) or mechanically (Timmer et al., 1978; Garnsey and Timmer, 1980; Roistacher, 1981; Sarachu et al., 1988; Navas-Castillo et al., 1991).

### 3.4.2. Entry

*Is the pest able to enter into the EU territory? (Yes or No) If yes, identify and list the pathways!*

**YES**

The most important pathway for entry of CPsV is the trade of plants for planting of *Citrus*, *Fortunella* and *Poncirus* and their hybrids, which is closed by the existing Annex III legislation (see Section 3.3.2 and Table 4 above). As a consequence, entry is only considered to be possible through minor alternative pathways.

- Trade of plants of Rutaceae species which are not known to be natural hosts of CPsV but have been shown to be experimental hosts (see Section 3.4.1).
- Illegal entry of infected plants for planting of susceptible host species for commercial or for personal use.

Between 1995 and the 5 September 2017, there are no interception records for CPsV in the Europhyt database.

### 3.4.3. Establishment

*Is the pest able to become established in the EU territory? (Yes or No)*

**YES**

There are no ecoclimatic constraints for CPsV, except for those affecting its host plants. Therefore, CPsV is expected to be able to establish in areas where its hosts are able to develop and ecoclimatic conditions are not limiting. Indeed CPsV is already present in three EU MS. Citrus cultivation occurs widely in the Mediterranean part of Europe (see EFSA PLH Panel, 2014), while ornamental rutaceous hosts may also grow in protected cultivation in more northern regions of the EU.

#### 3.4.3.1. EU distribution of main host plants

Citrus hosts of CPsV are widely grown for fruit production (oranges, mandarins, lemons, etc.) in eight MS in the Mediterranean part of the EU. In order of decreasing production, they are: Spain, Italy, Greece, Portugal, Cyprus, Croatia, Malta and France (Table 5). In addition, plants of *Citrus*, *Fortunella* and *Poncirus* are grown as ornamentals, either in the open or under protected cultivation in a number of MS.

**Table 5:** Area of citrus production (in 1,000 ha) in Europe according to the Eurostat database (Crop statistics apro\_acs\_a, extracted on 31 August 2017)

GEO/TIME	2012	2013	2014	2015	2016
<b>Spain</b>	310.50	306.31	302.46	298.72	295.33
<b>Italy</b>	146.79	163.59	140.16	149.10	141.22
<b>Greece</b>	50.61	49.88	49.54	46.92	44.72
<b>Portugal</b>	19.85	19.82	19.80	20.21	20.21
<b>France</b>	3.89	4.34	4.16	4.21	4.70
<b>Cyprus</b>	3.21	2.63	2.69	2.84	3.29
<b>Croatia</b>	1.88	2.17	2.17	2.21	2.18
<b>Malta</b>	0.00 <sup>(n)</sup>	0.00 <sup>(n)</sup>	0.00 <sup>(n)</sup>	0.00 <sup>(n)</sup>	0.00 <sup>(n)</sup>

Last update 25.8.17.

n: not significant.

### 3.4.4. Spread

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

**YES.** CPsV is able to spread through plants for planting. Natural transmission by *Olpidium* is an unconfirmed possibility

*RNQPs: Is spread mainly via specific plants for planting, rather than via natural spread or via movement of plant products or other objects?*

**YES**

#### 3.4.4.1. Vectors and their distribution in the EU

Plants for planting constitute the main pathway for virus spread and dissemination (Moreno et al., 2015). There are a few reports of seed transmission in *Poncirus trifoliata* (Pujol, 1966), but there are still uncertainties about the validity of these reports (Moreno et al., 2015). There is no confirmed vector transmission for CPsV (Moreno et al., 2015).

Given CPsV detection in zoospores isolated from roots of an infected citrus (Palle et al., 2005), there is, however the possibility that soil-borne *Olpidium* species may be possible vectors. Although *Olpidium* transmission has not been demonstrated for CPsV, it would probably only account for slow field spread over relatively short distances.<sup>7</sup> There are however important uncertainties on this point.

### 3.5. Impacts

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

**YES**

*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?<sup>8</sup>*

**YES**

Citrus psorosis affects most, if not all, commercial varieties of sweet orange, mandarin (*Citrus reticulata*), and grapefruit (*Citrus paradisi*), which in some cases respond with severe growth reduction and decline. In the field, a characteristic bark scaling may be observed on the trunk and branches of CPsV-infected trees, with gum accumulation and wood staining below the bark scales (Roistacher, 1991, 1993). Other species like sour orange (*Citrus aurantium*), lemon (*Citrus limon*) or rough lemon (*Citrus jambhiri*) do not show bark scaling, but infected plants display psorosis-like young leaf symptoms (Roistacher, 1981).

Sensitive infected plants have a long latency period (10–12 years) before exhibiting the characteristic bark scaling symptoms (Martín et al., 2002).

Isolate-dependent resistance has been only confirmed in Cleopatra mandarin (*Citrus reshni*), trifoliolate orange (*Poncirus trifoliata*), and Carrizo citrange (*Citrus sinensis* x *P. trifoliata*). However, when these genotypes are propagated on a CPsV-inoculated sweet orange a hypersensitive-like reaction occurs with bark necrosis at the bud union line between the scion and the rootstock (Velazquez et al., 2015). The disease has been a (not relevant) problem in Europe in the past. Since certification systems have started mother trees showing bark scaling have been progressively discarded based on visual check and indexing. Currently only old orchards or some clones may show scaling.

The impact of CPsV appears, however, to be limited in the affected EU MS, possibly as a consequence of the existing voluntary certification schemes. Given that Koch's postulates have not been fulfilled, there are some uncertainties attached to this assessment of the potential impact of CPsV. These uncertainties are, however seen by the Panel as being limited given the constant association of CPsV with psorosis.

<sup>7</sup> Rate of spread by *Olpidium* may be increased by irrigation.

<sup>8</sup> See Section 2.1 on what falls outside EFSA's remit.

### 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?*

**No.** Closing the potential minor pathway associated with unregulated rutaceous hosts would likely have limited effects given that CPsV is already present in at least three EU MS

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

**YES:** existing citrus certification systems constitute a strong limitation to CPsV spread through plants for planting as shown in Spain

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

- Long latency period for bark symptoms development, transient or absent leaf symptoms at elevated temperatures and uneven distribution of the virus in plants limit visual inspection efficiency.
- Existence of asymptomatic CPsV infections in some hosts.
- Other factors may induce bark scaling or ringspot symptoms in old leaves or fruits of citrus in the field, possibly resulting in false diagnosis.

#### 3.6.2. Biological or technical factors limiting the ability to prevent the presence of the pest on plants for planting

- Long latency period for bark symptoms development, transient or absent leaf symptoms at elevated temperatures and uneven distribution of the virus in plants limit visual inspection efficiency.
- Existence of asymptomatic CPsV infections in some hosts.
- Other factors may induce bark scaling or ringspot symptoms in old leaves or fruits of citrus in the field, possibly resulting in false diagnosis.

#### 3.6.3. Control methods

- Certification programmes are the most efficient control method.
- Eradication of infected plants.

### 3.7. Uncertainty

The major sources of uncertainty concern are as follows:

- The causal role of CPsV in the psorosis disease. Koch's postulates have not been fulfilled, and a co-infection with another, still undetected agent cannot be absolutely excluded.
- The existence and efficiency of a natural spread mechanism of CPsV.
- The seed transmissibility of CPsV in some citrus species or varieties.
- The existence of CPsV natural infection in unregulated rutaceous hosts.
- The exact nature of the naturally-spreading psorosis syndrome and the identity of its causal agent. Consequently, uncertainty on whether CPsV should be considered as being covered by the current legislation.
- The precise distribution of CPsV in the EU.

## 4. Conclusions

Of the criteria evaluated by EFSA to qualify as a Union quarantine pest or as a Union RNQP, naturally-spreading psorosis does not meet the criterion of being a well characterised pest or disease.

Concerning CPsV, it is unclear whether it meets the quarantine pest criterion of being currently regulated or under official control, as it is not explicitly mentioned in Directive 2000/29/EC. It meets, however, all the RNQP criteria (Table 6).

**Table 6:** 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)

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
<b>Identity of the pest (Section 3.1)</b>	There are doubts about the nature of the specific citrus syndrome covered by the term 'naturally-spreading psorosis'. However, <i>Citrus psorosis virus</i> (CPsV) is a well characterised virus that is systematically associated with the psorosis disease and therefore considered to be its causal agent	There are doubts about the nature of the specific citrus syndrome covered by the term 'naturally-spreading psorosis'. However, <i>Citrus psorosis virus</i> (CPsV) is a well characterised virus that is systematically associated with the psorosis disease and therefore considered to be its causal agent	Exact nature of the 'naturally-spreading psorosis' syndrome and identity of its causal agent not clearly established  Uncertainty on the causal role of CPsV in the psorosis disease not unambiguously established
<b>Absence/presence of the pest in the EU territory (Section 3.2)</b>	CPsV is present in the EU Territory	CPsV is present in the EU Territory	Uncertainty on the precise distribution of CPsV in the EU
<b>Regulatory status (Section 3.3)</b>	Naturally-spreading psorosis is currently regulated in Directive 2000/29/EC CPsV not listed as such in Directive 2000/29/EC	Naturally-spreading psorosis is currently regulated in Directive 2000/29/EC CPsV not listed as such in Directive 2000/29/EC	Uncertainty on the exact nature of the naturally-spreading psorosis syndrome and consequently on whether CPsV should be considered as being covered by the current legislation
<b>Pest potential for entry, establishment and spread in the EU territory (Section 3.4)</b>	CPsV has the potential to enter, establish and spread in the EU territory. However, the main pathway for entry is closed by the existing legislation so that entry is only possible through minor alternative pathways	Plants for planting are the major mechanism of spread	Uncertainty on the existence of CPsV natural infection in unregulated rutaceous hosts Uncertainty on the existence and efficiency of a natural spread mechanism of CPsV Uncertainty on the seed-transmissibility of CPsV in some citrus species or varieties
<b>Potential for consequences in the EU territory (Section 3.5)</b>	CPsV introduction and spread in the EU would have negative consequences on the EU citrus industry because CPsV is very likely to be the causal agent of the psorosis disease	Because of its pathogenicity, presence of CPsV on plants for planting would have a negative impact on their intended use	Causal role of CPsV in the psorosis disease not absolutely established
<b>Available measures (Section 3.6)</b>	Closing the potential pathway associated with unregulated rutaceous hosts is perceived as having limited relevance given the presence of CPsV in several EU MS	Existing citrus certification systems constitute a strong limitation to CPsV spread	Uncertainty on the existence of CPsV natural infection in unregulated rutaceous hosts Uncertainty on the seed-transmissibility of CPsV in some citrus species or varieties

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
<b>Conclusion on pest categorisation (Section 4)</b>	<p>Of the criteria evaluated by EFSA to qualify as a Union quarantine pest, naturally-spreading psorosis does not meet the criterion of being a well characterised pest or disease. In parallel, it is unclear whether CPsV meets the criterion of being currently regulated or under official control</p>	<p>Of the criteria evaluated by EFSA to qualify as a Union RNQP, naturally-spreading psorosis does not meet the criterion of being a well characterised pest or disease. In parallel, CPsV meets all the criteria</p>	
<b>Aspects of assessment to focus on/scenarios to address in future if appropriate</b>	<p>The key uncertainties of this categorisation concern:</p> <ul style="list-style-type: none"> <li>• The causal role of CPsV in the psorosis disease</li> <li>• The existence and efficiency of a natural spread mechanism of CPsV</li> <li>• The seed-transmissibility of CPsV in some citrus species or varieties</li> <li>• The existence of CPsV natural infection in unregulated rutaceous hosts</li> <li>• The exact nature of the naturally-spreading psorosis syndrome and the identity of its causal agent. Consequently, the uncertainty on whether CPsV should be considered as being covered by the current legislation</li> <li>• The precise distribution of CPsV in the EU</li> </ul>		



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## Abbreviations

CPsV	<i>Citrus psorosis virus</i>
EPPO	European and Mediterranean Plant Protection Organization
EU MS	European Union Member State
FAO	Food and Agriculture Organization
IPPC	International Plant Protection Convention
PsA	Psorosis A
PsB	Psorosis B
PCR	polymerase chain reaction
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