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SCIENTIFIC OPINION

Commodity risk assessment of *Vitis* spp. plants from Moldova

EFSA Panel on Plant Health (PLH) | Antonio Vicent Civera | Paula Baptista | Elisavet Chatzivassiliou | Jaime Cubero | Nik Cunniffe | Eduardo de la Peña | Nicolas Desneux | Anna Filipiak | Paolo Gonthier | Beata Hasiów-Jaroszewska | Hervé Jactel | Blanca B. Landa | Lara Maistrello | David Makowski | Panagiotis Milonas | Nikos T. Papadopoulos | Roel Potting | Hanna Susi | Dirk Jan van der Gaag | Pedro Gómez | Annemarie Fejer Justesen | Andrea Lucchi | Gregor Urek | Jonathan Yuen | Lucia Zappala | Umberto Bernardo | Giovanni Bubici | Anna Vittoria Carluccio | Michela Chiumenti | Francesco Di Serio | Elena Fanelli | Paraskevi Kariampa | Cristina Marzachì | Agata Kaczmarek | Louise Matic | Olaf Mosbach-Schulz | Anna Berlin

Correspondence: Ask a Question

The declarations of interest of all scientific experts active in EFSA's work are available at https://open.efsa.europa.eu/experts.

Abstract

The European Commission requests EFSA to provide scientific opinions in the field of plant health in accordance with Article 29 of Regulation (EC) No 178/2002. Annex VI of Commission Implementing Regulation (EU) 2019/2072 lists plants, plant products and other objects whose introduction into the Union from certain third countries is prohibited. This Scientific Opinion covers plant health risks posed by 1- to 2-year-old grafted bare root plants without leaves of *Vitis* spp. from the Republic of Moldova, taking into account the available scientific information, including the technical information provided by Moldova. All pests associated with the commodity were evaluated for their relevance for this opinion. Eight pests (one EU quarantine pest and seven *Vitis* spp. RNQPs) that fulfilled all the criteria were selected for further evaluation. For the selected pests, the risk mitigation measures implemented in Moldova and described in the technical dossier were evaluated. For the selected pests, an expert judgement is given on the likelihood of pest freedom considering the risk mitigation measures acting on the pest, including uncertainties associated with the assessment. The degree of pest freedom varies among the pests evaluated, with grapevine fleck virus (GFkV, *Maculavirus vitis*) and '*Candidatus* Phytoplasma solani' being the pests most frequently expected on the imported plants. The Expert Knowledge Elicitation indicated with 95% certainty that 9900 or more units per 10,000 will be free from the above-mentioned pests.

KEYWORDS

European Union, pathway risk assessment, plant health, plant pest, quarantine pest

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1 | INTRODUCTION

1.1 | Background and Terms of Reference as provided by European Commission

1.1.1 | Background

Annex VI of Commission Implementing Regulation (EU) 2019/2072[1] lists plants, plant products and other objects whose introduction into the Union from certain third countries are prohibited. That list includes plants of *Vitis* L. other than fruits, originating in third countries other than Switzerland.

The Republic of Moldova has made a request to the EU for a derogation from the prohibition on import of plants of *Vitis* L. other than fruits, originating in Moldova. That request was supported by a technical dossier prepared by the Republic of Moldova, containing details on the growing condition of the plants, the identified pests relevant for those plants, phytosanitary measures in place against those pests and the relevant Moldovan legislation. The technical dossier is annexed to this mandate.

1.1.2 | Terms of Reference

In view of the above and in accordance with Article 29 of Regulation (EC) No 178/2002,[2] the Commission asks EFSA to provide scientific opinions in the field of plant health.

In particular, EFSA is requested to assess the probability of entry (probability of pest freedom at entry) of regulated pests [Union quarantine pests (QPs), protected zone quarantine pests (PZQPs) and regulated non-quarantine pests (RNQPs)], associated with plants for planting of *Vitis* L. other than fruits and seeds, originating in the Republic of Moldova.

The assessment shall also include non-regulated pests present in Moldova that could be associated with *Vitis* L. plants and that could have an impact if they are introduced into the EU.

In this assessment, EFSA shall take into account the available scientific information, and in particular the scientific and technical information provided in the dossier by the Republic of Moldova. If necessary to complete its assessment, EFSA may ask additional scientific and technical information or clarifications (e.g. regarding pest status, pest control, production sites and systems, processing and shipping) on *Vitis* L. plants for planting produced in the Republic of Moldova. Such information can be requested by EFSA to the National Plant Protection Organisation of the Republic of Moldova as appropriate. Following the provision of such information, EFSA shall proceed with the assessment.

1.2 | Interpretation of the Terms of Reference

The EFSA Panel on Plant Health (hereafter referred to as 'the Panel') was requested to conduct a commodity risk assessment of*Vitis* spp. plants from Moldova following the Guidance on commodity risk assessment for the evaluation of high-risk plant dossiers (EFSA PLH Panel, 2019) taking into account the available scientific information, including the technical information provided by Republic of Moldova.

The EU quarantine pests that are regulated as a group in the Commission Implementing Regulation (EU) 2019/2072 were considered and evaluated separately at the species level.

In its evaluation, the panel:

- Checked whether the provided information in the technical dossier (hereafter referred to as 'the dossier') provided by the applicant (Republic of Moldova, Agenției Naționale pentru Siguranța Alimentelor – from this point onwards referred to as 'ANSA') was sufficient to conduct a commodity risk assessment. When necessary, additional information was requested from the applicant.
- Selected the relevant Union quarantine pests, and protected zone quarantine pests (as specified in Commission Implementing Regulation (EU) 2019/2072, hereafter referred to as 'EU quarantine pests'), regulated non-quarantine pests (as specified in Commission Implementing Regulation (EU) 2019/2072 Annex IV part C, hereafter referred to as 'RNQP') and other relevant pests present in Moldova and associated with the commodity which could have an impact if introduced into the EU.
- Did not assess the effectiveness of measures for Union quarantine pests for which specific measures are in place for the import of the commodity from the Republic of Moldova in Commission Implementing Regulation (EU) 2019/2072 and/or in the relevant legislative texts for emergency measures and if the specific country is in the scope of those emergency measures. The assessment was restricted to whether or not the applicant country implements those measures.

[1]Commission Implementing Regulation (EU) 2019/2072 of 28 November 2019 establishing uniform conditions for the implementation of Regulation (EU) 2016/2031 of the European Parliament and the Council, as regards protective measures against pests of plants, and repealing Commission Regulation (EC) No 690/2008 and amending Commission Implementing Regulation (EU) 2018/2019, OJ L 319, 10.12.2019, p. 1–279.

[2]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, 1.2.2002, pp. 1–24.

- Assessed the effectiveness of the measures described in the dossier for those Union quarantine pests for which no specific measures are in place for the import of the commodity from the applicant country, and for other relevant pests present in the applicant country and associated with the commodity.
- Assessed the information provided by ANSA on the national certification procedure of propagation material of *Vitis* spp. in Moldova (Government Decision No 432/2024). As per mandate, the Panel has not compared the certification and production cycle submitted by the applicant with the EU certification system (COUNCIL DIRECTIVE of 9 April 1968 on the marketing of material for the vegetative propagation of the vine (68/193/EEC). Therefore, the terms 'Basic' plant material and 'Certified' plant material hereafter used refer to the applicant's certification requirements.

Risk management decisions are not within EFSA's remit. Therefore, the panel provided a rating based on expert judgement regarding the likelihood of pest freedom for each relevant pest given the risk mitigation measures implemented by ANSA. The Plant Health Commodity Risk Assessment Opinions are prepared following the EFSA Standard Protocol for Commodity Risk Assessment (Gardi et al., 2025).

2 | DATA AND METHODOLOGIES

2.1 | Data provided by ANSA

The panel considered all the data and information in the dossier provided by ANSA of the Republic of Moldova on 20 June 2024, including the additional information provided by ANSA on 22 November 2024 and 26 May 2025, after EFSA's request. The dossier is managed by EFSA.

The structure and overview of the dossier is shown in Table 1. The number of the relevant section is indicated in the opinion when referring to a specific part of the dossier.

TABLE 1 Structure and overview of the dossier.

Dossier section	Overview of contents	File name
1.0	Annex II to the M-2024-0070	Annex II-Technical dossier Vitis L. EN
2.0	2024-05-23_Vitis L_ Response from Moldova	1.Technical dossier VITIS L. RM suplimentary 2025
2.0	2024-11-22_Vitis L_ Response from Moldova	2024-11-22_Vitis L_ADR Response from Moldova.pdf
3.0	2025-05-23_Vitis L_ Response from Moldova	1.Technical dossier VITIS L. RM suplimentary 2025.docx

The data and supporting information provided by Moldova formed the basis of the commodity risk assessment.

2.2 | Literature searches performed by EFSA

Literature searches in different databases were undertaken by EFSA to complete a list of pests potentially associated with *Vitis* spp., including *Vitis berlandieri*, *Vitis riparia*, *Vitis rupestris, Vitis vinifera* and their hybrids. The following searches were combined: (i) a general search to identify pests of selected *Vitis* spp. in different databases, (ii) a search to identify any EU quarantine pest reported on the *Vitis* genus and (iii) a tailored search to identify whether these pests are present or not in Moldova and the EU. The searches were run between 2 September 2024 and 8 July 2025. No language, date or document type restrictions were applied in the search strategy.

The search strategy and syntax were adapted to each of the databases listed in Table 2, according to the options and functionalities of the different databases and the CABI keyword thesaurus.

As for Web of Science, the literature search was performed using a specific, ad hoc established search string (see Appendix B). The string was run in 'All Databases' with no range limits for time or language filters. This is further explained in Section 2.3.2.

TABLE 2 Databases used by EFSA for the compilation of the pest list associated with *Vitis* spp.

Database	Platform/link	Database use
Aphids on World Plants	https://www.aphidsonworldsplants.info/C_HOSTS_AAIntro.htm	*Host plant records*
BIOTA of New Zealand	https://biotanz.landcareresearch.co.nz/	*Host plant records*
CABI Crop Protection Compendium	https://www.cabi.org/cpc/	*Pest distribution and host plant records*
Database of Insects and their Food Plants	https://www.brc.ac.uk/dbif/hosts.aspx	*Host plant records*
Database of the World's Lepidopteran Hostplants	https://www.nhm.ac.uk/our-science/data/hostplants/search/index.dsml	*Host plant records*

(Continues)

TABLE 2 (Continued)

Database	Platform/link	Database use
EPPO Global Database	https://gd.eppo.int/	*Regulated status, pest status, pest distribution and host plant records*
EUROPHYT	https://food.ec.europa.eu/plants/plant-health-and-biosecurity/europhyt_en	*Pest interceptions and outbreak reports*
Gallformers	https://www.gallformers.org/	*Host plant records*
Leaf-miners	https://www.leafmines.co.uk/html/plants.htm	*Host plant records*
GBIF	https://www.gbif.org/	*Arthropods distribution in EU ('human observation' category) only for validated records*
MyCoPortal	https://www.mycoportal.org/portal/collections/harvestparams.php	*Pest distribution*
Nemaplex	https://nemaplex.ucdavis.edu/Nemabase2010/PlantNematodeHostStatusDDQuery.aspx	*Host plant records* *Pest distribution*
PESI portal	https://www.eu-nomen.eu/portal/	*Pest distribution*
Plant Parasites of Europe	https://bladmineerders.nl/scientific-plant-names-genera/	*Host plant records*
Plant Pest Information Network	https://www.mpi.govt.nz/news-and-resources/resources/registers-and-lists/plant-pest-information-network/	*Host plant records*
Scalenet	https://scalenet.info/associates/	*Pest distribution and host plant records*
Scolytinae hosts and distribution database	https://www.scolytinaehostsdatabase.eu/site/it/home/	*Host plant records and pest distribution*
Spider Mites Web	https://www1.montpellier.inra.fr/CBGP/spmweb/	*Host plant records*
USDA ARS Fungal Database	https://fungi.ars.usda.gov/	*Pest distribution and host plant records*
Web of Science: All Databases (Web of Science Core Collection, CABI: CAB Abstracts, BIOSIS Citation Index, Chinese Science Citation Database, Current Contents Connect, Data Citation Index, FSTA, KCI-Korean Journal Database, Russian Science Citation Index, MEDLINE, SciELO Citation Index, Zoological Record)	Web of Science https://www.webofknowledge.com	*Host plant records and evidence of impact (for actionable pests)*
World Agroforestry	https://www.worldagroforestry.org/treedb2/speciesprofile.php?Spid=1749	*Host plant records*
Others if relevant	*Link*	*Use*

Additional searches were performed on the literature cited in retrieved documents when developing the opinion. The available scientific information, including previous EFSA opinions on the relevant pests and diseases (see pest datasheet in Appendix A) and the relevant literature and legislation (e.g. Regulation (EU) 2016/2031; Commission Implementing Regulations (EU) 2018/2019; (EU) 2018/2018 and (EU) 2019/2072), were taken into account.

2.3 | Methodology

When developing the opinion, the panel followed the EFSA Guidance on commodity risk assessment for the evaluation of high-risk plant dossiers (EFSA PLH Panel, 2019).

In the first step, pests potentially associated with the commodity in the country of origin (EU-quarantine, regulated non-quarantine and other pests) that may require risk mitigation measures were identified. The EU non-quarantine pests not known to occur in the EU or with a limited distribution were selected based on evidence of their potential impact in the EU. After the first step, all the relevant pests that may need risk mitigation measures were identified.

In the second step, the proposed risk mitigation measures for each relevant pest were evaluated in terms of efficacy or compliance with EU requirements, as explained in Section 1.2.

A conclusion on the likelihood of the commodity being free from each of the relevant pests was determined, and uncertainties were identified using expert judgements.

Pest freedom was assessed by estimating the number of infested/infected units out of 10,000 exported units.

2.3.1 | Commodity data

Based on the information provided by Moldova, the characteristics of the commodity are summarised in Section 3 of this opinion.

2.3.2 | Identification of pests potentially associated with the commodity

To evaluate the pest risk associated with the importation of *Vitis* L. plants from the Republic of Moldova, a pest list was compiled. The pest list is a compilation of all identified plant pests associated with *V. berlandieri*, *V. riparia, V. rupestris*, *V. vinifera* and their hybrids based on information provided in the dossier and on searches performed by the panel.

The scientific names of the host plants were used when searching in the EPPO Global database and the CABI Crop Protection Compendium. The same strategy was applied to the other databases, excluding EUROPHYT.

EUROPHYT was consulted by searching for the interceptions associated with commodities imported from Moldova, at the genus level, from 1995 to May 2020, and TRACES for interceptions from May 2020 to present. For the pests selected for further evaluation, a search in the EUROPHYT and/or TRACES was performed for the interceptions from the whole world, at the species and genus level.

The search strategy used for Web of Science Databases was designed by combining common names for pests and diseases, terms describing symptoms of plant diseases and the scientific and common names of the commodity. All of the pests already retrieved using the other databases were removed from the search terms in order to be able to reduce the number of records to be screened. The established search string is detailed in Appendix B and was run from 23 October 2024 to 17 December 2024.

The titles and abstracts of the scientific papers retrieved were screened, and the pests associated with selected *Vitis* species were included in the pest list. The pest list was eventually further compiled with other relevant information (e.g. EPPO code per pest, taxonomic information, categorisation, distribution) useful for the selection of the pests relevant for the purposes of this Opinion.

The compiled pest list (see Microsoft Excel® in Appendix C) includes all identified pests that use the selected *Vitis* species as hosts. The evaluation of the compiled pest list was done in two steps: first, the relevance of the EU-quarantine and regulated non-quarantine pests (RNQPs) was evaluated (Section 4.1); second, the relevance of any other plant pest was evaluated (Section 4.2).

2.3.3 | Listing and evaluation of risk mitigation measures

All implemented risk mitigation measures were listed and evaluated. When evaluating the likelihood of pest freedom at origin, the following types of potential infection sources for the selected *Vitis* species in nurseries were considered (see also Figure 1):

- pest entry from surrounding areas,
- pest entry with new plants/seeds,
- pest spread within the nursery.

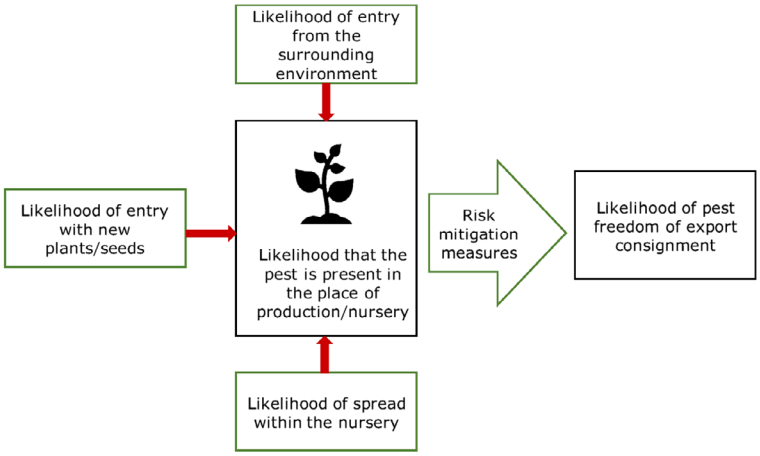

FIGURE 1 Conceptual framework to assess the likelihood that plants are exported free from relevant pests. Source: EFSA PLH Panel (2019).

The risk mitigation measures adopted in the plant nurseries (as communicated by ANSA) were evaluated with Expert Knowledge Elicitation (EKE) according to the Guidance on uncertainty analysis in scientific assessment (EFSA Scientific Committee, 2018) for pests selected for further evaluation.

Information on the pest biology, estimates of likelihood of entry of the pest to and spread within the nursery and the effect of the measures on a specific pest were summarised in pest data sheets compiled for each pest selected for further evaluation (see Appendix A).

2.3.4 | Expert Knowledge Elicitation (EKE)

To estimate the pest freedom of the commodity, an EKE was performed following EFSA guidance (Annex B.8 of EFSA Scientific Committee, 2018). The specific question for EKE was:

- 'Taking into account (i) the risk mitigation measures in place in the nurseries, and (ii) other relevant information, how many out of 10,000 units of *Vitis* L. plants will be infested with the relevant pest when arriving in the EU?'.

The risk assessment is based on bundles of 25–100 bare root plants as the most suitable units. The EKE question was common to all pests for which the pest freedom of the commodity was estimated.

The uncertainties associated with the EKE were taken into account and quantified in the probability distribution applying the semi-formal method described in section 3.5.2 of the EFSA-PLH Guidance on quantitative pest risk assessment (EFSA PLH Panel, 2018). Finally, the results were reported in terms of the likelihood of pest freedom. The lower 5% percentile of the uncertainty distribution reflects the opinion that pest freedom is with 95% certainty above this limit.

3 | COMMODITY INFORMATION

3.1 | Description of the commodity

According to the dossier and the integration of additional information provided by Moldova, the commodity to be imported into the EU is scions of *Vitis vinifera* (common name: grapevine; family: *Vitaceae*) that are grafted on rootstocks of hybrids of:

- *Vitis berlandieri* (common name: Spanish grape; family: *Vitaceae*).
- *Vitis riparia* (common name: riverbank grape, frost grape; family: *Vitaceae*).
- *Vitis rupestris* (common name: sand grape, sugar grape; family: *Vitaceae*).
- *Vitis vinifera* (common name: grapevine; family: *Vitaceae*).

Commodity to be exported is 1- to 2-year-old bare root-grafted plants without leaves, grouped in bundles of 25–100 plants of 'Certified' category according to Government Decision No 432/2024 of Moldova. Each bare root plant has one or two shoots, each with three to four buds, and at least three roots, 8–10 cm long, distributed radially around the stem. The stem is 30–35 cm long.

3.2 | Description of the production areas

According to the submitted dossier, the production of vine propagation and planting material is mainly concentrated in the central part of the country, in Straseni, Dubasari and Causeni regions. The planting material is produced exclusively in certified nurseries.

Any commercial nursery must be located at least 1000 m from residential areas and 500 m from rivers, lakes and other water sources. For scion and rootstock mother plantations, a minimum isolation distance of 10 m from neighbouring vineyards is required.

For nurseries insufficiently sheltered from strong winds, a windbreak should be established using three rows of vegetation: 70%–80% trees and 20%–30% shrubs. Trees should be spaced 2.5–3 m apart between rows and 1.5–2 m within rows. A buffer strip of 5–6 m and a perimeter road should separate the windbreak from the nursery.

All stages of the commodity production take place within the nursery, which consists of the following production sectors: rootstock plantations, scion plantations, grafting workshop and vine school. The vine school is the part of the nursery where the grafted cuttings develop into grafted vines. Fifteen producers are currently authorised to produce and market vine propagation and planting material. Most of them specialise in producing exclusively vine propagation material. However, some producers are also authorised to produce propagation material of *Malus domestica, Prunus domestica* L., *P. armeniaca* L., *P. persica* Batsch. and *P. avium* L.

3.3 | Production and handling processes

3.3.1 | Growing conditions

The rootstocks and scions' mother plantations are grown in open fields. The plantations are established according to field plans, which define the layout and the location of crops and varieties in the field. The land for planting must undergo a minimum fallow period of 6 years.

According to the dossier, before the establishment of the nursery, the soil must be tested for the presence of virus vector nematodes. At least 1 year before planting, a minimum of five soil samples per hectare must be analysed to confirm their absence. If virus vector nematodes are detected, the soil is either disinfected before planting or a different site is chosen.

3.3.2 | Source of planting material

Propagation material originates from mother plants of 'Basic' category.

3.3.3 | Production cycle

3.3.3.1 | *Production of rootstock cuttings*

According to the dossier, the rootstock mother plants are cultivated in open fields as described in Section 3.3.1. The rootstock strings are harvested by hand in long strings. After harvesting, they are stored in cold rooms at 2–4°C with approximately 95% relative humidity. Then, they are cut into 36–42 cm long and 7–13 mm thick rootstock cuttings, tied into bundles of 200 pieces, soaked in antifungal solutions (Boscalid 50%) and stored in special containers under the same temperature and humidity conditions. Hot water treatment of the rootstock cuttings is carried out before grafting in a specialised heat treatment machine (model T-220 RG, Valencia, Spain) at 50°C for 45 min.

3.3.3.2 | *Production of scion cuttings*

Mother plants for the scions (sometimes referred to as top grafts) are cultivated in open fields, as described in Section 3.3.1. The scions are usually harvested in December, although in some years harvesting may extend to January and February depending on weather conditions. Before grafting, the scions are segmented into single buds. They are then treated in a hot water machine (model RG T-220) at 50°C for 45 min.

3.3.3.3 | *Production of grafted plants (final commodity)*

The grafted plants are produced from scions and rootstock cuttings from the respective mother plantations. The grafting takes place in dedicated grafting workshops starting in the second half of March, with each step of the grafting, stratification and acclimatisation process conducted in separate areas or rooms. Grafted plants of different categories are produced in distinct rooms using separate machines and equipment. Grafting is mechanised using grafting machines Wahler Omega Star and Wahler Omega Uno (Germany), which are inspected and cleaned daily as well as at each change of variety (Figure 2). The graft union is sealed with paraffin waxes containing special auxins for grafting vines, such as Ciragref (SER), Rebwachs (Stahler) or Vivarium mixed with neutral paraffin waxes.

The stratification period lasts about 12–18 days at 30°C, depending on the scion–rootstock combination used for grafting. For the first 6–8 days, the relative humidity is kept at approximately 90% and then reduced to 70%. During this period, the grafted cuttings are grown under natural light supplemented with full-spectrum lamps (Figure 3). After stratification, the grafted cuttings are acclimatised for about 2 weeks and then recoated with special paraffin in preparation to be planted in the vine nursery (Figure 4). Planting in the field usually occurs from April 20 until May 20; however, depending on the weather conditions and frost risk, planting may be postponed to the second half of May.

FIGURE 2 Grafting of the rootstock and scion cuttings of *Vitis* spp. (Source ANSA).

FIGURE 3 Stratification of *Vitis* spp. grafted plants (Source ANSA).

FIGURE 4 *Vitis* spp. grafted plants in nursery during spring (Source ANSA).

Based on the dossier to reduce the risk of infection during the growing period, some producers plant the grafted cuttings in greenhouses in boxes filled with peat substrate (Figure 5). The greenhouses are equipped with fine water sprinklers and covered with shade netting. Once the grafts have rooted and started to grow, they are fertilised with mineral fertilisers. This method delays the planting in the field to the summer when the grafted cuttings have reached the vegetative seedling stage.

FIGURE 5 Grafted plant in spring (Source ANSA).

Harvesting of the final commodity starts in late October or November. Natural leaf fall is generally used as an indicator that the plants are sufficiently mature and ready for winter dormancy, marking the start of the harvest process. If the leaves have not fallen by late autumn, defoliation is recommended. For chemical defoliation, 10–15 days before harvesting, the vines can be sprayed with magnesium chlorate solution at a concentration of 1.0%–1.5%.

Harvesting is carried out using a Wagner-type plough that removes, shakes and ties the cuttings into sheaves in a single pass. To prevent root damage, the working depth is adjusted to 20–25 cm below the base of the grafted vines. In dry soil, shaking removes soil residues. During the transport of the newly harvested grafted vines, the roots are oriented inward and the shoots outwards. The vines are handled carefully to avoid trampling and breaking the grafting point and are pressed to ensure the roots remain compact.

3.3.4 | Pest monitoring during production

The production of vine propagating material is carried out by producers under the strict control of the ANSA. Thus, the biological and phytosanitary visual inspection of plants during production is carried out by inspectors from the territorial subdivisions of the ANSA.

3.3.4.1 | *Mother plant inspections*

Plant health control of the scion and rootstock mother plantations is carried out by inspectors from the Territorial Sub-Division for Food Safety (STSA). The inspections consist of a visual assessment of plantations to detect symptoms caused by harmful organisms. The approved list of vine pests to be monitored is established by ANSA and includes the following pests:

- Insects and Mites: *Daktulosphaira vitifoliae* [VITEVI]
- Bacteria: *Allorhizobium vitis* [AGRBVI] and *Xylophilus ampelinus* [XANTAM]
- Phytoplasmas: *Candidatus* Phytoplasma solani [PHYPSO] and *Candidatus* Phytoplasma vitis (Grapevine flavescence dorée phytoplasma [PHYP64])
- Viruses: arabis mosaic virus (ArMV, *Nepovirus arabis*), grapevine fanleaf virus (GFLV, *Nepovirus foliumflabelli*), grapevine leafroll-associated virus-1 (GLRAV-1, *Ampelovirus univitis*), grapevine leafroll-associated virus-3 (GLRAV-3, *Ampelovirus trivitis*), grapevine fleck virus (GFKV, *Maculavirus vitis*).

The visual inspections are carried out by STSA inspectors in the mother plantations during the following growing phases:

1. During the flowering phase (May–June), to detect symptoms associated with viral diseases such as GFLV.
2. During the grape ripening phase (September–October), to identify symptoms of GLRAV-1, GLRAV-3) and GFLV, as well as phytoplasma-related diseases, such as '*Candidatus* Phytoplasma solani' (PHYPSO) and *Candidatus* Phytoplasma vitis (PHYP64).
3. After leaf fall, to identify symptoms of GFLV and to indentify insufficient shoot maturation caused by phytoplasma infections and appearance of galls caused by *Allorhizobium vitis* (AGRBVI).

If symptomatic vines are detected, they are marked during plant health checks and subsequently removed from the nursery. In the case of *Allorhizobium vitis*, if symptoms are identified during the phytosanitary inspection, the affected vines and the neighbouring vines (one for each side) are marked, removed by uprooting and burnt. Plants showing symptoms of disease are sampled for laboratory testing. For positive pathogen findings in mother plants of basic category:

For viruses:

a. If less than 10% of the vines are affected, symptomatic stumps are removed and destroyed by burning, and the mother plantation is monitored.
b. If more than 10% of the vines are affected, or more than 15% cumulatively over years, the grafted vine plantation shall be downgraded and classified as a plantation intended for grape production.

For phytoplasmas:

a. If less than 1% of vines are affected, symptomatic stumps are removed and destroyed by burning, and the mother plantation is monitored.
b. If more than 1% of vines are affected, the harvesting of propagation material from the plantation is prohibited.

For *Allorhizobium vitis:*

a. The presence of even one symptomatic plant results in the mother plantation being downgraded to the certified category.

In addition to visual inspections, all mother plantations intended for the production of propagating material of the basic category must be sampled and tested for the presence of ARMV, GFLV, GLRAV-1 and GLRAV-3. The first sampling and testing is done at the age of 6 years and afterwards every 6 years. The results must be available prior to the acceptance of the plantation.

The annual sampling percentages are determined according to the category of the propagation material; for mother plantations of basic category, the following percentages of plants are tested: viral and bacterial diseases 10%, and phytoplasma diseases 30%.

3.3.4.2 | *Grafted vines inspections*

According to the Annual Inspection Program developed based on the approved multiplication declaration, the responsible inspector from STSA carries out the following inspections:

The first field inspection (June–July) focuses on:

– Good cultural upkeep of the vine schools;
– Accuracy of the declaration of grafted vines at multiplication;
– Proper delimitation of varieties in the vine school to prevent varietal mixing.

The second field inspection (August–October) focuses on:

– Examine for the presence of symptoms of harmful organisms;
– Highlight specific varietal characteristics to confirm varietal authenticity and purity.

The cumulative virus incidence in vegetative propagating material must not exceed 5%. If a higher level of infection is found, the plant material is subjected to plant health purification procedures, including repeated laboratory testing, and may be downgraded to a lower category, provided that the infection level remains within the limits of that category. All categories of vegetative propagating material must be free from *Allorhizobium vitis* and phytoplasma infections. If one of those pathogens is detected, the affected group of plants undergoes hot water treatment and is subsequently retested. When RNQPs are identified, vegetative propagating material is treated with plant protection products approved under plant protection regulations, in accordance with the manufacturer's recommendations. To prevent the spread of phytoplasma diseases, all vegetative propagating materials will be subjected to hot water treatment prior to grafting, as stated in the submitted dossier.

Following the field inspection, the STSA inspector prepares the Field Inspection Document (the act of variety recognition) for the mother plantations of scions and rootstocks, as well as for the vine nurseries, according to the submitted dossier. If remediable deviations are observed, such as weedy plots or other non-conformities, the inspector sets a deadline for correction and ensures that the recommendations are implemented. Crops are rejected from certification if they fail to meet regulatory requirements, including varietal authenticity, 100% varietal purity and acceptable cultural and phytosanitary conditions.

3.3.4.3 | *Laboratory analysis*

Laboratory testing is carried out by the Public Institution National Center for Animal and Plant Health and Food Safety, which is accredited by the National Accreditation Center (MOLDAC) in accordance with ISO/IEC 17025 requirements. As required by ISPM 6 (FAO, 2018): Surveillance, ANSA implements annual surveillance and monitoring programmes for organisms harmful to plants and plant products, including vines. All samples collected under the monitoring plan are analysed in the phytosanitary laboratory, following EPPO PM7 diagnostic protocols (EPPO Standards – PM7 Diagnostics). Samples taken by STSA inspectors are sent to the laboratory within 48 h.

The analysis of grapevine samples for the identification of harmful organisms is carried out with different methods, depending on the suspected organism:

- Insects (pests) – macro- and microscopic analysis;
- Bacteria – isolation on culture media, indirect immunofluorescence (IF) and PCR;
- Viruses – ELISA (immunoenzymatic) and IC-RT-PCR;
- Phytoplasmas – PCR.

During the last 2 years, the following organisms have been monitored: *Xylophilus ampelinus*, '*Candidatus* Phytoplasma solani' and '*Ca*. Phytoplasma vitis' (Grapevine flavescence dorée phytoplasma) – 15 samples, and GFLV – 15 samples. According to the laboratory results, no non-compliances were identified. In 2026, the NFSA will expand its monitoring scope to include additional harmful and quarantine organisms specific to viticultural material.

If the laboratory test report is issued with no non-compliances identified, the responsible inspector issues a Certificate of Biological Value as the result of this final certification. This Certificate of Biological Value authorises the producer to market the propagation material.

3.3.5 | Post-harvest processes and export procedure

During vine shaping, the cords are shortened to three to four buds, and the roots are shortened to 8–10 cm. The vines are treated with the fungicide solution Cantus (Boscalid 50%), paraffined over one-third of the top and stored in cold storage at a temperature of +2 to +4°C and a relative humidity of approximately 95%.

Grafted vines are graded according to the following criteria: main root sizes, shoot sizes, uniformity and continuity of sowing, presence or absence of traces of vine pests. Vines conform to the standard if they have at least three main roots evenly distributed around the base of the rootstock, each at least 2 mm thick and at least 12 cm long. The vine must have one or two cords (shoots) well developed and mature, 20 cm long and 5 mm thick, without mechanical strips or traces of hail or frost. Stem length should be 30–35 cm, without mechanical or pest damage, and must not have any shoots or roots emerging from the nodes or internodes of the rootstock.

Once the grafted vines are shaped, 25, 50 or 100 vines are placed in bundles with a tie around the middle of the stem. Each bundle is labelled with the variety, the clone of the grafting and rootstock if applicable, the number of units per bundle and the name of the producer.

Commodities ready for shipment are stored over winter in temperature- and humidity-controlled conditions using one of two methods: either placed in polyethylene bags or stacked in piles covered with polyethylene film or arranged in two horizontal rows with roots covered by 5–6 cm of wet sand or peat and then covered with polyethylene film. In both cases, the material is stored at a temperature of 1–4°C, with a humidity level of at least 70%.

During transport, the grafted vines are covered with polyethylene to maintain humidity, and a temperature from 0°C to 6°C is ensured. The commodity is positioned with a 40–45 cm gap from the ceiling to ensure proper ventilation. Packages and bundles must be sealed in a way that they cannot be opened without damaging the seal and/or the label. Any new closure must be performed under the supervision of ANSA inspectors.

The phytosanitary certificate is issued at the request of the exporter by phytosanitary inspectors authorised in accordance with the Order of the Director General of ANSA on the export of plants, plant products and other items intended for export. The post-harvest inspection in the nursery is conducted by inspectors, who check aspects including the distinguishing marks of the varieties, labelling, storage of the rooted grafts and the quality, phytosanitary and physiological condition of the root system. The phytosanitary certificate for export/re-export is completed according to the operational procedure based on ISPM 12: Phytosanitary certificates (FAO, 2022).

4 | IDENTIFICATION OF PESTS POTENTIALLY ASSOCIATED WITH THE COMMODITY

The search for potential pests associated with selected *Vitis* species rendered 2243 species (see Microsoft Excel® file in Appendix C).

4.1 | Selection of relevant EU-quarantine pests associated with the commodity

Seventy-six EU-quarantine and regulated non-quarantine pest (RNQP) species reported to use either of the selected *Vitis* species as a host plant were evaluated (Table 3) for their relevance of being included in this opinion.

Of these 76 EU-regulated pests evaluated, eight species are present in Moldova and are known to use one of the selected *Vitis* species as a host and to be associated with the commodity were selected for further evaluation.

TABLE 3 Overview of the evaluation of the 76 EU-quarantine and RNQP listed in Annex IV part C pest species known to use the selected *Vitis* species as a host plant for their relevance for this opinion.

No.	Pest name according to EU legislation[a] (Synonym)	EPPO Code	Group	Species of *Vitis* spp. confirmed as a host (reference)	Pest present in *Moldova*	EU regulation	Pest can be associated with the commodity	Pest relevance for the opinion
1	*Acrogonia citrina*	ACRGCI	Insects	*Vitis vinifera* (Azevedo-Filho et al., 2008)	Not known to occur in Moldova	Annex II Part A	NA	NA
2	*Aleurocanthus spiniferus*	ALECSN	Insects	*Vitis vinifera* (CABI, EPPO)	Not known to occur in Moldova	Annex II Part B	NA	NA
3	*Anastrepha fraterculus*	ANSTFR	Insects	*Vitis vinifera* (CABI, EPPO)	Not known to occur in Moldova	Annex II Part A	NA	NA
4	*Aphrophora permutata*	APHRPE	Insects	*Vitis vinifera* (EPPO)	Not known to occur in Moldova	Annex II Part A	NA	NA
5	Arabis mosaic virus (ArMV, *Nepovirus arabis)*	ARMV00	Virus	*Vitis vinifera* (CABI)	Yes	Annex IV, Part C	Yes	Yes
6	*Bactrocera dorsalis*	DACUDO	Insects	*Vitis vinifera* (EPPO)	Not known to occur in Moldova	Annex II Part A	NA	NA
7	*Bactrocera tryoni*	DACUTR	Insects	*Vitis vinifera* (CABI, EPPO)	Not known to occur in Moldova	Annex II Part A	NA	NA
8	*Bemisia tabaci*	BEMITA	Insects	*Vitis vinifera* (CABI)	Not known to occur in Moldova. *B. tabaci* is present in Ukraine and Romania.	Annex II Part A	No	Commodity is not a pathway
9	Blueberry leaf mottle virus (BLMV, *Nepovirus myrtilli)*	BLMOV0	Virus	*Vitis vinifera, Vitis berlandieri x Vitis riparia, Vitis riparia, Vitis rupestris, Vitis berlandieri* (EPPO)	Not known to occur in Moldova	Annex II Part A	NA	NA
10	*Buckland valley grapevine yellows phytoplasma*	PHYP77	Phytoplasma	*Vitis vinifera* (EPPO)	Not known to occur in Moldova	Annex II Part A	NA	NA
11	*Candidatus* Phytoplasma australiense	PHYPAU	Phytoplasma	*Vitis vinifera* (CABI, EPPO)	Not known to occur in Moldova	Annex II Part A	NA	NA
12	*Candidatus* Phytoplasma fraxini	PHYPFR	Phytoplasma	*Vitis vinifera* (EPPO)	Not known to occur in Moldova	Annex II Part A	NA	NA
13	*Candidatus* Phytoplasma phoenicium	PHYPPH	Phytoplasma	*Vitis vinifera* (EPPO)	Not known to occur in Moldova	Annex II Part A	NA	NA
14	*Candidatus* Phytoplasma solani		Phytoplasma	*Vitis vinifera* (CABI, EPPO)	Yes	Annex IV, Part C	Yes	Yes
15	*Candidatus* Phytoplasma pruni-related strain (North American *grapevine yellows, NAGYIII)*		Phytoplasma	*Vitis vinifera* (Washington State University 2014)	Not known to occur in Moldova	Annex II Part A	NA	NA
16	*Conotrachelus nenuphar*	CONHNE	Insects	*Vitis vinifera* (CABI)	Not known to occur in Moldova	Annex II Part A	NA	NA
17	*Cuerna costalis*	CUERCO	Insects	*Vitis vinifera* (EPPO)	Not known to occur in Moldova	Annex II Part A	NA	NA
18	*Cuerna occidentalis*	CUEROC	Insects	*Vitis vinifera* (EPPO)	Not known to occur in Moldova	Annex II Part A	NA	NA

(Continues)

TABLE 3 (Continued)

No.	Pest name according to EU legislation[a] (Synonym)	EPPO Code	Group	Species of *Vitis* spp. confirmed as a host (reference)	Pest present in *Moldova*	EU regulation	Pest can be associated with the commodity	Pest relevance for the opinion
19	*Daktulosphaira vitifoliae* (=*Viteus vitifoliae*)	VITEVI	Insects	*Vitis vinifera, Vitis riparia, Vitis rupestris, Vitis berlandieri, Vitis berlandieri* × *Vitis riparia* (Aphids on worlds plants, EPPO)	Yes	Annex III	No	Commodity is not a pathway
20	*Diabrotica virgifera zeae*	DIABVZ	Insects	*Vitis vinifera, Vitis rupestris, Vitis berlandieri* (EPPO)	Not known to occur in Moldova	Annex II Part A	NA	NA
21	*Dimargarodes meridionalis*	MARGME	Insects	*Vitis vinifera* (Scalenet, EPPO)	Not known to occur in Moldova	Annex II Part A	NA	NA
22	*Eotetranychus lewisi*	EOTELE	Insects	*Vitis vinifera* (Spider mites, EPPO)	Not known to occur in Moldova	Annex II Part A	NA	NA
23	*Eurhizococcus brasiliensis*	EURHBR	Insects	*Vitis vinifera, Vitis berlandieri* (CABI, EPPO)	Not known to occur in Moldova	Annex II Part A	NA	NA
24	*Euwallacea fornicatus* sensu lato	XYLBFO	Insects	*Vitis vinifera* (EPPO)	Not known to occur in Moldova	Annex II Part A	NA	NA
25	Grapevine berry inner necrosis virus (GINV, *Trichovirus necroacini)*	GINV00	Virus	*Vitis vinifera* (EPPO)	Not known to occur in Moldova	Annex II Part A	NA	NA
26	Grapevine fanleaf virus (GFLV, *Nepovirus foliumflabelli)*	GFLV00	Virus	*Vitis vinifera, Vitis rupestris* (CABI, EPPO)	Yes	Annex IV, Part C	Yes	Yes
27	Grapevine flavescence dorée phytoplasma	PHYP64	Phytoplasma	*Vitis vinifera, Vitis berlandieri* × *Vitis riparia, Vitis rupestris, Vitis berlandieri* (CABI, EPPO)	Not known to occur in Moldova	Annex II Part B	NA	NA
28	Grapevine fleck virus (GFkV, *Maculavirus vitis)*	GFKV00	Virus	*Vitis vinifera* (CABI)	Yes	Annex IV, Part C	Yes	Yes
29	Grapevine leafroll-associated virus 1 (GLRaV-1, *Ampelovirus univitis)*	GLRAV1	Virus	*Vitis vinifera* (EPPO)	Yes	Annex IV, Part C	Yes	Yes
30	Grapevine leafroll-associated virus 3 GLRaV-3, *Ampelovirus trivitis)*	GLRAV3	Virus	*Vitis vinifera* (EPPO)	Yes	Annex IV, Part C	Yes	Yes
31	Grapevine red blotch-associated virus (GRBaV, *Grablovirus vitis)*	GRBAV0	Virus	*Vitis vinifera* (EPPO)	Not known to occur in Moldova	Annex II Part A	NA	NA
32	Grapevine vein clearing virus (GVCV, *Badnavirus venavitis)*	GVCV00	Virus	*Vitis vinifera, Vitis rupestris* (EPPO)	Not known to occur in Moldova	Annex II Part A	NA	NA
33	*Graphocephala atropunctata*	GRCPAT	Insects	*Vitis vinifera, Vitis rupestris* (CABI, EPPO)	Not known to occur in Moldova	Annex II Part A	NA	NA

TABLE 3 (Continued)

No.	Pest name according to EU legislation[a] (Synonym)	EPPO Code	Group	Species of *Vitis* spp. confirmed as a host (reference)	Pest present in *Moldova*	EU regulation	Pest can be associated with the commodity	Pest relevance for the opinion
34	*Graphocephala confluens*	GRCPCF	Insects	*Vitis vinifera* (EPPO)	Not known to occur in Moldova	Annex II Part A	NA	NA
35	*Graphocephala versuta*	GRCPVE	Insects	*Vitis vinifera* (CABI)	Not known to occur in Moldova	Annex II Part A	NA	NA
36	*Helicoverpa zea*	HELIZE	Insects	*Vitis vinifera* (EPPO)	Not known to occur in Moldova	Annex II Part A	NA	NA
37	*Helochara delta*	HELHDE	Insects	*Vitis vinifera* (EPPO)	Not known to occur in Moldova	Annex II Part A	NA	NA
38	*Homalodisca ignorata*	HOMLIG	Insects	*Vitis vinifera* (CABI, EPPO)	Not known to occur in Moldova	Annex II Part A	NA	NA
39	*Homalodisca vitripennis*	HOMLTR	Insects	*Vitis vinifera, Vitis riparia, Vitis rupestris, Vitis berlandieri* (CABI, EPPO)	Not known to occur in Moldova	Annex II Part A	NA	NA
40	*Longidorus diadecturus*	LONGDI	Nematoda	*Vitis vinifera* (Skwiercz et al., 2015)	Not known to occur in Moldova	Annex II Part A	NA	NA
41	*Lopholeucaspis japonica*	LOPLJA	Insects	*Vitis vinifera* (Scalenet, EPPO)	Not known to occur in Moldova	Annex II Part A	NA	NA
42	*Lycorma delicatula*	LYCMDE	Insects	*Vitis vinifera, Vitis riparia* (CABI, EPPO)	Not known to occur in Moldova	Annex II Part A	NA	NA
43	*Margarodes capensis*	MARGCA	Insects	*Vitis vinifera* (Scalenet, EPPO)	Not known to occur in Moldova	Annex II Part A	NA	NA
44	*Margarodes greeni*	MARGGR	Insects	*Vitis vinifera* (Scalenet, EPPO)	Not known to occur in Moldova	Annex II Part A	NA	NA
45	*Margarodes prieskaensis* (=*Sphaeraspis prieskaensis*)	MARGPR	Insects	*Vitis vinifera, Vitis berlandieri* × *Vitis riparia, Vitis riparia, Vitis rupestris, Vitis berlandieri* (CABI, EPPO)	Not known to occur in Moldova	Annex II Part A	NA	NA
46	*Margarodes trimeni*	MARGTR	Insects	*Vitis vinifera* (EPPO)	Not known to occur in Moldova	Annex II Part A	NA	NA
47	*Margarodes vitis* (= *Sphaeraspis vitis*)	MARGVI	Insects	*Vitis vinifera, Vitis berlandieri x Vitis riparia, Vitis riparia, Vitis rupestris, Vitis berlandieri* (Scalenet, EPPO)	Not known to occur in Moldova	Annex II Part A	NA	NA
48	*Margarodes vredendalensis*	MARGVR	Insects	*Vitis vinifera, Vitis berlandieri x Vitis riparia, Vitis riparia, Vitis rupestris, Vitis berlandieri* (Scalenet, EPPO)	Not known to occur in Moldova	Annex II Part A	NA	NA
49	*Meloidogyne chitwoodi*	MELGCH	Nematoda	*Vitis vinifera, Vitis riparia x Vitis rupestris, Vitis berlandieri x Vitis riparia, Vitis riparia, Vitis rupestris, Vitis berlandieri* (Nemaplex, EPPO)	Not known to occur in Moldova	Annex II Part B	NA	NA
50	*Molomea consolida*	MOLMCO	Insects	*Vitis vinifera* (Azevedo-Filho et al., 2008)	Not known to occur in Moldova	Annex II Part A	NA	NA
51	*Neokolla hieroglyphica*	GRCPHI	Insects	*Vitis vinifera* (CABI)	Not known to occur in Moldova	Annex II Part A	NA	NA
52	*Oemona hirta*	OEMOHI	Insects	*Vitis vinifera* (EPPO)	Not known to occur in Moldova	Annex II Part A	NA	NA

(Continues)

TABLE 3 (Continued)

No.	Pest name according to EU legislation[a] (Synonym)	EPPO Code	Group	Species of *Vitis* spp. confirmed as a host (reference)	Pest present in *Moldova*	EU regulation	Pest can be associated with the commodity	Pest relevance for the opinion
53	*Oncometopia facialis*	ONCMFA	Insects	*Vitis vinifera* (Azevedo-Filho et al., 2008)	Not known to occur in Moldova	Annex II Part A	NA	NA
54	*Oncometopia orbona*	ONCMUN	Insects	*Vitis vinifera* (CABI)	Not known to occur in Moldova	Annex II Part A	NA	NA
55	Peach rosette mosaic virus (PRMV, *Nepovirus persicae)*	PRMV00	Virus	*Vitis vinifera* (EPPO)	Not known to occur in Moldova	Annex II Part A	NA	NA
56	*Phymatotrichopsis omnivora (= Phymatotrichum omnivorum*)	PHMPOM	Fungi	*Vitis vinifera, Vitis rupestris* (CABI, EPPO)	Not known to occur in Moldova	Annex II Part A	NA	NA
57	*Popillia japonica*	POPIJA	Insects	*Vitis vinifera, Vitis riparia* (CABI, EPPO)	Not known to occur in Moldova	Annex II Part B	NA	NA
58	Potato virus X – *non EU isolates* (PVX, *Potexvirus ecspotati)*	PVX000	Virus	*Vitis vinifera* (CABI)	Not known to occur in Moldova	Annex II Part A	NA	NA
59	*Prodiplosis longifila*	PRDILO	Insects	*Vitis vinifera* (EPPO)	Not known to occur in Moldova	Annex II Part A	NA	NA
60	*Scirtothrips aurantii*	SCITAU	Insects	*Vitis vinifera* (CABI, EPPO)	Not known to occur in Moldova	Annex II Part A	NA	NA
61	*Scirtothrips citri*	SCITCI	Insects	*Vitis vinifera* (CABI, EPPO)	Not known to occur in Moldova	Annex II Part A	NA	NA
62	*Scirtothrips dorsalis*	SCITDO	Insects	*Vitis vinifera* (CABI, EPPO)	Not known to occur in Moldova	Annex II Part A	NA	NA
63	*Spodoptera eridania*	PRODER	Insects	*Vitis vinifera* (CABI, EPPO)	Not known to occur in Moldova	Annex II Part A	NA	NA
64	*Spodoptera frugiperda*	LAPHFR	Insects	*Vitis vinifera* (CABI, EPPO)	Not known to occur in Moldova	Annex II Part A	NA	NA
65	*Spodoptera litura*	PRODLI	Insects	*Vitis vinifera* (CABI)	Not known to occur in Moldova	Annex II Part A	NA	NA
66	*Tapajosa rubromarginata*	TAPARU	Insects	*Vitis vinifera* (Azevedo-Filho et al., 2008)	Not known to occur in Moldova	Annex II Part A	NA	NA
67	Temperate fruit decay-associated virus (TFDAV, *Temfrudevirus temperatum)*	TFDAV0	Virus	*Vitis vinifera* (EPPO)	Not known to occur in Moldova	Annex II Part A	NA	NA
68	*Thaumatotibia leucotreta*	ARGPLE	Insects	*Vitis vinifera* (CABI, EPPO)	Not known to occur in Moldova	Annex II Part A	NA	NA
69	*Thrips palmi*	THRIPL	Insects	*Vitis vinifera* (CABI, EPPO)	Not known to occur in Moldova	Annex II Part A	NA	NA
70	*Xiphinema americanum* sensu stricto (= *Xiphinema americanum*)	XIPHAA	Nematoda	*Vitis vinifera, Vitis riparia x Vitis rupestris, Vitis berlandieri x Vitis riparia, Vitis riparia, Vitis rupestris, Vitis berlandieri* (CABI, EPPO)	Not known to occur in Moldova	Annex II Part A	NA	NA
71	*Xiphinema bricolense*	XIPHBC	Nematoda	*Vitis vinifera* (EPPO)	Not known to occur in Moldova	Annex II Part A	NA	NA
72	*Xiphinema californicum*	XIPHCA	Nematoda	*Vitis vinifera* (Nemaplex, EPPO)	Not known to occur in Moldova	Annex II Part A	NA	NA
73	*Xiphinema rivesi*	XIPHRI	Nematoda	*Vitis vinifera* (CABI, EPPO)	Yes	Annex II Part A	Yes	Yes

TABLE 3 (Continued)

No.	Pest name according to EU legislation[a] (Synonym)	EPPO Code	Group	Species of *Vitis* spp. confirmed as a host (reference)	Pest present in *Moldova*	EU regulation	Pest can be associated with the commodity	Pest relevance for the opinion
74	*Xylella fastidiosa*	XYLEFA	Bacteria	*Vitis vinifera, Vitis rupestris, Vitis berlandieri x Vitis riparia, Vitis riparia, Vitis rupestris, Vitis berlandieri* (CABI, EPPO)	Not known to occur in Moldova	Annex II Part B	NA	NA
75	*Xylophilus ampelinus (= Erwinia vitivora)*	XANTAM	Bacteria	*Vitis vinifera, Vitis berlandieri x Vitis riparia, Vitis riparia, Vitis rupestris, Vitis berlandieri* (CABI, EPPO)	Yes	Annex IV, Part C	Yes	Yes
76	*Xyphon fulgidum*	CARNFU	Insects	*Vitis vinifera* (EPPO)	Not known to occur in Moldova	Annex II Part A	NA	NA

[a]Commission Implementing Regulation (EU) 2019/2072.

4.2 | Selection of other relevant pests (non-regulated in the EU) associated with the commodity

The information provided by ANSA, integrated with the search performed by EFSA, was evaluated to assess whether there are other potentially relevant pests of the selected *Vitis* species present in the country of export. For these potential pests that are non-regulated in the EU, pest risk assessment information on the probability of entry, establishment, spread and impact is usually lacking. Therefore, these pests were also evaluated to determine their relevance for this opinion based on evidence that:

a. at least one of the selected *Vitis* species is a host of the pest;
b. the pest is present in the Republic of Moldova;
c. the pest is (i) absent or (ii) has a limited distribution in the EU;
d. one or more life stages of the pest can be associated with the specified commodity;
e. the pest may have an impact in the EU.

No other relevant pests were selected for further evaluation as none met all the relevant criteria.

4.3 | Summary of pests selected for further evaluation

The eight pests satisfying all the relevant criteria listed above in Sections 4.1 and 4.2 are included in Table 4. The effectiveness of the risk mitigation measures applied to the commodity was evaluated for these selected pests.

TABLE 4 List of relevant pests selected for further evaluation.

Number	Current scientific name	EPPO code	Name used in the EU legislation	Taxonomic information	Group	Regulatory status
1	*Ampelovirus trivitis* (grapevine leafroll-associated virus-3, GLRaV-3)	GLRAV3	Grapevine leafroll-associated virus 3	Order: Martellivirales Family: Closteroviridae	Virus	Annex IV, Part C
2	*Ampelovirus univitis* (grapevine leafroll-associated virus-1, GLRaV-1)	GLRAV1	Grapevine leafroll-associated virus 1	Order: Martellivirales Family: Closteroviridae	Virus	Annex IV, Part C
3	'*Candidatus* Phytoplasma solani'	PHYPSO	'*Candidatus* Phytoplasma solani'	Order: Acholeplasmatales Family: Acholeplasmataceae	Phytoplasma	Annex IV, Part C
4	*Maculavirus vitis* (grapevine fleck virus, GFkV)	GFKV00	Grapevine fleck virus	Order: Tymovirales Family: Tymoviridae	Virus	Annex IV, Part C
5	*Nepovirus arabis* (arabis mosaic virus, ArMV)	ARMV00	Arabis mosaic virus	Order: Picornavirales Family: Secoviridae	Virus	Annex IV, Part C
6	*Nepovirus foliumflabelli* (grapevine fanleaf virus, GFLV)	GFLV00	Grapevine fanleaf virus	Order: Picornavirales Family: Secoviridae	Virus	Annex IV, Part C
7	*Xiphinema rivesi*	XIPHRI	*Xiphinema rivesi* non EU populations	Order: Dorylaimida Family: *Longidoridae*	Nematoda	Annex II Part A
8	*Xylophilus ampelinus*	XANTAM	*Xylophilus ampelinus*	Order: Burkholderiales Family: *Comamonadaceae*	Bacteria	Annex IV, Part C

4.4 | List of potential pests not further assessed

As per mandate, only EU RNQPs for *Vitis* spp., included in Annex IV part C, were evaluated. Therefore, RNQPs other than those included in Annex IV part C were not evaluated in this opinion, even though they have a documented impact on *Vitis* spp.

5 | RISK MITIGATION MEASURES

For each selected pest (Table 5), the panel assessed the possibility that it could be present in the *Vitis* spp. nursery by evaluating the possibility that the commodity in the export nurseries is infested either by:

- introduction of the pest from the environment surrounding the nursery;
- introduction of the pest with new plants/seeds;
- spread of the pest within the nursery.

The information used in the evaluation of the effectiveness of the risk mitigation measures is summarised in a pest data sheet (see Appendix A).

5.1 | Risk mitigation measures applied in Moldova

With the information provided by ANSA, the panel summarised the risk mitigation measures that are implemented in the production nurseries (Table 4).

TABLE 5 Overview of implemented risk mitigation measures for the selected *Vitis* spp. plants designated for export to the EU from the Republic of Moldova.

Number	Risk mitigation measure	Implementation in the Republic of Moldova
1	*Registration of production sites*	Producer submits a Declaration of Multiplication to the inspector responsible of the Territorial Sub-Division for Food Safety (STSA).
2	*Certification of propagation material*	According to the submitted dossier and to the Moldovan certification scheme official annual field inspections certify compliance with phytosanitary requirements, soil requirements and production conditions. Adherence to Government Decision No. 432/2024 (effective July 23, 2025) for production, quality control, certification and commercialisation.
3	*Sanitation and inspection of field sites for virus-transmiting nematodes*	One year before the establishment of the production site, the soil is tested by an accredited laboratory for the presence of virus vector nematodes. After appropriate analysis, the laboratory issues a certificate confirming that the soil has been tested. If virus vector nematodes are found in the soil intended for the future planting of virus-free material, the soil is disinfected or another location is selected.
4	*Surveillance, monitoring and sampling*	Plantations are visually inspected for symptoms of infection by viruses, phytoplasmas and bacteria: 1) During the flowering phase (May–June); 2) During the grape ripening phase (September–October); 3) After leaves fall, in the autumn months. If plants with symptoms are found, they are marked, discarded and, representative individual samples are taken for laboratory analysis. The analysis of grapevine samples for the identification of harmful organisms is carried out through a series of steps, which vary depending on the type of suspected organism: • Insects (pests) – macro-microscopic analysis is used; • Bacteria – by the isolation method on culture media, the method and indirect immunofluorescence (IF); • Viruses – ELISA immuno enzymatic, IC-RT-PCR; • Phytoplasmas and viruses – PCR molecular tests The analysis of samples for the determination of pathogens and pests is carried out by specialists from the 'Laboratory of products of plant origin and phytosanitary products' within the Public Institution 'National Center for Animal, Plant Health and Food Safety', which is accredited by the National Accreditation Center MOLDAC and applies the requirements of the SM SR EN ISO/CEI 17025:2018 standard. After performing the respective analyses, a report is issued. Also, the National Food Safety Agency annually, on the basis of the National Monitoring and Surveillance Program in the field of food safety, plant health and quality of plant protection products, animal feed and veterinary drugs, plans and takes samples for determining the presence of harmful organisms and quarantine of planting material. Further details are provided in Section 3.3.4
5	*Application of phytosanitary products (pesticides)*	Systemic fungicides (azoxystrobin, boscalid, copper oxide, cyproconazole, difenconazole, penconazole, pyrimethanil, sulfur, tebuconazole), acaricides (tebufenpyrad) and insecticides (acetamipirid, cyantraniliprole, deltamethrin, fenoxycarb, indoxacarb, lambdacyhalothrin, pirimiphosmethyl) are applied based on forecasts and warnings, avoiding routine treatments. Preventive treatments are considered, as their effectiveness increases, and the number of treatments may decrease.
6	*Post-harvest treatment*	After harvesting, the plants are sorted, paraffined with special paraffin for storage, tied in bundles of 25 pieces, labelled and treated with the antifungal fungicide Cantus (active substance Boscalid 50%) at a dose of 50 g per 500 litres of water.

(Continues)

TABLE 5 (Continued)

Number	Risk mitigation measure	Implementation in the Republic of Moldova
7	*Forecasting of pest and diseases incidence*	For monitoring on an annual basis, the spread of pests of plants and plant products, the maintenance of the phytosanitary status of the Republic of Moldova territory and the non-admission of plant pests and quarantine by the state phytosanitary control body (ANSA), the Plan for the monitoring of pests of plants is approved. During the vegetation period, inspectors of ANSA's territorial subdivisions perform the following: – diagnosis, forecasting and monitoring of pests with warning to agricultural producers, natural and legal persons, regarding their occurrence and evolution; – organisation of the forecasting and warning system; – carrying out surveys to determine the range of diseases and pests with regard to their density, the frequency and intensity of the attack, the damage caused, the mortality of pests caused by entomophags or environmental conditions; – determining whether treatments are appropriate, depending on the economic threshold of the damage; – reporting any observations concerning changes to the biology of pests, with a view to the launch of specialist studies; – drawing up and providing technical documentation and instructions regarding harmful organisms (diseases, pests, weeds) and recommendations for controlling them; – taking samples for official control via laboratory assessment of plants, plant products and related goods subject to phytosanitary quarantine rules, imported, exported and marketed, in specialised accredited laboratories. The samples are taken to verify the phytosanitary status and to confirm the absence of RNQPs.
8	*Dissemination of warning notices to farmers*	During the vegetation period, inspectors of ANSA's territorial subdivisions perform production and dissemination of warning notices and development and editing of monthly and annual forecasts on the spread of major pests and agricultural plant diseases, participation in the development of instructions and recommendations in the field of plant protection and health.
9	*Sorting and storage*	Mother material The rootstocks are harvested by hand in long strings. After harvesting, they are stored in cold stores at a temperature of +2–+4°C and a relative humidity of around 95%. After harvesting and storage, the rootstock strings are segmented into 36–42 cm long and 7–13 mm thick rootstock cuttings, tied into 200 pieces, soaked in antifungal solutions (Boscalid 50%) and stored in special containers at a temperature of +2 + 4°C and a relative humidity of about 95%. Top graft material is treated in a similar manner. Grafted vines Grafted vines are sorted according to the following criteria: main root sizes, shoot sizes, uniformity and continuity of sowing, presence or absence of traces of vine pests. After the classification and labelling of the packages, the packages are prepared for winter storage. For this purpose, the vacuum packs shall be placed under a water stopper for washing soil and organic debris. After washing, it is treated with anti-cryptogamic solutions with fungicides. After the treatment, the material is left in the air chamber for 5–10 h; then, the vines are transferred for storage until planting. It is also used to keep the vine in the temperature-controlled refrigeration room and the humidity regulated. Two technical methods are practiced: by inserting the packages of vines (after anti-cryptogram treatment) in polyethylene bags or by stacking the packages and covering them with polyethylene foils. The air temperature in the room during the introduction of the vines for storage should not be higher than 10°C. The material is stored at 1–4°C with an air hygroscopicity of at least 70%.
10	*Hot water treatment*	Applied to grafted vines to prevent the spread of harmful organisms. Hot water treatment of the rootstock cuttings is carried out before grafting in a specialised heat treatment machine model RG T-220 at a temperature of 50°C for 45 minutes.
11	*Isolation distances*	For virus-certified plants, isolation distances must comply with the provisions of the regulatory framework. The cultivation of scion/rootstock in mother plantations of category 'pre-basic', 'basic', 'certified' must ensure a minimum isolation distance of 10 m from the most distant nearby vineyard.
12	*Cultural methods*	Grafting machines are checked and cleaned daily and at each change of a new variety. The graft union is sealed with paraffin waxes containing special auxins for grafting vines, such as Ciragref (SER), Rebwachs (Stahler) or Vivarium mixed with neutral paraffin waxes. Agro-technical hygiene measures, i.e. cutting and destruction of attacked leaves and shoots are applied.
13	*Physical methods*	Using low or high temperatures and fire to destroy plant debris.
14	*Biological control methods*	*Bacillus thuringiensis* var. *kurstaki* is applied for the control of *Lobesia botrana*.
15	*Bio-derived methods*	Pheromone dispensers for mating disruption of *Lobesia botrana* are installed at the rate of 250–500/ha.

5.2 | Evaluation of the current measures for the selected relevant pests including uncertainties

For each evaluated pest, the relevant risk mitigation measures acting on the pest were identified. Any limiting factors on the effectiveness of the measures were documented.

All the relevant information, including the related uncertainties deriving from the limiting factors used in the evaluation, are summarised in a pest data sheet provided in Appendix A.

Based on this information, for each selected relevant pest, an expert judgement is given for the likelihood of pest freedom, taking into consideration the risk mitigation measures and their combination acting on the pest.

An overview of the evaluation of each relevant pest is given in the sections below (Sections 5.2.1–5.2.8). The outcome of the EKE regarding pest freedom after the evaluation of the proposed risk mitigation measures is summarised in Section 5.2.9.

5.2.1 | Overview of the evaluation of grapevine leafroll-associated virus-3 (GLRaV-3, *Ampelovirus trivitis*)

Rating of the likelihood of pest freedom	***Pest free with some exceptional cases*** (based on the median)				
Percentile of the distribution	5%	25%	Median	75%	95%
Proportion of pest-free plants	***9930*** out of 10,000 plants	***9950*** out of 10,000 plants	***9965*** out of 10,000 plants	***9980*** out of 10,000 plants	***10,000*** out of 10,000 plants
Percentile of the distribution	5%	25%	Median	75%	95%
Proportion of infected plants	***0*** out of 10,000 plants	***20*** out of 10,000 plants	***35*** out of 10,000 plants	***50*** out of 10,000 plants	***70*** out of 10,000 plants
Summary of the information used for the evaluation	**Possibility that the pest could become associated with the commodity** GLRaV-3 host range is restricted to *Vitis* species, making grapevine propagating material the primary pathway for viral entry and spread. GLRaV-3 was detected in certified material from Moldova (2019–2023). The virus is readily transmitted through vegetative propagation methods such as grafting and cuttings. Additionally, GLRaV-3 can be transmitted by insect vectors including multiple mealybug species and soft scale insects in a semi-persistent manner. **Measures taken against the pest and their efficacy** Virus-tested mother plants Regular testing intervals Visual surveillance Isolation distances of nurseries Insect vector control by application of insecticides and traps Hot water treatment of scions The combination of these measures can substantially reduce pest presence and spread **Interception records** There are no records of interceptions from Moldova. **Shortcomings of current measures/procedures** Visual inspections may overlook early-stage infections or asymptomatic plants Sampling methods (protocols and procedures) are unclear Unknown occurrence and distribution of insect vectors Unknown effectiveness of hot water treatment **Main uncertainties** Time gaps between certification testing may allow virus accumulation Visual surveillance insufficient for detecting early or asymptomatic infections Lack of specific evidence for hot water treatment effectiveness Insufficient data on chemical control effectiveness against insect vectors				

For more details, see relevant pest data sheet on grapevine leafroll-associated virus-3 (GLRaV-3, *Ampelovirus trivitis*) (Section A.1 in Appendix A).

5.2.2 | Overview of the evaluation of grapevine leafroll-associated virus-1 (GLRaV-1, *Ampelovirus univitis*

Rating of the likelihood of pest freedom	***Pest free with some exceptional cases*** (based on the Median)				
Percentile of the distribution	5%	25%	Median	75%	95%
Proportion of pest-free plants	***9930*** out of 10,000 plants	***9950*** out of 10,000 plants	***9965*** out of 10,000 plants	***9980*** out of 10,000 plants	***10,000*** out of 10,000 plants
Percentile of the distribution	5%	25%	Median	75%	95%

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Proportion of infected plants	***0*** out of 10,000 plants	***20*** out of 10,000 plants	***35*** out of 10,000 plants	***50*** out of 10,000 plants	***70*** out of 10,000 plants
Summary of the information used for the evaluation	**Possibility that the pest could become associated with the commodity** GLRaV-1 host range is restricted to *Vitis* species, making grapevine propagating material the primary pathway for viral entry and spread. GLRaV-1 was detected in certified material from Moldova (2019–2023). The virus is readily transmitted through vegetative propagation methods such as grafting and cuttings. Additionally, GLRaV-1 can be transmitted by insect vectors including multiple mealybug species and soft scale insects in a semi-persistent manner. **Measures taken against the pest and their efficacy** Virus-tested mother plants Regular testing intervals Visual surveillance Isolation distances of nurseries Insect vector control by application of insecticides and traps Hot water treatment of scions The combination of these measures can substantially reduce pest presence and spread **Interception records** There are no records of interceptions from Moldova. **Shortcomings of current measures/procedures** Visual inspections may overlook early-stage infections or asymptomatic plants Sampling methods (protocols and procedures) are unclear Unknown occurrence and distribution of insect vectors Unknown effectiveness of hot water treatment **Main uncertainties** Time gaps between certification testing may allow virus accumulation Visual surveillance insufficient for early or asymptomatic infections Lack of specific evidence for hot water treatment effectiveness Insufficient data on chemical control effectiveness against insect vectors				

For more details, see relevant pest data sheet on Grapevine leafroll-associated virus-1 (*Ampelovirus univitis* GLRaV-1) (Section A.2 in Appendix A).

5.2.3 | Overview of the evaluation of '*Candidatus* Phytoplasma solani'

Rating of the likelihood of pest freedom	***Pest free with some exceptional cases*** (based on the median)				
Percentile of the distribution	5%	25%	Median	75%	95%
Proportion of pest-free plants	***9900*** out of 10,000 plants	***9940*** out of 10,000 plants	***9960*** out of 10,000 plants	***9980*** out of 10,000 plants	***9999*** out of 10,000 plants
Percentile of the distribution	5%	25%	Median	75%	95%
Proportion of infected plants	***1*** out of 10,000 plants	***20*** out of 10,000 plants	***40*** out of 10,000 plants	***60*** out of 10,000 plants	***100*** out of 10,000 plants
Summary of the information used for the evaluation	**Possibility that the pest could become associated with the commodity** *'Ca.* Phytoplasma solani' is a phloem-restricted non-cultivable bacteria that infects a wide range of weeds and cultivated plants. It is naturally dispersed over fairly long distances by its planthopper vectors. '*Ca.* P. solani' can also be disseminated through multiplication of vegetatively propagated hosts and by parasitic plants. The phytoplasma is acquired by overwintering nymphs feeding on infected roots, and the transmitted to plants (and from plant to plant) by flying adults, in the summer. The risk of introduction of '*Ca.* P. solani' to new regions is related to the dispersal of its vectors and to trade in cultivated host plants (e.g., symptomless seedlings) (EPPO, online) (EFSA PLH Panel 2014a, EFSA PLH Panel 2020) **Measures taken against the pest and their efficacy** Certified mother plants inspected to be free from '*Ca.* phytoplasma solani'. Visual field inspection is conducted to detect disease symptoms of grapevine bois noir phytoplasma and infested plants are discarded. Hot water treatment of the rootstock cuttings and science are carried out before grafting (50°C for 45 min). **Interception records** There are no records of '*Ca.* phytoplasma solani' from Moldova between 1998 and September 2025 (EUROPHYT, online; TRACES-NT, online) **Shortcomings of current measures/procedures** Latent infections could be overlooked since only visual surveys are made for this disease. Unknown occurrence and distribution of insect vectors **Main uncertainties** If and if so, how the surroundings are surveyed for the pathogen (ie presence of pathogen within the area of production). Material sampling procedures are unclear. Time gaps between certification and testing may allow pathogen development.				

For more details, see relevant pest data sheet on '*Candidatus* Phytoplasma solani' (Section A.3 in Appendix A).

5.2.4 | Overview of the evaluation of grapevine fleck virus (GFkV, *Maculavirus vitis*)

Rating of the likelihood of pest freedom	***Pest free with some exceptional cases*** (based on the median)				
Percentile of the distribution	5%	25%	Median	75%	95%
Proportion of pest-free plants	***9900*** out of 10,000 plants	***9925*** out of 10,000 plants	***9950*** out of 10,000 plants	***9975*** out of 10,000 plants	***9999*** out of 10,000 plants
Percentile of the distribution	5%	25%	Median	75%	95%
Proportion of infected plants	***1*** out of 10,000 plants	***25*** out of 10,000 plants	***50*** out of 10,000 plants	***75*** out of 10,000 plants	***100*** out of 10,000 plants
Summary of the information used for the evaluation	**Possibility that the pest could become associate with the commodity** GFkV host range is strictly limited to *Vitis* species, making grapevine propagating material the primary pathway for viral entry and spread. GFKV was detected in certified material from Moldova (2019–2023) with exceptionally high infection rates ranging from 15% to 65%, indicating significant risk of association with the commodity. The virus spreads primarily through vegetative propagation methods such as grafting and cuttings, with no known biological vectors and no evidence of seed, pollen or mechanical transmission. GFKV remains latent and asymptomatic in *Vitis vinifera*. **Measures taken against the pest and their efficacy** Virus-tested mother plants Regular testing intervals Visual surveillance Isolation distances of nurseries Hot water treatment of scions The combination of these measures can substantially reduce pest presence and spread **Interception records** There are no records of interceptions from Moldova. **Shortcomings of current measures/procedures** Visual inspections may overlook latent infections or asymptomatic plants Sampling methods (protocols and procedures) are unclear Unknown effectiveness of hot water treatment **Main uncertainties** Time gaps between certification testing may allow virus accumulation Visual surveillance insufficient for early or asymptomatic infections Lack of specific evidence for hot water treatment effectiveness				

For more details, see relevant pest data sheet on grapevine fleck virus (GFkV, *Maculavirus vitis*) (Section A.4 in Appendix A).

5.2.5 | Overview of the evaluation of arabis mosaic virus (ArMV, *Nepovirus arabis*)

Rating of the likelihood of pest freedom	***Pest free with some exceptional cases*** (based on the median)				
Percentile of the distribution	5%	25%	Median	75%	95%
Proportion of pest-free plants	***9950*** out of 10,000 plants	***9965*** out of 10,000 plants	***9975*** out of 10,000 plants	***9988*** out of 10,000 plants	***10,000*** out of 10,000 plants
Percentile of the distribution	5%	25%	Median	75%	95%
Proportion of infected plants	***0*** out of 10,000 plants	***12*** out of 10,000 plants	***25*** out of 10,000 plants	***35*** out of 10,000 plants	***50*** out of 10,000 plants
Summary of the information used for the evaluation	**Possibility that the pest could become associated with the commodity** *Vitis* is considered a major pathway for ArMV entry and spread, primarily due to vegetative propagation of grapevines. The virus is present in Moldova with a wide host range including *Vitis* species. ArMV can be transmitted through vegetative propagation methods such as grafting and cuttings. The primary vector, *Xiphinema diversicaudatum* is present in Moldova. Additionally, ArMV can remain latent or asymptomatic. **Measures taken against the pest and their efficacy** Field soil testing and disinfection Virus-tested mother plants Regular testing intervals Visual surveillance Isolation distances of nurseries Hot water treatment of scions The combination of these measures can substantially reduce pest presence and spread				

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	Interception records There are no records of interceptions from Moldova. **Shortcomings of current measures/procedures** Visual inspections may overlook latent infections or asymptomatic plants Sampling methods (protocols and procedures) are unclear Unknown occurrence and distribution of *X. diversicaudatum* in Moldova Unknown effectiveness of hot water treatment Incomplete effectiveness of soil disinfection **Main uncertainties** Limited data on *X. diversicaudatum* in Moldova Soil disinfection method is unclear Effectiveness of sampling and detection protocols for asymptomatic infections Lack of specific evidence for hot water treatment effectiveness

For more details, see relevant pest data sheet on arabis mosaic virus, (ArMV, *Nepovirus arabis*) (Section A.5 in Appendix A).

5.2.6 | Overview of the evaluation of grapevine fanleaf virus (GFLV, *Nepovirus foliumflabelli*)

Rating of the likelihood of pest freedom	***Pest free with some exceptional cases*** (based on the Median)				
Percentile of the distribution	5%	25%	Median	75%	95%
Proportion of pest-free plants	***9950*** out of 10,000 plants	***9965*** out of 10,000 plants	***9975*** out of 10,000 plants	***9988*** out of 10,000 plants	***10,000*** out of 10,000 plants
Percentile of the distribution	5%	25%	Median	75%	95%
Proportion of infected plants	***0*** out of 10,000 plants	***12*** out of 10,000 plants	***25*** out of 10,000 plants	***35*** out of 10,000 plants	***50*** out of 10,000 plants
Summary of the information used for the evaluation	**Possibility that the pest could become associated with the commodity** *Vitis* is considered a major pathway for GFLV entry and spread, primarily due to vegetative propagation of grapevines. The virus is present in Moldova with wide host range including *Vitis* species. GFLV can be transmitted through vegetative propagation methods such as grafting and cuttings. The primary vector *Xiphinema index* is present in Moldova. Additionally, GFLV can remain latent or asymptomatic. **Measures taken against the pest and their efficacy** Field soil testing and disinfection Virus-free mother plants Regular testing intervals Visual surveillance Isolation distances of nurseries Insect vector control by application of insecticides and traps Hot water treatment of scions The combination of these measures can substantially reduce pest presence and spread **Interception records** There are no records of interceptions from Moldova. **Shortcomings of current measures/procedures** Visual inspections may overlook latent infections or asymptomatic plants Sampling methods (protocols and procedures) are unclear Unknown occurrence and distribution of *X. index* in Moldova Unknown effectiveness of hot water treatment Incomplete effectiveness of soil disinfection **Main uncertainties** Limited data on *X. index* in Moldova Soil disinfection method is unclear Effectiveness of sampling and detection protocols for asymptomatic infections Lack of specific evidence for hot water treatment effectiveness In case of nematode findings, if the soil is disinfected or a different site is chosen				

For more details, see relevant pest data sheet on grapevine fanleaf virus (GFLV, *Nepovirus foliumflabelli*) (Section A.6 in Appendix A).

5.2.7 | Overview of the evaluation of *Xiphinema rivesi*

Rating of the likelihood of pest freedom	***Almost always pest free*** (based on the median)				
Percentile of the distribution	5%	25%	Median	75%	95%
Proportion of pest-free plants	***9990*** out of 10,000 plants	***9994*** out of 10,000 plants	***9996*** out of 10,000 plants	***9998*** out of 10,000 plants	***10,000*** out of 10,000 plants
Percentile of the distribution	5%	25%	Median	75%	95%
Proportion of infested plants	***0*** out of 10,000 plants	***2*** out of 10,000 plants	***4*** out of 10,000 plants	***6*** out of 10,000 plants	***10*** out of 10,000 plants
Summary of the information used for the evaluation	**Possibility that the pest could become associated with the commodity** **Possibility that the pest/pathogen could enter exporting nurseries** *Xiphinema rivesi* is a polyphagous ectoparasite with a worldwide distribution. It is a vector of several economically important nepoviruses that are on the EU and EPPO lists of quarantine organisms (TRSV, ToRSV, PRMV and CRLV). The introduction of non-EU populations of *X. rivesi* from third countries into the EU can lead to the introduction of viruses that can be later spread by nematode species already present in the EU (e.g. *X. rivesi* EU populations). In Moldova, *Xiphinema rivesi* has been reported from several fruit crops (apple, raspberry, strawberry, currant). So far, no TRSV, ToRSV, PRMV and CRLV has been reported in Moldova, but there are uncertainties due to lack of data from official monitoring surveys and reports of problems caused by this nematode in Moldovan *V. vinifera* production. The main pathways of this nematode are plants for planting, contaminated water, soil and growing media as such or attached to plants, agricultural machinery, tools and footwear. This nematode can be found in the soil of *V. vinifera* plants or other host plants in the environment and affect the commodity mainly through human-assisted dispersal. **Measures taken against the pest and their efficacy** The relevant proposed measures are (i) certification of propagation material; (ii) sanitation and inspection of field sites for virus-vector nematodes; (iii) surveillance, monitoring and sampling; and (iv) sorting and storage, including removal of soil and organic debris from roots (root washing). **Interception records** There are no records of interceptions from Moldova. **Shortcomings of current measures/procedures** Nurseries are inspected for the presence of virus vector nematodes 1 year before planting and, if necessary, disinfected or another production site is chosen if virus vector nematodes are present and cannot be controlled. Details of this measure and the threshold for intervention were not provided. Soil disinfection cannot be fully effective to eliminate nematodes. Washing the roots to remove soil and organic debris does not reduce the risk of nematode infestation. **Main uncertainties** • Symptoms caused by *X. rivesi* can be overlooked. • The presence of *X. rivesi* may not be detected. • In case of nematode findings, if the soil is disinfected or a different site is chosen. Washing the roots does not completely reduce the risk of nematode infestation in plants for planting.				

For more details, see relevant pest data sheet on *Xiphinema rivesi* (Section A.7 in Appendix A).

5.2.8 | Overview of the evaluation of *Xylophilus ampelinus*

Rating of the likelihood of pest freedom	***Pest free with some exceptional cases*** (based on the Median)				
Percentile of the distribution	5%	25%	Median	75%	95%
Proportion of pest-free plants	***9960*** out of 10,000 plants	***9980*** out of 10,000 plants	***9985*** out of 10,000 plants	***9990*** out of 10,000 plants	***10,000*** out of 10,000 plants
Percentile of the distribution	5%	25%	Median	75%	95%
Proportion of infected plants	***0*** out of 10,000 plants	***10*** out of 10,000 plants	***15*** out of 10,000 plants	***20*** out of 10,000 plants	***40*** out of 10,000 plants

Summary of the information used for the evaluation	**Possibility that the pest could become associated with the commodity** The only known host of *Xylophilus ampelinus* is *V. vinifera*. Natural spread of the bacterium is considered possible but limited to the immediate surrounding area and within nurseries; however, it is unlikely that the pathogen will enter nurseries through new plants. The pathogen is mainly disseminated through viticultural practices, particularly by contaminated tools and by water droplets carrying bacterial cells from the bleeding sap of infected vines. No other hosts, carrier plants or insect vectors have been described. The pathogen can persist latently in woody tissues as well as epiphytically on bracts and bud wool, remaining undetectable during visual inspections (EFSA PLH Panel 2014b). **Measures taken against the pest and their efficacy** The relevant proposed measures are: (i) certification of propagation material; (ii) sanitation and inspection of field sites for bacteria; (iii) surveillance, monitoring and sampling;(iv) sorting and storage, including removal of soil and organic debris from roots (root washing); (V) application of phytosanitary products (copper based); (VI) hot water treatments; (VII) proper cultural methods. **Interception records** There are no records of *X. ampelinus* interceptions from Moldova between 1998 and September 2025 (EUROPHYT, online; TRACES-NT, online). **Shortcomings of current measures/procedures** Latent infections could be overlooked and application of sanitary products or hot treatments could not be efficient. **Main uncertainties** The modalities of the surveillance for the disease are unclear. The isolation distance between the nursery and surrounding vineyards is unclear. Pest pressure in the surrounding areas is unknown. Latent infections may be present since they would not be detected by visual inspections. Efficiency of the hot water treatment.

For more details, see relevant pest data sheet on *Xylophilus ampelinus* (Section A.8 in Appendix A).

5.2.9 | Outcome of Expert Knowledge Elicitation

Table 6 and Figures 6 and 7 show the outcome of the EKE regarding pest freedom after the evaluation of the proposed risk mitigation measures for all the evaluated pests.

Figure 8 provides an explanation of the descending distribution function describing the likelihood of pest freedom after the evaluation of the proposed risk mitigation measures for selected *Vitis* spp. plants designated for export to the EU for grapevine fleck virus (GFkV, *Maculavirus vitis)*.

TABLE 6 Assessment of the likelihood of pest freedom following evaluation of current risk mitigation measures against GLRaV-3, GLRaV-1, *'Candidatus* Phytoplasma solani', GFkV, ArMV, GFLV, *Xiphinema rivesi* and *Xylophilus ampelinus* on selected *Vitis* species plants designated for export to the EU. In panel A, the median value for the assessed level of pest freedom for each pest is indicated by 'M', the 5% percentile is indicated by L and the 95% percentile is indicated by U. The percentiles together span the 90% uncertainty range regarding pest freedom. The pest freedom categories are defined in panel B of the table.

Number	Group	Pest species	Lower	Medium	Upper	Sometimes pest free	More often than not pest free	Frequently pest free	Very frequently pest free	Extremely frequently pest free	Pest free with some exceptional cases	Pest free with few exceptional cases	Almost always pest free
1	Virus	GFkV	9900	9950	9999					L	M	U	
2	Virus	GFLV & ArMV	9950	9975	10,000						LM		U
3	Virus	GLRaV-1 & GLRaV-3	9930	9965	10,000					L	M	U	
4	Nematode	*Xiphinema rivesi*	9990	9996	10,000							L	MU
5	Bacteria	*Xylophilus ampelinus*	9960	9985	10,000						LM	U	
6	Phytoplasma	'*Candidatus* phytoplasma solani'	9900	9960	9999					L	M	U	

PANEL A

Pest freedom category	Pest-free plants out of 10,000
Sometimes pest free	≤ 5000
More often than not pest free	5000–≤ 9000
Frequently pest free	9000–≤ 9500
Very frequently pest free	9500–≤ 9900
Extremely frequently pest free	9900–≤ 9950
Pest free with some exceptional cases	9950–≤ 9990
Pest free with few exceptional cases	9990–≤ 9995
Almost always pest free	9995–≤ 10,000

Legend of pest freedom categories	
L	Pest freedom category includes the elicited lower bound of the 90% uncertainty range
M	Pest freedom category includes the elicited median
U	Pest freedom category includes the elicited upper bound of the 90% uncertainty range

PANEL B

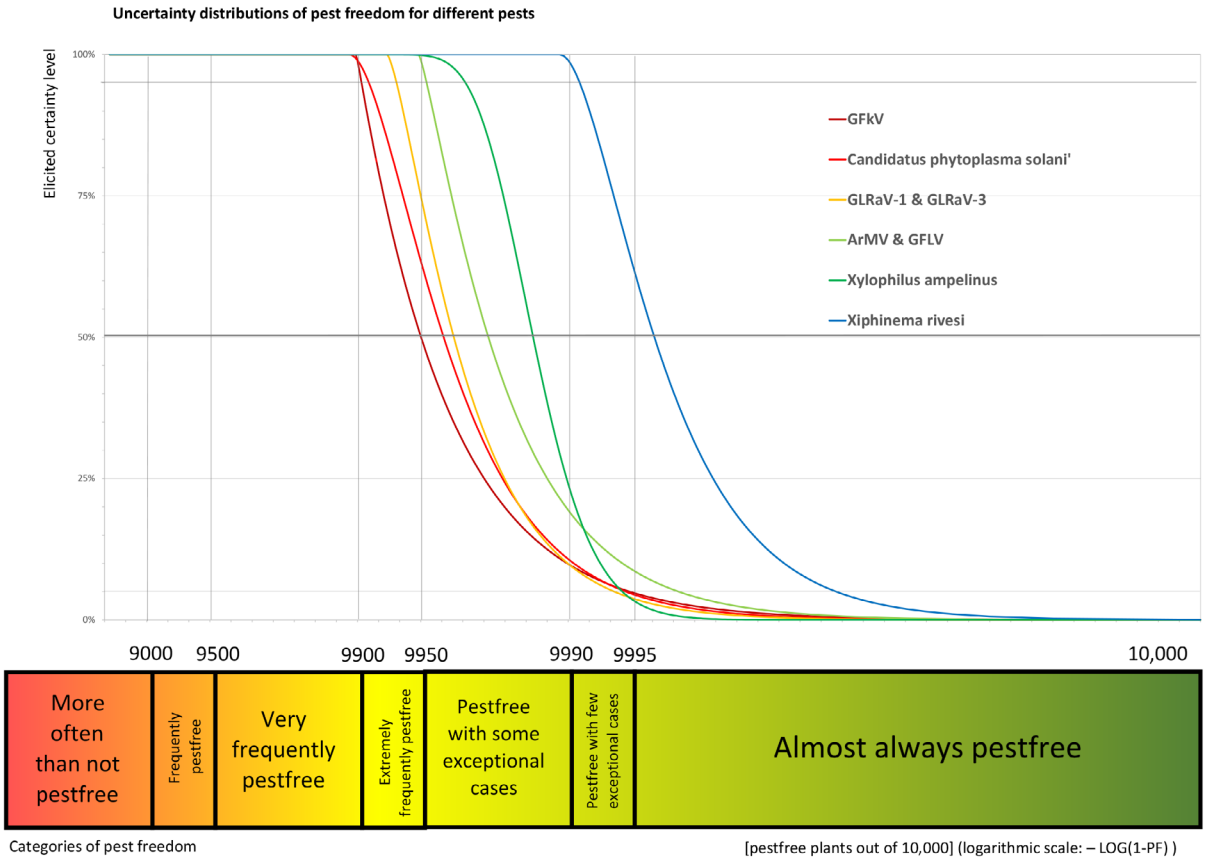

FIGURE 6 Elicited certainty levels (*y*-axis) of the number of pest-free relevant *Vitis* spp. commodities (*x*-axis; log-scaled) out of 10,000 designated for export to the EU from Moldova for all evaluated pests visualised as a descending distribution function. Horizontal lines indicate the percentiles (starting from the bottom 5%, 25%, 50%, 75%, 95%). The panel is 95% confident that 9900 (GFkV and *Candidatus* Phytoplasma solani), 9930 (GLRaV-3 and GLRaV-1), 9950 (ARMV and GFLV), 9960 (*Xylophilus ampelinus*), 9990 (*Xiphinema rivesi*), will be pest-free *Vitis* spp. commodities.

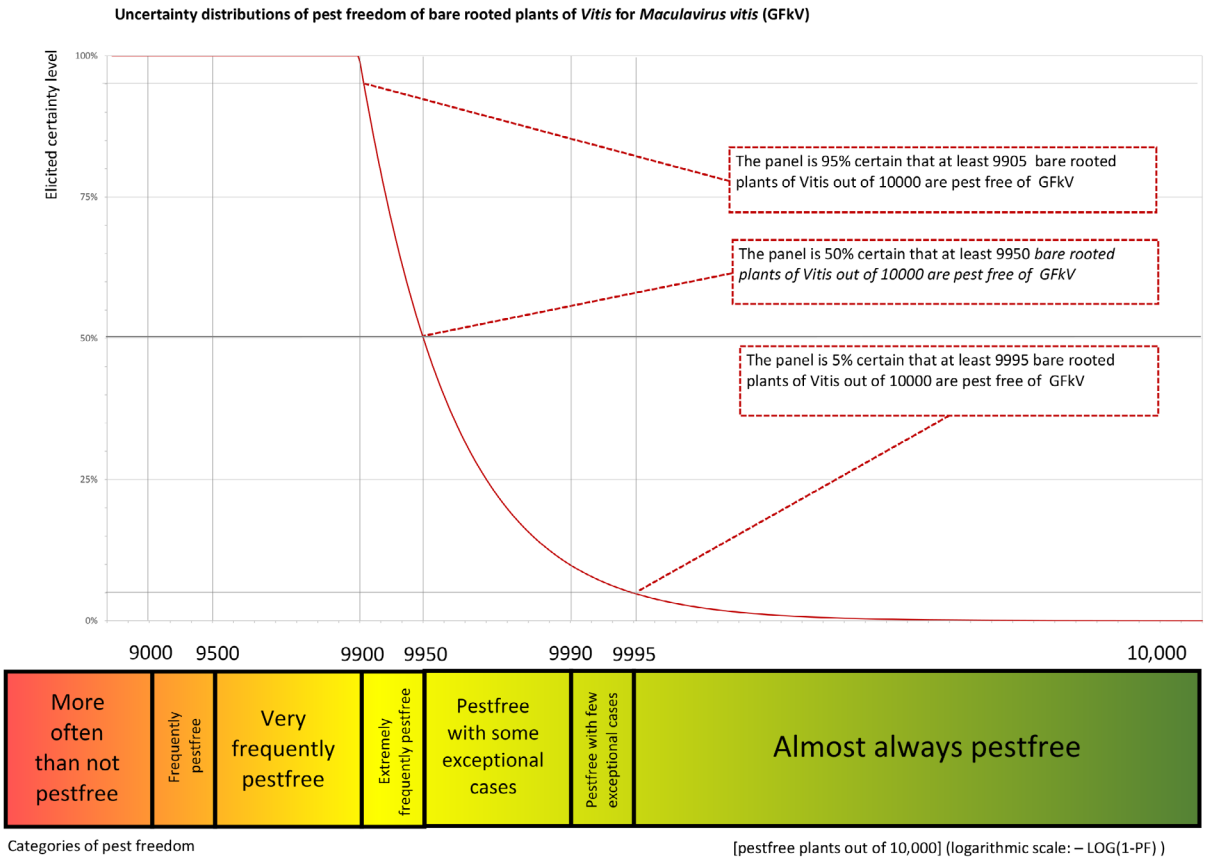

FIGURE 7 Explanation of the descending distribution function describing the likelihood of pest freedom after the evaluation of the proposed risk mitigation measures for potted plants designated for export to the EU based on the example of grapevine fleck virus (GFkV).

6 | CONCLUSIONS

There are eight pests identified to be present in Moldova and considered to be potentially associated with the commodity of the selected *Vitis* species imported from Moldova and relevant for the EU.

These pests are grapevine leafroll-associated virus 3 (GLRaV-3), grapevine leafroll-associated virus 1 (GLRaV-1), '*Candidatus* Phytoplasma solani', grapevine fleck virus (GFkV), arabis mosaic virus (ArMV), grapevine fanleaf virus (GFLV), *Xiphinema rivesi* and

Xylophilus ampelinus. The likelihood of the pest freedom after the evaluation of the implemented risk mitigation measures for bare root *Vitis* spp. plants designated for export to the EU was estimated.

For GLRaV-3, the likelihood of pest freedom following evaluation of current risk mitigation measures was estimated as '*Pest free with some exceptional cases with* the 90% uncertainty range reaching from '*Extremely frequently pest free*' to '*Pest free with few exceptional cases*'. The Expert Knowledge Elicitation indicated, with 95% certainty, that between *9930* and 10,000 units per 10,000 will be free from GLRaV-3.

For GLRaV-1, the likelihood of pest freedom following evaluation of current risk mitigation measures was estimated as '*Pest free with some exceptional cases* with the 90% uncertainty range reaching from '*Extremely frequently pest free*' to '*Pest free with few exceptional cases*'. The Expert Knowledge Elicitation indicated, with 95% certainty, that between *9930* and 10,000 units per 10,000 will be free from GLRaV-1.

For '*Candidatus* Phytoplasma solani', the likelihood of pest freedom following evaluation of current risk mitigation measures was estimated as '*Pest free with some exceptional cases* with the 90% uncertainty range reaching from '*Extremely frequently pest free*' to '*Pest free with few exceptional cases*'. The Expert Knowledge Elicitation indicated, with 95% certainty, that between *9900* and 10,000 units per 10,000 will be free from '*Candidatus* Phytoplasma solani'.

For GFkV, the likelihood of pest freedom following evaluation of current risk mitigation measures was estimated as '*Pest free with some exceptional cases* with the 90% uncertainty range reaching from '*Pest free with some exceptional cases*' to '*Pest free with some exceptional cases*'. The Expert Knowledge Elicitation indicated, with 95% certainty, that between *9900* and 10,000 units per 10,000 will be free from GFkV.

For ArMV, the likelihood of pest freedom following the evaluation of current risk mitigation measures was estimated as '*Pest free with some exceptional cases* with the 90% uncertainty range reaching from '*Extremely frequently pest free*' to '*Almost always pest free*'. The Expert Knowledge Elicitation indicated, with 95% certainty, that between *9950* and 10,000 units per 10,000 will be free from ArMV.

For GFLV, the likelihood of pest freedom following the evaluation of current risk mitigation measures was estimated as '*Pest free with some exceptional cases* with the 90% uncertainty range reaching from '*Extremely frequently pest free*' to '*Almost always pest free*'. The Expert Knowledge Elicitation indicated, with 95% certainty, that between *9950* and 10,000 units per 10,000 will be free from GFLV.

For *Xiphinema rivesi*, the likelihood of pest freedom following evaluation of current risk mitigation measures was estimated as '*Almost always pest free*' with the 90% uncertainty range reaching from '*Pest free with few exceptional cases*' to '*Almost always pest free*'. The Expert Knowledge Elicitation indicated, with 95% certainty, that between *9990* and 10,000 units per 10,000 will be free from *Xiphinema rivesi*.

For *Xylophilus ampelinus*, the likelihood of pest freedom following evaluation of current risk mitigation measures was estimated as '*Pest free with some exceptional cases* with the 90% uncertainty range reaching from '*Pest free with some exceptional cases*' to '*Pest free with some exceptional cases*'. The Expert Knowledge Elicitation indicated, with 95% certainty, that between *9960* and 10,000 units per 10,000 will be free from *Xylophilus ampelinus*.

The methodology used to establish pest presence depends in part on published literature. The limited number of publications from Moldova can lead to an underestimation of the number of pests present (Bebber et al., 2014). Thus, there is uncertainty as to whether all relevant pests have been identified.

GLOSSARY

Control (of a pest)	Suppression, containment or eradication of a pest population (FAO, 1995, 2024).
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, 2024).
Establishment (of a pest)	Perpetuation, for the foreseeable future, of a pest within an area after entry (FAO, 2024).
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, 2024)
Measures	Control (of a pest) is defined in ISPM 5 (FAO, 2024) 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 mitigation measures that do not directly affect pest abundance.

Pathway	Any means that allows the entry or spread of a pest (FAO, 2024).
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, 2024).
Protected zone	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, 2024).
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, 2024).
Risk mitigation measure	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 risk mitigation measure 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, 2024).

ABBREVIATIONS

BAC	Bacteria
CABI	Centre for Agriculture and Bioscience International
EKE	Expert Knowledge Elicitation
EPPO	European and Mediterranean Plant Protection Organization
FAO	Food and Agriculture Organization
FUN	Fungi
INS	Insect
ISPM	International Standards for Phytosanitary Measures
NEM	Nematode
PHY	Phytoplasma
PLH	Plant Health
PRA	Pest Risk Assessment
RNQPs	Regulated Non-Quarantine Pests

REQUESTOR

European Commission

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PANEL MEMBERS

Antonio Vicent Civera, Paula Baptista, Anna Berlin, Elisavet Chatzivassiliou, Jaime Cubero, Nik Cunniffe, Eduardo de la Peña, Nicolas Desneux, Francesco Di Serio, Anna Filipiak, Paolo Gonthier, Beata Hasiów-Jaroszewska, Hervé Jactel, Blanca B. Landa, Lara Maistrello, David Makowski, Panagiotis Milonas, Nikos T. Papadopoulos, Roel Potting, Hanna Susi, and Dirk Jan van der Gaag.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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APPENDIX A

Data sheets of pests selected for further evaluation via Expert Knowledge Elicitation

A.1 | GRAPEVINE LEAFROLL-ASSOCIATED VIRUS 3 (GLRAV-3)

A.1.1 | Organism information

Taxonomic information	Current valid scientific name: *Ampelovirus trivitis* Common name/Synonyms: Grapevine leafroll-associated ampelovirus 3; grapevine leafroll-associated closterovirus 3; grapevine leafroll-associated virus 3, GLRaV-3 Name used in the EU legislation: *Grapevine leafroll-associated virus 3* [GLRAV3] Category: Virus Order: Martellivirales Family: Closteroviridae Name used in the Dossier: Grapevine leafroll-associated virus 3 (GLRaV-3)	
Group	Viruses and Viroids	
EPPO code	GLRAV3	
Regulated status	GLRaV-3 is listed as a Regulated Non-Quarantine Pest (RNQP, Annex IV, Part C, concerning vine propagating material of Commission Implementing Regulation (EU) 2019/2072). RNQP: Switzerland (2019), United Kingdom (2020). Quarantine pest: United States of America (2000). A2 list: Jordan (2013), Türkiye (2016). (EPPO database).	
Pest status in applicant country	Present, no details (CABI datasheet).	
Pest status in the EU	Present, no details: Austria (1994), Bulgaria (1977), Croatia (1991), France (1958), Germany (1991), Greece (1991), Hungary (1969), Italy (1981), Malta (1994), Poland (2014), Portugal (1991), Romania (1993), Slovenia (1991), Spain (2010), (CABI datasheet).	
Host status on commodity species	*Vitis* sp. is reported as a host for GLRaV-3 in the EPPO Global Database (EPPO, online).	
PRA information/CRA information		
Other relevant information for the assessment		
Biology	GLRaV-3 is a filamentous virus that belongs to the family *Closteroviridae*, genus *Closterovirus*. It is a phloem-restricted virus, with flexuous filaments about 12 nm wide, exhibiting open structure and distinct cross banding (Karasev, 2000; Martelli et al., 1997). The genome is a monopartite single-stranded positive sense RNA molecule. GLRaV-3, which was proposed as type species of the novel genus *Vinivirus* (Karasev, 2000), has a genome of 17,919 nt, containing 13 ORFs, and has structural organisation differing from that of other sequenced closteroviruses (Ling et al., 1998). Grapevine leafroll disease and associated viruses have a worldwide distribution, and its natural major host is *Vitis vinifera*. GLRaV-3 is readily transmitted by grafting and insect vectors (Martelli, 1993; Tsai et al., 2010). Vectors include *Coccidae* and *Pseudococcidae* mealybug species, such as *Planococcus ficus, Pl. citri, Pseudococcus longispinus, Ps. affinis, Ps.calceolariae, Ps. maritimus, Ps. viburni, Ps. comstocki, Heliococcus bohemicus, Phenacoccus aceris* (Sforza et al., 2003; Zorloni et al., 2004) and also soft scale insects, such as *Pulvinaria vitis, Neopulvinaria innumerabilis, Parthenolecanium corni, Coccus hesperidium, C. longulus, Saissetia* sp., *Parassaissetia nigra* and *Ceroplastes rusci* (Sforza et al., 2003). This vector transmission is associated with a semi-persistent manner, i.e. acquisition and inoculation access periods in the range of 15–60 min and 30 min, respectively, retention of infectivity from 2 or 3 up to 8 days (Cabaleiro and Segura, 1997). Transmission by sap inoculation or seeds has not been documented.	
Symptoms	**Main type of symptoms**	Symptoms of GLRaV-3 infection typically emerge in summer. Affected leaves become thicker than normal, brittle and show downwardly rolled margins. In white-berried cultivars, leaves turn yellow, while in red-berried cultivars, they develop red to deep purple discoloration with a characteristic narrow green band along the primary and secondary veins. Symptom severity varies depending on the grapevine cultivar and the specific virus or viral combinations present, with GLRaV-3 inducing more pronounced interveinal reddening compared to GLRaV-1 or GLRaV-5 (Martelli, 1993; Walter and Zimmermann, 1991). Different strains of the same virus can vary in pathogenicity, leading to variation in symptom expressions. Also, the severity may depend on scion–rootstock combinations and co-infections with other viruses or viroids that may act synergistically.
	Presence of asymptomatic plants	GLRaV-3 infection is generally symptomatic, although at early stages might do not show symptoms.
	Confusion with other pests	The symptoms can vary significantly depending on the virus isolate, plant cultivar, rootstock, environmental conditions and season. Mixed infections with other GLRaVs are common and can exacerbate symptoms and impact.

(Continued)

Host plant range	The natural host of GLRaV-3 is *Vitis vinifera*, including *V. californica* and *Vitis* hybrids (EPPO database; Klaassen et al., 2011).
Reported evidence of impact	GLRaV-3 is considered the second most common viral disease affecting Vitis. It is associated with leaf rolling, discoloration and reduced vine vigour, which can impact grape quality and yield (Alabi et al. 2016). Yield losses can reach up to 40%, with quality parameters affected by ripening.
Evidence that the commodity is a pathway	Plants for planting of *Vitis* are considered the major pathway for GLRaV-3 entry and spread (Martelli 2017).
Surveillance information	GLRaV-3 is subject to official surveillance programmes under the ANSA. The phytosanitary control is carried out twice annually. According to the additional information provided, as well as CABI and EPPO database, GLRaV-3 is present in Moldova. According to a recent study on certified grapevine planting material from the Republic of Moldova, GLRaV-3 was found to be present, with infection rates ranging from 7% to 39% during 2019–2023 (Dubceac et al., 2023).

A.1.2 | Possibility of pest presence in the nursery

A.1.2.1 | Possibility of entry from the surrounding environment

The natural host range of GLRaV-3 is primarily restricted to *Vitis* spp. The virus is readily transmitted by grafting from naturally infected *V. vinifera* to plants of the same or other *Vitis* species (Martelli, 1993). GLRaV-3 appeared to be present in certified material from Moldova (2019–2023), with infection rates ranging from 7% to 39% (Dubceac et al., 2023). This may indicate a significant risk of entry through infected propagative material. GLRaV-3 can also be transmitted by insect vectors, such as several mealybug species and soft scale insects in a semipersistent manner. Although the transmission efficiency can be variable among vector species, viruliferous vectors can introduce viral infection from infected areas.

Based on the technical dossier information, GLRaV-3 is recognised as RNQP, and there is a set of standard official precautions from ANSA to ensure the detection and control of this virus in the commodity. Nurseries are located at least 1000 m from settlements and industrial vineyards, and 500 m from rivers, lakes and other water sources. Vine mother plantations are tested for the presence of the virus for the first time at the age of 6 years and thereafter at intervals of each 6 years, while those of the 'certified' category are sampled and tested for the first time at the age of 10 years and thereafter at intervals of 10 years. Additionally, plant health control of the mother graft/rootstock plantations is carried out annually by visual examination of plants for viral diseases.

Uncertainties:

- Limited information about the current presence of GLRaV-3 in Moldova.
- There are no data on the occurrence and distribution of the insect vectors in Moldova.
- The efficacy of pest control measures.

Taking into account this evidence and the uncertainties, the panel considers that **entry into the nursery from the surrounding environment infecting vine plants may be possible**.

A.1.2.2 | Possibility of entry with new plants/seeds

GLRaV-3 host range is restricted to *Vitis* spp., with no other natural host species. There is no conclusive evidence for seed or pollen transmission. The main possibility of entry is through infected grapevine planting material. Mother plants for scions are grown under official inspection, with sampling and testing for viruses first at 6 years of age, then every 6 years. GLRaV-3 infection typically shows visible symptoms, although it may show minimal foliar symptoms at early stages, potentially evading visual detection.

Uncertainties:

- The efficacy of the sampling procedure and reliability of detection from latent or asymptomatic infections.
- Variation in symptom expression in certain cultivars affecting visual inspections.

Considering this evidence and uncertainties, the panel concludes that **entry with new plants or seeds may be possible but unlikely**.

A.1.2.3 | Possibility of spread within the nursery

GLRaV-3 can spread by grafting and clonal propagation of infected mother plants. There is no evidence of mechanical sap transmission through contaminated tools. *Vitis* propagating material is produced under the certification scheme in

nurseries, and the plant materials are monitored and inspected during the vegetation period. Standard nursery control practices include pest control measures, daily cleaning of grafting machines and hot water treatment of scions (50°C for 45 min). It is not known whether hot water treatment could have an effect on GLRaV-3.

Uncertainties:

- Unknown efficiency (if any) of hot-water treatments.

Taking this evidence and uncertainties into account, the Panel considers that the **spread of GLRaV-3 within the nursery may be possible**.

A.1.3 | Information from interceptions

There are no records of GLRaV-3 from Moldova between 1998 and August 2025 (EUROPHYT, online; TRACES-NT, online).

A.1.4 | Evaluation of the risk mitigation options

In the table below, all risk mitigation measures currently applied in Moldova are listed and an indication of their effectiveness on GLRaV-3 is provided. The description of the risk mitigation measures currently applied in Moldova is provided in Table 5 (Section 5).

No	Risk mitigation measure	Effect on the pest	Evaluation and uncertainties
1	*Registration of production sites*	No	
2	*Certification of propagation material*	Yes	Propagation material comes from pre-basic and basic mother plants that were tested virus-free. Virus testing is every 6 years for mother plantations, and every 10 years for certified stock nurseries. Uncertainties: – Procedure of material sampling is unclear. – Time gaps between certification testing (6 years) may allow virus accumulation.
3	*Sanitation and inspection of field sites for virus-transmission nematodes*	No	
4	*Surveillance, monitoring and sampling*	Yes	All plants from mother plantations are sampled and tested for viruses, with an interval of 6 years. Additionally, visual inspections are carried out in mother plantations and commodity material twice yearly may help to control the virus infection. Uncertainties: – Visual surveillance can be insufficient for early infections. – GLRaV-3 infection can be asymptomatic, making visual detection unreliable.
5	*Application of phytosanitary products (pesticides)*	Yes	The application of chemical insecticides can have a moderate effectivity against the insect vectors (mealybugs and scale insects). Uncertainties: – The effectiveness of chemical control against insect life stages and seasonal timing.
6	*Forecasting of pest and diseases incidence*	Yes	Visual inspections may help to prevent viral spread. Uncertainties: – The detection of latent or symptomless infections by visual inspections is questionable.
7	*Dissemination of warning notices to farmers*	No	
8	*Sorting and storage*	No	
9	*Hot water treatment*	Yes	Scions are treated at 50°C for 45 mins before grafting. Uncertainties: – Unknown efficiency against viral infection in general and GLRaV-3 in particular
10	*Isolation distances*	Yes	Nurseries located > 1000 m from settlements and industrial vineyards, and > 500 m from water sources. Uncertainties: – It is unclear if the distance is sufficient to prevent entry of the potential vectors.
11	*Cultural methods*	No	
12	*Physical methods*	Yes	Use of insect traps to catch insects. If infected plants are detected, they should be destroyed. Uncertainties: – The effectiveness of used traps for vectors is uncertain.

(Continued)

No	Risk mitigation measure	Effect on the pest	Evaluation and uncertainties
13	*Biological control methods*	No	
14	*Bio-derived methods*	No	

A.1.5 | Overall likelihood of pest freedom

A.1.5.1 | Reasoning for a scenario which would lead to a reasonably low number of infested consignments

- Host range of GLRaV-3 is restricted to *Vitis* spp.
- Insect vectors are the only efficient way to get within the nurseries, and their occurrence is unknown in the production areas.
- Visual inspections are under official regulation, and virus symptoms seem easy to detect in diseased plants.
- Mother plants are certified.

A.1.5.2 | Reasoning for a scenario which would lead to a reasonably high number of infested consignments

- GLRaV-3 was detected in a proportion of 39% in Moldova.
- Wide spread of insect vectors.
- Visual inspection will not detect early stages of infections or asymptomatic infections.
- High numbers of plants in a bundle lead to increase the risk associated with virus presence in the bundle.

A.1.5.3 | Reasoning for a central scenario equally likely to over- or underestimate the number of infested consignments (median)

- The presence of the primary vectors is very unlikely with phytosanitary measures.
- Introduction of the virus from the surrounding areas or from propagation material within the nurseries is very unlikely.

A.1.5.4 | Reasoning for the precision of the judgement describing the remaining uncertainties (1st and 3rd quartile/interquartile range)

- Status of the virus in the surrounding areas is unknown.
- Effectiveness of current sampling and detection protocols for asymptomatic infections.

A.1.5.5 | Elicitation outcomes of the assessment of the pest freedom for grapevine leafroll-associated virus 3 (GLRaV-3)

The following tables show the elicited and fitted values for pest infestation/infection (Table A.1) and pest freedom (Table A.2).

TABLE A.1 Elicited and fitted values of the uncertainty distribution of pest infestation by GLRaV-3 per 10,000 plants.

Percentile	1%	2.5%	5%	10%	17%	25%	33%	50%	67%	75%	83%	90%	95%	97.5%	99%
Elicited values	0					20		35		50					70
EKE	1.87	3.64	6.03	10.1	14.8	20.1	25.1	34.9	44.8	50.1	55.7	60.8	65.3	68.0	70.1

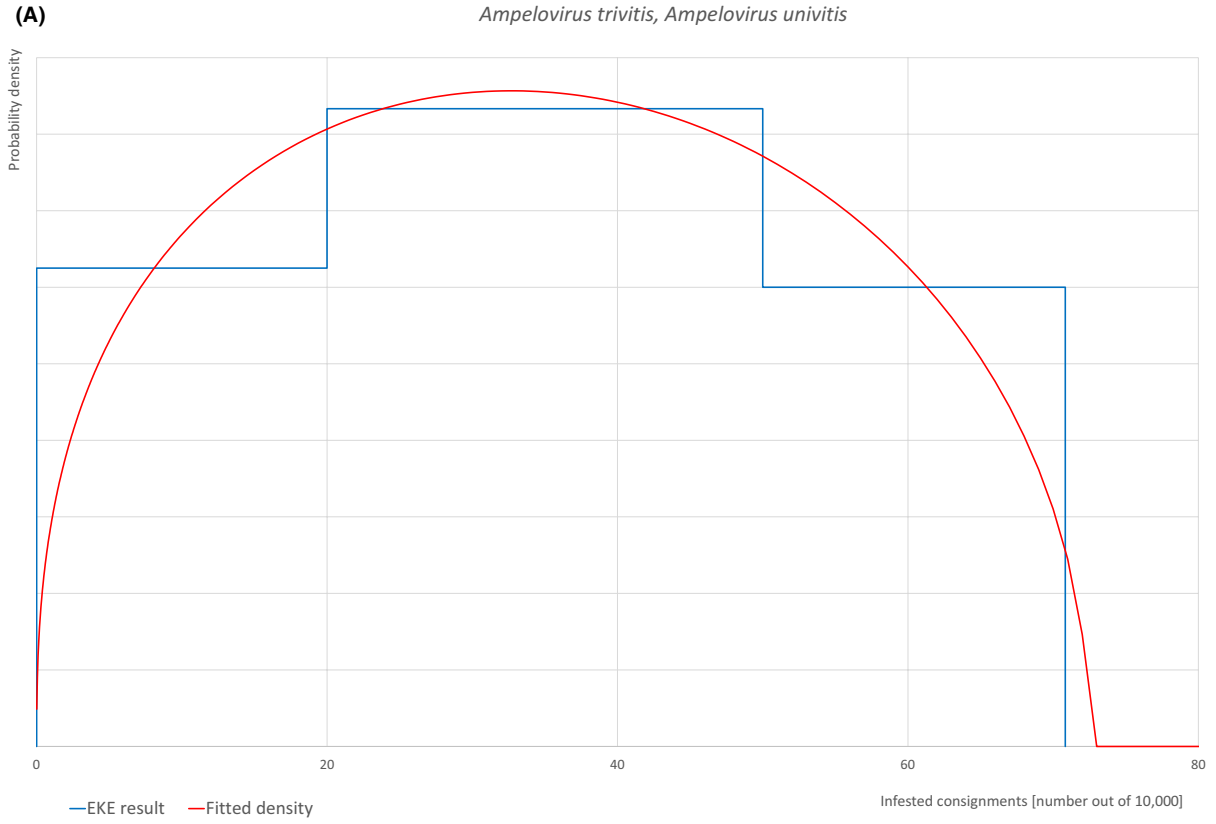
Note: The EKE results are BetaGeneral (1.3894, 1.4741, 0, 72.5) fitted with @Risk version 7.5.

Based on the numbers of estimated infested plants, the pest freedom was calculated (i.e. = 10,000 – the number of infested plants per 10,000). The fitted values of the uncertainty distribution of the pest freedom are shown in Table A.2.

TABLE A.2 The uncertainty distribution of plants free of GLRaV-3 per 10,000 plants calculated in Table A.1.

Percentile	1%	2.5%	5%	10%	17%	25%	33%	50%	67%	75%	83%	90%	95%	97.5%	99%
Values	9930					9950		9965		9980					10,000
EKE results	9929.9	9932	9935	9939	9944	9950	9955	9965	9975	9980	9985	9990	9994	9996	9998

Note: The EKE results are the fitted values.



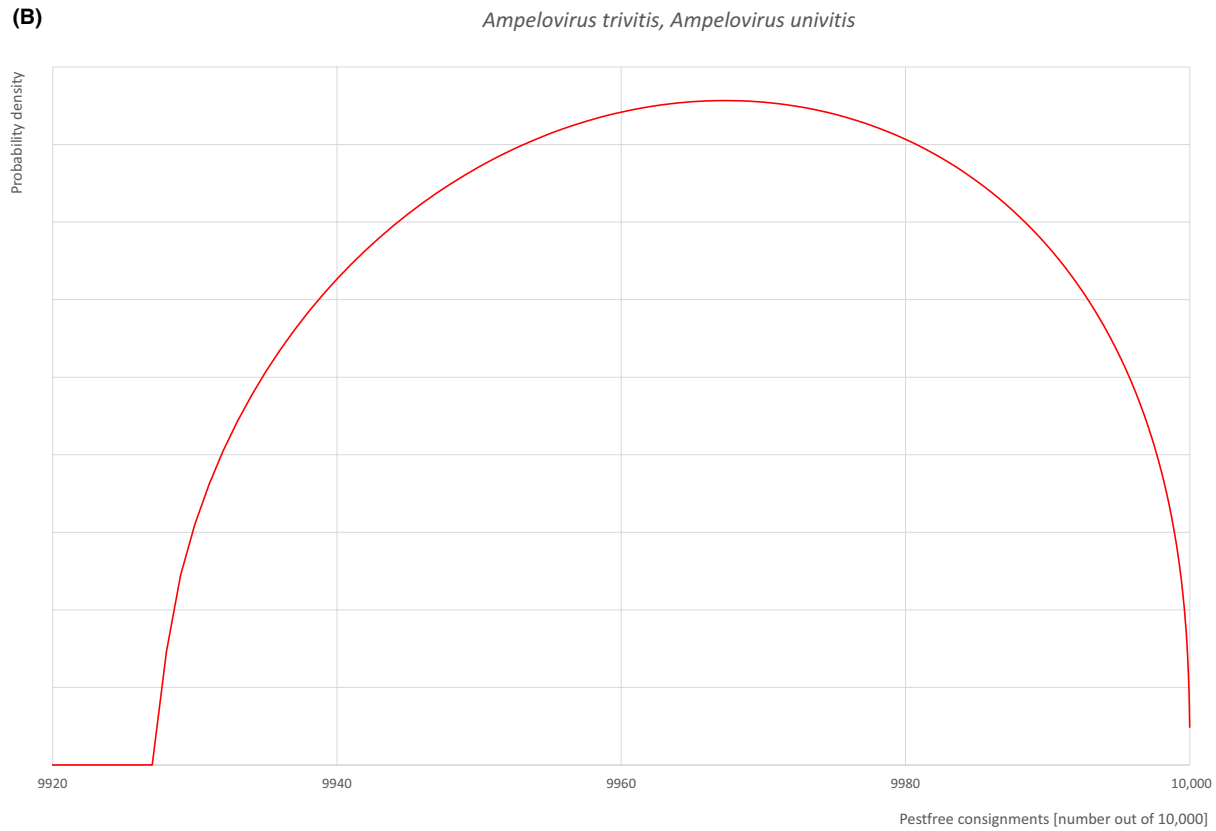


FIGURE A.1 (Continued)

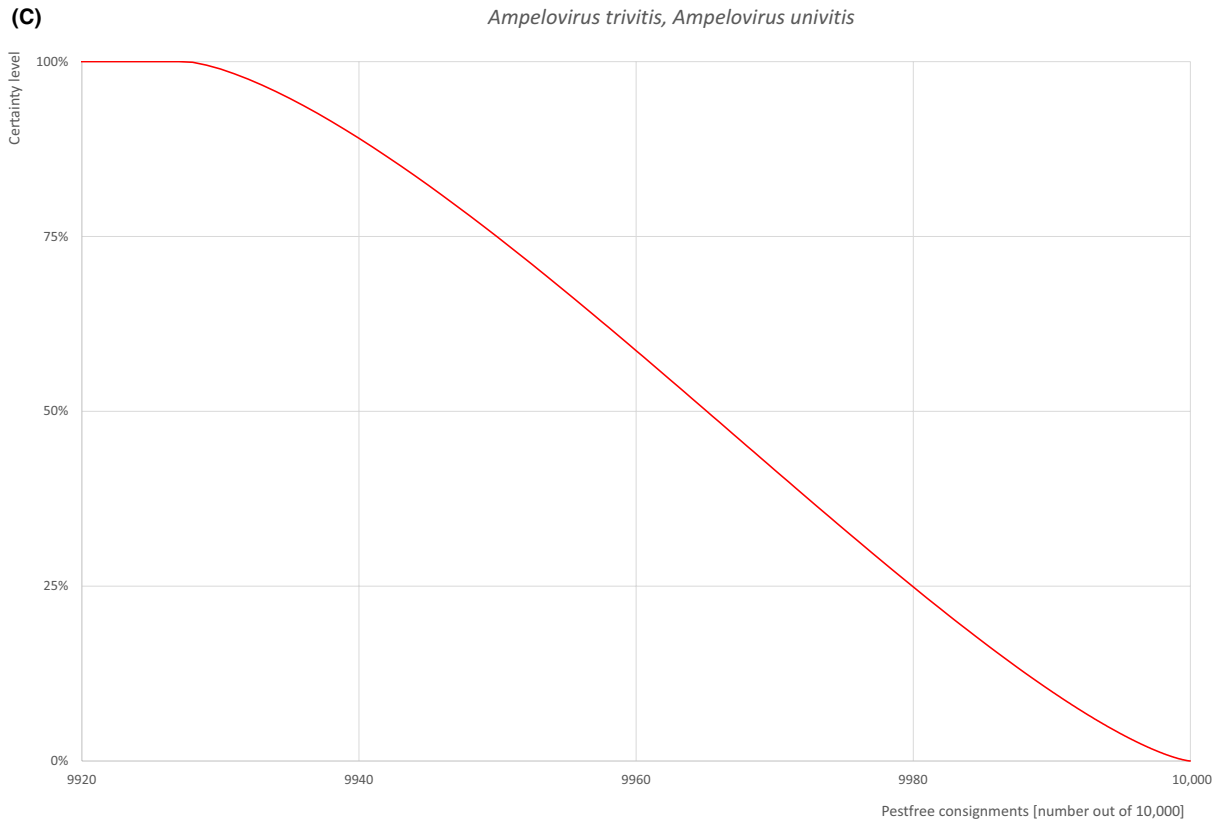


FIGURE A.1 (A) Elicited uncertainty of pest infestation per 10,000 plants (histogram in blue–vertical blue line indicates the elicited percentile in the following order: 1%, 25%, 50%, 75%, 99%) and distributional fit (red line); (B) uncertainty of the proportion of pest-free plants per 10,000 (i.e. = 1 – pest infestation proportion expressed as percentage); (C) descending uncertainty distribution function of pest infestation per 10,000 plants.

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A.2 | GRAPEVINE LEAFROLL-ASSOCIATED VIRUS 1 (GLRAV-1)

A.2.1 | Organism information

Taxonomic information	Current valid scientific name: *Ampelovirus univitis* Synonyms/common names: Grapevine leafroll-associated ampelovirus 1; Grapevine leafroll-associated closterovirus 1; Grapevine leafroll-associated virus 1, GLRaV-1 Name used in the EU legislation: *Grapevine leafroll-associated virus 1* [GLRAV1] Category: Virus Order: Martellivirales Family: Closteroviridae Name used in the Dossier: Grapevine leafroll-associated virus 1 (GLRaV-1)	
Group	Viruses and Viroids	
EPPO code	GLRAV1	
Regulated status	GLRaV-1 is listed as a regulated non-quarantine pest (RNQP, Annex IV, Part C, concerning vine propagating material of Commission Implementing Regulation (EU) 2019/2072). RNQP: Switzerland (2019), United Kingdom (2020). Quarantine pest: United States of America (1989). A1 List: Uruguay (1995) A2 list: Jordan (2013), Türkiye (2016). (EPPO database).	
Pest status in applicant country	Present, no details (CABI datasheet).	
Pest status in the EU	Present, no details: Austria (1994), Bulgaria (1977), Croatia (1991), France (1958), Germany (1991), Greece (1991), Hungary (1969), Italy (1981), Malta (1994), Poland (2014), Portugal (1991), Romania (1993), Slovenia (1991), Spain (2010), (CABI datasheet).	
Host status on commodity species	*Vitis vinifera* is reported as a major host for GLRaV-1 in the EPPO Global Database (EPPO, online).	
PRA information/CRA information	–	
Other relevant information for the assessment		
Biology	GLRaV-1 is a filamentous virus that belongs to the family *Closteroviridae*, genus *Closterovirus*. It is a phloem-restricted virus, with flexuous filaments about 12 nm wide, exhibiting open structure and distinct cross banding (Karasev, 2000; Martelli et al., 1997). The genome is a monopartite single-stranded positive sense RNA molecule. GLRaV-1 has a genome ranging from 12,394 to 18,946 nt, containing 10 major ORFs, and has structural organization differing from that of other sequenced closteroviruses (Karasev, 2000; Donda et al., 2014; Fazeli and Rezaian, 2000). GLRaV-1 is considered as the second most widely distributed ampelovirus, after GLRaV-3, across grapevine-growing regions (Naidu 2017). Its natural major host is *Vitis vinifera*, and disseminated mainly via clonal propagation of plant material (Martelli, 1993; EPPO database). GLRaV-1 is readily transmitted by grafting and insect vectors (Martelli, 1993; Sforza et al., 2003; Tsai et al., 2010; Zorloni et al., 2004). Vectors include *Coccidae* and *Pseudococcidae* mealybug species, such as *Planococcus ficus, Pseudococcus longispinus, Heliococcus bohemicus* and *Phenacoccus aceris* (Sforza et al., 2003) and also soft scale insects, such as *Pulvinaria vitis, Neopulvinaria innumerabilis, Parthenolecanium corni*, among others (Martelli, 1993; 2000; Sforza et al., 2003; Tsai et al., 2010). This vector transmission is associated to a semi-persistent manner, i.e. acquisition and inoculation access periods in the range of 15–60 min and 30 min, respectively, retention of infectivity from 2 or 3 up to 8 days (Cabaleiro and Segura, 1997). Transmission by sap inoculation or seeds has not been documented.	
Symptoms	**Main type of symptoms**	Symptoms of GLRaV-1 infection typically emerge in summer and more pronounced in mature leaves at the base of shoots. Affected leaves become thicker than normal, brittle and show downwardly rolled margins. In white-berried cultivars, leaves turn yellow, while in red-berried cultivars, they develop red to deep purple discoloration with a characteristic narrow green band along the primary and secondary veins. Symptom severity varies depending on the grapevine cultivar and the specific virus or viral combinations present (Martelli, 1993; Walter and Zimmermann, 1991). Different strains of the same virus can vary in pathogenicity, leading to variation in symptom expressions. Also, the severity may depend on scion–rootstock combinations and co-infections with other viruses or viroids that may act synergistically.
	Presence of asymptomatic plants	GLRaV-1 infection is generally symptomatic, although at early stages might do not show symptoms.
	Confusion with other pests	The symptoms can vary significantly depending on the virus isolate, plant cultivar, rootstock, environmental conditions and season. Mixed infections with other GLRaVs are common and can exacerbate symptoms and impact.
Host plant range	The natural host of GLRaV-1 is *Vitis vinifera* and other *V. species* (EPPO database).	

(Continues)

(Continued)

Reported evidence of impact	GLRaV-1 is considered a common viral disease in grapevines. It is associated with downward curling of leaf margins or leaf rolling, discoloration and reduced vine vigour, which can impact grape quality and yield (Alabi et al. 2016). Yield losses can reach up to 40%, with quality parameters affected by ripening, suggesting important economic losses. The virus also affects the longevity of vineyard blocks and can reduce winter hardiness.
Evidence that the commodity is a pathway	Plants for planting of *Vitis* are considered the major pathway for GLRaV-1 entry and spread (Martelli 2017).
Surveillance information	GLRaV-1 is subject to official surveillance programmes under the ANSA. The phytosanitary control is carried out twice annually. According to the additional information provided, as well as CABI and EPPO database, GLRaV-1 is present in Moldova, but no further specifics on distribution or prevalence. According to a recent study on certified grapevine planting material from the Republic of Moldova, GLRaV-1 was found to be present, with infection rates ranging from 8% to 26% during 2019–2023 (Dubceac et al., 2023).

A.2.2 | Possibility of pest presence in the nursery

A.2.2.1 | Possibility of entry from the surrounding environment

The natural host range of GLRaV-1 is primarily restricted to Vitis sp. The virus is readily transmitted by grafting from naturally infected *V. vinifera* to plants of the same or other Vitis species (Martelli, 1993). GLRaV-1 appeared to be present in certified material from Moldova (2019–2023), with infection rates ranging from 8% to 26% (Dubceac et al., 2023). This may indicate a significant risk of entry through infected propagative material. GLRaV-1 can be transmitted by insect vectors, including soft scale and mealybug insects. Although transmission efficiency can be variable among vector species, viruliferous vectors can introduce viral infection from infected areas.

Based on the technical dossier information, GLRaV-1 is recognised as RNQP, and there is a set of standard official precautions from ANSA to ensure the detection and control of this virus in the commodity. Nurseries are located at least 1000 m from settlements and industrial vineyards, and 500 m from rivers, lakes and other water sources. Vine mother plantations are tested for the presence of the virus for the first time at the age of 6 years and thereafter at intervals of each 6 years, while those of the 'certified' category are sampled and tested for the first time at the age of 10 years and thereafter at intervals of 10 years. Additionally, plant health control of the mother graft/rootstock plantations is carried out annually by visual examination of plants for viral diseases.

Uncertainties:

- Limited information about the current presence of GLRaV-1 in Moldova.
- There is no data on the occurrence and distribution of the insect vectors in Moldova.
- The efficacy of pest control measures.

Taking into account this evidence and the uncertainties, the panel considers that **entry into the nursery from the surrounding environment infecting vine plants may be possible**.

A.2.2.2 | Possibility of entry with new plants/seeds

GLRaV-1 host range is restricted to *Vitis* spp., with no other natural host species. There is no conclusive evidence for seed or pollen transmission. The main possibility of entry is through infected grapevine planting material. Mother plants for scions are grown under official inspection, with sampling and testing for viruses first at 6 years of age, then every 6 years. GLRaV-1 infection typically shows visible symptoms, although it may show minimal foliar symptoms at early stages, potentially evading visual detection.

Uncertainties:

- The efficacy of the sampling procedure and reliability of detection from latent or asymptomatic infections.
- Variation in symptom expression in certain cultivars affecting visual inspections.

Considering this evidence and uncertainties, the panel concludes that **entry with new plants or seeds may be possible but unlikely**.

A.2.2.3 | Possibility of spread within the nursery

GLRaV-1 can spread by grafting procedures and clonal propagation of infected mother plants. There is no evidence of mechanical sap transmission through contaminated tools. Vitis propagating material is produced under the certification scheme in nurseries, and the plant materials are monitored and inspected during the vegetation period. Standard nursery

control practices include pest control measures, daily cleaning of grafting machines and hot water treatment of scions (50°C for 45 min). It is not known whether hot water treatment could have an effect on GLRaV-3.

Uncertainties:

- Unknown efficiency of hot-water treatment.

Taking this evidence and uncertainties into account, the panel considers that the **spread of GLRaV-1 within the nursery may be possible**.

A.2.3 | Information from interceptions

There are no records of GLRaV-1 from Moldova between 1998 and September 2025 (EUROPHYT, online; TRACES-NT, online).

A.2.4 | Evaluation of the risk mitigation options

In the table below, all risk mitigation measures currently applied in Moldova are listed and an indication of their effectiveness on GLRaV-1 is provided. The description of the risk mitigation measures currently applied in Moldova is provided in Table 4 (Section 5).

No	Risk mitigation measure	Effect on the pest	Evaluation and uncertainties
1	*Registration of production sites*	No	
2	*Certification of propagation material*	Yes	Propagation material comes from pre-basic and basic mother plants that were tested virus-free. Virus testing is every 6 years for mother plantations, and every 10 years for certified stock nurseries. Uncertainties: – Procedure of material sampling is unclear. – Time gaps between certification testing (6 years) may allow virus accumulation.
3	*Sanitation and inspection of field sites for virus-transmission nematodes*	No	
4	*Surveillance, monitoring and sampling*	Yes	All plants from mother plantations are sampled and tested for viruses, with an interval of 6 years. Additionally, visual inspections are carried out in mother plantations and commodity material twice yearly may help to control the virus infection. Uncertainties: - Visual surveillance can be insufficient for early infections. - GLRaV-1 infection can be asymptomatic, making visual detection unreliable.
5	*Application of phytosanitary products (pesticides)*	Yes	The application of chemical insecticides can have a moderate effectivity against the insect vectors (mealybugs and scale insects). Uncertainties: – The effectiveness of chemical control against insect life stages and seasonal timing.
6	*Forecasting of pest and diseases incidence*	Yes	Visual inspections may help to prevent viral spread. Uncertainties: – The detection of latent or symptomless infections by visual inspections is questionable.
7	*Dissemination of warning notices to farmers*	No	
8	*Sorting and storage*	No	
9	*Hot water treatment*	Yes	Scions are treated at 50°C for 45 min before grafting. Uncertainties: – Unknown efficiency against viral infection in general and GLRaV-1 in particular
10	*Isolation distances*	Yes	Nurseries located > 1000 m from settlements and industrial vineyards, and > 500 m from water sources. Uncertainties: – It is unclear if the distance is sufficient to prevent entry of the potential vectors.
11	*Cultural methods*	No	
12	*Physical methods*	Yes	Use of insect traps to catch insects. If infected plants are detected, they should be destroyed. Uncertainties: – The effectiveness of used traps for vectors is uncertain.
13	*Biological control methods*	No	

(Continues)

(Continued)

No	Risk mitigation measure	Effect on the pest	Evaluation and uncertainties
14	*Bio-derived methods*	No	

A.2.5 | Overall likelihood of pest freedom

A.2.5.1 | Reasoning for a scenario which would lead to a reasonably low number of infested consignments

- Host range of GLRaV-1 is restricted to *Vitis* spp.
- Insect vectors are the only efficient way to get within the nurseries, and their occurrence is unknown in the production areas.
- Visual inspections are under official regulation, and virus symptoms seem easy to detect in diseased plants.
- Mother plants are certified.

A.2.5.2 | Reasoning for a scenario which would lead to a reasonably high number of infested consignments

- GLRaV-1 was detected in a proportion of 39% in Moldova.
- Widespread of insect vectors.
- Visual inspection will not detect early stages of infections or asymptomatic infections.
- High numbers of plants in a bundle lead to increase the risk associated with virus presence in the bundle.

A.2.5.3 | Reasoning for a central scenario equally likely to over- or underestimate the number of infested consignments (median)

- The presence of the primary vectors is very unlikely with phytosanitary measures.
- Introduction of the virus from the surrounding areas or from propagation material within the nurseries is very unlikely.

A.2.5.4 | Reasoning for the precision of the judgement describing the remaining uncertainties (1st and 3rd quartile/interquartile range)

- Status of the virus in the surrounding areas is unknown.
- Effectiveness of current sampling and detection protocols for asymptomatic infections.

A.2.5.5 | Elicitation outcomes of the assessment of the pest freedom for grapevine leafroll-associated virus 1 (GLRaV-1)

The following tables show the elicited and fitted values for pest infestation/infection (Table A.3) and pest freedom (Table A.4).

TABLE A.3 Elicited and fitted values of the uncertainty distribution of pest infestation by GLRaV-1 per 10,000 plants.

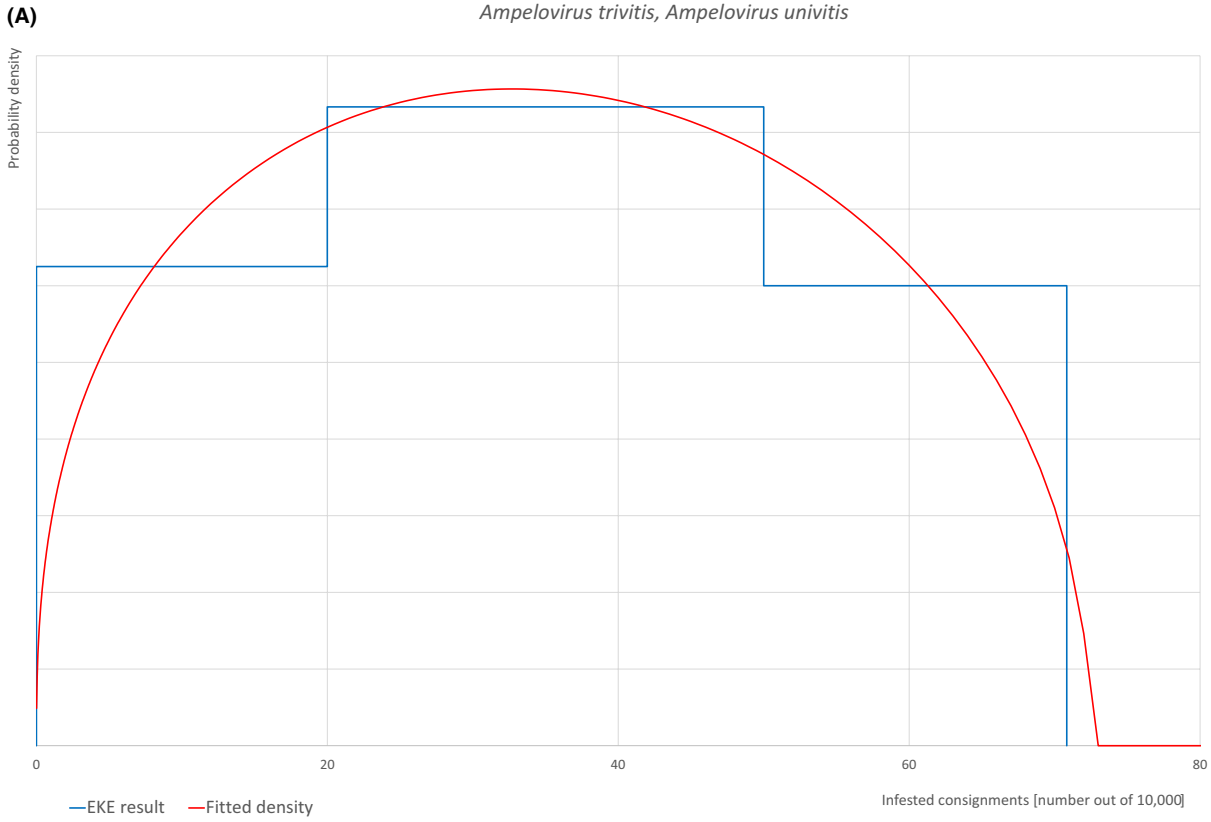
Percentile	1%	2.5%	5%	10%	17%	25%	33%	50%	67%	75%	83%	90%	95%	97.5%	99%
Elicited values	0					20		35		50					70
EKE	1.87	3.64	6.03	10.1	14.8	20.1	25.1	34.9	44.8	50.1	55.7	60.8	65.3	68.0	70.1

Note: The EKE results are BetaGeneral (1.3894, 1.4741, 0, 72.5) fitted with @Risk version 7.5.

Based on the numbers of estimated infested plants, the pest freedom was calculated (i.e. = 10,000 – the number of infested plants per 10,000). The fitted values of the uncertainty distribution of the pest freedom are shown in Table A.2.

TABLE A.4 The uncertainty distribution of plants free of GLRaV-1 per 10,000 plants calculated in Table A.3.

Percentile	1%	2.5%	5%	10%	17%	25%	33%	50%	67%	75%	83%	90%	95%	97.5%	99%
Values	9930					9950		9965		9980					10,000
EKE results	9929.9	9932	9935	9939	9944	9950	9955	9965	9975	9980	9985	9990	9994	9996	9998



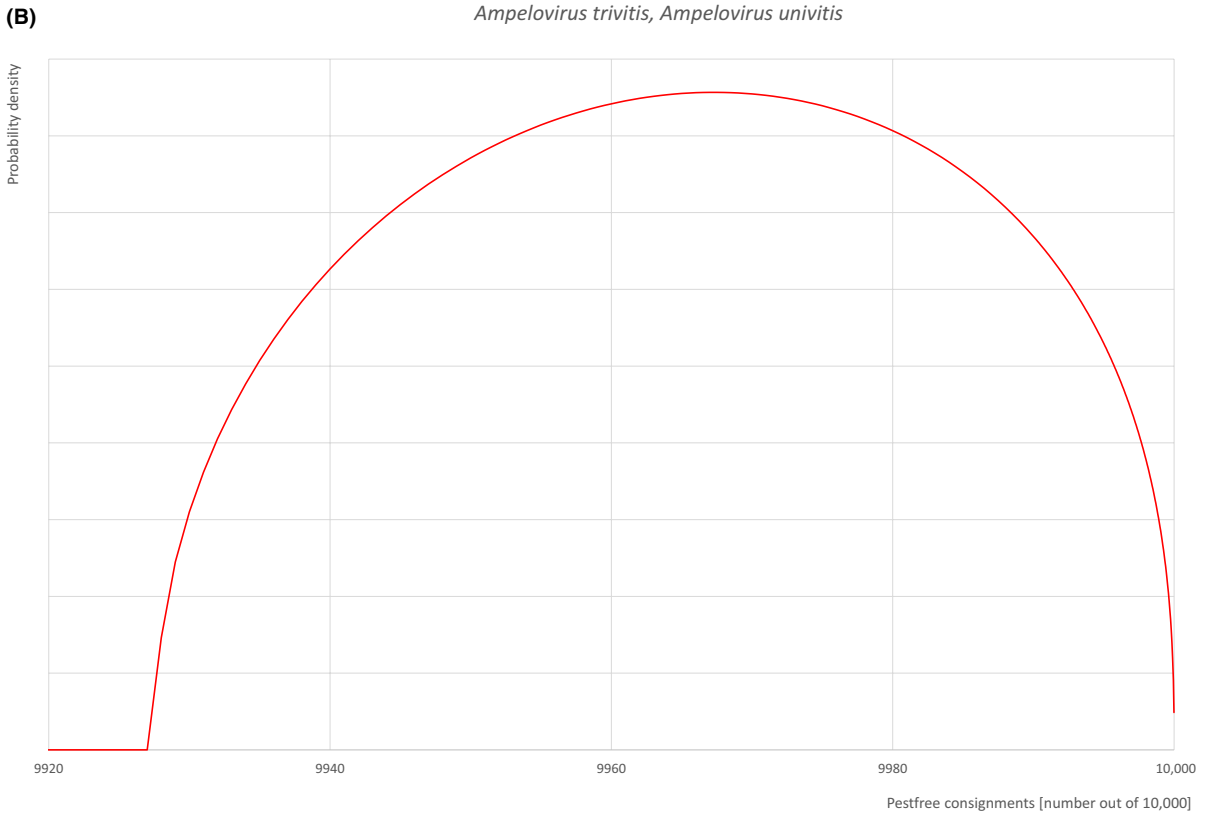


FIGURE A.2 (Continued)

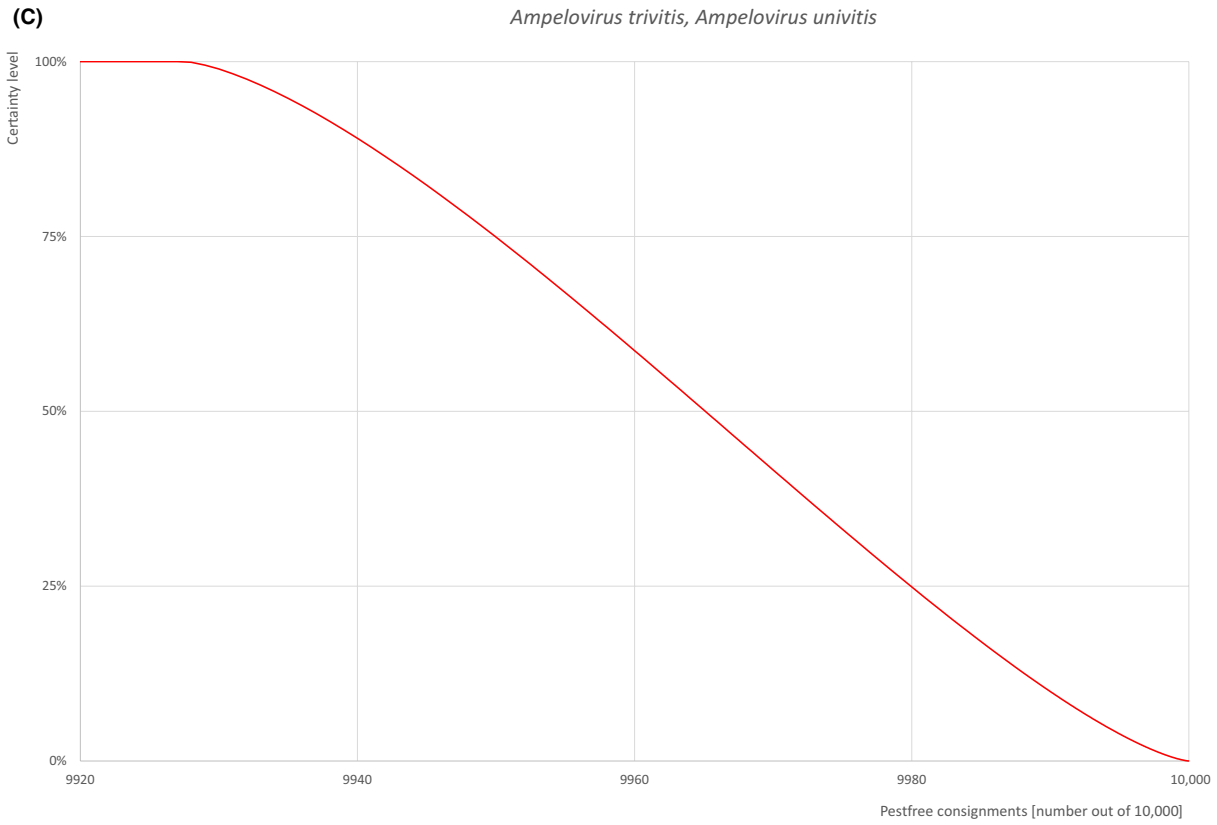


FIGURE A.2 (A) Elicited uncertainty of pest infestation per 10,000 plants (histogram in blue–vertical blue line indicates the elicited percentile in the following order: 1%, 25%, 50%, 75%, 99%) and distributional fit (red line); (B) uncertainty of the proportion of pest free plants per 10,000 (i.e. = 1 – pest infestation proportion expressed as percentage); (C) descending uncertainty distribution function of pest infestation per 10,000 plants.

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A.3 | '*CANDIDATUS* PHYTOPLASMA SOLANI'

A.3.1 | Organism information

Taxonomic information	Current valid scientific name: '*Candidatus* Phytoplasma solani' Synonyms: Grapevine bois noir phytoplasma, Maize redness phytoplasma, Phytoplasma solani, Potato stolbur phytoplasma, Stolbur phytoplasma Name used in the EU legislation: Candidatus Phytoplasma solani Name used in the Dossier: Candidatus Phytoplasma solani Order: Acholeplasmatales Family: Phytoplasma
Group	Bacteria
EPPO code	PHYPSO
Regulated status	EU status: PHYPSO is listed as a regulated non-quarantine pest (RNQP, Annex IV, Part C, concerning vine propagating material of Commission Implementing Regulation (EU) 2019/2072).
Pest status in applicant country	Present, no details (Bondarciuc et al., 2018; EPPO, online)
Pest status in the EU	Czechia, Poland, Romania: Present, no details Austria: Present, few occurrences Bulgaria, Croatia, France, Germany, Greece, Hungary, Slovakia, Slovenia, Spain: Present, restricted distribution Italy: Present, widespread
Host status on commodity species	*Vitis vinifera* is a major host (EPPO GD)
PRA information/CRA information	EFSA PHL Panel (2014) Scientific Opinion on the pest categorisation of *Candidatus* Phytoplasma solani. MPI (2022) Import Risk Analysis: Persea americana Plants for Planting. Version 1.0. June 2022. Ministry for Primary Industries, New Zealand.
Other relevant information for the assessment	
Biology	This phytoplasma is a phloem-restricted non-cultivable bacteria that infects a wide range of weeds and cultivated plants in Europe, such as solanaceous crops, grapevine, celery, maize, sugarbeet, strawberry and lavender. CPs is naturally transmitted by polyphagous planthoppers of the family Cixiidae, mainly *Hyalestes obsoletus* and *Reptalus panzeri* (Cvrkovic et al., 2014; Fos et al., 1992; Maixner, 1994). All infected crops, except lavender, are epidemiological dead-end hosts for the phytoplasma, as its planthopper vectors do not develop on these crops. The same situation applies to many weed hosts, but some, such as bindweed (*Convolvulus arvensis* and *Calystegia sepium*) and stinging nettles (*Urtica dioica*), act as plant reservoirs, hosting both the phytoplasma and its vector (Bressan et al., 2007; Langer & Maixner, 2004). '*Ca*. P. solani' can also be disseminated through multiplication of vegetatively propagated hosts such as potato, grapevine, strawberry and lavender. There is neither seed transmission in host plants, nor transovarial transfer of the phytoplasma from infected planthopper vectors to the progeny. In Europe, '*Ca*. P. solani' planthopper vectors are monovoltine. The phytoplasma is acquired by overwintering nymphs feeding on infected roots, and the transmitted to plants (and from plant to plant) by flying adults, in the summer.
Symptoms	**Main type of symptoms**: In Europe and in the Mediterranean basin, '*Ca*. Phytoplasma solani' strains are associated with bois noir disease of grapevine, with stolbur disease in wild and cultivated herbaceous and woody plants, and with yellowing, reddening, decline, dwarfism, leaf malformation and degeneration diseases of other plants. The symptoms of '*Ca*. Phytoplasma solani' infection are variable, depending on environmental factors. Grapevine. Leaf yellows (in white-berried cultivars) or leaf reddening (in red-berried cultivars), downwards leaf rolling, irregular ripening of wood, growth reduction and shrivelling and drying up of berries and bunches. Young plants can die following infection, while older plants tend to recover. The severity of the symptoms depends on cultivar sensitivity. **Presence of asymptomatic plants**: Symptoms on perennial hosts can appear 1 or more years after inoculation. **Confusion with other pests**: The symptoms caused by '*Ca*. Phytoplasma solani' cannot be distinguished from those caused by grapevine flavescence dorée.
Host plant range	*Achillea millefolium*, *Actinidia deliciosa*, *Allium ampeloprasum*, *Amaranthus retroflexus, Ammi majus, Anethum graveolens, Apium graveolens, Artemisia scoparia, Artemisia vulgaris, Bellis perennis, Beta vulgaris, Brassica oleracea* var. *gemmifera, Bromus inermis, Bupleurum tenuissimum, Calendula officinalis, Calystegia sepium, Capsella bursa-pastoris, Capsicum annuum, Carica papaya, Carum carvi, Centaurium erythraea, Cephalaria transsylvanica, Chenopodium album, Chrysanthemum indicum, Cichorium intybus, Cirsium arvense, Cistus ladanifer, Convolvulus arvensis, Convolvulus tricolor, Coronilla varia, Crepis foetida, Crepis* sp., *Cucumis sativus, Cuscuta* sp., *Cynodon dactylon, Datura stramonium, Daucus carota, Dianthus barbatus, Digitalis purpurea, Echinacea angustifolia, Echinacea purpurea, Echium vulgare, Epilobium* sp., *Erigeron annuus, Erigeron bonariensis,*

(Continued)

	Erigeron canadensis, Eucalyptus camaldulensis, Euonymus japonicus, Euphorbia falcata, Fallopia convolvulus, Ficus carica, Fragaria x *ananassa, Galium* sp., *Geranium dissectum, Gomphocarpus physocarpus, Helianthus annuus, Helminthotheca aculeata, Helminthotheca echioides, Hibiscus cannabinus, Hydrangea macrophylla, Hypericum barbatum, Hypericum perforatum, Hyssopus officinalis, Jasminum officinale, Laburnum anagyroides, Lactuca saligna, Lactuca sativa, Lactuca serriola, Lapsana communis, Lavandula angustifolia, Lavandula* x *intermedia, Levisticum officinale, Lilium longiflorum, Linaria vulgaris, Liquidambar styraciflua, Lupinus polyphyllus, Macroptilium lathyroides, Malus domestica, Malva sylvestris, Matricaria chamomilla, Medicago lupulina, Medicago sativa, Melilotus albus, Melissa officinalis, Mentha arvensis, Mercurialis annua, Monarda fistulosa, Myrtus communis, Narcissus tazetta, Nicotiana tabacum, Oenothera biennis, Olea europaea, Origanum vulgare, Oxalis* sp., *Paeonia tenuifolia, Paeonia* x *suffruticosa, Parietaria judaica, Parietaria officinalis, Pastinaca sativa, Persicaria maculosa, Petroselinum, Phaseolus vulgaris, Picris hieracioides, Pistacia vera, Pisum sativum, Plantago lanceolata, Plantago major, Polygonum aviculare, Portulaca oleracea, Potentilla reptans, Prunella vulgaris, Prunus armeniaca, Prunus avium, Prunus domestica, Prunus dulcis, Prunus mahaleb, Prunus mume, Prunus persica, Punica granatum, Pyrus communis, Raphanus sativus, Rhododendron* sp., *Rubia peregrina, Rubus fruticosus, Rumex acetosa, Salix alba, Salix babylonica, Salvia miltiorrhiza, Salvia rosmarinus, Salvia sclarea, Sambucus nigra, Saponaria officinalis, Senecio vulgaris, Setaria viridis, Silene latifolia subsp. alba, Silene noctiflora, Silene vulgaris, Solanum glaucophyllum, Solanum lycopersicum, Solanum melongena, Solanum nigrum, Solanum tuberosum, Sonchus oleraceus, Sonchus* sp., *Sophora alopecuroides, Sorghum halepense, Spartium junceum, Spinacia oleracea, Styphnolobium japonicum, Tagetes erecta, Taraxacum officinale, Thymus vulgaris, Trifolium medium, Trifolium pratense, Trifolium repens, Trigonella foenum-graecum, Triticum aestivum* subsp. *aestivum, Tussilago farfara, Ulmus glabra, Urtica dioica, Urtica urens, Vaccinium corymbosum, Valeriana officinalis, Veronica persica, Viola odorata, Vitex agnus-castus, Vitis vinifera, Zea mays*
Reported evidence of impact	The impact on *Vitis* production by '*Ca*. Phytoplasma solani' can be severe as it causes shrivelling and drying up of berries and bunches. Young plants can die following infection.
Evidence that the commodity is a pathway	'*Ca*. P. solani' is naturally dispersed over fairly long distances by its planthopper vectors. It can be transmitted by the parasitic plant dodder (*Cuscuta campestris*, *C. epilinum*, *C. trifolii*). In addition, the plant *Orobanche aegyptiaca*, which parasitizes roots of diseased tomato plants, has been shown to contain phytoplasmas, so it could be involved in transmission in the field. '*Ca*. P. solani' is not thought to be transmitted in the true seed of any of its hosts, but it can be transmitted by vegetative propagation of infected host plants. The phytoplasma has a complex ecology and epidemiological cycle, and a high capability to adapt to different agro-ecosystems. The risk of introduction of '*Ca*. P. solani' to new regions is related to the dispersal of its vectors and to trade in cultivated host plants (e.g. symptomless seedlings) (EPPO online)
Surveillance information	The phytosanitary control is carried out twice annually. According to the additional information provided, as well as CABI and EPPO databases '*Ca*. P. solani' is present in Moldova, but detailed distribution data within the country is not documented. It should be noted that the disease was common in all commercial vineyards according to Bondarciuc et al. (2018). In the same study, they surveyed for potential vectors of the disease using yellow sticky traps and confirmed the presence of previously identified vectors including *Scaphoideus titanus*, *Hyalesthes obsoletus*, *Orientus ishidae*, and other leafhoppers, such *as Philaenus spumarius* and *Euscelidius variegatus*. *S. titanus* (Bondarciuc, 2018; Timus, 2015).

A.3.2 | Possibility of pest presence in the nursery

A.3.2.1 | Possibility of entry from the surrounding environment

The pathogen is present in other crops in the country as well as in commercial vineyards. This, in combination with the presence of the vectors makes it likely that the pathogen could enter both the mother plantations and the grafted plant nurseries from the surrounding areas.

Uncertainties:

- Presence of infected plants in the surrounding
- Presence of vectors in the nurseries
- It is unknown if, and if so, how the surroundings are surveyed for the pathogen

Taking into account this evidence and the uncertainties, the panel considers that **entry into the nursery from the surrounding environment infecting vine plants may be possible**.

A.3.2.2 | Possibility of entry with new plants/seeds

The pathogen could enter via infected mother plants. Though this is unlikely since the material is of basic or certified categories and the plants are visually surveyed for symptoms.

Uncertainties:

- Latent infections could be overlooked even if it is basic or certified since only visual surveys are made for this disease

Taking into consideration the above evidence and uncertainties, the panel considers that it is unlikely that the pathogen will enter the nursery with new plants.

A.3.2.3 | Possibility of spread within the nursery

For the grafted plants, if the mother plants have been infected prior to harvest, the pathogen may spread at the grafting stage. At the same time, all plant parts are subjected to hot water treatment.

If infected plants are present within the nursery, insect vectors may spread the pathogen within the nursery. In particular, if the plants are left in the field over winter since the nymphs spread the pathogen when sucking on the roots during winter.

Uncertainties:

- No details were provided for insecticide treatments.
- Latent infections could be overlooked since only visual surveys are made for this disease.

Taking into consideration the above evidence and uncertainties, the panel considers that spread within the nursery is possible.

A.3.3 | Information from interceptions

There are no records of '*Ca*. Phytoplasma solani' from Moldova between 1998 and September 2025 (EUROPHYT, online; TRACES-NT, online).

A.3.4 | Evaluation of the risk mitigation options

In the table below, all risk mitigation measures currently applied in Moldova are listed and an indication of their effectiveness on Ca. Phytoplasma solani is provided. The description of the risk mitigation measures currently applied in Moldova is provided in Table 4 (Section 5).

No	Risk mitigation measure	Effect on the pest	Evaluation and uncertainties
1	*Registration of production sites*	No	
2	*Certification of propagation material*	Yes	According to the dossier, material from basic mother plants that is inspected to be free from phytoplasmas. Uncertainties: – Latent, asymptomatic infections could be overlooked – Uncertain if PCR targets specifically Ca. P. solani – Uncertain sampling procedure
3	*Sanitation and inspection of field sites for virus-transmission nematodes*	Yes	Visual field inspection could detect disease symptoms of grapevine bois noir phytoplasma. Parasitic weeds (dodder) may spread the pathogen. Weeds are not tested for presence of phytoplasma. After harvesting, the rootstock strings and scions are prepared for grafting and sorted. After grafting and growing in the field, the grafted vines are sorted and classified. Infested plants are discarded. Uncertainties: – Latent, asymptomatic infections could be overlooked. – Uncertain if weeds are tested
4	*Surveillance, monitoring and sampling*	Yes	Mother plantations and nurseries are visually inspected for symptoms of infections by phytoplasmas during the grape ripening phase (September–October); Uncertainties: – Latent, asymptomatic infections could be overlooked. – PCR and sampling?
5	*Application of phytosanitary products (pesticides)*	Yes	Insecticides are applied based on forecasts and warnings, avoiding routine treatments. Uncertainties: – The effectiveness of insecticide treatments on potential vectors for the pathogen is unknown
6	*Forecasting of pest and diseases incidence*	Yes	The samples are taken to verify the phytosanitary status and to confirm the absence of RNQPs. Visual inspections may be effective to prevent pathogen spread. Uncertainty: – The effectiveness of visual inspections and sampling to detect latent and early infections is questionable

(Continued)

No	Risk mitigation measure	Effect on the pest	Evaluation and uncertainties
7	*Dissemination of warning notices to farmers*	No	
8	*Sorting and storage*	No	
9	*Hot water treatment*	Yes	Rootstock cuttings and scions are treated at 50°C for 45 minutes before grafting. This treatment is documented to be effective against phytoplasmas. Uncertainties: – Uncertain if efficient at all levels of infection.
10	*Isolation distances*	Yes	Nurseries located > 1000 m from settlements and industrial vineyards and from residential areas and 500 metres from rivers, lakes and other water sources. For scion and rootstock mother plantations, a minimum 10 m from neighbouring vineyards. Uncertainties: – It is uncertain if the distance is sufficient to prevent entry of the potential vectors from the surrounding. – Uncertainty of other host plants in surrounding area.
11	*Cultural methods*	Yes	Good growing practices should be applied. Daily cleaning of grafting machines and standardised cleaning protocols. Uncertainties: – The presence of weeds and other plants that may host the pathogens are present within the nursery. – Effectiveness of cleaning protocols and cross-contamination through shared equipment
12	*Physical methods*	Yes	Use of insect traps to catch insects. If infected plants are detected, they should be destroyed. Uncertainties: – The effectiveness of used traps for vectors is uncertain.
13	*Biological control methods*	No	
14	*Bio-derived methods*	No	

A.3.5 | Overall likelihood of pest freedom

A.3.5.1. | Reasoning for a scenario which would lead to a reasonably low number of infested consignments

– Registration and certification of propagation material ensure phytoplasma-free production.
– Hot water treatment, as done in the nurseries, is considered as an effective treatment.
– Poor lignification is a symptom of PHYPSO which would prevent any grafting for symptomatic plant material.
– Plant material is carefully examined during and after the grafting process.

A.3.5.2 | Reasoning for a scenario which would lead to a reasonably high number of infested consignments

Visual inspection will not detect early stages of infections or asymptomatic infections.

High percentage of infected vines in some reports for commercial vineyards suggests that both the vector and pathogen are widespread (Bondarciuc et al., 2018).

Large host range, including many weeds, as a source of inoculum could be present in and around the nurseries.

A.3.5.3 | Reasoning for a central scenario equally likely to over- or underestimate the number of infested consignments (Median)

– High percentage of infected vines in commercial vineyards,
– As an RNQP, appropriate control measures and inspections are expected to be in place.

A.3.5.4 | Reasoning for the precision of the judgement describing the remaining uncertainties (1st and 3rd quartile/interquartile range)

– Status of the phytoplasma in the surrounding areas is unknown.
– Effectiveness of current sampling and detection protocols for asymptomatic infections.

A.3.5.5 | Elicitation outcomes of the assessment of the pest freedom for '*Candidatus* phytoplasma solani'

The following tables show the elicited and fitted values for pest infestation/infection (Table A.5) and pest freedom (Table A.6).

TABLE A.5 Elicited and fitted values of the uncertainty distribution of pest infestation by '*Candidatus* phytoplasma solani per 10,000 plants.

Percentile	1%	2.5%	5%	10%	17%	25%	33%	50%	67%	75%	83%	90%	95%	97.5%	99%
Elicited values	1					20		40		60					100
EKE	1.46	3.04	5.32	9.41	14.5	20.5	26.5	39.0	52.9	60.9	70.1	79.2	88.3	94.6	100

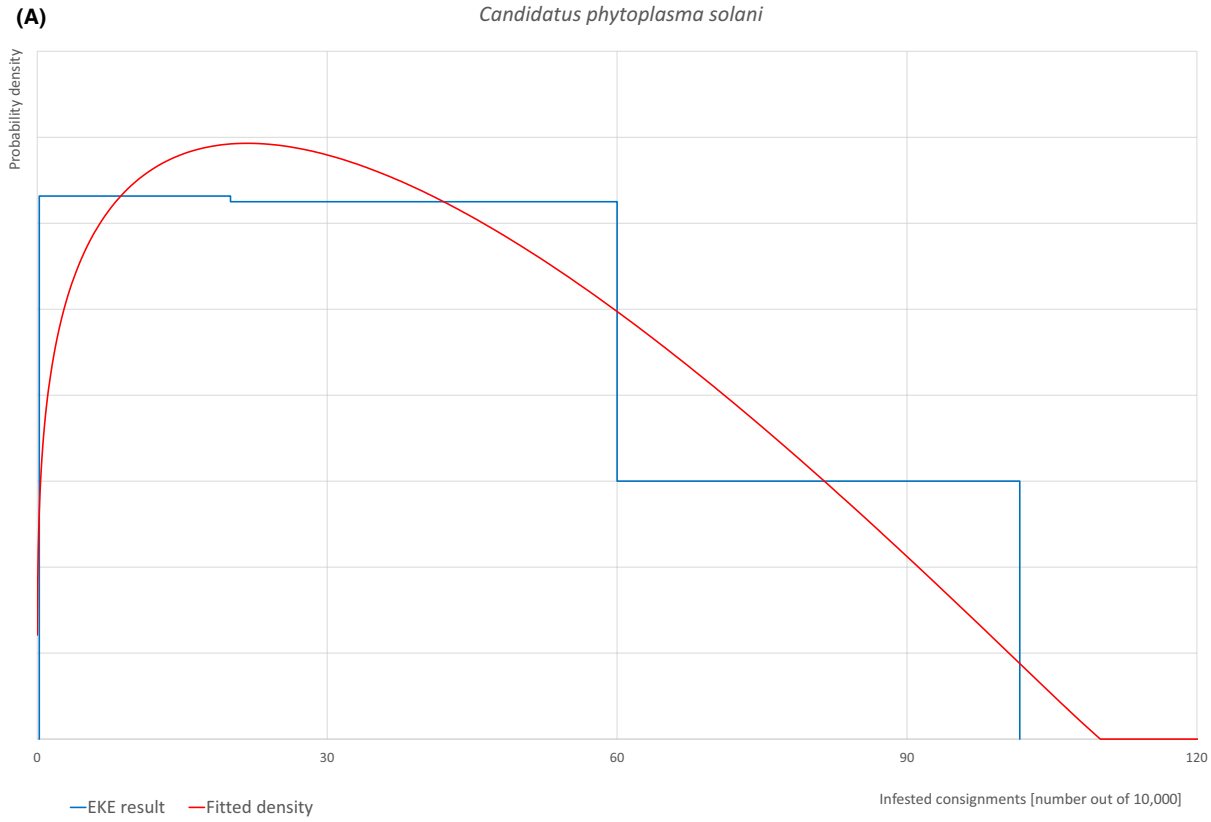
Note: The EKE results are BetaGeneral (1.2569, 2.0427, 0, 110) fitted with @Risk version 7.5.

Based on the numbers of estimated infested plants, the pest freedom was calculated (i.e. = 10,000 – the number of infested plants per 10,000). The fitted values of the uncertainty distribution of the pest freedom are shown in Table A.6.

TABLE A.6 The uncertainty distribution of plants free of '*Candidatus* phytoplasma solani' per 10,000 plants calculated in Table A.1.

Percentile	1%	2.5%	5%	10%	17%	25%	33%	50%	67%	75%	83%	90%	95%	97.5%	99%
Values	9900					9940		9960		9980					9999
EKE results	9900	9905	9912	9921	9930	9939	9947	9961	9973	9979	9986	9991	9995	9997	9999

Note: The EKE results are the fitted values.



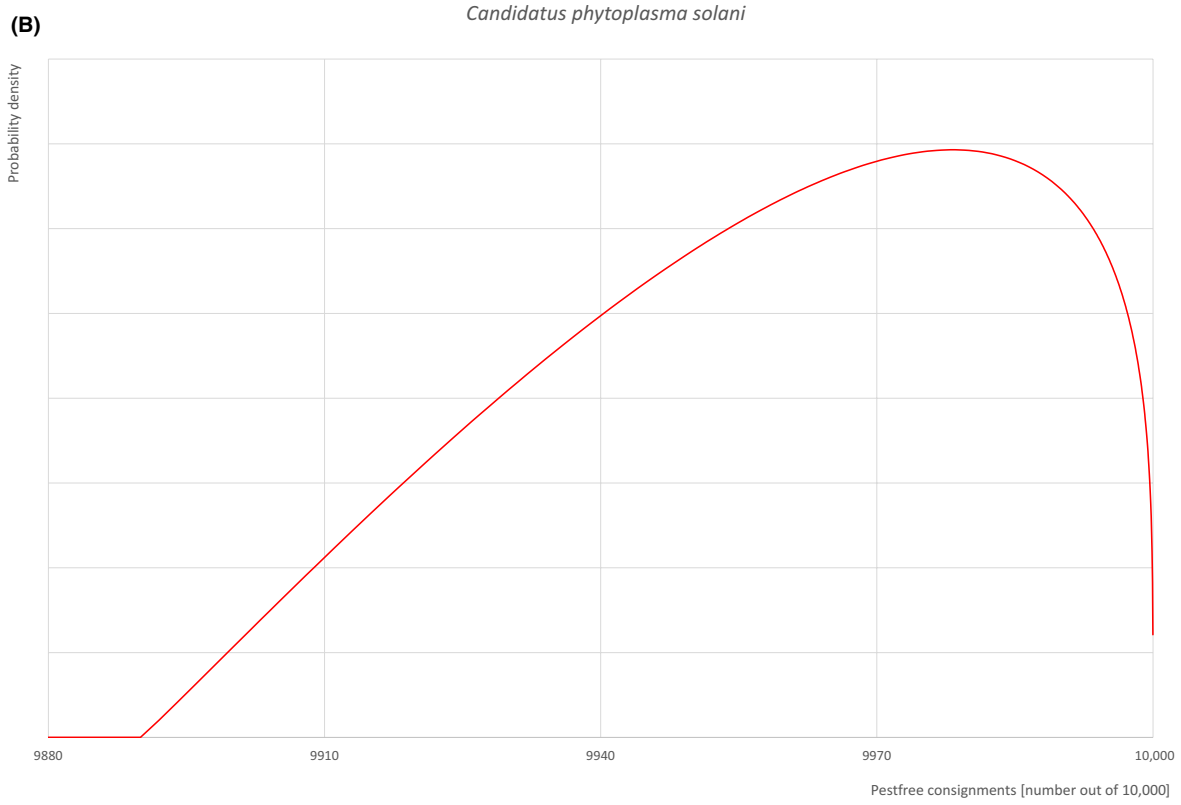


FIGURE A.3 (Continued)

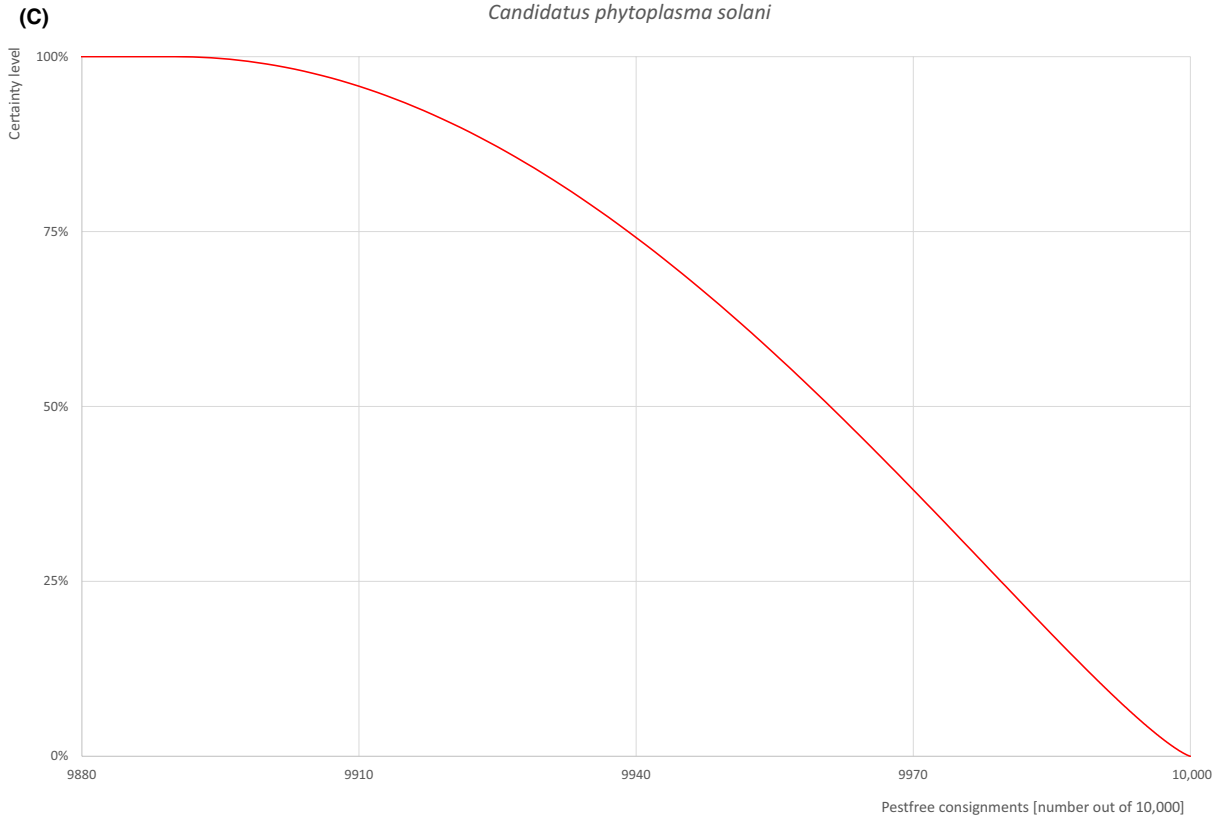


FIGURE A.3 (A) Elicited uncertainty of pest infestation per 10,000 plants (histogram in blue–vertical blue line indicates the elicited percentile in the following order: 1%, 25%, 50%, 75%, 99%) and distributional fit (red line); (B) uncertainty of the proportion of pest free plants per 10,000 (i.e. = 1 – pest infestation proportion expressed as percentage); (c) descending uncertainty distribution function of pest infestation per 10,000 plants.

A.3.6 | Reference list

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A.4 | GRAPEVINE FLECK VIRUS (GFKV)

A.4.1 | Organism information

Taxonomic information	Current valid scientific name: *Maculavirus vitis* Synonyms/Common name: Grapevine fleck virus, Grapevine fleck maculavirus, GFkV Name used in the EU legislation: *Grapevine fleck virus* [GFKV00] Category: Virus Order: *Tymovirales* Family: *Tymoviridae* Name used in the Dossier: Grapevine fleck virus (GFKV)	
Group	Viruses and Viroids	
EPPO code	GFKV00	
Regulated status	GFkV is listed as a regulated non-quarantine pest (RNQP, Annex IV, Part C, concerning vine propagating material of Commission Implementing Regulation (EU) 2019/2072). RNQP: Switzerland (2019), United Kingdom (2020). Quarantine pest: Canada (2019), United States of America (1989). A1 list: Egypt (2018). A2 list: Jordan (2013). (EPPO, online_a).	
Pest status in applicant country	Present, no details (CABI datasheet).	
Pest status in the EU	GFkV is a globally distributed virus. It is present in several EU countries: Croatia (2022); Czech Republic (2016); France (2022); Hungary (2003); Italy (2018); Italy/Sardegna (2018); Poland (2014); Romania (2021);; Spain (2017) (CABI, online).	
Host status on commodity species	*Vitis* spp. is reported as a major host for GFKV in the EPPO Global Database (EPPO, online).	
PRA information/CRA information		
Other relevant information for the assessment		
Biology	Grapevine fleck virus (GFkV) is a globally distributed phloem-limited maculavirus, with isometric particles approximately 30 nm in diameter. It has a positive-sense, single-stranded RNA genome of about 7500 nucleotides (Martelli 1997). GFkV is spreading primarily through vegetative propagation methods such as grafting and vegetative propagation, with no known biological vectors and no evidence of seed, pollen or mechanically contact transmission (Cory and Hewitt, 1968; Digiaro et al., 2017; Martelli 1993). Its natural host range is restricted to the genus *Vitis*, where it remains latent and asymptomatic in *Vitis vinifera*, but induces specific foliar symptoms, such as vein clearing and mosaic patterns, in *Vitis rupestris* and certain hybrids (Boscia et al., 1991, 1995; Digiaro et al., 2017; Hewitt et al., 1972).	
Symptoms	**Main type of symptoms**	GFkV infections in *Vitis vinifera* are typically latent, with most commercial grapevine cultivars showing no visible symptoms. However, *Vitis rupestris* and certain hybrids are sensitive species. It causes vein clearing in young leaves (Boscia et al., 1991, 1995; Digiaro et al., 2017). Affected leaves can become distorted and exhibit upward curling, with symptoms most apparent in spring and often disappearing during hot weather. Although, it is asymptomatic in *V. vinifera*, it can contribute to graft incompatibility and reduced vigour, particularly in rootstocks or when present in mixed infections with other grapevine viruses (Digiaro et al., 2017; Martelli, 2017).
	Presence of asymptomatic plants	GFkV infections are typically latent in *Vitis vinifera* (Fuchs et al., 2025)
	Confusion with other pests	Mixed infections with other grapevine viruses can exacerbate symptoms and impact.
Host plant range	The host range of GFkV is limited *Vitis* spp. (EPPO database).	
Reported evidence of impact	It is commonly found in grapevines, with limited impact on health and productivity. According to the recent report (Fuchs et al., 2025), GFkV infections are often latent and do not typically cause significant symptoms or damage. For instance, data indicate that the impact of GFkV on vine vigour, yield and fruit quality is negligible in most cases, and consequently, it is considered to have minimal effects on grapevine cultivation. Thus, it has been considered to argue that GFkV should not be regulated (EPPO, 2025; Fuchs et al., 2025).	
Evidence that the commodity is a pathway	Plants for planting of *Vitis* spp. are considered the major pathway for GFKV entry and spread (Martelli 2017; EPPO database).	
Surveillance information	GFkV is subject to official surveillance programmes under the ANSA. The phytosanitary control is carried out twice annually. According to the additional information provided, as well as CABI and EPPO database, GFLV is present in Moldova. According to a recent study on certified grapevine planting material from the Republic of Moldova during 2019–2023, GFkV was found with infection rates ranging from 15% to 65% (Dubceac et al., 2023).	

A.4.2 | Possibility of pest presence in the nursery

A.4.2.1 | Possibility of entry from the surrounding environment

The natural host range of GFkV is limited to *Vitis* sp., and it has not been found naturally in any wild or cultivated plant species other than Vitis. GFkV appeared to be present in certified material from Moldova (2019–2023), with infection rates ranging from 15% to 65% (Dubceac et al., 2023). GFkV has no known biological vectors, and mechanical transmission has not been documented. Short- and long-dispersal is mainly attributed to infected material through grafting and vegetative propagation. GFkV is generally asymptomatic in commercial grapevine cultivars. It is often found in mixed infections.

Based on the technical dossier information, GFkV is recognised as RNQP, and there is a set of standard official precautions from ANSA to ensure the detection and control of this virus in the commodity. In certified nurseries, propagation material is produced under official inspection, with regular testing to detect viral presence in mother plants.

Uncertainties:

- The efficacy of the sampling procedure and reliability of detection from latent or asymptomatic infections.

Taking into account this evidence and the uncertainties, the panel considers that **entry into the nursery from the surrounding environment infecting vine plants may be possible**.

A.4.2.2 | Possibility of entry with new plants/seeds

GFLV host range is restricted to Vitis spp. There is no evidence of seed or pollen transmission. GFkV infection is asymptomatic in *Vitis vinifera* and can cause clear symptoms in *Vitis rupestris* and its hybrids, which are used as rootstocks. Mother plants for scions are grown under official inspection, with sampling and testing for viruses first at 6 years of age, then every 6 years (basic) or every 10 years (certified).

Uncertainties:

- The efficacy of the sampling procedure and reliability of detection from latent or asymptomatic infections.

Considering this evidence and uncertainties, the panel concludes that **entry with new plants or seeds is likely to be possible**.

A.4.2.3. | Possibility of spread within the nursery

GFkV can remain latent and asymptomatic, making visual inspections very difficult. Transmission occurs mainly through grafting or vegetative propagation from infected mother plants. Mechanical spread (via tools) has not been documented. Nevertheless, *Vitis* propagating material is produced under the certification scheme in nurseries, and the plant materials are monitored and inspected during the vegetation period. It is not known whether hot water treatment could have an effect on GLRaV-3.

Uncertainties:

- Unknown efficiency of hot water treatment.

Taking this evidence and uncertainties into account, the panel considers that the **spread of GFkV within the nursery may be possible**.

A.4.3 | Information from interceptions

There are no records of GFkV from Moldova between 1998 and September 2025 (EUROPHYT, online; TRACES-NT, online).

A.4.4 | Evaluation of the risk mitigation options

In the table below, all risk mitigation measures currently applied in Moldova are listed and an indication of their effectiveness on GFkV is provided. The description of the risk mitigation measures currently applied in Moldova is provided in Table 4 (Section 5).

No	Risk mitigation measure	Effect on the pest	Evaluation and uncertainties
1	*Registration of production sites*	No	
2	*Certification of propagation material*	Yes	Propagation material comes from pre-basic and basic mother plants that were tested virus-free. Virus testing is every 6 years for mother plantations, and every 10 years for certified stock nurseries. Uncertainties: – Procedure of material sampling is unclear. – Time gaps between certification testing (6 years) may allow virus accumulation.
3	*Sanitation and inspection of field sites for virus-transmission nematodes*	No	
4	*Surveillance, monitoring and sampling*	Yes	Visual inspections twice yearly may help to control the virus infection. Uncertainties: – Visual surveillance insufficient for latent infections. – Symptom expression varies with rootstock and hybrids, and virus strain.
5	*Application of phytosanitary products (pesticides)*	No	–
6	*Forecasting of pest and diseases incidence*	Yes	Visual inspections may help to prevent viral spread. Uncertainties: – The detection of latent or symptomless infections by visual inspections is questionable.
7	*Dissemination of warning notices to farmers*	No	
8	*Sorting and storage*	No	
9	*Hot water treatment*	Yes	Scions are treated at 50°C for 45 minutes before grafting. Uncertainties: Unknown efficiency of hot water treatment against viral infection in general and GFkV in particular.
10	*Isolation distances*	No	
11	*Cultural methods*	No	
12	*Physical methods*	No	
13	*Biological control methods*	No	
14	*Bio-derived methods*	No	

A.4.5 | Overall likelihood of pest freedom

A.4.5.1 | Reasoning for a scenario which would lead to a reasonably low number of infested consignments

– Host range of GFkV is restricted to *Vitis* and no other alternative hosts.
– Registration and certification of propagation material ensure virus-free production.
– Absence of vectors and no documented mechanical transmission or by seeds or pollen.

A.4.5.2 | Reasoning for a scenario which would lead to a reasonably high number of infested consignments

– Latent and asymptomatic infections may escape from visual inspections.

A.4.5.3 | Reasoning for a central scenario equally likely to over- or underestimate the number of infested consignments (median)

– GFkV is widespread in grapevines.
– Latent infections require molecular methods for detection.

A.4.5.4 | Reasoning for the precision of the judgement describing the remaining uncertainties (1st and 3rd quartile/interquartile range)

– Transmission by unknown vectors;
– Status of the virus in the surrounding areas is unknown;
– Effectiveness of current sampling and detection protocols for latent infections.

A.4.5.5 | Elicitation outcomes of the assessment of the pest freedom for grapevine fleck virus (GFkV)

The following tables show the elicited and fitted values for pest infestation/infection (Table A.7) and pest freedom (Table A.8).

Based on the numbers of estimated infested plants, the pest freedom was calculated (i.e. = 10,000 – the number of infested plants per 10,000). The fitted values of the uncertainty distribution of the pest freedom are shown in Table A.8.

TABLE A.7 Elicited and fitted values of the uncertainty distribution of pest infestation by GFkV per 10,000 plants.

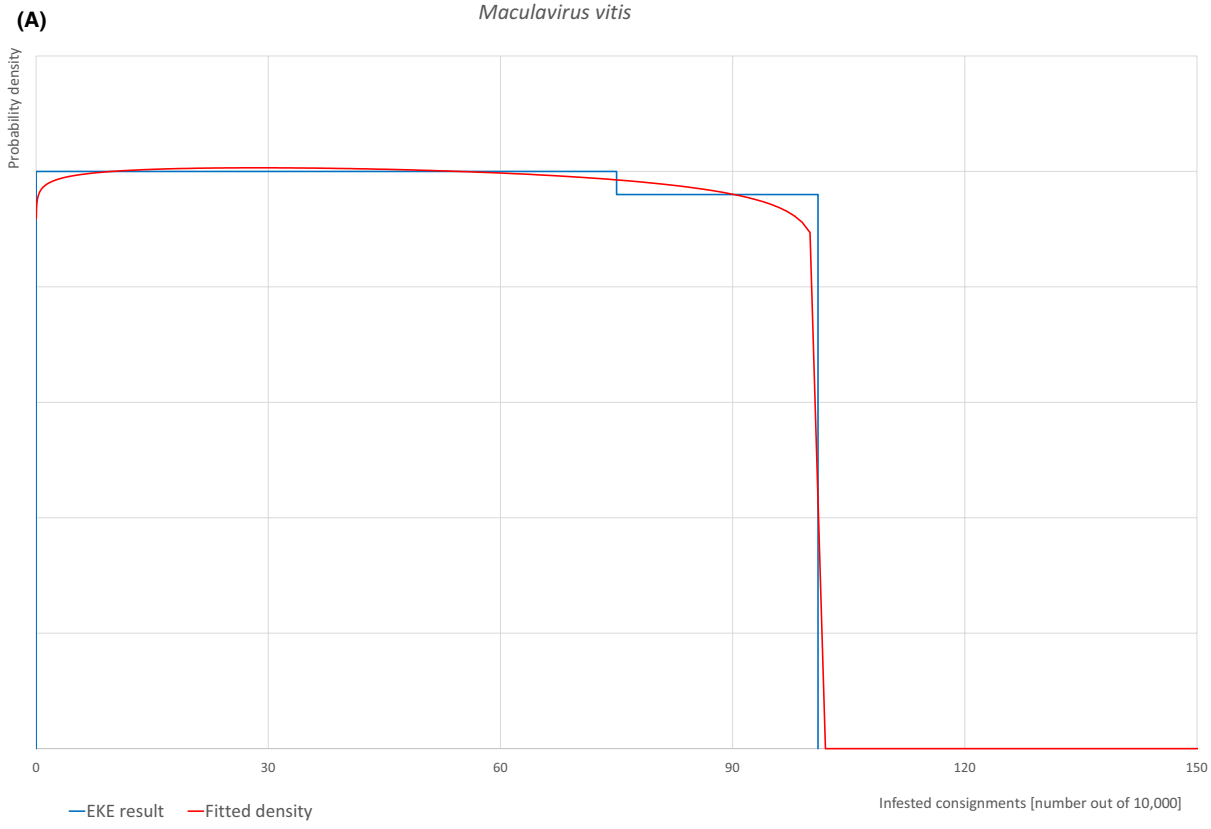
Percentile	1%	2.5%	5%	10%	17%	25%	33%	50%	67%	75%	83%	90%	95%	97.5%	99%
Elicited values	1					25		50		75					100
EKE	1.04	2.57	5.09	10.1	16.8	25.0	33.3	49.9	66.7	75.0	83.5	90.4	95.7	98.4	100

Note: The EKE results are *BetaGeneral (1.0129, 1.0328, 0, 101.2)* fitted with @Risk version 7.5.

TABLE A.8 The uncertainty distribution of plants free of GFkV per 10,000 plants calculated in Table A.1.

Percentile	1%	2.5%	5%	10%	17%	25%	33%	50%	67%	75%	83%	90%	95%	97.5%	99%
Values	9900					9925		9950		9975					9999
EKE results	9900	9902	9904	9910	9916	9925	9933	9950	9967	9975	9983	9990	9995	9997	9999

Note: The EKE results are the fitted values.



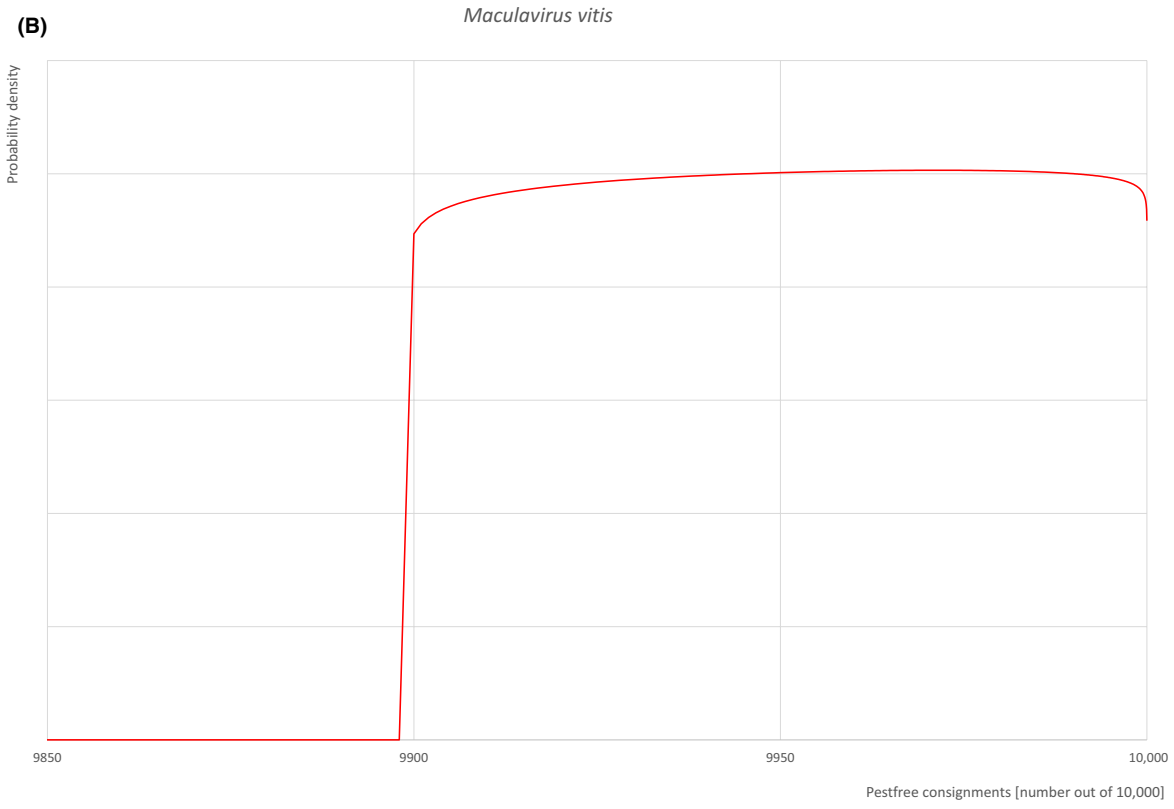


FIGURE A.4 (Continued)

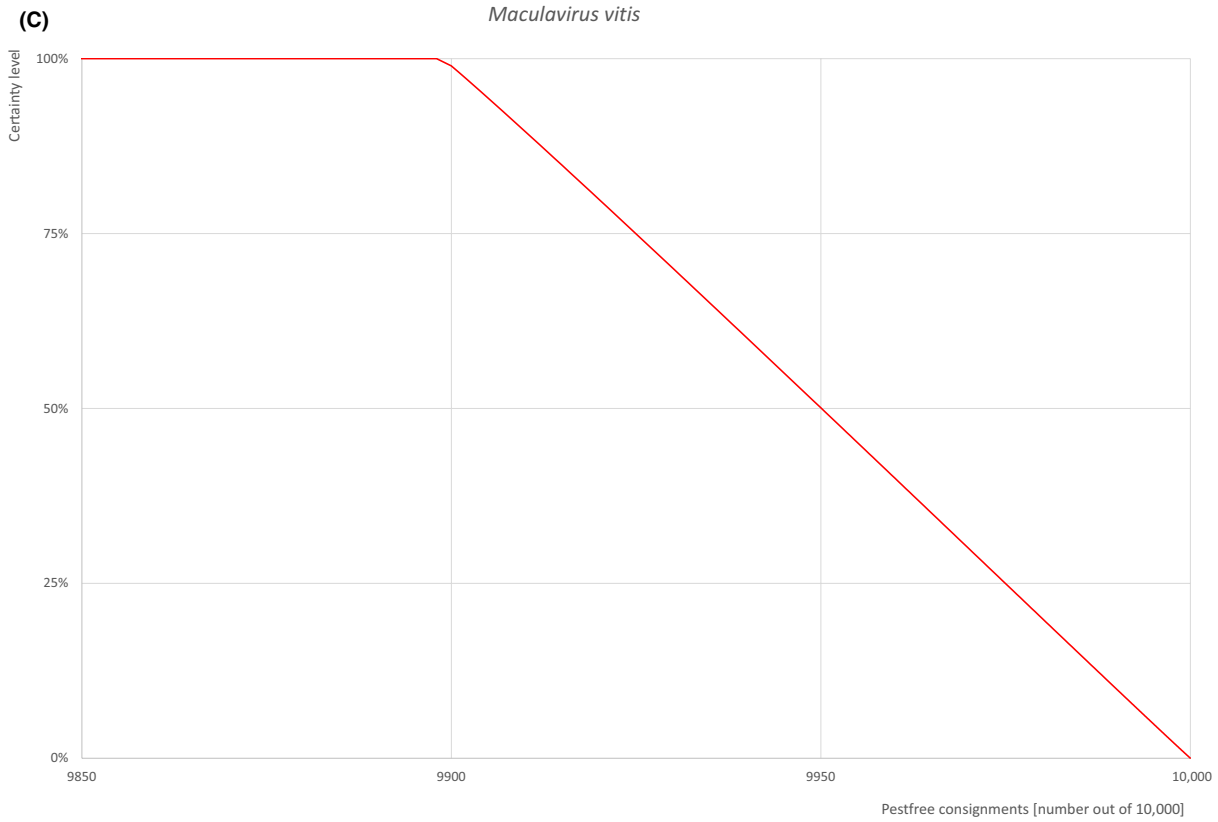


FIGURE A.4 (A) Elicited uncertainty of pest infestation per 10,000 plants (histogram in blue–vertical blue line indicates the elicited percentile in the following order: 1%, 25%, 50%, 75%, 99%) and distributional fit (red line); (B) uncertainty of the proportion of pest-free plants per 10,000 (i.e. = 1 – pest infestation proportion expressed as percentage); (C) descending uncertainty distribution function of pest infestation per 10,000 plants.

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A.5 | ARABIS MOSAIC VIRUS (ARMV)

A.5.1 | Organism information

Taxonomic information	Current valid scientific name: *Nepovirus arabis* Synonyms/Common name: arabis mosaic virus, ArMV Order: *Picornavirales* Family: *Secoviridae* Name used in the dossier: Arabis mosaic virus (ARMV)	
Group	Virus and Viroids	
EPPO code	ARMV00	
Regulated status	ARMV is listed as a regulated non-quarantine pest (RNQP, Annex IV, Part C, concerning vine propagating material of Commission Implementing Regulation (EU) 2019/2072). RNQP: Switzerland (2019), United Kingdom (2020). Quarantine pest: United States of America (1989), China (2021), Israel (2009). A1 list: Brazil (2018), Bahrain (2003). A2 list: Egypt (2018), Jordan (2013), Serbia (2015), Türkiye (2016). (EPPO, online_a).	
Pest status in applicant country	Present, no details (EPPO, online_b). AMRV has been detected in Moldova, but no further specifics on distribution or prevalence.	
Pest status in the EU	Present, no details: Austria (2014); Belgium (2007); Bulgaria (1995); Croatia (2012); Czech Republic (2007); Denmark (1993); Finland (2011); France (2000); Germany (2009); Hungary (2009); Ireland (1997); Italy (2007); Latvia (1990); Lithuania (2006); Luxembourg (1996); Netherlands (2015); Poland (2012); Romania (2011); Slovenia (1996); Spain (2011); Sweden (1993) (EPPO, online_b).	
Host status on commodity species	*Vitis* sp. is reported as a host for ARMV in the EPPO Global Database (EPPO, online_c).	
PRA information/CRA information	Scientific opinion on the risk to plant health posed by Arabis mosaic virus, Raspberry ringspot virus, Strawberry latent ringspot virus and Tomato black ring virus to the EU territory with the identification and evaluation of risk reduction options (EFSA PLH Panel, 2013).	
Other relevant information for the assessment		
Biology	Arabis mosaic virus (ArMV) is a nepovirus belonging to the family Secoviridae with a bipartite, single-stranded positive-sense RNA genome. The virus has two genomic RNAs (RNA1 and RNA2) that are translated into polyproteins and subsequently cleaved into functional proteins (Mayo and Robinson, 1996). The primary vector of ArMV is the dagger nematode *Xiphinema diversicaudatum*. This ectoparasitic nematode feeds on plant roots and can transmit the virus both as juveniles and adults for months to years. The nematode transmission is highly specific, with *X. diversicaudatum* being the main vector for ArMV (Brown et al., 1996; Murant, 1983; Valdez et al., 1974). It can also be transmitted via the seed of at least 15 species across 12 plant families, although most infected seedlings show no obvious symptoms (Lister and Murant, 1967; Murrant, 1983).	
Symptoms	**Main type of symptoms**	In grapevine, ArMV is associated with fanleaf disease, causing important yield and quality reductions. Plants show a leaf deformation, yellowing, chlorotic mottling, mosaics, vein clearing and shortening of internodes. ArMV symptoms may depend on the cultivar and virus strain (Murrant and Lister, 1987). Different strains of the same virus can vary in pathogenicity, leading to variation in symptom expressions. Also, the severity may depend on scion–rootstock combinations and co-infections with other viruses or viroids that may act synergistically. Mixed virus infections occur frequently between Grapevine fan leaf virus (GFLV) and ArMV (Wetzel et al., 2001). Although, they are transmitted by two different vector nematodes: *Xiphinema index* for GFLV and X. *diversicaudatum* for ArMV, generally, the symptoms observed in the presence of one or the other of these viruses are similar.
	Presence of asymptomatic plants	In some cases, infections may be asymptomatic or no obvious foliar symptoms are shown (Jones et al., 1980).
	Confusion with other pests	The symptoms can vary significantly depending on the virus isolate, plant cultivar, rootstock, environmental conditions and season (Murrant and Lister, 1987). Mixed infections with other nepoviruses can exacerbate symptoms and impact.
Host plant range	ArMV has an extremely broad host range, infecting multiple plant families. Experimentally, it can infect 93 dicotyledonous species across 28 families. As natural major hosts include strawberry, raspberry, *Prunus* spp., *Vitis* and other crops: bean, celery, cucumber, horseradish, lettuce, rhubarb, sugar beet, hop, olive, white clover and several ornamentals and wild plants (EFSA PLH Panel, 2013).	
Reported evidence of impact	The virus is widely distributed globally, with confirmed presence in Europe (Austria, Belgium, Denmark, France, Germany, Hungary, Ireland, Italy, Netherlands, Poland, Czech Republic, Slovakia, Slovenia, Spain, Sweden, United Kingdom), Asia (China, India, Iran, Israel, Japan, Kazakhstan, Lebanon, Syria, Türkiye), North America (Canada, USA), South America (Chile), Africa (South Africa) and Oceania (Australia, New Zealand). ArMV poses a significant risk to raspberry and strawberry cultivation due to its ability to infect multiple hosts, persist within plants and often remain latent (EFSA PLH Panel, 2013). Vitis is one of the host plants, although specific details about symptoms expression or impact in grapevines are limited (EFSA PLH Panel, 2013).	

(Continues)

(Continued)

Evidence that the commodity is a pathway	Plants for planting of *Fragaria, Rubus, Ribes* and *Vitis* are considered the major pathway for ArMV entry and spread. Thus, plants for planting of grapevines coming from a country where ArMV occurs can be the main pathway of entry (EFSA PLH Panel, 2013).
Surveillance information	ArMV is subject to official surveillance programmes under the ANSA. The phytosanitary control is carried out twice annually. According to the additional information provided, as well as CABI and EPPO database, ArMV is present in Moldova, but detailed distribution data within the country are not documented.

A.5.2 | Possibility of pest presence in the nursery

A.5.2.1 | Possibility of entry from the surrounding environment

The natural host range of ArMV is wide, including strawberry, raspberry, bean, celery, cucumber, horseradish, lettuce, rhubarb, sugar beet, hop crops, as well as ornamentals and wild plants (EFSA PLH Panel, 2013). ArMV is naturally transmitted by *Xiphinema diversicaudatum* in a highly specific way (Murant, 1983; Valdez et al., 1974). The vector, *X. diversicaudatum*, is present in Moldova (Poiras et al., 2015), and there are no details about the distribution (EPPO database). *Vitis* is a natural host of ArMV, and plants for planting of *Vitis* are a well-documented and significant pathway for the introduction and spread of ArMV, mainly due to the vegetative propagation of grapevine (EFSA PLH Panel, 2013). Based on the technical dossier information, ArMV is recognised as RNQP, and there is a set of standard official precautions from ANSA to ensure the detection and control of this virus in the commodity. Nurseries are located at least 1000 m from settlements and industrial vineyards, and 500 m from rivers, lakes and other water sources. If a potential reservoir of viral infection or nematode vector is detected within 1000 m, a different site is chosen or the soil is disinfected. Vine mother plantations are tested for the presence of the virus for the first time at the age of 6 years and thereafter at intervals of each 6 years, while those of the 'certified' category are sampled and tested for the first time at the age of 10 years and thereafter at intervals of 10 years. Additionally, plant health control of the mother graft/rootstock plantations is carried out annually by visual examination of plants for viral diseases.

Uncertainties:

- Limited data on *X. diversicaudatum* distribution and occurrence in Moldova;
- Transmission efficiency in different *Vitis* species is unclear;
- Efficiency of the soil disinfection in case of vector presence;
- Efficiency of the testing scheme (time intervals).

Taking into account this evidence and the uncertainties, the panel considers that **entry into the nursery from the surrounding environment infecting vine plants may be possible**.

A.5.2.2 | Possibility of entry with new plants/seeds

ArMV host range may allow potential sources of inocula in nursery settings. Mother plants for scions are grown under official inspection, with sampling and testing for viruses first at 6 years of age, and then every 6 years (basic). ArMV was shown to be seed transmitted in 15 species from 12 families, with a 10% transmission rate in strawberry but no transmission in raspberry in parallel experiments (Lister and Murant, 1967), and there is no conclusive evidence in *Vitis*. ArMV infections may be asymptomatic or no obvious foliar symptoms are shown, escaping visual detection.

Uncertainties:

- Effectiveness of material sampling and detection for asymptomatic infections;
- Variation in symptom expression affecting visual inspections;
- Lack of data on seed and pollen transmission rates in *Vitis*.

Considering this evidence and uncertainties, the panel concludes that the **entry with new plants or seeds is likely to be possible**.

A.5.2.3 | Possibility of spread within the nursery

Vitis propagating material is produced under the certification scheme in nurseries, and the plant materials are monitored and inspected during the vegetation period. ArMV can remain latent without visible symptoms, making visual inspections insufficient. *X. diversicaudatum* is typically absent in controlled soil nursery. ArMV can be spread by clonal propagation of infected mother plants. It is not known whether hot water treatment could have an effect on ArMV.

Uncertainties:

- Effectiveness of material sampling and detection for asymptomatic infections;
- Unknown efficiency of hot water treatment.

Taking this evidence and uncertainties into account, the panel considers that the **spread of ArMV within the nursery may be possible**.

A.5.3 | Information from interceptions

There are no records of ArMV from Moldova between 1998 and September 2025 (EUROPHYT, online; TRACES-NT, online).

A.5.4 | Evaluation of the risk mitigation options

In the table below, all risk mitigation measures currently applied in Moldova are listed and an indication of their effectiveness on ArMV is provided. The description of the risk mitigation measures currently applied in Moldova is provided in Table 4 (section 5).

No	Risk mitigation measure	Effect on the pest	Evaluation and uncertainties
1	*Registration of production sites*	No	
2	*Certification of propagation material*	Yes	Propagation material comes from pre-basic and basic mother plants that were tested virus-free. Virus testing is every 6 years for mother plantations, and every 10 years for certified stock nurseries. Uncertainties: – Procedure of material sampling is unclear. – Time gaps between certification testing (6 years) may allow virus accumulation.
3	*Sanitation and inspection of field sites for virus-transmission nematodes*	Yes	Soil testing and virus detection by visual inspections may be effective and constrain primary transmission pathway. Uncertainties: – No details on the distribution of the vector population. – Effectiveness of soil disinfection methods unclear
4	*Surveillance, monitoring and sampling*	Yes	All plants from mother plantations are sampled and tested for viruses, with an interval of 6 years. Additionally, visual inspections are carried out in mother plantations and commodity material twice yearly may help to control the virus infection. Uncertainties: – Time gaps between certification testing (6 years) may allow virus accumulation. – Visual surveillance insufficient for early infections. – ArMV can be asymptomatic, making visual detection unreliable.
5	*Application of phytosanitary products (pesticides)*	No	–
6	*Forecasting of pest and diseases incidence*	Yes	Visual inspections may help to prevent viral spread. Uncertainties: – The detection of latent or symptomless infections by visual inspections is questionable.
7	*Dissemination of warning notices to farmers*	No	
8	*Sorting and storage*	No	
9	*Hot water treatment*	Yes	Scions treated at 50°C for 45 minutes before grafting. Uncertainties: – Unknown efficiency (if any) against viral infection in general and ArMV in particular.
10	*Isolation distances*	Yes	Nurseries located >1000 m from settlements and industrial vineyards, and > 500 m from water sources. The vector is not really mobile; therefore, this measure is expected to be efficient.
11	*Cultural methods*	No	
12	*Physical methods*	No	
13	*Biological control methods*	No	
14	*Bio-derived methods*	No	

A.5.5 | Overall likelihood of pest freedom

A.5.5.1 | Reasoning for a scenario which would lead to a reasonably low number of infested consignments

- Registration and certification of propagation material ensure virus-free production.
- Nurseries are placed in areas where the virus has not been reported.
- Nematode vectors are the only efficient way to get within the nurseries, and they are absent in the production areas.
- Visual inspections are under official regulation, and virus symptoms seem easy to detect in diseased plants.
- Limited evidence of ArMV in commercial *Vitis* production from other countries.

A.5.5.2 | Reasoning for a scenario which would lead to a reasonably high number of infested consignments

- Visual inspection will not detect early stages of infections or asymptomatic infections;
- Presence of unidentified ArMV reservoirs in surrounding areas;
- Potential presence of undetected nematode vectors;
- Increasing numbers of plants in a bundle lead to increasing risks associated to the virus presence in the bundle.

A.5.5.3 | Reasoning for a central scenario equally likely to over- or underestimate the number of infested consignments (Median)

- The presence of the primary vectors is very unlikely with phytosanitary measures.
- Introduction of the virus from the surrounding areas or from propagation material within the nurseries is very unlikely.

A.5.5.4 | Reasoning for the precision of the judgement describing the remaining uncertainties (1st and 3rd quartile/ interquartile range)

- Status of the virus in the surrounding areas is unknown.
- Effectiveness of current sampling and detection protocols for asymptomatic infections.

A.5.5.5 | Elicitation outcomes of the assessment of the pest freedom for arabis mosaic virus (ArMV)

The following tables show the elicited and fitted values for pest infestation/infection (Table A.9) and pest freedom (Table A.10).

TABLE A.9 Elicited and fitted values of the uncertainty distribution of pest infestation by ArMV per 10,000 plants.

Percentile	1%	2.5%	5%	10%	17%	25%	33%	50%	67%	75%	83%	90%	95%	97.5%	99%
Elicited values	0					12		25		35					50
EKE	0.724	1.62	2.99	5.52	8.73	12.6	16.3	23.9	31.7	35.8	40.1	43.8	47.0	48.8	50.0

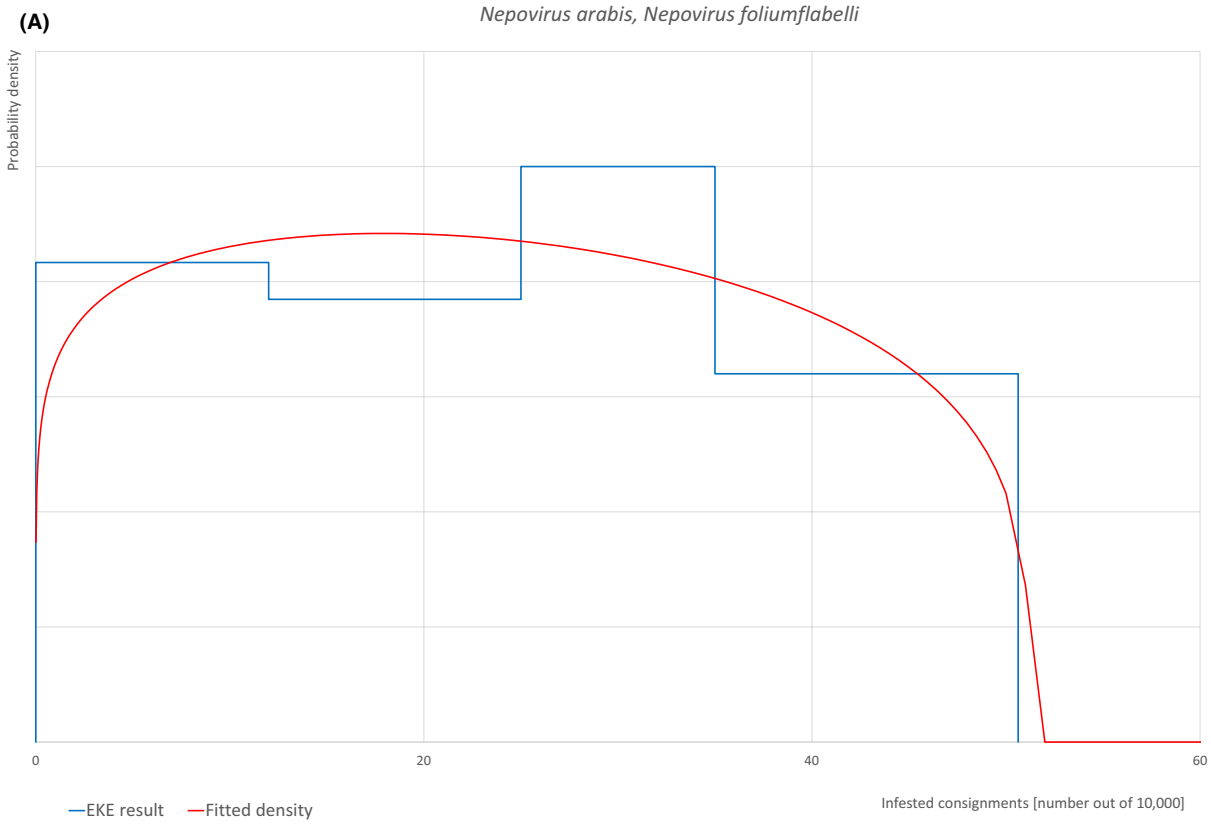
Note: The EKE results are BetaGeneral (1.1396, 1.2584, 0, 51.2) fitted with @Risk version 7.5.

Based on the numbers of estimated infested plants, the pest freedom was calculated (i.e. = 10,000 – the number of infested plants per 10,000). The fitted values of the uncertainty distribution of the pest freedom are shown in Table A.10.

TABLE A.10 The uncertainty distribution of plants free of ArMV per 10,000 plants calculated in Table A.1.

Percentile	1%	2.5%	5%	10%	17%	25%	33%	50%	67%	75%	83%	90%	95%	97.5%	99%
Values	9950					9965		9975		9988					10,000
EKE results	9950	9951	9953	9956	9960	9964	9968	9976	9984	9987	9991	9994	9997	9998	9999

Note: The EKE results are the fitted values.



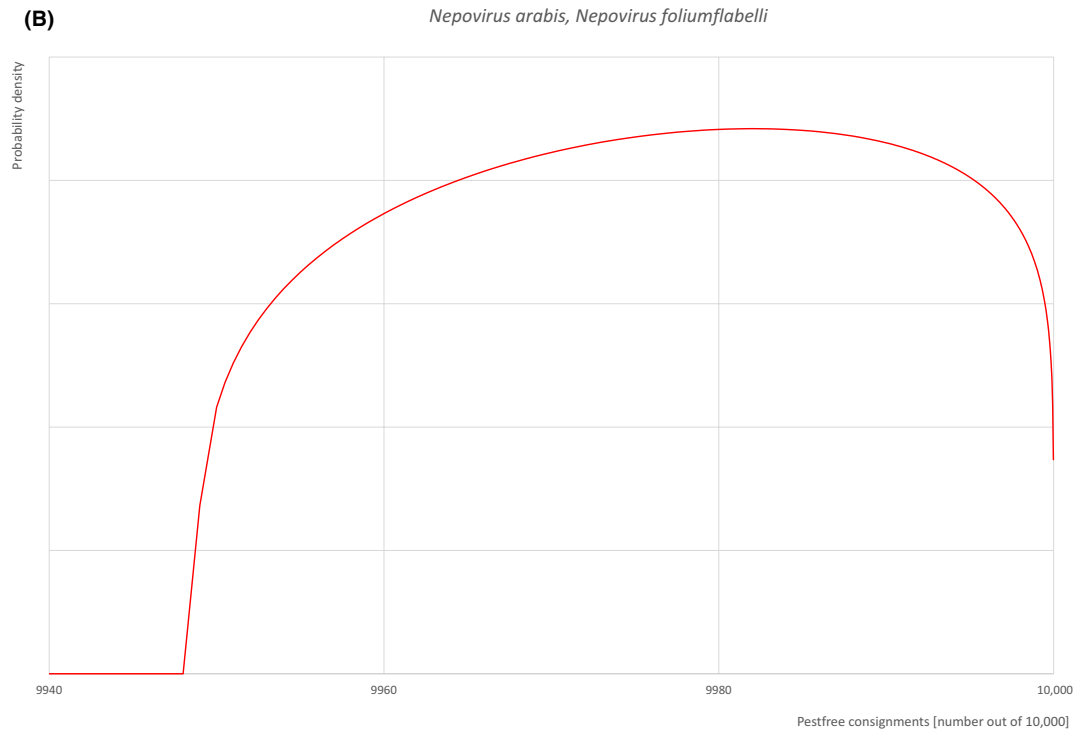


FIGURE A.5 (Continued)

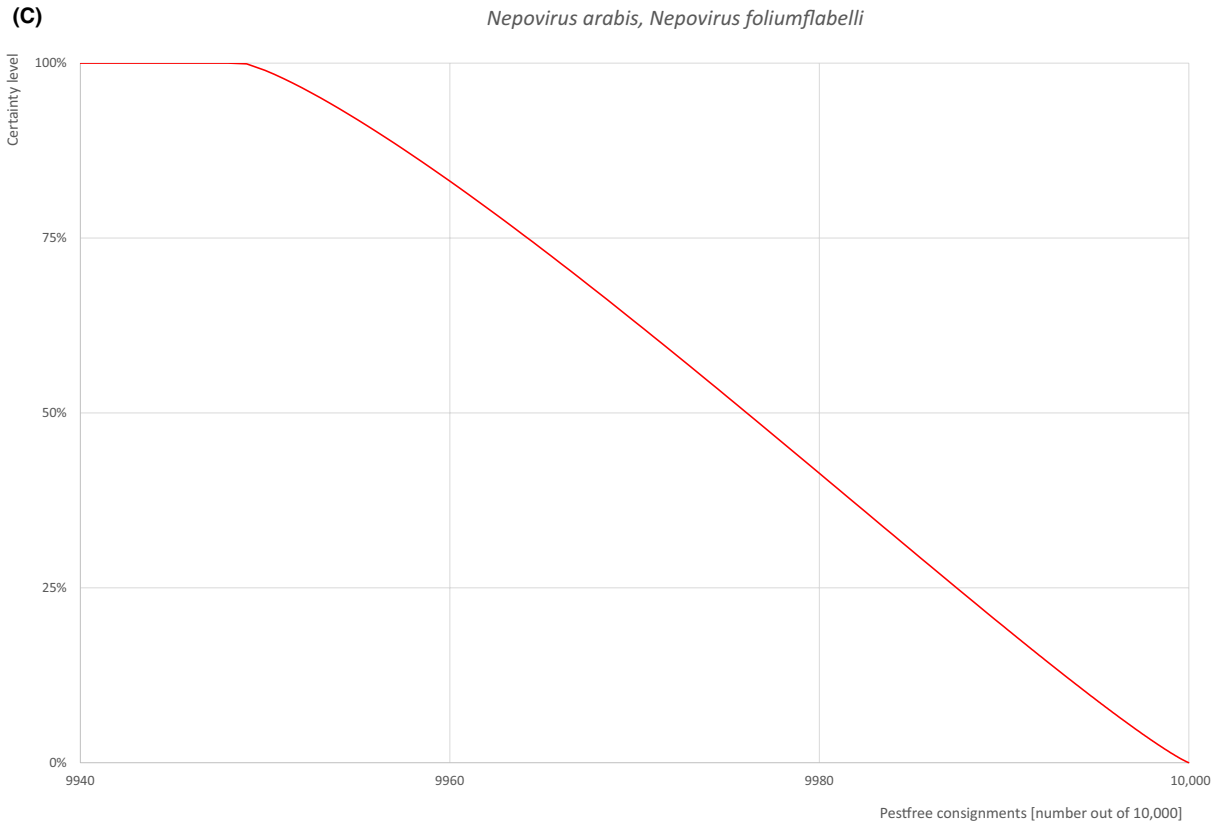


FIGURE A.5 (A) Elicited uncertainty of pest infestation per 10,000 plants (histogram in blue–vertical blue line indicates the elicited percentile in the following order: 1%, 25%, 50%, 75%, 99%) and distributional fit (red line); (B) uncertainty of the proportion of pest free plants per 10,000 (i.e. = 1 – pest infestation proportion expressed as percentage); (C) descending uncertainty distribution function of pest infestation per 10,000 plants.

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A.6 | GRAPEVINE FANLEAF VIRUS (GFLV)

A.6.1 | Organism information

Taxonomic information	Current valid scientific name: *Nepovirus foliumflabelli* Common name/Synonyms: Grapevine fanleaf virus, Grapevine fanleaf nepovirus, GFLV. Name used in the EU legislation: *Grapevine fanleaf virus* [GFLV00] Category: Virus Order: *Picornavirales* Family: *Secoviridae* Name used in the Dossier: Grapevine fanleaf virus (GFLV)	
Group	Viruses and Viroids	
EPPO code	GFLV00	
Regulated status	GFLV is listed as a regulated non-quarantine pest (RNQP, Annex IV, Part C, concerning vine propagating material of Commission Implementing Regulation (EU) 2019/2072). RNQP: Switzerland (2019), United Kingdom (2020). Quarantine pest: United States of America (1989). A1 list: Bahrain (2003). A2 list: Egypt (2018), Jordan (2013), Türkiye (2016). (EPPO, online_a).	
Pest status in applicant country	Present, no details (EPPO, online_b).	
Pest status in the EU	Present, no details: Austria (2000); Bulgaria (2000); Croatia (2000); Cyprus (2000); Czech Republic (2000); France (2000); Germany (2000); Greece (2000);; Hungary (2000); Italy (2000); Italy(2000); Malta (2000); Portugal (2000); Portugal/Azores (2000); Romania (2000); Slovakia (2000); Slovenia (2000); Spain (2000); Spain/Islas Canarias (2000) (EPPO, online_b).	
Host status on commodity species	*Vitis* spp. is reported as a host for GFLV in the EPPO Global Database (EPPO, online_c).	
PRA information/CRA information		
Other relevant information for the assessment		
Biology	Grapevine fanleaf virus (GFLV) is a nepovirus belonging to the family Secoviridae with a bipartite, single-stranded positive-sense RNA genome. It has isometric particles about 30 nm in diameter and two genomic RNAs (RNA1 and RNA2) that are encapsidated in separate particles and translated into polyproteins and subsequently cleaved into functional proteins (Mayo and Robinson, 1996). GFLV is a grapvevine pathogen, and is transmitted by the species complex of dagger nematode *Xiphinema index* (and occasionally *X. italiae*) in a highly specific, non-circulative and semi-persistent manner (Brown et al., 1996; Hewitt et al., 1958; Murant, 1983). GFLV can be retained for up to 8 months (Taylor and Raski 1964). In the absence of host plants, *X. index* can survive and retain GFLV for at least 4 years in vineyard soil stored at 7°C or 20°C (Demangeat et al. 2005). This study, however, did not ascertain whether the GFLV particles retained for such a long time by the nematodes were viable, nor if the potentially viruliferous nematodes were able to transmit the virus to bait plants (Demangeat et al. 2005). Additionally, it can be spread through infected propagation material (Martelli 1993). GFLV has been found in the endosperm of seeds from infected vines (Cory & Hewitt, 1968) and can occasionally be transmitted to seedlings (Lazar et al., 1990). The virus occurs in pollen of infected grapevines and herbaceous hosts (Cory & Hewitt, 1968) and is seed-transmitted in soybean (Cory & Hewitt, 1968).	
Symptoms	**Main type of symptoms**	GFLV symptoms may depend on the cultivar and virus strain (Murrant and Lister, 1987). *V. vinifera* cultivars are susceptible, with variable levels of sensitivity (Digiaro et al., 2017). It causes fanleaf and yellow mosaic diseases in grapevines, characterised by leaf malformations, shoot deformities, and mottling, yellowing, and ring spots in leaves. Yellowing discoloration of leaves and shoots is most pronounced in spring (Digiaro et al., 2017; Hewitt et al., 1970). Different strains of the same virus can vary in pathogenicity, leading to variation in symptom expressions. Also, the severity may depend on scion–rootstock combinations and co-infections with other viruses or viroids that may act synergistically. Mixed virus infections occur frequently between GFLV and ArMV (Wetzel et al., 2001). Although, they are transmitted by two different vector nematodes: *Xiphinema index* for GFLV and *X. diversicaudatum* for ArMV, generally, the symptoms observed in the presence of one or the other of these viruses are similar.
	Presence of asymptomatic plants	In young grapevines, under particular environmental conditions, GFLV infection may be asymptomatic or no obvious visible symptoms are observed (Jež-Krebelj, et al., 2022).
	Confusion with other pests	The symptoms can vary significantly depending on the virus isolate, plant cultivar, rootstock, environmental conditions and season (Murrant and Lister, 1987). Mixed infections with other nepoviruses can exacerbate symptoms and impact.
Host plant range	The natural host of GFLV is *Vitis vinifera*, but it can infect about 35 species in six families experimentally. Diagnostic hosts include *Vitis rupestris, Chenopodium amaranticolor, C. quinoa, Gomphrena globosa* and *Nicotiana* spp. (Horvath et al., 1994)	

(Continued)

Reported evidence of impact	GFLV is considered one of the most damaging viral agents affecting *Vitis*. It is widespread in grapevines. The virus is apparently native to V. vinifera and originated in the same area as the natural host (Hewitt, 1968). Records on its presence in Europe date back some 150 years (Martelli 2017). Its impact is significant both in terms of yield and fruit quality, as well as vine longevity and vineyard profitability. Yield losses can reach up to 80%, with any fruit that does mature of poor quality. Infected vines have a shortened life span, increased sensitivity to environmental stress, and reduced grafting and rooting potential (Jackson 2014).
Evidence that the commodity is a pathway	Plants for planting of *Vitis* are considered the major pathway for GFLV entry and spread (Golino et al., 2015; Martelli 2017).
Surveillance information	GFLV is subject to official surveillance programmes under the ANSA. The phytosanitary control is carried out twice annually. According to the additional information provided, as well as CABI and EPPO database, GFLV is present in Moldova, but no further specifics on distribution or prevalence. According to a recent study on testing certified planting material of grapevine from the Republic of Moldova, GFLV was not detected (Dubceac et al., 2023).

A.6.2 | Possibility of pest presence in the nursery

A.6.2.1 | Possibility of entry from the surrounding environment

The natural host range of GFLV is restricted to Vitis sp. It has not been found naturally in any wild or cultivated plant species other than *Vitis*. Due to GFLV having very few alternative hosts, the vector, *X. index*, plays a major role, and there is evidence that GFLV can be retained for a long time even in the absence of the host (Andret-Link et al., 2004; Demangeat et al., 2005). *X. index* has been reported to be present in Moldova (CABI, 2021; Koev and Polinkovskii, 1976). *Vitis* plants for planting constitute the most significant pathway for GFLV introduction and spread due to the vegetative propagation of grapevines (EPPO and CABI databases). Based on the technical dossier information, GFLV is recognised as RNQP, and there is a set of standard official precautions from ANSA to ensure the detection and control of this virus in the commodity. Nurseries are located at least 1000 m from settlements and industrial vineyards, and 500 m from rivers, lakes, and other water sources. If a potential reservoir of viral infection or nematode vector is detected within 1000 m, a different site is chosen, or the soil is disinfected. Vine mother plantations are tested for the presence of the virus for the first time at the age of 6 years and thereafter at intervals of each 6 years, while those of the 'certified' category are sampled and tested for the first time at the age of 10 years and thereafter at intervals of 10 years. Additionally, plant health control of the mother graft/rootstock plantations is carried out annually by visual examination of plants for viral diseases.

Uncertainties:

- Limited data on *X. index* distribution and occurrence in Moldova.
- Transmission efficiency in different *Vitis* species is unclear.

Taking into account this evidence and the uncertainties, the panel considers that **entry into the nursery from the surrounding environment infecting vine plants may be possible**.

A.6.2.2 | Possibility of entry with new plants/seeds

GFLV host range is restricted to *Vitis*. Mother plants for scions are grown under official inspection, with sampling and testing for viruses first at 6 years of age, and then every 6 years. Despite GFLV has been found to be present in the endosperm of infected vine seeds (Hewitt et al. 1970), there is no evidence of seed transmission. GFLV infections may be asymptomatic or no obvious foliar symptoms are shown, escaping visual detection.

Uncertainties:

- Effectiveness of material sampling and detection methods for asymptomatic infections.
- Variation in symptom expression from certain cultivars affecting visual inspections.
- Lack of data on seed and pollen transmission rates in *Vitis*.

Considering this evidence and uncertainties, the panel concludes that **entry with new plants or seeds is likely to be possible**.

A.6.2.3 | Possibility of spread within the nursery

Vitis propagating material is produced under the certification scheme in nurseries, and the plant materials are monitored and inspected during the vegetation period. GFLV can remain latent without visible symptoms, making visual inspections

insufficient. *X. index* is typically absent in a controlled soil nursery. GFLV can be spread by clonal propagation of infected mother plants. Standard nursery control practices include pest control measures, daily cleaning of grafting machines and hot water treatment of scions (50°C for 45 min). However, it is not known whether heat treatment could have an effect on GLRaV-3 in plants,

Uncertainties:

Unknown efficiency of hot water treatment. Taking this evidence and uncertainties into account, the panel considers that the **spread of GFLV within the nursery may be possible**.

A.6.3 | Information from interceptions

There are no records of GFLV from Moldova between 1998 and September 2025 (EUROPHYT, online; TRACES-NT, online).

A.6.4 | Evaluation of the risk mitigation options

In the table below, all risk mitigation measures currently applied in Moldova are listed and an indication of their effectiveness on GFLV is provided. The description of the risk mitigation measures currently applied in Moldova is provided in Table 4 (section 5).

No	Risk mitigation measure	Effect on the pest	Evaluation and uncertainties
1	*Registration of production sites*	No	
2	*Certification of propagation material*	Yes	Propagation material comes from pre-basic and basic mother plants that were tested virus-free. Virus testing is every 6 years for mother plantations, and every 10 years for certified stock nurseries. Uncertainties: – Procedure of material sampling is unclear. – Time gaps between certification testing (6 years) may allow virus accumulation.
3	*Sanitation and inspection of field sites for virus-transmission nematodes*	Yes	Soil testing and virus detection b visual inspections may be effective and constrain primary transmission pathway. Uncertainties: – No details on the distribution of the vector population. – Effectiveness of soil disinfection methods unclear
4	*Surveillance, monitoring and sampling*	Yes	All plants from mother plantations are sampled and tested for viruses, with an interval of 6 years. Additionally, visual inspections are carried out in mother plantations and commodity material twice yearly may help to control the virus infection. Uncertainties: – Time gaps between certification testing (6 years) may allow for virus accumulation. – Visual surveillance insufficient for early infections.
5	*Application of phytosanitary products (pesticides)*	No	
6	*Forecasting of pest and diseases incidence*	Yes	Visual inspections may help to prevent viral spread. Uncertainties: – The detection of latent or symptomless infections by visual inspections is questionable.
7	*Dissemination of warning notices to farmers*	No	
8	*Sorting and storage*	No	
9	*Hot water treatment*	Yes	Scions treated at 50°C for 45 minutes before grafting. Uncertainties: – Unknown efficiency against viral infection in general and GFLV in particular.
10	*Isolation distances*	Yes	Nurseries located > 1000 m from settlements and industrial vineyards, and > 500 m from water sources. The vector is not really mobile; therefore, this measure appears to be efficient.
11	*Cultural methods*	No	
12	*Physical methods*	No	
13	*Biological control methods*	No	
14	*Bio-derived methods*	No	

A.6.5 | Overall likelihood of pest freedom

A.6.5.1 | Reasoning for a scenario which would lead to a reasonably low number of infested consignments

- Registration and certification of propagation material ensure virus-free production.
- Nurseries are placed in areas where the virus has not been reported.
- Nematode vectors are the only efficient way to get into the nurseries, and they are absent in the production areas.
- Visual inspections are under official regulation, and virus symptoms are easy to detect in diseased plants.
- Host range of GFLV is restricted to *Vitis* and no other alternative hosts.

A.6.5.2 | Reasoning for a scenario which would lead to a reasonably high number of infested consignments

- Visual inspection will not detect early stages of infections or asymptomatic infections.
- Potential presence of undetected nematode vectors.
- Increasing numbers of plants in a bundle lead to increasing risks associated to the virus presence in the bundle.

A.6.5.3 | Reasoning for a central scenario equally likely to over- or underestimate the number of infested consignments (Median)

- Presence of the nematode vectors is very unlikely.
- Introduction of the virus from the surrounding areas or from propagation material within the nurseries is very unlikely.

A.6.5.4 | Reasoning for the precision of the judgement describing the remaining uncertainties (1st and 3rd quartile/interquartile range)

- Transmission efficiency by other potential nematode vectors species is not well documented.
- Status of the virus in the surrounding areas is unknown.
- Effectiveness of current sampling and detection protocols for asymptomatic infections.

A.6.5.5 | Elicitation outcomes of the assessment of the pest freedom for grapevine fanleaf virus (GFLV)

The following tables show the elicited and fitted values for pest infestation/infection (Table A.11) and pest freedom (Table A.12).

TABLE A.11 Elicited and fitted values of the uncertainty distribution of pest infestation by GFLV per 10,000 plants.

Percentile	1%	2.5%	5%	10%	17%	25%	33%	50%	67%	75%	83%	90%	95%	97.5%	99%
Elicited values	0					12		25		35					50
EKE	0.724	1.62	2.99	5.52	8.73	12.6	16.3	23.9	31.7	35.8	40.1	43.8	47.0	48.8	50.0

Note: The EKE results are BetaGeneral(1.1396,1.2584,0,51.2) fitted with @Risk version 7.5.

Based on the numbers of estimated infested plants, the pest freedom was calculated (i.e. = 10,000 – the number of infested plants per 10,000). The fitted values of the uncertainty distribution of the pest freedom are shown in Table A.12.

TABLE A.12 The uncertainty distribution of plants free of GFLV per 10,000 plants calculated by Table A.11.

Percentile	1%	2.5%	5%	10%	17%	25%	33%	50%	67%	75%	83%	90%	95%	97.5%	99%
Values	9950					9965		9975		9988					10,000
EKE results	9950	9951	9953	9956	9960	9964	9968	9976	9984	9987	9991	9994	9997	9998	9999

Note: The EKE results are the fitted values.

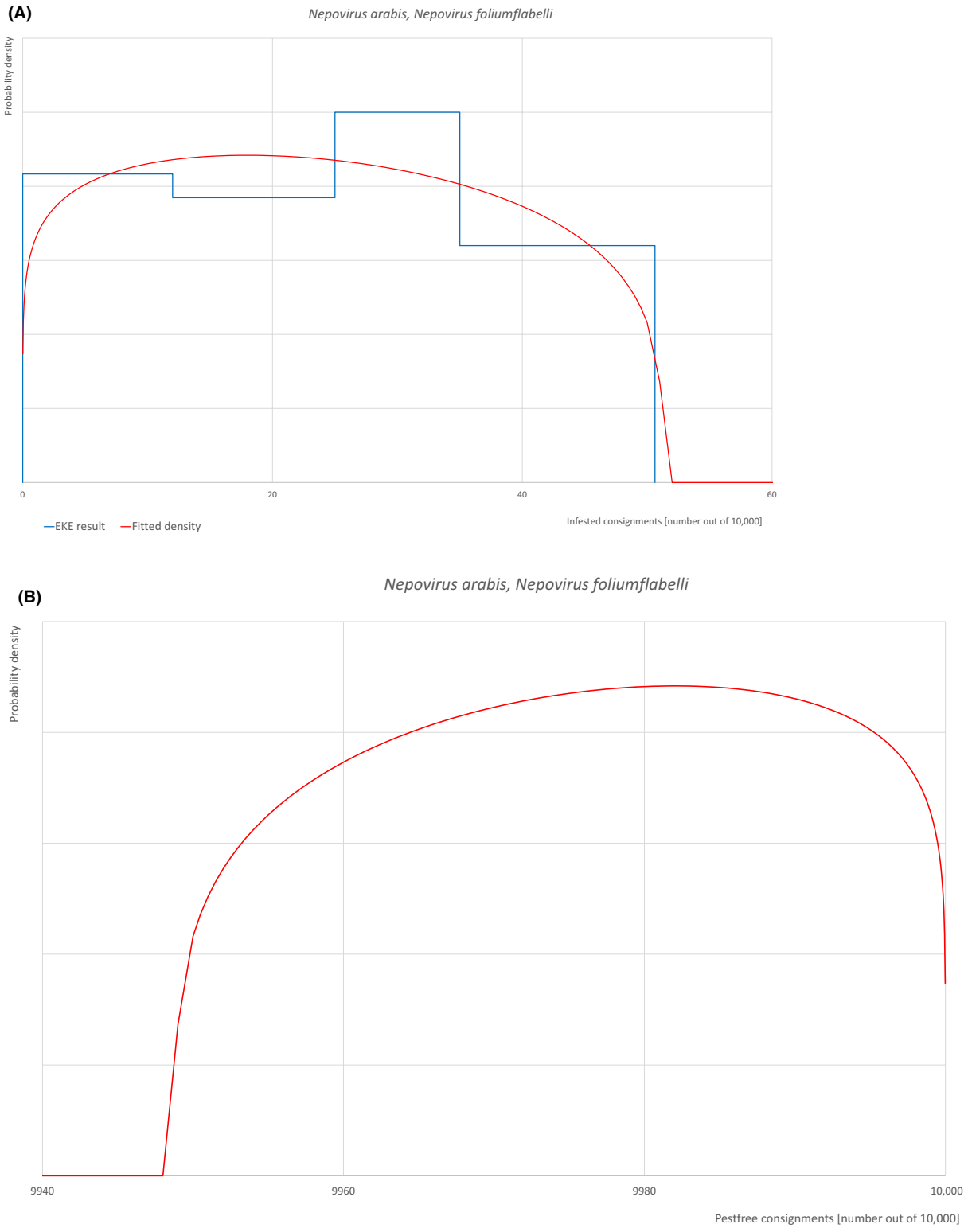

FIGURE A.6 (Continued)

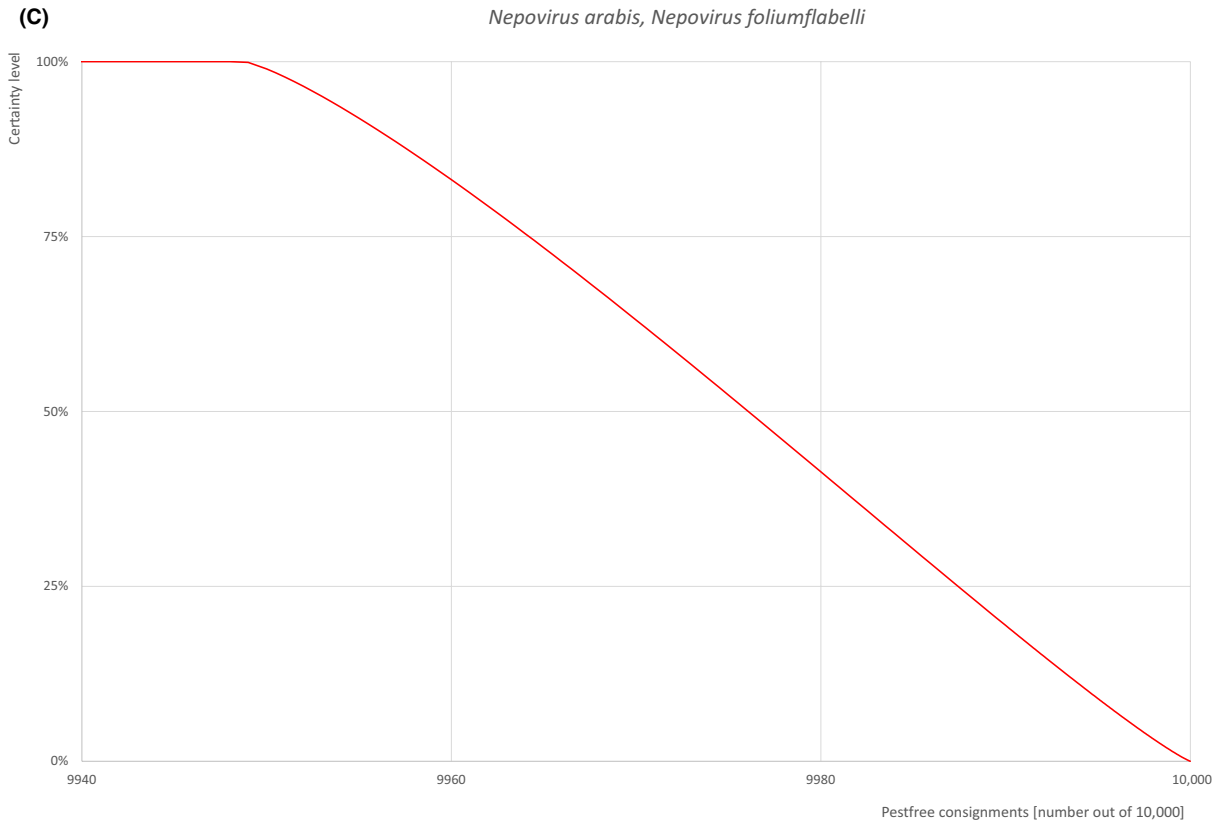

FIGURE A.6 (A) Elicited uncertainty of pest infestation per 10,000 plants (histogram in blue–vertical blue line indicates the elicited percentile in the following order: 1%, 25%, 50%, 75%, 99%) and distributional fit (red line); (B) uncertainty of the proportion of pest-free plants per 10,000 (i.e. = 1 – pest infestation proportion expressed as percentage); (C) descending uncertainty distribution function of pest infestation per 10,000 plants.

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A.7 | *XIPHINEMA RIVESI*

A.7.1 | Organism information

Taxonomic information	Current valid scientific name: *Xiphinema rivesi* Dalmasso, 1969 Synonyms: - Name used in the EU legislation: *Xiphinema rivesi* (non-EU populations) Name used in the Dossier: Not mentioned in the dossier Order: Dorylaimida Family: Longidoridae/Xiphinematidae	
Group	Nematoda	
EPPO code	XIPHRI	
Regulated status	**EU status:** A1 Quarantine pest (Annex II A) – *X. rivesi* (non-EU populations) (EPPO, online) **Non-EU:** Africa: Egypt (A1 list, 2018); Morocco (Quarantine pest; 2018) (EPPO, online) America: Brazil (A1 list, 2018); Mexico (Quarantine pest, 2018) (EPPO, online) EAEU (=Eurasian Economic Union): Armenia, Belarus, Kazakhstan, Kyrgyzstan and Russia) (A1 list, 2018) (EPPO, online) Europe: Azerbaijan (A1 list, 2024); Georgia (A1 list, 2018); Serbia (A1 list, 2016); Switzerland (A1 list, 2019); Türkiye (A1 list, 2016); United Kingdom (A1 list, 2020) (EPPO, online) EPPO (A2 list, 1981, 1993) (EPPO, online)	
Pest status in applicant country	Present (Poiras, 2012; Poiras et al., 2013; 2014; 2015)	
Pest status in the EU	Present in France, Germany, Italy, Portugal, Slovenia, Spain (EPPO, online)	
Host status on commodity species	*Vitis vinifera* has been reported as a host of *Xiphinema rivesi* (EPPO, online).	
PRA information/CRA information	Pest Risk Analysis for *Xiphinema americanum* s.l., 2010. Plant Protection Service, the Netherlands, version no.: 1. Rapid Pest Risk Analysis for *Xiphinema americanum* s.l. (European populations), 2014. The Food and Environmental Research Agency (Author: Derek Tomlinson), Version no.: 2.	
Other relevant information for the assessment		
Biology	*Xiphinema rivesi* is a polyphagous ectoparasite that lives its entire life and moves freely in the soil. It feeds externally on the root tips or the sides of the roots of various host plants and causes direct damage to the plants, often manifested by a reduced number of lateral feeder roots, which may be swollen and necrotic, with swollen, necrotic root tips. During feeding, juveniles and adults can acquire and transmit viruses, which can persist for several months and up to 2 years (Bitterlin and Gonsalves, 1987; EFSA, 2018). The life cycle of *X. rivesi* consists of 5–6 stages: the egg, 3–4 juvenile stages (according to EPPO, the number of juvenile stages in this species is unclear), and the adult female (males are extremely rare) and lasts at least 1 year. It is assumed that females produce eggs parthenogenetically. It has been found that all stages of this nematode can survive and mature in soil without a host, but the population does not reproduce. The nematode does not survive long in frozen soil, and in areas with low winter temperatures, it overwinters mainly in the egg stage. Where the soil is not frozen, all stages can survive the winter (EFSA, 2018).	
Symptoms	**Main type of symptoms**	The above-ground symptoms of *X. rivesi* infestation are not very obvious and manifest themselves in a general reduction in the vigour of the plants, which can easily be confused with other plant stresses caused by lack of water or nutrients. Direct damage can only occur at high population densities, which are indicated by characteristic depressed growth spots corresponding to the highest concentration of nematodes (CABI online). A reduced root system with fewer lateral feeder roots, necrosis, and swelling of the root tips can be caused by this nematode. The most commonly recognised symptoms of this pest are caused by the transmission of the associated plant viruses.
	Presence of asymptomatic plants	The symptoms caused by *X. rivesi* on plants are generally not very specific and can easily be overlooked, especially if the nematode infestation is small. Therefore, the nematode may not be detected by existing phytosanitary procedures and export controls, including laboratory tests.

(Continues)

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Confusion with other pests	*X. rivesi* can be confused with other species from the group of *X. americanum* sensu lato. Due to the only slight morphological and morphometric differences, the differentiation of *X. rivesi* from the group *X. americanum* sensu lato is extremely difficult (EFSA, 2018) and only possible for experienced nematologists. Therefore, the use of molecular approaches is recommended (Brown et al., 1995; EFSA, 2018; Lamberti et al., 2000), but currently there is no reliable molecular test for routine diagnosis. Such a molecular diagnostic method is available on the Q-Bank website, but it has not yet been included in the relevant IPPC and EPPO diagnostic protocols (EFSA, 2018; EPPO, online; FAO, 2016). It is not possible to distinguish EU populations of *X. rivesi* from non-EU populations.
Host plant range	Reported hosts of *X. rivesi* are: *Allium sativum* (garlic), *Acer* spp. (maples), *Avena sativa* (oat), *Betula pubescens* (downy birch), *Celtis occidentalis* (hackberry), *Chenopodium quinoa* (quinoa), *Citrus sinensis* (sweet orange), Cottonwood, *Cucumis sativus* (cucumber), *Fagus* spp.(beeches), *Fragaria ananassa* (strawberry), *Juglans* spp. (walnut), *Juniperus* spp. (junipers), *Lonicera* spp. (honeysuckles), *Malus domestica* (apple), *Malus sylvestris* (ornamental apple tree), mango, *Medicago sativa* (alfalfa), *Nicotiana tabacum* (tobacco), *Picea* spp. (spruces), *Picea glauca* (white spruce), *Picea pungens* (blue spruce), *Pinus koraiensis* (fruit pine), *Prunus* spp. (stone fruit), *Prunus avium* (sweet cherry), *Prunus domestica* (plum), *Prunus persica* (peach), *Prunus salicina* (Japanese plum), *Rosa* spp. (roses), *Rubus* spp. (blackberry, raspberry), *Rubus idaeus* (raspberry), *Quercus* spp. (oak), *Solanum tuberosum* (potato), *Sorghum bicolor* (sorghum), *Taraxacum* spp. (dandelion), *Trifolium pratense* (red clover), *Trifolium repens* (white clover), *Trifolium* spp., *Tsuga* spp. (hemlocks), turf grasses, *Ulmus* spp. (elms), *Vaccinium* spp. (blueberries), *Vitis vinifera* (grapevine), *Zea mays* (corn) (Nemaplex, CABI, Plantwise Knowledge Bank).
Reported evidence of impact	*X. rivesi* feeds on the roots of host plants and causes swelling, stunting, and destruction of root tips (Nemaplex, online). However, the greatest damage caused by this species is the transmission of viruses (tobacco ringspot (TRSV), tomato ringspot (ToRSV), peach rosette mosaic (PRMV) and cherry rasp leaf (CRLV) (EFSA, 2018). This nematode is distributed worldwide and has been reported from Africa, Asia, Europe, North and South America and Oceania (EPPO, online). The introduction of non-EU populations of *X. rivesi* from third countries into the EU can lead to the introduction of viruses that can be transmitted by *X. rivesi* populations already present in the EU (*X. rivesi* EU populations).
Evidence that the commodity is a pathway	– Plants, plants for planting with attached soil – Soil and growing media as such from areas where the nematode occurs Soil and growing media attached to machinery, tools, packing materials, etc.
Surveillance information	In Moldova, vine propagation material is produced in registered production nurseries under various certification schemes. The nurseries are inspected for the presence of virus-transmitted nematodes 1 year before planting. If nematodes are detected, the soil is disinfected or another production site is chosen (the threshold for intervention was not mentioned in the dossier). Details of this measure were not provided. In Moldova, *X. rivesi* has been found in several fruit crops (apples, grapes, raspberries, strawberries, currants) in the past (Poiras, 2012; Poiras et al., 2013; 2014; 2015), but according to the Moldovan Food Safety Authority, it has not been detected in recent years, although *Xiphinema* spp. including *X. rivesi* are officially monitored.

A.7.2 | Possibility of pest presence in the nursery

A.7.2.1 | Possibility of entry from the surrounding environment

According to the available literature data, *Xiphinema rivesi* has been found in Moldova on apple, raspberry, strawberry, currant and grapes. However, no epidemics or economic losses due to this nematode have been reported in Moldova so far. Furthermore, according to the Moldovan Food Safety Authority, the nematode has not been detected in recent years.

If *X. rivesi* is present in the environment, it can enter *Vitis vinifera* growing areas with planting material, water, soil and growing media attached to agricultural machinery, tools and footwear. The active spread of *X. rivesi* is only effective over short distances.

Uncertainties:

Xiphinema rivesi has been reported from Moldova, but it has not been detected in recent years, and there is no information on its distribution in the *Vitis vinifera* growing area.

The pest pressure in this area is not known.

The occurrence of *X. rivesi* in the areas around the vine nurseries is uncertain.

Based on the above evidence and uncertainties, the Panel concludes that it is possible that the nematode is present in the environment and that it can enter the nursery with the planting material or other human activities.

A.7.2.2 | Possibility of entry with new plants/seeds

Plants for planting originating from production sites where the nematode is present are considered an important pathway for the introduction of this nematode into a new area/field, especially if the roots have not been properly cleaned/washed or if soil particles that may contain nematodes are attached to the roots.

Uncertainties:

If *X. rivesi* infestation is low, the symptoms and presence of the nematode may be overlooked.

It is uncertain how effective root cleaning/washing can be.

Due to the above-mentioned evidence and uncertainties, the Panel considers it possible that the infestation is not recognised and the nematode can be introduced into nurseries/orchards with new plants.

A.7.2.3 | Possibility of spread within the nursery

The active movement of *X. rivesi* is only effective over short distances. At greater distances, the human-assisted dispersal route is the most important dispersal route for the nematode.

Uncertainties:

No uncertainties.

In view of the above evidence, the Panel considers that the nematode, when present in the field, can be transmitted from one host plant to another.

A.7.3 | Information from interceptions

There are no records of X. *rivesi* from Moldova between 1998 and September 2025 (EUROPHYT, online; TRACES-NT, online).

A.7.4 | Evaluation of the risk mitigation options

In the table below, all risk mitigation measures currently applied in Moldova are listed and an indication of their effectiveness on *X. rivesi* is provided. The description of the risk mitigation measures currently applied in Moldova is provided in Table 5 (Section 5).

No	Risk mitigation measure	Effect on the pest	Evaluation and uncertainties
1	*Registration of production sites*	No	–
2	*Certification of propagation material*	Yes	Evaluation: 1 year before planting, the vine nursery is inspected for the presence of virus vector nematodes. If nematodes are found, the soil is disinfected, or another planting site is chosen. Uncertainties: • Details of the inspection and monitoring have not been described. • If the population of virus vector nematodes is low or the symptoms caused by these nematodes are not very pronounced, the soil infestation is difficult to recognise.
3	*Sanitation and inspection of field sites for virus-transmission nematodes*	Yes	Evaluation: Nurseries are checked for the presence of virus vector nematodes before planting and, if necessary, treated or removed from production if nematode density or the presence of nematodes cannot be controlled. However, the Panel considers disinfection of soil is not sufficient for complete *X. rivesi* removal Uncertainties: – The efficiency of soil disinfection Details of this measure were not provided. Threshold for intervention was not mentioned in the dossier.
4	*Surveillance, monitoring and sampling*	Yes	Evaluation: The presence of virus vector nematodes in nurseries is checked before planting. However, there is no information on how sampling is carried out in Moldova. Uncertainties: – The details of sampling have not been provided.
5	*Application of phytosanitary products (pesticides)*	No	
6	*Forecasting of pest and diseases incidence*	No	
7	*Dissemination of warning notices to farmers*	No	
8	*Sorting and storage*	Yes	Evaluation: Washing the roots to remove soil and organic debris can effectively reduce the risk of nematode infestation in plants intended for planting. Uncertainties: It is uncertain how effectively root washing is carried out.
9	*Hot water treatment*	No	
10	*Isolation distances*	No	
11	*Cultural methods*	No	

(Continues)

(Continued)

No	Risk mitigation measure	Effect on the pest	Evaluation and uncertainties
12	*Physical methods*	No	
13	*Biological control methods*	No	
14	*Bio-derived methods*	No	

A.7.5 | Overall likelihood of pest freedom

A.7.5.1 | Reasoning for a scenario which would lead to a reasonably low number of infested consignments

- *Vitis vinifera* is not considered an important host.
- Pest pressure is very low in Moldova.
- Certified nurseries are mainly located in the part of the country where *X. rivesi* has not been reported.
- Regular inspections by phytosanitary authorities are effective and help to reduce the infection pressure of this nematode.
- Washing the roots is effective against this nematode.

A.7.5.2 | Reasoning for a scenario which would lead to a reasonably high number of infested consignments

Vitis vinifera is considered the main host for this nematode.

Certified vineyards are located in areas where *X. rivesi* has been reported in Moldova, and the pest pressure is similar throughout the country.

The nematode is widespread in *Vitis vinifera*-growing areas, and it is very likely that grape plants are infested with nematodes.

Visual selection of *Vitis vinifera* plants for planting and visual inspections prior to export without laboratory testing is not effective and result in high infestation level.

Washing the roots during the production of V. vinifera plants for planting is not effective against this nematode.

A.7.5.3 | Reasoning for a central scenario equally likely to over- or underestimate the number of infested consignments (Median)

– Uncertainties about the occurrence of the pest in Moldova.
– There is no information on infections of *X. rivesi* on *V. vinifera* plants in Moldova.
– The lack of reports on problems related to viruses that can be transmitted by this nematode in the *V. vinifera* growing area in Moldova.
– The likelihood of introduction into *V. vinifera* growing areas through human activities.
– Washing the roots is only partially effective against this pest.

A.7.5.4 | Reasoning for the precision of the judgement describing the remaining uncertainties (1st and 3rd quartile/ interquartile range)

– The greatest uncertainty factor is the absence of symptoms caused by nematodes, so that the presence of the nematode in the roots of *V. vinifera* can be overlooked; it cannot be detected by visual inspection

A.7.5.5 | Elicitation outcomes of the assessment of the pest freedom for *Xiphinema rivesi*

The following tables show the elicited and fitted values for pest infestation/infection (Table A.13) and pest freedom (Table A.14).

TABLE A.13 Elicited and fitted values of the uncertainty distribution of pest infestation by *Xiphinema rivesi* per 10,000 plants.

Percentile	1%	2.5%	5%	10%	17%	25%	33%	50%	67%	75%	83%	90%	95%	97.5%	99%
Elicited values	*10*					*55*		*100*		*400*					*1000*
EKE	*9.5*	*9.7*	*10.5*	*13.7*	*21.9*	*38.8*	*63.8*	*143*	*273*	*365*	*486*	*619*	*760*	*863*	*954*

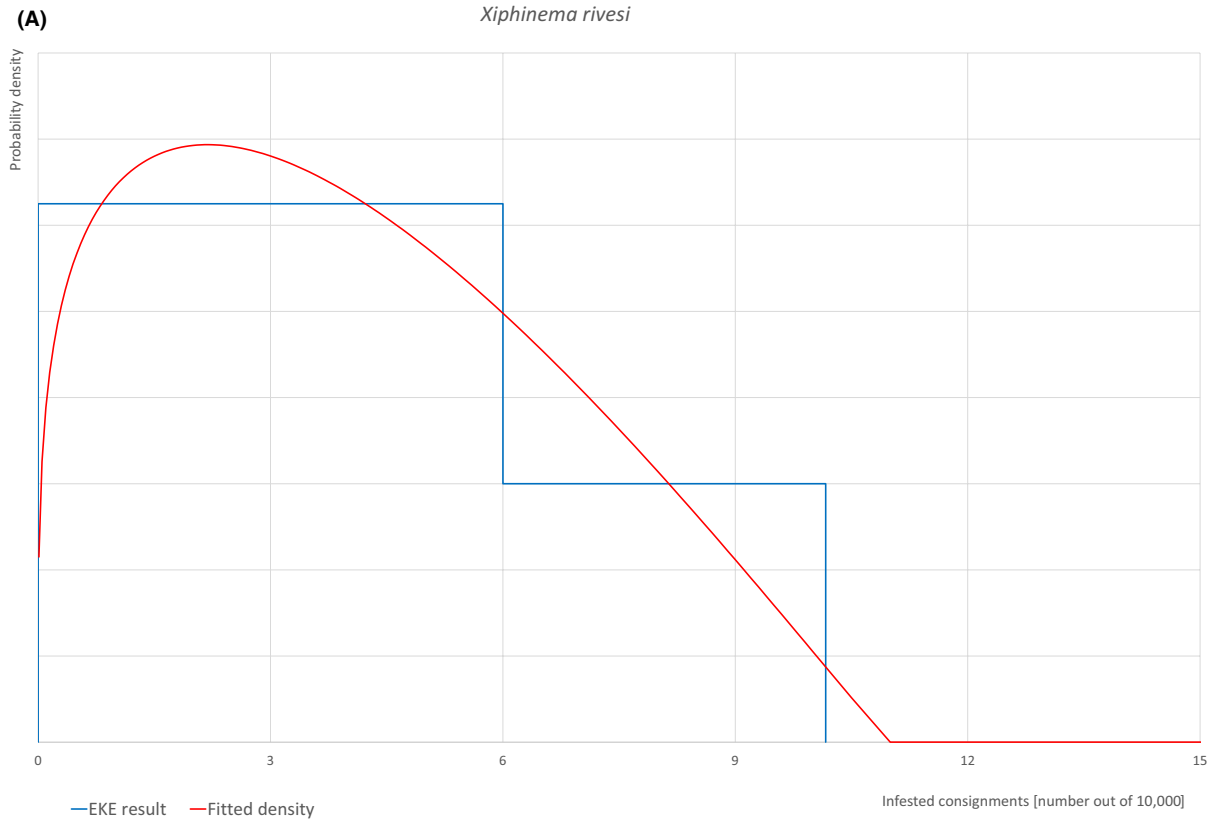
Note: The EKE results are *BetaGeneral (1.2604, 2.0485, 0, 11)* fitted with @Risk version 7.5.

Based on the numbers of estimated infested plants, the pest freedom was calculated (i.e. = 10,000 – the number of infested plants per 10,000). The fitted values of the uncertainty distribution of the pest freedom are shown in Table A.14.

TABLE A.14 The uncertainty distribution of plants free of *Xiphinema rivesi* per 10,000 plants calculated in Table A.13.

Percentile	1%	2.5%	5%	10%	17%	25%	33%	50%	67%	75%	83%	90%	95%	97.5%	99%
Values	*9000*					*9600*		*9900*		*9945*					*9990*
EKE results	*9046*	*9137*	*9240*	*9381*	*9514*	*9635*	*9727*	*9857*	*9936*	*9961*	*9978*	*9986*	*9990*	*9990*	*9990*

Note: The EKE results are the fitted values.



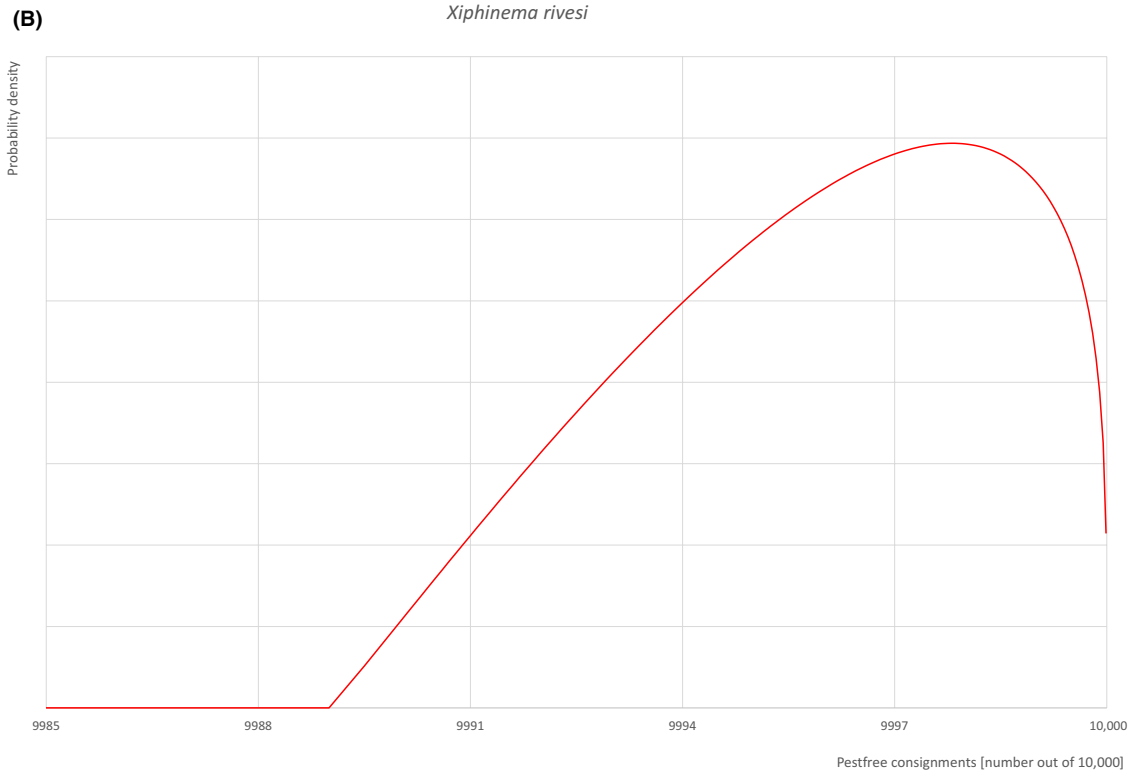


FIGURE A.7 (Continued)

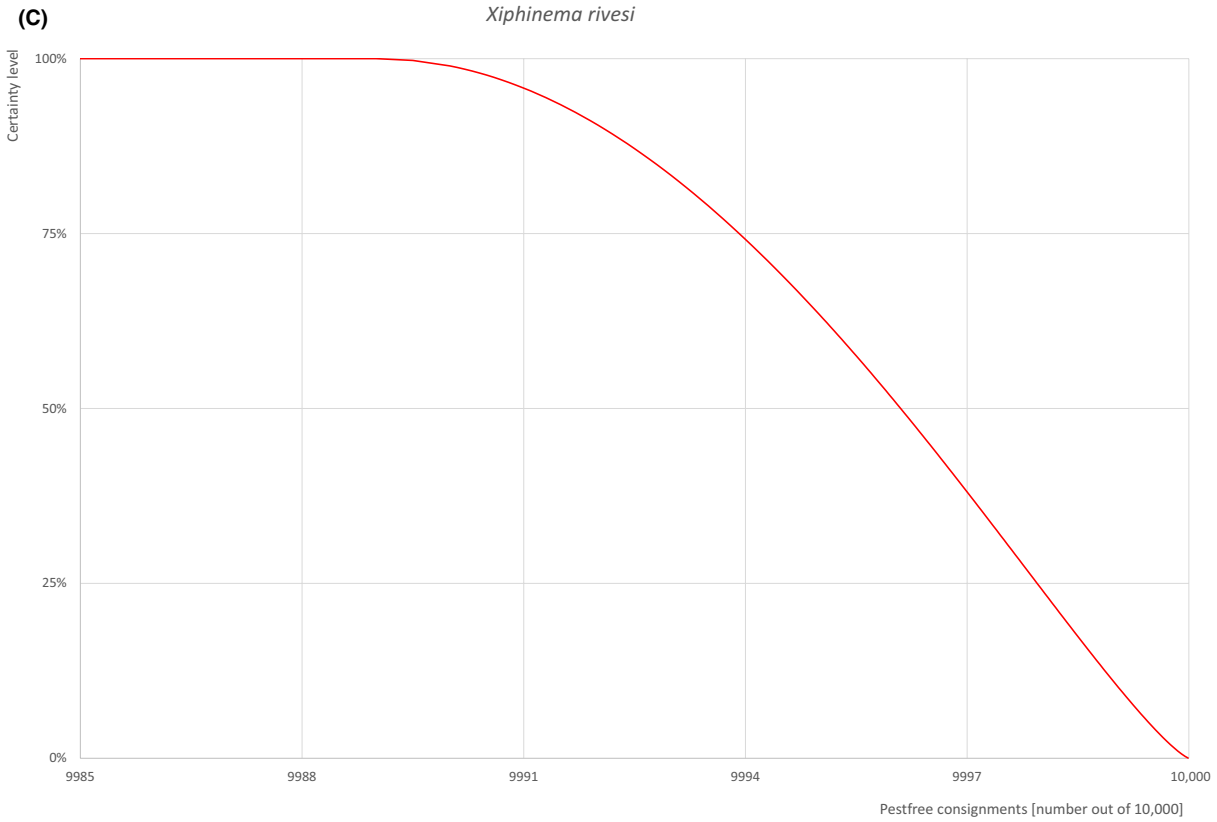


FIGURE A.7 (A) Elicited uncertainty of pest infestation per 10,000 plants (histogram in blue–vertical blue line indicates the elicited percentile in the following order: 1%, 25%, 50%, 75%, 99%) and distributional fit (red line); (B) uncertainty of the proportion of pest-free plants per 10,000 (i.e. = 1 – pest infestation proportion expressed as percentage); (C) descending uncertainty distribution function of pest infestation per 10,000 plants.

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A.8 | *XYLOPHILUS AMPELINUS*

A.8.1 | Organism information

Taxonomic information	Current valid scientific name: *Xylophilus ampelinus* (Panagopoulos) Willems et al. Synonyms: Bacillus vitivorus (Smith, 1903) Dye, Erwinia vitivora (Du Plessis, 1940), Xanthomonas ampelina (Panagopoulos, 1969a) Name used in the EU legislation: *Xylophilus ampelinus* Name used in the dossier: *Xylophilus ampelinus* Order: Burkholderiales Family: Comamonadaceae	
Group	Bacteria	
EPPO code	XANTAM	
Regulated status	**EU status:** XANTAM is listed as a regulated non-quarantine pest (RNQP, Annex IV, Part C, concerning vine propagating material of Commission Implementing Regulation (EU) 2019/2072).	
Pest status in applicant country	Present, no details (EPPO GD)	
Pest status in the EU	France Present, restricted distribution; Greece Present, restricted distribution; Italy Present, restricted distribution, Slovenia Present, only in some limited areas; Spain	
Host status on commodity species	*Vitis vinifera* is a major host (EPPO GD)	
PRA information/CRA information		
Other relevant information for the assessment		
Biology	The bacterium *Xylophilus ampelinus* can persist latently in various grapevine propagation materials, including rootstocks, scions, bud chips, and dormant buds (Héritier, 1983). It is capable of overwintering within the vascular tissues of infected plants (Panagopoulos, 1987), although there is no experimental evidence suggesting that fruits serve as a reservoir. In vineyards where the pathogen is present, it survives in woody cankers on trunks, branches, and twigs, as well as in asymptomatic infected vines (Grall et al., 2005). Mechanical operations such as pre-pruning, pruning, and harvesting can facilitate its spread, with bacterial cells detected on pruning tools and inside harvesting equipment (Marcellin, 1976; Ridé, 2000). The pathogen may remain dormant in vine tissues for several years (Ridé et al., 1983), making cuttings a major vehicle for long-distance dissemination (EPPO, 2009). Old wood serves as a key inoculum source, enabling internal colonisation of canes and contamination of bleeding sap during winter (Grall et al., 2005). Even symptomless plants can harbour high bacterial loads in their trunks. During dormancy, bacteria migrate from necrotic xylem vessels into active ones and are subsequently released in the bleeding sap as metabolic activity resumes in early spring (Galet, 2000). This sap, although nutrient-poor, supports bacterial growth and dispersal throughout the bleeding period (Grall et al., 2005). Emerging shoots and leaves are particularly vulnerable to infection. Sap dripping from pruning wounds can contaminate nearby young tissues, allowing the bacteria to travel through xylem vessels toward the trunk (Grall & Manceau, 2003). Symptom development depends on environmental conditions and may not always follow infection (Grall et al., 2005). Additionally, harvest-related wounds in autumn can provide entry points for the pathogen, enabling it to overwinter undetected.	
Symptoms	**Main type of symptoms**	Leaves: angular and brown lesions or discoloration of leaf tips Shoots: linear and brown streaks, developing in cracks and cankers Flowers: blackening, dieback and desiccation Roots: poor development Stems: cracks and cankers, leading to the death of whole vines and by the dieback and desiccation of infected flowers
	Presence of asymptomatic plants	Infected planting material is, most of the time, asymptomatic
	Confusion with other pests	The symptoms of *Xylophilus ampelinus* in grapevines, such as stem cracks and cankers, flower wilting and death of branches or the entire plant, can be confused with several other diseases by fungi or bacteria or physiological disorders.
Host plant range	The only known host is *V. vinifera*. Susceptibility of cultivars can influence the occurrence of the disease (EFSA PLH Panel 2021, EPPO online; Portier et al. 2022)	
Reported evidence of impact	The disease causes severe damage to grapevines, stem cracks, cankers, flower dieback and vine death resulting in yield and quality losses. Its severity depends on the cultivar and strain, and in some cases can lead to major economic losses. Historically, South Africa saw 70–80% losses in 1940 and 1980, though later outbreaks were sporadic and managed with copper sprays. In France, from the 1960s to 1990s, cultivars like Alicante Bouschet, Ugni Blanc, Grenache, and Maccabeu were heavily affected, especially own-rooted vines, while early 21st-century outbreaks impacted Ugni Blanc, Colombard, Grenache and Clairette Muscat. In Greece, the disease is widespread in Crete (notably Sultanine) and has spread to other Aegean islands and the Peloponnese, affecting Corinthe noir and other major grape-growing areas. The overall impact is hard to gauge due to limited studies and potential confusion with other pathogens, likely leading to underestimation.	

(Continued)

Evidence that the commodity is a pathway	The pathogen is mainly confined to vineyards and nearby areas, with viticultural practices such as pruning and irrigation contributing to its spread. Dissemination occurs also through water, particularly rain splash from wounded plants (EPPO online). *X. ampelinus* is most likely spread via infected propagation material, as the bacterium can persist latently in wood. Planting material is therefore considered the main pathway of introduction into new grape-growing regions. Plants for planting are a pathway for long-distance No alternative hosts, carrier plants or insect vectors have been identified.
Surveillance information	Visual inspection and symptom assessment Detection in the laboratory by DNA methods or serology

A.8.2 | Possibility of pest presence in the nursery

A.8.2.1 | Possibility of entry from the surrounding environment

Natural spread of *Xylophilus ampelinus* is considered possible but limited to the immediate surrounding area. The pathogen is mainly spread by viticultural practices through contaminated tools (EPPO, 2009; Ridé, 1977) and by water droplets carrying bacterial cells from bleeding sap of infected vines (EPPO, 1996; Grall, 2005). No host other than *Vitis vinifera*, carrier plants or insect vectors have been described. *X. ampelinus* is monitored by ANSA and has not been detected for 2 years; however, the number of samples is unclear.

Uncertainties:

- The modalities of the surveillance for the disease are unclear.
- The isolation distance between the nursery and surrounding vineyards is unclear.
- Pest pressure in the surrounding areas is unknown.
- Latent infections may be present since they would not be detected by visual inspections.

Taking into consideration the above evidence and uncertainties, the panel considers that it is possible for the pest/pathogen to enter the nursery from the surrounding area.

A.8.2.2 | Possibility of entry with new plants/seeds

The main long-distance pathway of *X. ampelinus* is the movement of infected nursery stock or propagation material, including cuttings, scions and grafted vines (EPPO, 2009). The pathogen can persist latently in woody tissues as well as epiphytically on bracts and bud wool, remaining undetectable by visual inspections (Komatsu, 2015; Panagopoulos, 1987; Ridé, 1983). Thus, the risk of introduction with planting material cannot be fully excluded, even though the risk is unlikely since the material is sourced from basic categories.

Uncertainties:

- Latent infections could remain undetected, even in certified or basic propagation material.
- The extent of testing beyond visual inspection in Moldovan nurseries is unknown.

Taking into consideration the above evidence and uncertainties, the panel considers that it is unlikely that the pathogen will enter the nursery with new plants.

A.8.2.3 | Possibility of spread within the nursery

Natural spread of *Xylophilus ampelinus* is considered likely within the nursery. The pathogen is mainly spread by viticultural practices such as pruning or harvesting through contaminated tools (EPPO, 2009; Ridé, 1977). Bleeding sap exuding from wounds of infected vines and old wood is the main source of contamination (Grall, 2005). Moreover, the spread of the bacteria has been shown to be mediated from shoot to shoot by moist conditions and water including rain splash, overhead irrigation sprinkler and irrigation water used to control *Daktulosphaira vitifoliae* (EFSA, 2014; EPPO, 1996; Mathee, 1970). In spring, *Xylophilus ampelinus* emerges from infected vines and spreads via moisture to healthy plants, with wounds facilitating but not being required for infection (Bradbury, 1991). In vineyards, local spread is often observed along vine rows. Grafting is also a critical pathway (EPPO, 2009), as *X. ampelinus* can survive on woody surfaces and initiate infection when scions and rootstocks are wounded.

Taking into consideration the above evidence and uncertainties, the panel considers that spread within the nursery is possible.

Uncertainties:

- Latent infections in apparently healthy plants may serve as undetected sources of inoculum.
- The degree to which nursery hygiene practices (e.g. tool disinfection, debris management) are applied is not clear.

Taking into consideration the above evidence and uncertainties, the Panel considers that it is possible that the pathogen will spread within the nursery.

A.8.3 | Information from interceptions

There are no records of *X. ampelinus* from Moldova between 1998 and September 2025 (EUROPHYT, online; TRACES-NT, online).

A.8.4 | Evaluation of the risk mitigation options

In the table below, all risk mitigation measures currently applied in Moldova are listed and an indication of their effectiveness on *Xylophilus ampelinus* is provided. The description of the risk mitigaation measures currently applied in Moldova is provided in Table 5 (Section 5).

No	Risk mitigation measure	Effect on the pest	Evaluation and uncertainties
1	*Registration of production sites*	No	
2	*Certification of propagation material*	Yes	According to the dossier material from basic mother plants is inspected to be free from *X. ampelinus* Uncertainties: – Latent, asymptomatic infections could be overlooked – Correct traceability of the starting material in relation to the presence of the disease in it
3	*Sanitation and inspection*	Yes	Visual field inspection could detect disease symptoms. After harvesting, the rootstock strings and scions are prepared for grafting and sorted. After grafting and growing in the field, the grafted vines are sorted and classified. Infested plants are discarded. – Uncertainties: Infection may be latent, or symptoms may not be detected during sorting.
4	*Surveillance, monitoring and sampling*	Yes	Mother plantations and nurseries are visually inspected for symptoms of infections by bacteria Uncertainties: – Latent, asymptomatic infections could be overlooked. – PCR and sampling? –
5	*Application of phytosanitary products (pesticides)*	Yes	Copper-based products may act against *X. ampelinus* – The effectiveness of copper oxide is uncertain
6	*Forecasting of pest and diseases incidence*	Yes	The samples are taken to verify the phytosanitary status and to confirm the absence of RNQPs. Visual inspections are effective at preventing pathogen spread only when clear symptoms are present Uncertainty: – The effectiveness of visual inspections and sampling to detect latent and early infections is questionable
7	*Dissemination of warning notices to farmers*	No	
8	*Sorting and storage*	No	
9	*Hot water treatment*	Yes	Scions treated at 50°C for 45 minutes before grafting, and documented that it is effective against phytoplasmas Uncertainties: – Uncertain if efficient at all levels of infection.
10	*Isolation distances*	Yes	Nurseries located > 1000 m from settlements and industrial vineyards Uncertainties: – It is uncertain if the distance is sufficient to prevent entry of the potential vectors from the surrounding.

(Continued)

No	Risk mitigation measure	Effect on the pest	Evaluation and uncertainties
11	*Cultural methods*	Yes	Good growing practices should be applied. Daily cleaning of grafting machines and standardised cleaning protocols. Uncertainties: – Effectiveness of cleaning protocols and cross-contamination through shared equipment
12	*Physical methods*	No	
13	*Biological control methods*	No	

A.8.5 | Overall likelihood of pest freedom

A.8.5.1 | Reasoning for a scenario which would lead to a reasonably low number of infested consignments

Registration and certification of propagation material ensure bacteria-free production.

A.8.5.2 | Reasoning for a scenario which would lead to a reasonably high number of infested consignments

Visual inspection will not detect early stages of infections or asymptomatic infections.

A.8.5.3 | Reasoning for a central scenario equally likely to over- or underestimate the number of infested consignments (median)

Scattered to the left because the low-risk scenario is more likely to happen.

A.8.5.4 | Reasoning for the precision of the judgement describing the remaining uncertainties (1st and 3rd quartile/interquartile range)

– Status of the bacteria in the surrounding areas is unknown.

A.8.5.5 | Elicitation outcomes of the assessment of the pest freedom for *Xylophilus ampelinus*

The following Tables show the elicited and fitted values for pest infestation/infection (Table A.15) and pest freedom (Table A.16).

Based on the numbers of estimated infested plants, the pest freedom was calculated (i.e. = 10,000 – the number of infested plants per 10,000). The fitted values of the uncertainty distribution of the pest freedom are shown in Table A.16.

TABLE A.15 Elicited and fitted values of the uncertainty distribution of pest infestation by *Xylophilus ampelinus* per 10,000 plants.

Percentile	1%	2.5%	5%	10%	17%	25%	33%	50%	67%	75%	83%	90%	95%	97.5%	99%
Elicited values	0					10		15		20					40
EKE	3.36	4.43	5.53	7.04	8.57	10.2	11.7	14.7	18.2	20.3	23.2	26.5	30.7	34.7	39.7

Note: The EKE results are *BetaGeneral (4.0869, 2558.1, 0, 10,000)* fitted with @Risk version 7.5.

TABLE A.16 The uncertainty distribution of plants free of *Xylophilus ampelinus* per 10,000 plants calculated in Table A.15.

Percentile	1%	2.5%	5%	10%	17%	25%	33%	50%	67%	75%	83%	90%	95%	97.5%	99%
Values	9960					9980		9985		9990					10,000
EKE results	9960	9965	9969	9973	9977	9980	9982	9985	9988	9990	9991	9993	9994	9996	9997

Note: The EKE results are the fitted values.

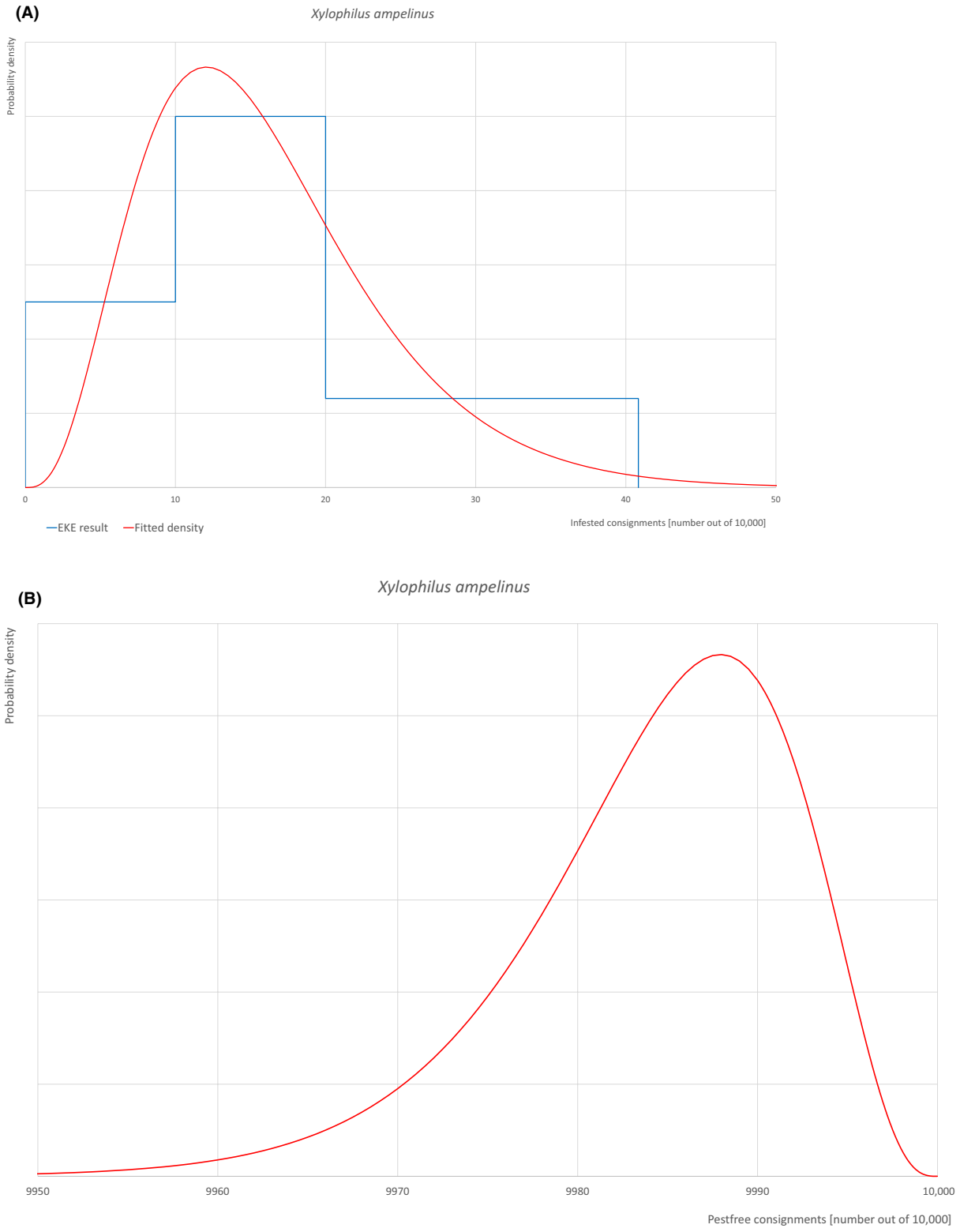

FIGURE A.8 (Continued)

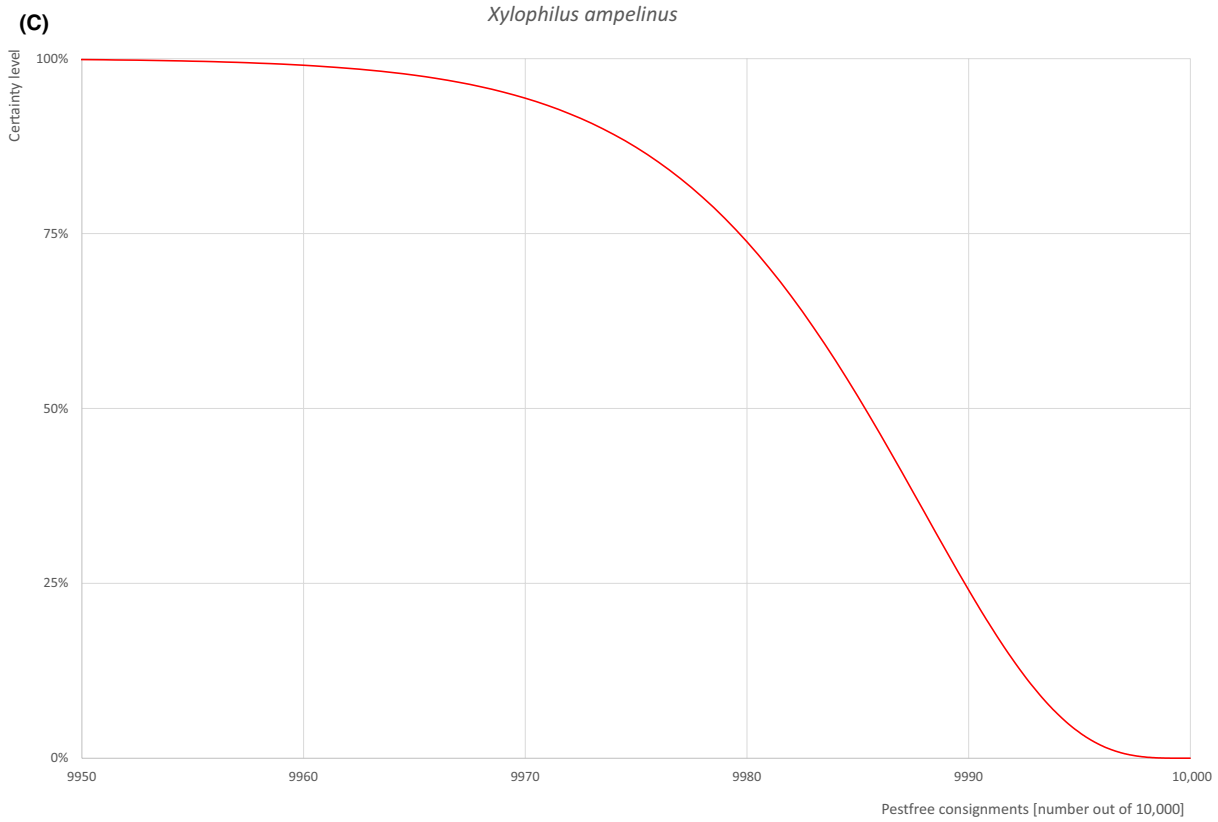

FIGURE A.8 (A) Elicited uncertainty of pest infestation per 10,000 plants (histogram in blue–vertical blue line indicates the elicited percentile in the following order: 1%, 25%, 50%, 75%, 99%) and distributional fit (red line); (B) uncertainty of the proportion of pest-free plants per 10,000 (i.e. = 1 – pest infestation proportion expressed as percentage); (C) descending uncertainty distribution function of pest infestation per 10,000 plants.

A.8.6 | References list

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APPENDIX B

Web of Science All Databases Search String

In the table below, the search string used in Web of Science is reported. In total, *3619* papers were retrieved. Titles and abstracts were screened, and *453* pests were added to the list of pests (see Appendix C).

Web of Science All databases	*TOPIC:* *("Vitis berlandieri" OR "V. berlandieri" OR "Spanish grape"); ("Vitis berlandieri x Vitis riparia"); ("Vitis rupestris" OR "V. rupestris" OR "frost grape"); ("Vitis vinifera" OR "V. vinifera" OR "grapevine"); ("Vitis riparia x Vitis rupestris"); ("Vitis riparia" OR "Vitis rubra" OR "riverbank grape")* *AND* *TOPIC: ("pathogen*" OR "fung*" OR "oomycet*" OR "myce*" OR "disease$" OR "infecti*" OR "damag*" OR "symptom*" OR "pest$" OR "vector" OR "host plant$" OR "host-plant$" OR "host" OR "root lesion$" OR "decline$" OR "infestation$" OR "damage$" OR "dieback*" OR "die back*" OR "die-back*" OR "blight$" OR "canker" OR "scab$" OR "rot" OR "rots" OR "rotten" OR "damping-off" OR "smut" OR "mould" OR "mold" OR nematod* OR "root knot" OR "root-knot" OR root tip OR cyst$ OR "dagger" OR "plant parasitic" OR "root feeding" OR "root$ feeding" OR "plant$parasitic" OR "root lesion$" OR damage$ OR infestation$ OR symptom* OR pest$ OR pathogenic bacteria OR mycoplasma* OR bacteri* OR phytoplasma* OR wilt$ OR wilted OR canker OR witch* OR yellowing OR leafroll OR bacterial gall OR crown gall OR spot OR blast OR pathogen* OR virus* OR viroid* OR disease$ OR infecti* OR damag* OR symptom* OR pest$ OR decline$ OR infestation$ OR damage$ OR virosis OR canker OR blister$ OR mosaic OR "leaf curl" OR "latent" OR insect$ OR mite$ OR malaise OR aphid$ OR curculio OR thrip$ OR cicad$ OR miner$ OR borer$ OR weevil$ OR "plant bug$" OR spittlebug$ OR moth$ OR mealybug$ OR cutworm$ OR pillbug$ OR caterpillar$ OR "foliar feeder$" OR "root feeder$")* *NOT* *TOPIC: ("heavy metal$" OR "pollut*" OR "weather" OR "propert*" OR probes OR "spectr*" OR "antioxidant$" OR "transformation" OR "RNA" OR "peach palm$" OR peel OR resistance OR gene OR DNA OR "Secondary plant metabolite$" OR metabolite$ OR Catechin OR "Epicatechin" OR "Rutin" OR "Phloridzin" OR "Chlorogenic acid" OR "Caffeic acid" OR "Phenolic compounds" OR "Quality" OR "Appearance" OR Postharvest OR Antibacterial OR Abiotic OR Storage OR Pollin* OR Ethylene OR Thinning OR fertil* OR Mulching OR Nutrient$ OR Pruning OR "human virus" OR "animal disease$" OR "plant extracts" OR "immunological" OR "purified fraction" OR "traditional medicine" OR "medicine" OR mammal$ OR bird$ OR "human disease$")* *NOT* *TOPIC: ("Acanalonia conica" OR "Aphis illinoisensis" OR "Aphis illinoisensis" OR "Apscaviroid betaflavivitis" OR "Botryosphaeria dothidea" OR "Brevipalpus azores" OR "Brevipalpus yothersi" OR "Cadophora luteo-olivacea" OR "Campylocarpon pseudofasciculare" OR "Dactylonectria riojana" OR "Daktulosphaira vitifoliae" OR "Daktulosphaira vitifoliae" OR "Diabrotica virgifera zeae")* ***Search string for Vitis berlandieri*** *TOPIC:* *("Vitis berlandieri" OR "V. berlandieri" OR "Spanish grape")* *AND* *("pathogen*" OR "fung*" OR "oomycet*" OR "myce*" OR "disease$" OR "infecti*" OR "damag*" OR "symptom*" OR "pest$" OR "vector" OR "host plant$" OR "host-plant$" OR "host" OR "root lesion$" OR "decline$" OR "infestation$" OR "damage$" OR "dieback*" OR "die back*" OR "die-back*" OR "blight$" OR "canker" OR "scab$" OR "rot" OR "rots" OR "rotten" OR "damping-off" OR "smut" OR "mould" OR "mold" OR nematod* OR "root knot" OR "root-knot" OR root tip OR cyst$ OR "dagger" OR "plant parasitic" OR "root feeding" OR "root$ feeding" OR "plant$parasitic" OR "root lesion$" OR "damage$" OR "infestation$" OR "symptom*" OR "pest$" OR "pathogenic bacteria" OR "mycoplasma*" OR "bacteri*" OR "phytoplasma*" OR "wilt$" OR "wilted" OR "canker" OR "witch*" OR "yellowing" OR "leafroll" OR "bacterial gall" OR "crown gall" OR "spot" OR "blast" OR "pathogen*" OR "virus*" OR "viroid*" OR "disease$" OR "infecti*" OR "damag*" OR "symptom*" OR "pest$" OR "decline$" OR "infestation$" OR "damage$" OR "virosis" OR "canker" OR "blister$" OR "mosaic" OR "leaf curl" OR "latent" OR "insect$" OR "mite$" OR "malaise" OR "aphid$" OR "curculio" OR "thrip$" OR "cicad$" OR "miner$" OR "borer$" OR "weevil$" OR "plant bug$" OR "spittlebug$" OR "moth$" OR "mealybug$" OR "cutworm$" OR "pillbug$" OR "caterpillar$" OR "foliar feeder$" OR "root feeder$")* *NOT* *("heavy metal$" OR "pollut*" OR "weather" OR "propert*" OR probes OR "spectr*" OR "antioxidant$" OR "transformation" OR "RNA" OR "peel" OR "resistance" OR gene OR "DNA" OR "Secondary plant metabolite$" OR "metabolite$" OR "Catechin" OR "Epicatechin" OR "Rutin" OR "Phloridzin" OR "Chlorogenic acid" OR "Caffeic acid" OR "Phenolic compounds" OR "Quality" OR "Appearance" OR "Postharvest" OR "Antibacterial" OR "Abiotic" OR "Storage" OR "Pollin* "OR "Ethylene" OR "Thinning" OR "fertil*" OR "Mulching" OR "Nutrient$" OR "Pruning" OR "human virus" OR "animal disease$" OR "plant extracts" OR "immunological" OR "purified fraction" OR "traditional medicine" OR "medicine" OR "mammal$" OR "bird$" OR "human disease$")* *NOT* *("Acanalonia conica" OR "Aphis illinoisensis" OR "Aphis illinoisensis" OR "Apscaviroid betaflavivitis" OR "Botryosphaeria dothidea" OR "Brevipalpus azores" OR "Brevipalpus yothersi" OR "Cadophora luteo-olivacea" OR "Campylocarpon pseudofasciculare" OR "Dactylonectria riojana" OR "Daktulosphaira vitifoliae" OR "Daktulosphaira vitifoliae" OR "Diabrotica virgifera zeae" OR "Grapevine flavescence dorée phytoplasma" OR "Guignardia bidwellii" OR "Hemiberlesia lataniae" OR "Homalodisca vitripennis" OR "Ilyonectria vivaria" OR "Margarodes prieskaensis" OR "Margarodes vitis" OR "Margarodes vredendalensis" OR "Meloidogyne chitwoodi" OR "Meloidogyne ethiopica" OR "Meloidogyne incognita" OR "Meloidogyne javanica" OR "Meloidogyne nataliei" OR "Mesocriconema xenoplax" OR "Nepovirus myrtilli" OR "Paratylenchus hamatus" OR "Phaeoacremonium pravum" OR "Phenacoccus solenopsis" OR "Pratylenchus vulnus" OR "Pseudococcus comstocki" OR "Pseudopezicula tetraspora" OR "Tylenchulus semipenetrans" OR "Uncinula necator" OR "Uncinula necator var. necator" OR "Viteus vitifolii" OR "Xiphinema americanum" OR "Xiphinema index" OR "Xylella fastidiosa" OR "Xylophilus ampelinus")*

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String for Vitis berlandierixVitis riparia

TOPIC ("Vitis berlandieri x Vitis riparia ")
AND
("pathogen" OR "fung*" OR "oomycet*" OR "myce*" OR "disease$" OR "infecti*" OR "damag*" OR "symptom*" OR "pest$" OR "vector" OR "host plant$" OR "host-plant$" OR "host" OR "root lesion$" OR "decline$" OR "infestation$" OR "damage$" OR "dieback*" OR "die back*" OR "die-back*" OR "blight$" OR "canker" OR "scab$" OR "rot" OR "rots" OR "rotten" OR "damping-off" OR "smut" OR "mould" OR "mold" OR nematod* OR "root knot" OR "root-knot" OR root tip OR cyst$ OR "dagger" OR "plant parasitic" OR "root feeding" OR "root$ feeding" OR "plant$parasitic" OR "root lesion$" OR "damage$" OR "infestation$" OR "symptom*" OR "pest$" OR "pathogenic bacteria" OR "mycoplasma*" OR "bacteri*" OR "phytoplasma*" OR "wilt$" OR "wilted" OR "canker" OR "witch*" OR "yellowing" OR "leafroll" OR "bacterial gall" OR "crown gall" OR "spot" OR "blast" OR "pathogen*" OR "virus*" OR "viroid*" OR "disease$" OR "infecti*" OR "damag*" OR "symptom*" OR "pest$" OR "decline$" OR "infestation$" OR "damage$" OR "virosis" OR "canker" OR "blister$" OR "mosaic" OR "leaf curl" OR "latent" OR "insect$" OR "mite$" OR "malaise" OR "aphid$" OR "curculio" OR "thrip$" OR "cicad$" OR "miner$" OR "borer$" OR "weevil$" OR "plant bug$" OR "spittlebug$" OR "moth$" OR "mealybug$" OR "cutworm$" OR "pillbug$" OR "caterpillar$" OR "foliar feeder$" OR "root feeder$")*
NOT
("heavy metal$" OR "pollut*" OR "weather" OR "propert*" OR probes OR "spectr*" OR "antioxidant$" OR "transformation" OR "RNA" OR "peel" OR "resistance" OR gene OR "DNA" OR "Secondary plant metabolite$" OR "metabolite$" OR "Catechin" OR "Epicatechin" OR "Rutin" OR "Phloridzin" OR "Chlorogenic acid" OR "Caffeic acid" OR "Phenolic compounds" OR "Quality" OR "Appearance" OR "Postharvest" OR "Antibacterial" OR "Abiotic" OR "Storage" OR "Pollin "OR "Ethylene" OR "Thinning" OR "fertil*" OR "Mulching" OR "Nutrient$" OR "Pruning" OR "human virus" OR "animal disease$" OR "plant extracts" OR "immunological" OR "purified fraction" OR "traditional medicine" OR "medicine" OR "mammal$" OR "bird$" OR "human disease$")*
NOT
("Apiotrichum porosum" OR "Cylindrocarpon liriodendri" OR "Daktulosphaira vitifoliae" OR "Grapevine flavescence dorıe phytoplasma" OR "Margarodes prieskaensis" OR "Margarodes vitis" OR "Margarodes vredendalensis" OR "Meloidogyne chitwoodi" OR "Meloidogyne ethiopica" OR "Meloidogyne incognita" OR "Meloidogyne javanica" OR "Meloidogyne nataliei" OR "Mesocriconema xenoplax" OR "Nepovirus myrtilli" OR "Paratylenchus hamatus" OR "Phaeoacremonium armeniacum" OR "Phaeoacremonium globosum" OR "Phaeoacremonium occidentale" OR "Phomopsis eucommiicola" OR "Pratylenchus vulnus" OR "Trichosporon porosum" OR "Tylenchulus semipenetrans" OR "Umbelopsis ramanniana" OR "Xiphinema americanum" OR "Xiphinema index" OR "Xylella fastidiosa" OR "Xylophilus ampelinus")

String for Vitis riparia

TOPIC ("Vitis riparia" OR "Vitis rubra" OR "riverbank grape")
AND
("pathogen" OR "fung*" OR "oomycet*" OR "myce*" OR "disease$" OR "infecti*" OR "damag*" OR "symptom*" OR "pest$" OR "vector" OR "host plant$" OR "host-plant$" OR "host" OR "root lesion$" OR "decline$" OR "infestation$" OR "damage$" OR "dieback*" OR "die back*" OR "die-back*" OR "blight$" OR "canker" OR "scab$" OR "rot" OR "rots" OR "rotten" OR "damping-off" OR "smut" OR "mould" OR "mold" OR nematod* OR "root knot" OR "root-knot" OR root tip OR cyst$ OR "dagger" OR "plant parasitic" OR "root feeding" OR "root$ feeding" OR "plant$parasitic" OR "root lesion$" OR "damage$" OR "infestation$" OR "symptom*" OR "pest$" OR "pathogenic bacteria" OR "mycoplasma*" OR "bacteri*" OR "phytoplasma*" OR "wilt$" OR "wilted" OR "canker" OR "witch*" OR "yellowing" OR "leafroll" OR "bacterial gall" OR "crown gall" OR "spot" OR "blast" OR "pathogen*" OR "virus*" OR "viroid*" OR "disease$" OR "infecti*" OR "damag*" OR "symptom*" OR "pest$" OR "decline$" OR "infestation$" OR "damage$" OR "virosis" OR "canker" OR "blister$" OR "mosaic" OR "leaf curl" OR "latent" OR "insect$" OR "mite$" OR "malaise" OR "aphid$" OR "curculio" OR "thrip$" OR "cicad$" OR "miner$" OR "borer$" OR "weevil$" OR "plant bug$" OR "spittlebug$" OR "moth$" OR "mealybug$" OR "cutworm$" OR "pillbug$" OR "caterpillar$" OR "foliar feeder$" OR "root feeder$")*
NOT
("heavy metal$" OR "pollut*" OR "weather" OR "propert*" OR probes OR "spectr*" OR "antioxidant$" OR "transformation" OR "RNA" OR "peel" OR "resistance" OR gene OR "DNA" OR "Secondary plant metabolite$" OR "metabolite$" OR "Catechin" OR "Epicatechin" OR "Rutin" OR "Phloridzin" OR "Chlorogenic acid" OR "Caffeic acid" OR "Phenolic compounds" OR "Quality" OR "Appearance" OR "Postharvest" OR "Antibacterial" OR "Abiotic" OR "Storage" OR "Pollin "OR "Ethylene" OR "Thinning" OR "fertil*" OR "Mulching" OR "Nutrient$" OR "Pruning" OR "human virus" OR "animal disease$" OR "plant extracts" OR "immunological" OR "purified fraction" OR "traditional medicine" OR "medicine" OR "mammal$" OR "bird$" OR "human disease$" OR "esca" OR "black measles" OR "grape leaf disease" OR "Phylloxera" OR "downy mildew" OR "powdery mildew" OR "grey mould" OR "eutypa dieback" OR "botryosphaeria dieback" OR "excoriosis")*
NOT
("Amphion floridensis" OR "Aphis fabae" OR "Aphis illinoisensis" OR "Aphis ripariae" OR "Botrytis ampelophila" OR "Briosia ampelophaga" OR "Cadophora orientoamericana" OR "Campylocarpon pseudofasciculare" OR "Colletotrichum siamense" OR "Cylindrocladiella pseudoparva" OR "Daktulosphaira vitifoliae" OR "Darapsa myron myron" OR "Diplodia ampelina" OR "Elsinoe ampelina" OR "Eumorpha pandorus" OR "Gloeosporium sarmenticola" OR "Hainesia lythri" OR "Halyomorpha halys" OR "Hemiberlesia lataniae" OR "Homalodisca vitripennis" OR "Lycorma delicatula" OR "Margarodes prieskaensis" OR "Margarodes vitis" OR "Margarodes vredendalensis" OR "Meloidogyne chitwoodi" OR "Meloidogyne ethiopica" OR "Meloidogyne incognita" OR "Meloidogyne javanica" OR "Meloidogyne nataliei" OR "Mesocriconema xenoplax" OR "Neofusicoccum luteum" OR "Neopulvinaria innumerabilis innumerabilis" OR "Nepovirus myrtilli" OR "Paratylenchus hamatus" OR "Passalora vitis-ripariae" OR "Phaeoacremonium canadense" OR "Phenacoccus solenopsis" OR "Phyllocnistis vitegenella" OR "Phyllosticta ampelicida" OR "Phyllosticta turmalis" OR "Phyllosticta viticola" OR "Plasmopara viticola" OR "Popillia japonica" OR "Pratylenchus vulnus" OR "Pseudococcus comstocki" OR "Pseudopezicula tetraspora" OR "Pseudovalsa viticola" OR "Sclerotiopsis concava" OR "Septoria ampelina" OR "Sphecodina abbottii" OR "Thyridium vitis" OR "Tylenchulus semipenetrans" OR "Viteus vitifoliae" OR "Xiphinema americanum" OR "Xiphinema globosum" OR "Xiphinema index" OR "Xylella fastidiosa" OR "Xylophilus ampelinus")

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String for Vitis ripariaxVitis rupestris

TOPIC ("Vitis riparia x Vitis rupestris")
AND
("pathogen" OR "fung*" OR "oomycet*" OR "myce*" OR "disease$" OR "infecti*" OR "damag*" OR "symptom*" OR "pest$" OR "vector" OR "host plant$" OR "host-plant$" OR "host" OR "root lesion$" OR "decline$" OR "infestation$" OR "damage$" OR "dieback*" OR "die back*" OR "die-back*" OR "blight$" OR "canker" OR "scab$" OR "rot" OR "rots" OR "rotten" OR "damping-off" OR "smut" OR "mould" OR "mold" OR nematod* OR "root knot" OR "root-knot" OR root tip OR cyst$ OR "dagger" OR "plant parasitic" OR "root feeding" OR "root$ feeding" OR "plant$parasitic" OR "root lesion$" OR "damage$" OR "infestation$" OR "symptom*" OR "pest$" OR "pathogenic bacteria" OR "mycoplasma*" OR "bacteri*" OR "phytoplasma*" OR "wilt$" OR "wilted" OR "canker" OR "witch*" OR "yellowing" OR "leafroll" OR "bacterial gall" OR "crown gall" OR "spot" OR "blast" OR "pathogen*" OR "virus*" OR "viroid*" OR "disease$" OR "infecti*" OR "damag*" OR "symptom*" OR "pest$" OR "decline$" OR "infestation$" OR "damage$" OR "virosis" OR "canker" OR "blister$" OR "mosaic" OR "leaf curl" OR "latent" OR "insect$" OR "mite$" OR "malaise" OR "aphid$" OR "curculio" OR "thrip$" OR "cicad$" OR "miner$" OR "borer$" OR "weevil$" OR "plant bug$" OR "spittlebug$" OR "moth$" OR "mealybug$" OR "cutworm$" OR "pillbug$" OR "caterpillar$" OR "foliar feeder$" OR "root feeder$")*
NOT
("heavy metal$" OR "pollut*" OR "weather" OR "propert*" OR probes OR "spectr*" OR "antioxidant$" OR "transformation" OR "RNA" OR "peel" OR "resistance" OR gene OR "DNA" OR "Secondary plant metabolite$" OR "metabolite$" OR "Catechin" OR "Epicatechin" OR "Rutin" OR "Phloridzin" OR "Chlorogenic acid" OR "Caffeic acid" OR "Phenolic compounds" OR "Quality" OR "Appearance" OR "Postharvest" OR "Antibacterial" OR "Abiotic" OR "Storage" OR "Pollin "OR "Ethylene" OR "Thinning" OR "fertil*" OR "Mulching" OR "Nutrient$" OR "Pruning" OR "human virus" OR "animal disease$" OR "plant extracts" OR "immunological" OR "purified fraction" OR "traditional medicine" OR "medicine" OR "mammal$" OR "bird$" OR "human disease$" OR "esca" OR "black measles" OR "grape leaf disease" OR "Phylloxera" OR "downy mildew" OR "powdery mildew" OR "grey mould" OR "eutypa dieback" OR "Botryosphaeria dieback" OR "excoriosis")*
NOT
("Campylocarpon pseudofasciculare" OR "Dactylonectria novozelandica" OR "Epicoccum nigrum" OR "Meloidogyne chitwoodi" OR "Meloidogyne ethiopica" OR "Meloidogyne incognita" OR "Meloidogyne javanica" OR "Mesocriconema xenoplax" OR "Neofusicoccum australe" OR "Neofusicoccum luteum" OR "Neofusicoccum parvum" OR "Ophiostoma nigrocarpum" OR "Paratylenchus hamatus" OR "Phaeoacremonium canadense" OR "Phaeomoniella chlamydospora" OR "Phoma exigua" OR "Pratylenchus vulnus" OR "Roesleria subterranea" OR "Tylenchulus semipenetrans" OR "Xiphinema americanum" OR "Xiphinema index")

String for Vitis rupestris

TOPIC ("Vitis rupestris" OR "V. rupestris" OR "frost grape")
AND
("pathogen" OR "fung*" OR "oomycet*" OR "myce*" OR "disease$" OR "infecti*" OR "damag*" OR "symptom*" OR "pest$" OR "vector" OR "host plant$" OR "host-plant$" OR "host" OR "root lesion$" OR "decline$" OR "infestation$" OR "damage$" OR "dieback*" OR "die back*" OR "die-back*" OR "blight$" OR "canker" OR "scab$" OR "rot" OR "rots" OR "rotten" OR "damping-off" OR "smut" OR "mould" OR "mold" OR nematod* OR "root knot" OR "root-knot" OR root tip OR cyst$ OR "dagger" OR "plant parasitic" OR "root feeding" OR "root$ feeding" OR "plant$parasitic" OR "root lesion$" OR "damage$" OR "infestation$" OR "symptom*" OR "pest$" OR "pathogenic bacteria" OR "mycoplasma*" OR "bacteri*" OR "phytoplasma*" OR "wilt$" OR "wilted" OR "canker" OR "witch*" OR "yellowing" OR "leafroll" OR "bacterial gall" OR "crown gall" OR "spot" OR "blast" OR "pathogen*" OR "virus*" OR "viroid*" OR "disease$" OR "infecti*" OR "damag*" OR "symptom*" OR "pest$" OR "decline$" OR "infestation$" OR "damage$" OR "virosis" OR "canker" OR "blister$" OR "mosaic" OR "leaf curl" OR "latent" OR "insect$" OR "mite$" OR "malaise" OR "aphid$" OR "curculio" OR "thrip$" OR "cicad$" OR "miner$" OR "borer$" OR "weevil$" OR "plant bug$" OR "spittlebug$" OR "moth$" OR "mealybug$" OR "cutworm$" OR "pillbug$" OR "caterpillar$" OR "foliar feeder$" OR "root feeder$")*
NOT
("heavy metal$" OR "pollut*" OR "weather" OR "propert*" OR probes OR "spectr*" OR "antioxidant$" OR "transformation" OR "RNA" OR "peel" OR "resistance" OR gene OR "DNA" OR "Secondary plant metabolite$" OR "metabolite$" OR "Catechin" OR "Epicatechin" OR "Rutin" OR "Phloridzin" OR "Chlorogenic acid" OR "Caffeic acid" OR "Phenolic compounds" OR "Quality" OR "Appearance" OR "Postharvest" OR "Antibacterial" OR "Abiotic" OR "Storage" OR "Pollin "OR "Ethylene" OR "Thinning" OR "fertil*" OR "Mulching" OR "Nutrient$" OR "Pruning" OR "human virus" OR "animal disease$" OR "plant extracts" OR "immunological" OR "purified fraction" OR "traditional medicine" OR "medicine" OR "mammal$" OR "bird$" OR "human disease$")*
NOT
("Apscaviroid betaflavivitis" OR "Badnavirus venavitis" OR "Berkeleyomyces basicola" OR "Bovistella radicata" OR "Brevipalpus azores" OR "Brevipalpus yothersi" OR "Campylocarpon pseudofasciculare" OR "Cercospora vitis var. rupestris" OR "Daktulosphaira vitifoliae" OR "Daktulosphaira vitifoliae" OR "Diabrotica virgifera zeae" OR "Elsinoë ampelina" OR "Eutypa lata" OR "Eutypella vitis" OR "Grapevine flavescence dorıe phytoplasma" OR "Grapevine leafroll associated viruses" OR "Grapevine virus A" OR "Graphocephala atropunctata" OR "Guignardia bidwellii" OR "Hemiberlesia lataniae" OR "Hemicriconemoides californianus" OR "Homalodisca vitripennis" OR "Margarodes prieskaensis" OR "Margarodes vitis" OR "Margarodes vredendalensis" OR "Meloidogyne arenaria" OR "Meloidogyne chitwoodi" OR "Meloidogyne ethiopica" OR "Meloidogyne incognita" OR "Meloidogyne javanica" OR "Meloidogyne nataliei" OR "Mesocriconema xenoplax" OR "Mycosphaerella personata" OR "Neopulvinaria innumerabilis innumerabilis" OR "Nepovirus myrtilli" OR "Paratylenchus hamatus" OR "Phenacoccus solenopsis" OR "Phomopsis viticola" OR "Phyllosticta viticola" OR "Phymatotrichopsis omnivora" OR "Phymatotrichum omnivorum" OR "Phytophthora cinnamomi" OR "Plasmopara viticola" OR "Pratylenchus vulnus" OR "Pseudocercospora vitis" OR "Pseudococcus comstocki" OR "Pseudopezicula tetraspora" OR "Thielaviopsis basicola" OR "Trematosphaeria vitigena" OR "Trichocladium basicola" OR "Tylenchulus semipenetrans" OR "Uncinula necator" OR "Uncinula necator var. necator" OR "Verticillium dahliae" OR "Viteus vitifolii" OR "Xiphinema americanum" OR "Xiphinema australiae" OR "Xiphinema diversicaudatum" OR "Xiphinema index" OR "Xylella fastidiosa" OR "Xylella fastidiosa" OR "Xylophilus ampelinus")

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String for Vitis vinifera

TOPIC ("Vitis vinifera" OR "V. vinifera" OR "grapevine")
AND
("pathogen" OR "fung*" OR "oomycet*" OR "myce*" OR "disease$" OR "infecti*" OR "damag*" OR "symptom*" OR "pest$" OR "vector" OR "host plant$" OR "host-plant$" OR "host" OR "root lesion$" OR "decline$" OR "infestation$" OR "damage$" OR "dieback*" OR "die back*" OR "die-back*" OR "blight$" OR "canker" OR "scab$" OR "rot" OR "rots" OR "rotten" OR "damping-off" OR "smut" OR "mould" OR "mold" OR nematod* OR "root knot" OR "root-knot" OR root tip OR cyst$ OR "dagger" OR "plant parasitic" OR "root feeding" OR "root$ feeding" OR "plant$parasitic" OR "root lesion$" OR "damage$" OR "infestation$" OR "symptom*" OR "pest$" OR "pathogenic bacteria" OR "mycoplasma*" OR "bacteri*" OR "phytoplasma*" OR "wilt$" OR "wilted" OR "canker" OR "witch*" OR "yellowing" OR "leafroll" OR "bacterial gall" OR "crown gall" OR "spot" OR "blast" OR "pathogen*" OR "virus*" OR "viroid*" OR "disease$" OR "infecti*" OR "damag*" OR "symptom*" OR "pest$" OR "decline$" OR "infestation$" OR "damage$" OR "virosis" OR "canker" OR "blister$" OR "mosaic" OR "leaf curl" OR "latent" OR "insect$" OR "mite$" OR "malaise" OR "aphid$" OR "curculio" OR "thrip$" OR "cicad$" OR "miner$" OR "borer$" OR "weevil$" OR "plant bug$" OR "spittlebug$" OR "moth$" OR "mealybug$" OR "cutworm$" OR "pillbug$" OR "caterpillar$" OR "foliar feeder$" OR "root feeder$")*
NOT
("heavy metal$" OR "pollut*" OR "weather" OR "propert*" OR probes OR "spectr*" OR "antioxidant$" OR "transformation" OR "RNA" OR "peel" OR "resistance" OR gene OR "DNA" OR "Secondary plant metabolite$" OR "metabolite$" OR "Catechin" OR "Epicatechin" OR "Rutin" OR "Phloridzin" OR "Chlorogenic acid" OR "Caffeic acid" OR "Phenolic compounds" OR "Quality" OR "Appearance" OR "Postharvest" OR "Antibacterial" OR "Abiotic" OR "Storage" OR "Pollin "OR "Ethylene" OR "Thinning" OR "fertil*" OR "Mulching" OR "Nutrient$" OR "Pruning" OR "human virus" OR "animal disease$" OR "plant extracts" OR "immunological" OR "purified fraction" OR "traditional medicine" OR "medicine" OR "mammal$" OR "bird$" OR "human disease$")*
NOT
("Abagrotis cupida" OR "Abagrotis orbis" OR "Abgrallaspis cyanophylli" OR "Acanalonia conica" OR "Acanthacris ruficornis" OR "Achatia distincta" OR "Achatina fulica" OR "Acherontia atropos" OR "Acoloithus falsarius" OR "Acremonium acutatum" OR "Acremonium alternatum" OR "Acremonium sclerotigenum" OR "Acremonium strictum" OR "Acrocalymma vagum" OR "Acrospermum viticola" OR "Actinomucor elegans" OR "Adoretus sinicus" OR "Aeolothrips collaris" OR "Aeolothrips intermedius" OR "Aequabiliella palatina" OR "Agalmatium bilobum" OR "Agrilus viridis" OR "Agriotes lineatus" OR "Agrobacterium tumefaciens" OR "Agrobacterium tumefaciens" OR "Agrotis crassa" OR "Agrotis ipsilon" OR "Agrotis segetum" OR "Agrotis segetum" OR "Ailanthus altissima" OR "Albifimbria verrucaria" OR "Albifimbria viridis" OR "Albonectria rigidiuscula" OR "Aleurocanthus spiniferus" OR "Aleurodicus dispersus" OR "Aleurodothrips fasciapennis" OR "Alfalfa mosaic virus" OR "Alfaria cyperi-esculenti" OR "Alfaria vitis" OR "Allonychus braziliensis" OR "Alternaria alternata" OR "Alternaria alternata" OR "Alternaria arborescens" OR "Alternaria cucurbitae" OR "Alternaria italica" OR "Alternaria mali" OR "Alternaria tenuis" OR "Alternaria tenuissima" OR "Alternaria viticola" OR "Alternaria vitis" OR "Altica ampelophaga" OR "Alydus calcaratus" OR "Alypia octomaculata" OR "Amaranthus blitum" OR "Amaranthus graecizans" OR "Amaranthus retroflexus" OR "Amaranthus viridis" OR "Amblypelta lutescens" OR "Ameroseius pavidus" OR "Amerosporium concinnum" OR "Ampelophaga rubiginosa" OR "Ampelovirus tetravitis" OR "Ampelovirus trivitis" OR "Ampelovirus univitis" OR "Amphicerus bicaudatus" OR "Amphicerus bimaculatus" OR "Amphion floridensis" OR "Amphipyra pyramidoides" OR "Amphipyra tragopoginis" OR "Amphisphaeria sylvana" OR "Amplicephalus sonorus" OR "Amyelois transitella" OR "Anacridium rubrispinum" OR "Anagallis arvensis" OR "Anastrepha fraterculus" OR "Anastrepha obliqua" OR "Angiopsora ampelopsidis" OR "Angustimassarina populi" OR "Anomala cuprea" OR "Anomala dubia" OR "Anoxia orientalis" OR "Antherina suraka" OR "Antispila oinophylla" OR "Antispila oinophylla" OR "Anystis baccarum" OR "Aonidiella aurantii" OR "Aonidiella aurantii" OR "Aonidiella citrina" OR "Aonidiella inornata" OR "Aonidiella orientalis" OR "Aonidiella orientalis" OR "Apate monachus" OR "Aphelenchoides hamatus" OR "Aphelenchus avenae" OR "Aphis aurantii" OR "Aphis craccivora" OR "Aphis fabae" OR "Aphis fabae" OR "Aphis gossypii" OR "Aphis gossypii" OR "Aphis hederae" OR "Aphis illinoisensis" OR "Aphis illinoisensis" OR "Aphis spiraecola" OR "Aphis spiraecola" OR "Aphrophora permutata" OR "Apiospora montagnei" OR "Aploneura ampelina" OR "Aplosporella fabaeformis" OR "Arabis mosaic virus" OR "Arambarria cognata" OR "Arboridia adanae" OR "Arboridia kakogawana" OR "Arboridia kakogowana" OR "Arctia caja" OR "Arctia villica" OR "Argyrotaenia ljungiana" OR "Argyrotaenia ljungiana" OR "Armillaria limonea" OR "Armillaria luteobubalina" OR "Armillaria luteobubalina" OR "Armillaria mellea" OR "Armillaria mellea" OR "Armillaria novae-zelandiae" OR "Armillariella mellea" OR "Armillariella tabescens" OR "Arthrinium arundinis" OR "Arthrinium phaeospermum" OR "Artichoke Italian latent virus" OR "Arxiomyces vitis" OR "Ascochyta ampelina" OR "Ascochytella ampelina" OR "Ascospora viticola" OR "Aspergillus aculeatus" OR "Aspergillus awamori" OR "Aspergillus carbonarius" OR "Aspergillus flavus" OR "Aspergillus flavus" OR "Aspergillus japonicus" OR "Aspergillus niger" OR "Aspergillus niger" OR "Aspergillus pallidofulvus" OR "Aspergillus puulaauensis" OR "Aspergillus sydowii" OR "Aspergillus terreus" OR "Aspergillus tubingensis" OR "Aspergillus ustus" OR "Aspergillus uvarum" OR "Aspergillus welwitschiae" OR "Asperisporium vitiphyllum" OR "Aspidiotus destructor" OR "Aspidiotus destructor" OR "Aspidiotus hederae" OR "Aspidiotus ligusticus" OR "Aspidiotus nerii" OR "Aspidiotus nerii" OR "Asterococcus muratae" OR "Asterodiaspis pustulans" OR "Asymmetrasca decedens" OR "Athelia rolfsii" OR "Aulacorthum solani" OR "Aulacorthum solani" OR "Aureobasidium pullulans" OR "Aureobasidium pullulans" OR "Aureobasidium pullulans var. pullulans" OR "Aureobasidium vitis" OR "Aureobasidium vitis var. tuberculatum" OR "Australian grapevine viroid" OR "Austroagallia sinuata" OR "Autographa gamma" OR "Bacillus subtilis" OR "Bactrocera correcta" OR "Bactrocera dorsalis" OR "Bactrocera tryoni" OR "Bactrodesmium pallidum" OR "Badnavirus decolorationis" OR "Badnavirus venavitis" OR "Balclutha mexicana" OR "Bartalinia robillardoides" OR "Beauveria bassiana" OR "Bemisia tabaci" OR "Bertia vitis" OR "Bidens pilosa" OR "Bionectria ochroleuca" OR "Bipolaris maydis" OR "Bipolaris secalis" OR "Biscogniauxia capnodes" OR "Biscogniauxia mediterranea" OR "Bonagota cranaodes"

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OR "Botryodiplodia palmarum" OR "Botryodiplodia theobromae" OR "Botryodiplodia vitis" OR "Botryosphaeria australis" OR "Botryosphaeria bondarzewii" OR "Botryosphaeria dothidea" OR "Botryosphaeria dothidea" OR "Botryosphaeria iberica" OR "Botryosphaeria lutea" OR "Botryosphaeria mamane" OR "Botryosphaeria obtusa" OR "Botryosphaeria parva" OR "Botryosphaeria rhodina" OR "Botryosphaeria ribis" OR "Botryosphaeria ribis" OR "Botryosphaeria stevensii" OR "Botryosphaeria stevensii" OR "Botryosphaeria viticola" OR "Botryosphaeria vitis" OR "Botryotinia fuckeliana" OR "Botryotinia pseudofuckeliana" OR "Botrytis californica" OR "Botrytis cinerea" OR "Botrytis cinerea" OR "Botrytis euroamericana" OR "Botrytis medusae" OR "Botrytis prunorum" OR "Botrytis pseudocinerea" OR "Botrytis sinoviticola" OR "Bovistella radicata" OR "Brachycaudus helichrysi" OR "Brachynema germarii" OR "Brevipalpus azores" OR "Brevipalpus californicus" OR "Brevipalpus chilensis" OR "Brevipalpus lewisi" OR "Brevipalpus yothersi" OR "Briosia ampelophaga" OR "Broad bean wilt virus" OR "Bromius obscurus" OR "Bromus tectorum" OR "Bryobia praetiosa" OR "Buckland valley grapevine yellows phytoplasma" OR "Bycticus betulae" OR "Cacoecimorpha pronubana" OR "Cactodera milleri" OR "Cadophora fastigiata" OR "Cadophora luteo-olivacea" OR "Cadophora malorum" OR "Cadophora melinii" OR "Cadophora novi-eboraci" OR "Cadophora orientoamericana" OR "Cadophora sabaouae" OR "Cadophora spadicis" OR "Cadophora viticola" OR "Cadra calidella" OR "Cadra figulilella" OR "Cadra figulilella" OR "Calepitrimerus vitis" OR "Calicium pallidum" OR "Calonectria kyotensis" OR "Calonectria macrospora" OR "Camarosporium viniferum" OR "Camptopus lateralis" OR "Campylocarpon fasciculare" OR "Campylocarpon pseudofasciculare" OR "Candidatus Phytoplasma asteris" OR "Candidatus Phytoplasma australiense" OR "Candidatus Phytoplasma fraxini" OR "Candidatus Phytoplasma mali" OR "Candidatus Phytoplasma phoenicium" OR "Candidatus Phytoplasma solani" OR "Candidatus Phytoplasma solani" OR "Candidatus Phytoplasma trifolii" OR "Capnodium salicinum" OR "Capsodes sulcatus" OR "Capturomyces funiculosus" OR "Capturomyces luteus" OR "Carnation ringspot virus" OR "Carpocoris fuscispinus" OR "Carpocoris purpureipennis" OR "Cerastis tenebrifera" OR "Ceratitis capitata" OR "Ceratitis rosa" OR "Ceratobasidium cornigerum" OR "Cercospora brachypus" OR "Cercospora coryneoides" OR "Cercospora fuckelii" OR "Cercospora judaica" OR "Cercospora leonii" OR "Cercospora roesleri" OR "Cercospora roesleri f. fuckelii" OR "Cercospora roesleri f. typica" OR "Cercospora viticola" OR "Cercospora vitiphylla" OR "Cercospora vitis" OR "Cercospora zebrina" OR "Ceresa alta" OR "Ceroplastes actiniformis" OR "Ceroplastes cirripediformis" OR "Ceroplastes rusci" OR "Ceroplastes rusci" OR "Ceroplastes sinensis" OR "Cerosterna scabrator" OR "Chaetocnema confinis" OR "Chaetomium erectum" OR "Chaetomium globosum" OR "Chaetomium nigricolor" OR "Chaetospermum chaetosporum" OR "Chalara ampullula" OR "Chalastospora gossypii" OR "Chalastospora gossypii var. polymorpha" OR "Chenopodium album" OR "Chenopodium polyspermum" OR "Cherry leaf roll virus" OR "Chileulia stalactitis" OR "Chinavia hilaris" OR "Chlidaspis asiatica" OR "Chloridea virescens" OR "Chondrostereum purpureum" OR "Chorizococcus viticola" OR "Chrysomphalus aonidum" OR "Chrysomphalus dictyospermi" OR "Chrysomphalus dictyospermi" OR "Chrysomphalus ficus" OR "Chrysomphalus pinnulifer" OR "Cicadella viridis" OR "Cicinobolus cesatii" OR "Cicinobolus humuli" OR "Cirsium arvense" OR "Cirsium vulgare" OR "Citrus exocortis viroid" OR "Citrus yellow vein clearing virus" OR "Cladosporium aggregatocicatricatum" OR "Cladosporium asperulatum" OR "Cladosporium baccae" OR "Cladosporium cladosporioides" OR "Cladosporium cucumerinum" OR "Cladosporium fasciculatum" OR "Cladosporium fumago f. vitis" OR "Cladosporium halotolerans" OR "Cladosporium hebeiense" OR "Cladosporium herbarum" OR "Cladosporium limoniforme" OR "Cladosporium longipes" OR "Cladosporium macrocarpum" OR "Cladosporium oxysporum" OR "Cladosporium perangustum" OR "Cladosporium pseudocladosporioides" OR "Cladosporium ramotenellum" OR "Cladosporium roesleri" OR "Cladosporium sphaerospermum" OR "Cladosporium tenellum" OR "Cladosporium tenuissimum" OR "Cladosporium uvarum" OR "Clathrospora turkestanica" OR "Claudopus proteus" OR "Clematis vitalba" OR "Clepsis spectrana" OR "Clinodiplosis cilicrus" OR "Clonostachys rosea" OR "Closterovirus vitis" OR "clover phyllody phytoplasma" OR "Clytra novempunctata" OR "Cnephasia incertana" OR "Cnephasia longana" OR "Cnidoscolus urens" OR "Coccus discrepans" OR "Coccus hesperidum" OR "Coccus hesperidum" OR "Coccus hesperidum hesperidum" OR "Coccus longulus" OR "Coccus longulus" OR "Coccus microogenes" OR "Cochliobolus geniculatus" OR "Colaspis caligula" OR "Colletotrichum acutatum" OR "Colletotrichum acutatum" OR "Colletotrichum aenigma" OR "Colletotrichum ampelinum" OR "Colletotrichum capsici" OR "Colletotrichum capsici" OR "Colletotrichum citri" OR "Colletotrichum dematium" OR "Colletotrichum fioriniae" OR "Colletotrichum fructicola" OR "Colletotrichum fructicola" OR "Colletotrichum gloeosporioides" OR "Colletotrichum godetiae" OR "Colletotrichum hebeiense" OR "Colletotrichum nymphaeae" OR "Colletotrichum perseae" OR "Colletotrichum siamense" OR "Colletotrichum truncatum" OR "Colletotrichum viniferum" OR "Collophora pallida" OR "Colomerus vitis" OR "Commelina benghalensis" OR "Commelina diffusa" OR "Comstockaspis perniciosa" OR "Comstockaspis perniciosa" OR "Coniella castaneicola" OR "Coniella diplodiella" OR "Coniella diplodiella" OR "Coniella diplodiopsis" OR "Coniella fragariae" OR "Coniella granati" OR "Coniella petrakii" OR "Coniella vitis" OR "Coniochaeta hoffmannii" OR "Coniochaeta polymorpha" OR "Coniocybe pallida" OR "Coniothyrium berlandieri" OR "Coniothyrium diplodiella" OR "Coniothyrium iranicum" OR "Coniothyrium vitivorum" OR "Conogethes punctiferalis" OR "Conotrachelus nenuphar" OR "Convolvulus arvensis" OR "Conyza bonariensis" OR "Conyza canadensis" OR "Cophinforma mamane" OR "Coprinellus radians" OR "Coptobasis lunalis" OR "Corizus hyoscyami" OR "Cornu aspersum" OR "Corticium centrifugum" OR "Corticium rolfsii" OR "Corticium salmonicolor" OR "Coryneopsis microsticta" OR "Coryneum vitiphyllum" OR "Costelytra zealandica" OR "Cotinis nitida" OR "Crenulaspidiotus lahillei" OR "Criconema mutabile" OR "Criconema permistum" OR "Criconemella xenoplax" OR "Cristulariella moricola" OR "Crocidosema plebejana" OR "Croton sonderianus" OR "Crypticerya palmeri" OR "Cryptinglisia lounsburyi" OR "Cryptoblabes gnidiella" OR "Cryptoblabes gnidiella" OR "Cryptocline cinerascens" OR "Cryptococcus laurentii" OR "Cryptococcus uzbekistanensis" OR "Cryptophaeella trematosphaeriicola" OR "Cryptosphaeria pullmanensis" OR "Cryptosporella viticola" OR "Cryptostictis ampelophila" OR "Cryptostictis hysterioides" OR "Cryptovalsa ampelina" OR "Cryptovalsa protracta" OR "Cryptovalsa rabenhorstii" OR "Ctenopseustis obliquana" OR "Cucumber mosaic virus" OR "Cucumis anguria" OR "Cuerna costalis" OR "Cuerna occidentalis" OR "Curvularia verruculosa" OR "Cuscuta japonica" OR "Cylindrocarpon destructans" OR "Cylindrocarpon destructans var. crassum" OR "Cylindrocarpon destructans var. destructans" OR "Cylindrocarpon liriodendri" OR "Cylindrocarpon macrodidymum" OR "Cylindrocarpon obtusisporum" OR "Cylindrocarpon olidum" OR "Cylindrocarpon olidum var. crassum" OR "Cylindrocarpon pauciseptatum" OR "Cylindrocladiella lageniformis" OR

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"Cylindrocladiella parva" OR "Cylindrocladiella peruviana" OR "Cylindrocladiella viticola" OR "Cylindrocladiella vitis" OR "Cylindrocladium peruvianum" OR "Cynodon dactylon" OR "Cyperus rotundus" OR "Cyphella alboviolascens" OR "Cyphella monacha" OR "Cytospora ampelina" OR "Cytospora chrysosperma" OR "Cytospora cincta" OR "Cytospora leucostoma" OR "Cytospora vinacea" OR "Cytospora viticola" OR "Cytospora vitis" OR "Dactylonectria alcacerensis" OR "Dactylonectria estremocensis" OR "Dactylonectria hordeicola" OR "Dactylonectria macrodidyma" OR "Dactylonectria novozelandica" OR "Dactylonectria pauciseptata" OR "Dactylonectria pinicola" OR "Dactylonectria torresensis" OR "Dactylonectria vitis" OR "Daktulosphaira vitifoliae" OR "Daktulosphaira vitifoliae" OR "Daphnis nerii" OR "Daphnis nerii" OR "Darapsa choerilus" OR "Darapsa myron myron" OR "Deidamia inscriptum" OR "Deilephila elpenor" OR "Dematophora necatrix" OR "Dematophora necatrix" OR "Dendrophoma pleurospora" OR "Dendrothyrium variisporum" OR "Desmia funeralis" OR "Desmia ufeus" OR "Diabrotica speciosa" OR "Diabrotica virgifera zeae" OR "Diaporthe ambigua" OR "Diaporthe ambigua" OR "Diaporthe ampelina" OR "Diaporthe amygdali" OR "Diaporthe australafricana" OR "Diaporthe baccae" OR "Diaporthe bohemiae" OR "Diaporthe celeris" OR "Diaporthe chamaeropis" OR "Diaporthe cytosporella" OR "Diaporthe eres" OR "Diaporthe eres" OR "Diaporthe foeniculina" OR "Diaporthe guangxiensis" OR "Diaporthe gulyae" OR "Diaporthe gulyae" OR "Diaporthe helianthi" OR "Diaporthe helianthi" OR "Diaporthe hispaniae" OR "Diaporthe hongkongensis" OR "Diaporthe hubeiensis" OR "Diaporthe hungariae" OR "Diaporthe kyushuensis" OR "Diaporthe medusaea" OR "Diaporthe medusaea var. viburni" OR "Diaporthe nebulae" OR "Diaporthe neotheicola" OR "Diaporthe nobilis" OR "Diaporthe novem" OR "Diaporthe perjuncta" OR "Diaporthe perniciosa" OR "Diaporthe pescicola" OR "Diaporthe phaseolorum" OR "Diaporthe phaseolorum" OR "Diaporthe rudis" OR "Diaporthe sojae" OR "Diaporthe unshiuensis" OR "Diaporthe viniferae" OR "Diaporthe viticola" OR "Diaspidiotus osborni" OR "Diaspidiotus uvae" OR "Diaspidiotus viticola" OR "Diatrype oregonensis" OR "Diatrype stigma" OR "Diatrype whitmanensis" OR "Diatrypella verrucaeformis" OR "Diatrypella vitis" OR "Diatrypella vulgaris" OR "Dicranotropis hamata" OR "Dictyla echii" OR "Dictyosporium toruloides" OR "Didymella glomerata" OR "Didymella negriana" OR "Didymella pomorum" OR "Didymosphaeria bacchans" OR "Didymosphaeria sarmenti" OR "Digitaria horizontalis" OR "Dikrella cockerellii" OR "Dimargarodes meridionalis" OR "Dimargarodes meridionalis" OR "Diplodea porosum" OR "Diplodia africana" OR "Diplodia ampelina" OR "Diplodia bacchi" OR "Diplodia cacaoicola" OR "Diplodia corticola" OR "Diplodia intermedia" OR "Diplodia mutila" OR "Diplodia natalensis" OR "Diplodia olivarum" OR "Diplodia porosum" OR "Diplodia sapinea" OR "Diplodia seriata" OR "Diplodia seriata" OR "Diplodia vineae" OR "Diplodia viticola" OR "Diplodina vitis" OR "Discosia artocreas var. ampelina" OR "Discosia vitis" OR "Discostroma corticola" OR "Ditula angustiorana" OR "Ditula angustiorana" OR "Ditylenchus destructor" OR "Ditylenchus dipsaci" OR "Ditylenchus dipsaci" OR "Ditylenchus myceliophagus" OR "Ditylenchus sp." OR "Dociostaurus maroccanus" OR "Dolycoris baccarum" OR "Doratomyces microsporus" OR "Doratomyces stemonitis" OR "Dothiorella americana" OR "Dothiorella iberica" OR "Dothiorella neclivorem" OR "Dothiorella omnivora" OR "Dothiorella plurivora" OR "Dothiorella reniformis" OR "Dothiorella rimiseda" OR "Dothiorella sarmentorum" OR "Dothiorella vidmadera" OR "Dothiorella vinea-gemmae" OR "Dothiorella viticola" OR "Dothiorella westralis" OR "Draeculacephala minerva" OR "Drepanothrips reuteri" OR "Drepanothrips reuteri" OR "Drosicha stebbingii" OR "Drosophila melanogaster" OR "Drosophila simulans" OR "Drosophila suzukii" OR "Duplaspidiotus fossor" OR "Duplaspidiotus tesseratus" OR "Dysmicoccus brevipes" OR "Dysmicoccus brevipes" OR "Dysmicoccus umbambae" OR "Dysphania ambrosioides" OR "Edwardsiana rosae" OR "Eleusine indica" OR "Elsinoe ampelina" OR "Elsinoe ampelina" OR "Elymus repens" OR "Emericella nidulans" OR "Emex australis" OR "Empoasca decipiens" OR "Empoasca solani" OR "Empoasca vitis" OR "Endobasidium clandestinum" OR "Endoclita signifer" OR "Endopiza viteana" OR "Enyo lugubris" OR "Enyo lugubris lugubris" OR "Eotetranychus carpini" OR "Eotetranychus carpini" OR "Eotetranychus carpini vitis" OR "Eotetranychus coryli" OR "Eotetranychus geniculatus" OR "Eotetranychus kankitus" OR "Eotetranychus lewisi" OR "Eotetranychus lewisi" OR "Eotetranychus pruni" OR "Eotetranychus pruni" OR "Eotetranychus queenslandicus" OR "Eotetranychus rubiphilus" OR "Eotetranychus sexmaculatus" OR "Eotetranychus smithi" OR "Eotetranychus truncatus" OR "Eotetranychus vinealis" OR "Eotetranychus willamettei" OR "Eotetranychus willamettei" OR "Eotetranychus yumensis" OR "Ephestiodes gilvescentella" OR "Epicoccum nigrum" OR "Epicoccum nigrum" OR "Epicoccum purpurascens" OR "Epiphyas postvittana" OR "Erasmoneura vulnerata" OR "Eriosphaeria oenotria" OR "Erodium moschatum" OR "Erysiphe necator" OR "Erysiphe necator" OR "Erysiphe tuckeri" OR "Erythroneura comes" OR "Erythroneura elegantula" OR "Erythroneura variabilis" OR "Erythroneura ziczac" OR "Eucasphaeria capensis" OR "Euchloron megaera" OR "Euclidia cuspidea" OR "Eudocima fullonia" OR "Eudryas grata" OR "Eudryas unio" OR "Eulecanium giganteum" OR "Eulecanium tiliae" OR "Eulecanium tiliae" OR "Eulithis diversilineata" OR "Eulithis gracilineata" OR "Eumorpha achemon" OR "Eumorpha labruscae" OR "Eumorpha pandorus" OR "Eumorpha satellitia" OR "Eumorpha satellitia licaon" OR "Eumorpha satellitia posticatus" OR "Eumorpha vitis" OR "Eumorpha vitis vitis" OR "Euphorbia helioscopia" OR "Euphorbia hirta" OR "Eupoecilia ambiguella" OR "Eupoecilia ambiguella" OR "Euproctis chrysorrhoea" OR "Eurhizococcus brasiliensis" OR "Eurhizococcus brasiliensis" OR "Eurydema ventralis" OR "Eurygaster austriaca" OR "Eurytetranychus ulmi" OR "Euseius scutalis" OR "Eutetranychus africanus" OR "Eutetranychus banksi" OR "Eutetranychus banksi" OR "Eutetranychus orientalis" OR "Eutetranychus orientalis" OR "Eutypa armeniacae" OR "Eutypa consobrina" OR "Eutypa cremea" OR "Eutypa laevata" OR "Eutypa lata" OR "Eutypa lata" OR "Eutypa leptoplaca" OR "Eutypella aequilinearis" OR "Eutypella aulacostroma" OR "Eutypella citricola" OR "Eutypella leprosa" OR "Eutypella microtheca" OR "Eutypella vitis" OR "Euwallacea fornicatus sensu lato" OR "Euwallacea fornicatus sensu stricto" OR "Euxoa messoria" OR "Euxoa scandens" OR "Euxoa tessellata" OR "Exitianus excavatus" OR "Exitianus picatus" OR "Exobasidium vitis" OR "Exosporium sultanae" OR "Ferrisia cristinae" OR "Ferrisia gilli" OR "Ferrisia virgata" OR "Ferrisia virgata" OR "Fidia viticida" OR "Fieberiella florii" OR "Filago gallica" OR "Floricola viticola" OR "Fomes fomentarius" OR "Fomes igniarius" OR "Fomitiporia australiensis" OR "Fomitiporia capensis" OR "Fomitiporia mediterranea" OR "Fomitiporia mediterranea" OR "Fomitiporia polymorpha" OR "Fomitiporia punctata" OR "Forficula auricularia" OR "Formica cunicularia" OR "Formicococcus robustus" OR "Frankliniella auripes" OR "Frankliniella australis" OR "Frankliniella cestrum" OR "Frankliniella occidentalis" OR "Frankliniella schultzei" OR "Frankliniella tenuicornis" OR "Fumago vagans" OR "Fumaria officinalis" OR "Furcasterigmium furcatum" OR "Fusarium acuminatum" OR "Fusarium avenaceum" OR "Fusarium brachygibbosum" OR "Fusarium crookwellense" OR "Fusarium culmorum" OR "Fusarium equiseti" OR "Fusarium euwallaceae" OR "Fusarium euwallaceae" OR "Fusarium graminearum" OR "Fusarium incarnatum" OR "Fusarium lateritium" OR "Fusarium moniliforme var. anthophilum" OR "Fusarium oxysporum" OR "Fusarium oxysporum" OR "Fusarium oxysporum f. sp. Herbemontis" OR "Fusarium proliferatum" OR "Fusarium sambucinum" OR "Fusarium solani" OR "Fusarium subglutinans" OR "Fusarium verticillioides" OR "Fusicladium viticis" OR "Fusicoccum aesculi" OR "Fusicoccum luteum" OR "Fusicoccum viticlavatum" OR "Fusicoccum viticola" OR "Fusicoccum vitifusiforme" OR "Galactomyces reessii" OR "Galium aparine" OR "Geina periscelidactylus" OR "Geniocremnus chiliensis" OR "Geococcus coffeae" OR "Geococcus coffeae" OR "Geoica lucifuga" OR "Geomyces pannorum" OR "Geotrichum candidum" OR "Gibberella avenacea" OR "Gibberella intricans" OR "Gibberella sacchari" OR "Gibberella zeae" OR "Gliomastix murorum" OR "Globisporangium heterothallicum" OR "Globisporangium irregulare" OR "Gloeosporium ampelinum"

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OR "Gloeosporium ampelophagum" OR "Gloeosporium crassipes" OR "Gloeosporium fructigenum" OR "Gloeosporium rufomaculans" OR "Glomerella cingulata" OR "Gloniopsis praelonga" OR "Glyptoscelis squamulata" OR "Gnomoniella viticola" OR "Gonatobotrys flava" OR "Gonocephalum simplex" OR "Grablovirus vitis" OR "Gracilacus mira" OR "Graminella nigrifrons" OR "Grapevine Anatolian ringspot virus" OR "Grapevine asteroid mosaic-associated virus" OR "Grapevine berry inner necrosis virus" OR "Grapevine Bulgarian latent virus" OR "Grapevine chrome mosaic virus" OR "Grapevine corky bark-associated virus" OR "Grapevine deformation virus" OR "Grapevine enamovirus 1" OR "Grapevine fanleaf virus" OR "Grapevine flavescence doree phytoplasma" OR "Grapevine flavescence dorıe phytoplasma" OR "Grapevine fleck virus" OR "Grapevine geminivirus A" OR "Grapevine infectious necrosis agent" OR "Grapevine leafroll-associated virus 1" OR "Grapevine leafroll-associated virus 2" OR "Grapevine leafroll-associated virus 3" OR "Grapevine leafroll-associated virus 4" OR "Grapevine leafroll-associated virus 7" OR "Grapevine leafroll-associated viruses" OR "Grapevine little leaf agent" OR "Grapevine Pinot gris virus" OR "Grapevine polerovirus 1" OR "Grapevine red blotch virus" OR "Grapevine red globe virus" OR "Grapevine Roditis leaf discoloration-associated virus" OR "Grapevine rupestris stem pitting-associated virus" OR "Grapevine rupestris vein feathering virus" OR "Grapevine Syrah virus 1" OR "Grapevine Syrah virus-1" OR "Grapevine vein mosaic agent" OR "Grapevine vein necrosis agent" OR "Grapevine vein necrosis virus" OR "Grapevine virus A" OR "Grapevine virus B" OR "Grapevine virus D" OR "Grapevine virus E" OR "Grapevine virus F" OR "Grapevine virus G" OR "Grapevine virus H" OR "Grapevine virus L" OR "Grapevine virus T" OR "Grapevine yellow speckle viroid 1" OR "Grapevine yellow speckle viroid 2" OR "Grapevine yellow speckle viroid 2" OR "Grapevine yellows phytoplasmas" OR "Graphium cinerellum" OR "Graphocephala atropunctata" OR "Graphocephala confluens" OR "Graphocephala fennahi" OR "Graphocephala versuta" OR "Greeneria fuliginea" OR "Greeneria uvicola" OR "Greeneria uvicola" OR "Grovesinia pyramidalis" OR "Grovesinia pyramidalis" OR "Gryllotalpa gryllotalpa" OR "Gueriniella serratulae" OR "Guignardia baccae" OR "Guignardia bidwellii" OR "Guignardia bidwellii" OR "Gyrothrix podosperma" OR "Haematonectria haematococca" OR "Haematonectria haematococca" OR "Halyomorpha halys" OR "Hansfordia ugandensis" OR "Haplosporella ailanthi" OR "Haplosporella fabaeformis" OR "Haplothrips aculeatus" OR "Harmonia axyridis" OR "Harrisina americana" OR "Harrisina americana" OR "Harrisina brillians" OR "Harrisina coracina" OR "Harrisina metallica" OR "Helianthus ciliaris" OR "Helicobasidium mompa" OR "Helicotylenchus abunaamai" OR "Helicotylenchus anhelicus" OR "Helicotylenchus conicephalus" OR "Helicotylenchus digonicus" OR "Helicotylenchus dihystera" OR "Helicotylenchus dihystera" OR "Helicotylenchus erythrinae" OR "Helicotylenchus multicinctus" OR "Helicotylenchus pseudorobustus" OR "Helicotylenchus pseudorobustus" OR "Helicoverpa zea" OR "Heliococcus bohemicus" OR "Heliothis virescens" OR "Heliotropium europaeum" OR "Helminthosporium decacuminatum" OR "Helochara delta" OR "Helopeltis antonii" OR "Helotium sarmentorum" OR "Hemiberlesia cyanophylli" OR "Hemiberlesia lataniae" OR "Hemiberlesia lataniae" OR "Hemiberlesia rapax" OR "Hemicriconemoides californianus" OR "Hemicriconemoides chitwoodi" OR "Hemicriconemoides mangiferae" OR "Hemicriconemoides ortonwilliamsi" OR "Hemicriconemoides sinensis" OR "Hemicriconemoides wessoni" OR "Hemicycliophora arenaria" OR "Hemicycliophora onubensis" OR "Hemicycliophora similis" OR "Hemicycliophora thornei" OR "Hendersonia cookeana" OR "Hendersonia sarmentorum" OR "Hendersonia tenuipes" OR "Hendersonia viticola" OR "Hendersoniella toruloidea" OR "Hendersonula toruloidea" OR "Heraclia butleri" OR "Heraclia superba" OR "Herissantia crispa" OR "Heterobasidion parviporum" OR "Heterodera zeae" OR "Heteronychus arator" OR "Hibiscus trionum" OR "Hippotion celerio" OR "Hippotion celerio" OR "Hippotion eson" OR "Hippotion osiris" OR "Hishimonus hamatus" OR "Holocacista capensis" OR "Holocacista rivillei" OR "Holotrichia consanguinea" OR "Holotrichia serrata" OR "Homalodisca vitripennis" OR "Hop stunt viroid" OR "Hoplolaimus pararobustus" OR "Hoplolaimus seinhorsti" OR "Hormonema viticola" OR "Hyalesthes obsoletus" OR "Hyalesthes obsoletus" OR "Hyalopterus amygdali" OR "Hyles euphorbiae" OR "Hyles gallii" OR "Hyles lineata" OR "Hyles lineata" OR "Hyles lineata livornica" OR "Hyles livornica" OR "Hyphantria cunea" OR "Hypocrea parapilulifera" OR "Hypocrella reineckeana" OR "Hypoderma commune" OR "Hypothenemus eruditus" OR "Hypoxylon serpens" OR "Hypurus bertrandi" OR "Hysterium pulicare" OR "Icerya aegyptiaca" OR "Icerya aegyptiaca" OR "Icerya purchasi" OR "Icerya schrottkyi" OR "Icerya seychellarum" OR "Icerya seychellarum" OR "Idaeovirus rubi" OR "Ilyonectria alcacerensis" OR "Ilyonectria estremocensis" OR "Ilyonectria europaea" OR "Ilyonectria liriodendri" OR "Ilyonectria lusitanica" OR "Ilyonectria macrodidyma" OR "Ilyonectria novozelandica" OR "Ilyonectria pseudodestructans" OR "Ilyonectria robusta" OR "Ilyonectria torresensis" OR "Ilyonectria vitis" OR "Inocutis jamaicensis" OR "Isariopsis clavispora" OR "Isariopsis fuckelii" OR "Ischyja manlia" OR "Jacobiasca lybica" OR "Japananus hyalinus" OR "Kalmusia variispora" OR "Kalotermes flavicollis" OR "Kerria lacca lacca" OR "Kluyveromyces marxianus" OR "Kuehneola vitis" OR "Lachnella macrochaeta" OR "Lachnella myceliosa" OR "Lachnella uvicola" OR "Lachnella viticola" OR "Lacinipolia meditata" OR "Lacinipolia renigera" OR "Laestadia bidwellii" OR "Laodelphax striatellus" OR "Lasiodiplodia brasiliense" OR "Lasiodiplodia brasiliensis" OR "Lasiodiplodia citricola" OR "Lasiodiplodia crassispora" OR "Lasiodiplodia egyptiacae" OR "Lasiodiplodia euphorbicola" OR "Lasiodiplodia exigua" OR "Lasiodiplodia gilanensis" OR "Lasiodiplodia hormozganensis" OR "Lasiodiplodia jatrophicola" OR "Lasiodiplodia laeliocattleyae" OR "Lasiodiplodia mediterranea" OR "Lasiodiplodia missouriana" OR "Lasiodiplodia parva" OR "Lasiodiplodia plurivora" OR "Lasiodiplodia pseudotheobromae" OR "Lasiodiplodia theobromae" OR "Lasiodiplodia theobromae" OR "Lasiodiplodia viticola" OR "Lasiodiplodia vitis" OR "Lasius turcicus" OR "Lecanicillium lecanii" OR "Lecanidion atratum" OR "Lecanodiaspis rugosa" OR "Lecythophora hoffmannii" OR "Lepidium draba" OR "Lepidosaphes buzenensis" OR "Lepidosaphes gloverii" OR "Lepidosaphes laterochitinosa" OR "Lepidosaphes malicola" OR "Lepidosaphes ulmi" OR "Lepidosaphes ussuriensis" OR "Leptosphaeria ampelina" OR "Leptosphaeria cerlettii" OR "Leptosphaeria chaetostoma" OR "Leptosphaeria cirricola" OR "Leptosphaeria cookei" OR "Leptosphaeria gibelliana" OR "Leptosphaeria ogilviensis" OR "Leptosphaeria pampini" OR "Leptosphaeria slavonica" OR "Leptosphaeria socia" OR "Leptosphaeria vinealis" OR "Leptosphaeria viticola" OR "Leptosphaeria vitigena" OR "Leptosphaeria vitis" OR "Leptothyrium passerinii" OR "Leucaspis vitis" OR "Leucostoma persoonii" OR "Libertella blepharis" OR "Lichtheimia ramosa" OR "Limothrips cerealium" OR "Linaria vulgaris" OR "Liorhyssus hyalinus" OR "Lobesia botrana" OR "Lolium multiflorum" OR "Lolium rigidum" OR "Longidorus africanus" OR "Longidorus attenuatus" OR "Longidorus carniolensis" OR "Longidorus crataegi" OR "Longidorus elongatus" OR "Longidorus elongatus" OR "Longidorus euonymus" OR "Longidorus goodeyi" OR "Longidorus henanus" OR "Longidorus leptocephalus" OR "Longidorus magnus" OR "Longidorus orientalis" OR "Longidorus pauli" OR "Longidorus pisi" OR "Longidorus vineacola" OR "Lophiostoma caulium" OR "Lophiostoma elegans" OR "Lophiostoma macrostomum" OR "Lophiostoma thuemenianum" OR "Lopholeucaspis japonica" OR "Lopholeucaspis japonica" OR "Lycorma delicatula" OR "Lygaeus equestris" OR "Lygus spinolae" OR "Lymantria dispar" OR "Maconellicoccus hirsutus" OR "Maconellicoccus hirsutus" OR "Macrophoma flaccida" OR "Macrophoma reniformis" OR "Macrophoma rimiseda" OR "Macrophoma sicula" OR "Macrophomina phaseoli" OR "Macrophomina phaseolina" OR "Macrophomina phaseolina" OR "Macroposthonia xenoplax" OR "Macrosiphum euphorbiae" OR "Macrosiphum euphorbiae" OR "Macrosporium vitis" OR "Maculavirus vitis" OR "Malva sylvestris" OR "Mamestra brassicae" OR "Marafivirus asteroides" OR "Margarodes capensis" OR "Margarodes capensis" OR "Margarodes greeni" OR

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"Margarodes greeni" OR "Margarodes prieskaensis" OR "Margarodes trimeni" OR "Margarodes vitis" OR "Margarodes vitis" OR "Margarodes vredendalensis" OR "Margarodes vredendalensis" OR "Marssonina viticola" OR "Massariella viticola" OR "Massarina corticola" OR "Melanaspis arnaldoi" OR "Melanconium fuligineum" OR "Melilotus indicus" OR "Melittia cucurbitae" OR "Meloidogyne arenaria" OR "Meloidogyne arenaria" OR "Meloidogyne chitwoodi" OR "Meloidogyne chitwoodi" OR "Meloidogyne ethiopica" OR "Meloidogyne ethiopica" OR "Meloidogyne hapla" OR "Meloidogyne hapla" OR "Meloidogyne hispanica" OR "Meloidogyne incognita" OR "Meloidogyne incognita" OR "Meloidogyne javanica" OR "Meloidogyne javanica" OR "Meloidogyne luci" OR "Meloidogyne luci" OR "Meloidogyne mali" OR "Meloidogyne morocciensis" OR "Meloidogyne silvestris" OR "Meloidogyne thamesi" OR "Meloidogyne vitis" OR "Meloidogyne vitis" OR "Melolontha melolontha" OR "Merlinius brevidens" OR "Merlinius nanus" OR "Merophyas divulsana" OR "Mesocriconema rusticum" OR "Mesocriconema xenoplax" OR "Metadiplodia subsolitaria f. viticola" OR "Metaseiulus occidentalis" OR "Metasphaeria socia" OR "Metcalfa pruinosa" OR "Metschnikowia viticola" OR "Microdiplodia microsporella" OR "Microdochium bolleyi" OR "Micropera ampelina" OR "Microthyrium microscopicum" OR "Mimosa pudica" OR "Minutiella simplex" OR "Moesziomyces aphidis" OR "Momordica charantia" OR "Monilia fructigena" OR "Monilinia fructicola" OR "Monilinia fructicola" OR "Monilinia fructigena" OR "Monilinia laxa" OR "Monochaetia ampelophila" OR "Monochaetia ellisiana var. affinis" OR "Monochaetia sarmenti" OR "Monochaetia unicornis" OR "Monochaetia viticola" OR "Monochaetinula ampelophila" OR "Monochaetinula terminaliae" OR "Monodictys antiqua" OR "Moristroma germanicum" OR "Moristroma palatinum" OR "Mortierella hyalina" OR "Mucor circinelloides" OR "Mucor circinelloides" OR "Mucor fragilis" OR "Mucor hiemalis" OR "Mucor plumbeus" OR "Mucor racemosus" OR "Murgantia histrionica" OR "Mycodiplosis inimica" OR "Mycosphaerella angulata" OR "Mycosphaerella cuboniana" OR "Mycosphaerella manganottiana" OR "Mycosphaerella personata" OR "Mycosphaerella vitis" OR "Mycosphaerella vitis-viniferae" OR "Mycovellosiella fulva" OR "Myzus persicae" OR "Nattrassia mangiferae" OR "Naupactus xanthographus" OR "Nectria fuckeliana" OR "Nectria radicicola" OR "Nectria ramulariae" OR "Nectria tawa" OR "Nectria viticola" OR "Neoaliturus fenestratus" OR "Neoanthostomella viticola" OR "Neoconiothyrium viticola" OR "Neofabraea kienholzii" OR "Neofusicoccum algeriense" OR "Neofusicoccum australe" OR "Neofusicoccum cordaticola" OR "Neofusicoccum italicum" OR "Neofusicoccum kwambonambiense" OR "Neofusicoccum luteum" OR "Neofusicoccum macroclavatum" OR "Neofusicoccum mangiferae" OR "Neofusicoccum mediterraneum" OR "Neofusicoccum occulatum" OR "Neofusicoccum parvum" OR "Neofusicoccum ribis" OR "Neofusicoccum stellenboschiana" OR "Neofusicoccum viticlavatum" OR "Neofusicoccum vitifusiforme" OR "Neokolla hieroglyphica" OR "Neomassaria fabacearum" OR "Neonectria liriodendri" OR "Neonectria macrodidyma" OR "Neonectria quercicola" OR "Neonectria radicicola" OR "Neopestalotiopsis asiatica" OR "Neopestalotiopsis clavispora" OR "Neopestalotiopsis hydeana" OR "Neopestalotiopsis javaensis" OR "Neopestalotiopsis rosae" OR "Neopestalotiopsis vitis" OR "Neophaeomoniella constricta" OR "Neophaeomoniella ossiformis" OR "Neophaeomoniella zymoides" OR "Neophysopella euvitis" OR "Neopulvinaria innumerabilis innumerabilis" OR "Neoscytalidium dimidiatum" OR "Neoscytalidium hyalinum" OR "Neoscytalidium novaehollandiae" OR "Neoselenaspidus silvaticus" OR "Nepovirus arabis" OR "Nepovirus avii" OR "Nepovirus bulgariense" OR "Nepovirus chromusivum" OR "Nepovirus foliumflabelli" OR "Nepovirus italiaense" OR "Nepovirus lycopersici" OR "Nepovirus myrtilli" OR "Nepovirus nicotianae" OR "Nepovirus nigranuli" OR "Nepovirus persicae" OR "Nepovirus rubi" OR "Nicandra physalodes" OR "Nigrospora gorlenkoana" OR "Nigrospora oryzae" OR "Nipaecoccus viridis" OR "Nipaecoccus viridis" OR "Noctua fimbriata" OR "Noctua pronuba" OR "Noctua pronuba" OR "Nokona regalis" OR "Nysius niger" OR "Nysius vinitor" OR "Oceanaspidiotus spinosus" OR "Oemona hirta" OR "Oides scutellata" OR "Oidium tuckeri" OR "Oligonychus acugni" OR "Oligonychus anonae" OR "Oligonychus bagdasariani" OR "Oligonychus bicolor" OR "Oligonychus biharensis" OR "Oligonychus coffeae" OR "Oligonychus coffeae " OR "Oligonychus fileno" OR "Oligonychus litchii" OR "Oligonychus milleri " OR "Oligonychus perseae" OR "Oligonychus perseae " OR "Oligonychus peruvianus" OR "Oligonychus pongami" OR "Oligonychus punicae" OR "Oligonychus punicae" OR "Oligonychus sayedi" OR "Oligonychus yothersi" OR "Omophlus lepturoides" OR "Oncometopia orbona" OR "Ophiostoma piceae" OR "Ophiostoma quercus" OR "Ophiostoma subalpinum" OR "Orgyia postica" OR "Orgyia postica" OR "Orientus ishidae" OR "Orthotospovirus tomatomaculae" OR "Orthotydeus californicus" OR "Orthotydeus kochi" OR "Osbornellus borealis" OR "Otiorhynchus clavipes" OR "Otiorhynchus ligustici" OR "Otiorhynchus rugosostriatus" OR "Otiorhynchus sulcatus" OR "Oulema melanopus" OR "Ovaticoccus peruvianus" OR "Oxalis pes-caprae" OR "Oxyptilus delawaricus" OR "Panonychus citri" OR "Panonychus citri" OR "Panonychus ulmi" OR "Panonychus ulmi" OR "Pantoea agglomerans" OR "Papaipema nebris" OR "Papaver rhoeas" OR "Paracoccus marginatus" OR "Paraconiothyrium brasiliense" OR "Paraconiothyrium fuckelii" OR "Paraconiothyrium variabile" OR "Paradiaspis lizeriana" OR "Paralipsa gularis" OR "Paralongidorus maximus" OR "Paranthrene asilipennis" OR "Paranthrene regalis" OR "Paranthrene simulans" OR "Paraphlepsius irroratus" OR "Paraputo leveri" OR "Parasaissetia nigra" OR "Parasaissetia nigra" OR "Paratrichodorus divergens" OR "Paratrichodorus hispanus" OR "Paratrichodorus minor" OR "Paratrichodorus minor" OR "Paratrichodorus pachydermus" OR "Paratrichodorus porosus" OR "Paratrichodorus teres" OR "Paratylenchus baldaccii" OR "Paratylenchus hamatus" OR "Pareutypella sulcata" OR "Parlatoria cinerea" OR "Parlatoria oleae" OR "Parlatoria pergandii" OR "Parlatoria proteus" OR "Parlatoria theae" OR "Paropta paradoxa" OR "Parthenolecanium corni" OR "Parthenolecanium corni apuliae" OR "Parthenolecanium corni corni" OR "Parthenolecanium persicae" OR "Parthenolecanium persicae" OR "Parthenolecanium pruinosum" OR "Paspalum distichum" OR "Passalora dissiliens" OR "Passiflora foetida" OR "Patellaria atrata" OR "Patellaria viticola" OR "Peach latent mosaic viroid" OR "Peach rosette mosaic virus" OR "Peliococcus turanicus" OR "Pellicularia rolfsii" OR "Pemphigus saliciradicis" OR "Penicillium adametzioides" OR "Penicillium astrolabium" OR "Penicillium aurantiogriseum" OR "Penicillium bilaiae" OR "Penicillium brevicompactum" OR "Penicillium crocicola" OR "Penicillium crustosum" OR "Penicillium cyclopium" OR "Penicillium elongatum" OR "Penicillium expansum" OR "Penicillium expansum" OR "Penicillium fructuariae-cellae" OR "Penicillium funiculosum" OR "Penicillium glabrum" OR "Penicillium griseofulvum" OR "Penicillium italicum" OR "Penicillium neocrassum" OR "Penicillium notatum" OR "Penicillium olsonii" OR "Penicillium oxalicum" OR "Penicillium sclerotigenum" OR "Penicillium steckii" OR "Penicillium sumatrense" OR "Penicillium toxicarium" OR "Penicillium ubiquetum" OR "Penicillium viridicatum" OR "Penicillium viticola" OR "Peniophora albomarginata" OR "Peniophora viticola" OR "Pennisetum clandestinum" OR "Perenniporia tenuis" OR "Pergesa acteus" OR "Peribatodes rhomboidaria" OR "Periconia byssoides" OR "Periconia igniaria" OR "Peridroma saucia" OR "Peridroma saucia" OR "Perissopneumon ferox" OR "Peritelus sphaeroides" OR "Peronospora viticola" OR "Pestalotia affinis" OR "Pestalotia ampelogena" OR "Pestalotia europaea" OR "Pestalotia malicola" OR "Pestalotia menezesiana" OR "Pestalotia monochaetoidea var. affinis" OR "Pestalotia pezizoides" OR "Pestalotia pitospora" OR "Pestalotia ramosa" OR "Pestalotia sarmenti" OR "Pestalotia thuemenii" OR "Pestalotia uvicola" OR "Pestalotia viticola" OR "Pestalotiopsis biciliata" OR "Pestalotiopsis chamaeropis" OR "Pestalotiopsis funerea" OR "Pestalotiopsis mangiferae" OR "Pestalotiopsis mangiferae" OR "Pestalotiopsis menezesiana" OR "Pestalotiopsis photiniae" OR "Pestalotiopsis telopeae" OR "Pestalotiopsis trachicarpicola" OR "Pestalotiopsis uvicola" OR "Petrobia harti" OR "Petrobia latens" OR "Peziza ascoboloides" OR "Phaeoacremonium album" OR "Phaeoacremonium

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aleophilum" OR "Phaeoacremonium alvesii" OR "Phaeoacremonium amstelodamense" OR "Phaeoacremonium angustius" OR "Phaeoacremonium argentinense" OR "Phaeoacremonium armeniacum" OR "Phaeoacremonium australiense" OR "Phaeoacremonium austroafricanum" OR "Phaeoacremonium canadense" OR "Phaeoacremonium chlamydosporum" OR "Phaeoacremonium cinereum" OR "Phaeoacremonium croatiense" OR "Phaeoacremonium fraxinopennsylvanicum" OR "Phaeoacremonium globosum" OR "Phaeoacremonium griseo-olivaceum" OR "Phaeoacremonium griseorubrum" OR "Phaeoacremonium hispanicum" OR "Phaeoacremonium hungaricum" OR "Phaeoacremonium inflatipes" OR "Phaeoacremonium iranianum" OR "Phaeoacremonium italicum" OR "Phaeoacremonium junior" OR "Phaeoacremonium krajdenii" OR "Phaeoacremonium minimum" OR "Phaeoacremonium minimum" OR "Phaeoacremonium mortoniae" OR "Phaeoacremonium nordesticola" OR "Phaeoacremonium occidentale" OR "Phaeoacremonium parasiticum" OR "Phaeoacremonium pravum" OR "Phaeoacremonium prunicola" OR "Phaeoacremonium roseum" OR "Phaeoacremonium rubrigenum" OR "Phaeoacremonium scolyti" OR "Phaeoacremonium sicilianum" OR "Phaeoacremonium subulatum" OR "Phaeoacremonium tuscanicum" OR "Phaeoacremonium tuscanum" OR "Phaeoacremonium venezuelense" OR "Phaeoacremonium viticola" OR "Phaeobotryosphaeria porosa" OR "Phaeoisariopsis vitis" OR "Phaeomoniella chlamydospora" OR "Phaeomoniella chlamydospora" OR "Phaeoramularia dissiliens" OR "Phakopsora ampelopsidis" OR "Phakopsora cronartiiformis" OR "Phakopsora euvitis" OR "Phakopsora euvitis" OR "Phakopsora meliosmae-myrianthae" OR "Phakopsora montana" OR "Phakopsora uva" OR "Phakopsora vitis" OR "Phalaenoides glycinae" OR "Phellinus igniarius" OR "Phellinus noxius" OR "Phellinus noxius" OR "Phellinus punctatus" OR "Phellinus resupinatus" OR "Phenacoccus aceris" OR "Phenacoccus madeirensis" OR "Phenacoccus solani" OR "Phenacoccus solenopsis" OR "Phenacoccus solenopsis" OR "Phialocephala dimorphospora" OR "Phialophora parasitica" OR "Philaenus spumarius" OR "Philopedon plagiatus" OR "Philotherma rosa" OR "Phlogotettix cyclops" OR "Phlyctinus callosus" OR "Phoma ampelina" OR "Phoma ampelocarpa" OR "Phoma betae" OR "Phoma confluens" OR "Phoma exigua" OR "Phoma flaccida" OR "Phoma glomerata" OR "Phoma lenticularis" OR "Phoma negriana" OR "Phoma pilisporis" OR "Phoma plurivora" OR "Phoma pomorum" OR "Phoma reniformis" OR "Phoma uvicola" OR "Phoma viticola" OR "Phoma vitis" OR "Phomopsis amygdali" OR "Phomopsis cordifolia" OR "Phomopsis cotoneastri" OR "Phomopsis fukushii" OR "Phomopsis theicola" OR "Phomopsis viticola" OR "Phomopsis viticola" OR "Phomopsis vitimegaspora" OR "Phyllactinia ampelopsidis" OR "Phyllactinia guttata" OR "Phyllactinia guttata" OR "Phyllactinia suffulta" OR "Phyllocnistis ampelopsiella" OR "Phyllocnistis toparcha" OR "Phyllocnistis vitegenella" OR "Phyllocnistis vitegenella" OR "Phyllocoptes vitis" OR "Phylloporia ampelina" OR "Phyllosticta ampelicida" OR "Phyllosticta ampelicida" OR "Phyllosticta ampelina" OR "Phyllosticta ampelophila" OR "Phyllosticta badhami" OR "Phyllosticta dzumajensis" OR "Phyllosticta microspila" OR "Phyllosticta negriana" OR "Phyllosticta pilispora" OR "Phyllosticta succedanea" OR "Phyllosticta viticola" OR "Phyllosticta vitis" OR "Phymatotrichopsis omnivora" OR "Phymatotrichum omnivorum" OR "Physopella ampelopsidis" OR "Physopella vitis" OR "Phytonemus pallidus" OR "Phytophthora cactorum" OR "Phytophthora cambivora" OR "Phytophthora cinnamomi" OR "Phytophthora citricola" OR "Phytophthora cryptogea" OR "Phytophthora cryptogea" OR "Phytophthora megasperma" OR "Phytophthora nicotianae" OR "Phytophthora niederhauseri" OR "Phytoplasma brasiliense" OR "Phytoplasma mali" OR "Phytopythium helicoides" OR "Phytopythium litorale" OR "Phytopythium vexans" OR "Pilidiella castaneicola" OR "Pilidiella diplodiella" OR "Pilidiella diplodiopsis" OR "Pilidiella granati" OR "Pilidium concavum" OR "Pinnaspis strachani" OR "Pinnaspis strachani" OR "Pionnotes biasolettiana" OR "Pityrocarpa moniliformis" OR "Plagionotus arcuatus" OR "Plagiostoma devexum" OR "Planococcus citri" OR "Planococcus citri" OR "Planococcus ficus" OR "Planococcus ficus" OR "Planococcus lilacinus" OR "Planococcus lilacinus" OR "Planococcus minor" OR "Planococcus minor" OR "Plasmopara viticola" OR "Plasmopara viticola" OR "Platymetopius rostratus" OR "Platynota nigrocervina" OR "Platynota stultana" OR "Platynota stultana" OR "Pleiocarpon algeriense" OR "Pleospora dichromotricha" OR "Pleospora herbarum" OR "Pleospora herbarum" OR "Pleospora vitis" OR "Pleospora vitis-viniferae" OR "Pleospora vulgaris" OR "Pleurostoma richardsiae" OR "Pleurostomophora richardsiae" OR "Pleurotus ostreatus" OR "Pleurotus ostreatus" OR "Plodia interpunctella" OR "Plutella xylostella" OR "Pochazia shantungensis" OR "Polistes dominula" OR "Polychrosis viteana" OR "Polygonum aviculare" OR "Polygonum lapathifolium" OR "Polyphagotarsonemus latus" OR "Popillia japonica" OR "Porodiplodia vitis" OR "Portulaca oleracea" OR "Potato virus X" OR "Potexvirus citriflavivenae" OR "Pratylenchus brachyurus" OR "Pratylenchus crenatus" OR "Pratylenchus fallax" OR "Pratylenchus hexincisus" OR "Pratylenchus hippeastri" OR "Pratylenchus neglectus" OR "Pratylenchus neglectus" OR "Pratylenchus penetrans" OR "Pratylenchus penetrans" OR "Pratylenchus pratensis" OR "Pratylenchus scribneri" OR "Pratylenchus thornei" OR "Pratylenchus vulnus" OR "Pratylenchus vulnus" OR "Preussia africana" OR "Prociphilus oleae" OR "Prodiplosis longifila" OR "Proeulia auraria" OR "Proeulia auraria" OR "Proeulia chrysopteris" OR "Proeulia triquetra" OR "Prosapia ignifera" OR "Psammotettix striatus" OR "Pseudaonidia marquesi" OR "Pseudaonidia trilobitiformis" OR "Pseudaonidia trilobitiformis" OR "Pseudaulacaspis pentagona" OR "Pseudaulacaspis pentagona" OR "Pseudocamarosporium propinquum" OR "Pseudocercospora riachueli" OR "Pseudocercospora riachueli var. horiana" OR "Pseudocercospora vitis" OR "Pseudococcus calceolariae" OR "Pseudococcus calceolariae" OR "Pseudococcus comstocki" OR "Pseudococcus comstocki" OR "Pseudococcus cribata" OR "Pseudococcus cryptus" OR "Pseudococcus longispinus" OR "Pseudococcus longispinus" OR "Pseudococcus maritimus" OR "Pseudococcus meridionalis" OR "Pseudococcus viburni" OR "Pseudococcus viburni" OR "Pseudocochliobolus verruculosus" OR "Pseudokermes vitreus" OR "Pseudolachnea hispidula" OR "Pseudomonas fluorescens" OR "Pseudomonas syringae" OR "Pseudomonas syringae pv. syringae" OR "Pseudomonas viridiflava" OR "Pseudopestalotiopsis camelliae-sinensis" OR "Pseudopezicula tetraspora" OR "Pseudopezicula tracheiphila" OR "Pseudopezicula tracheiphila" OR "Pseudopeziza tracheiphila" OR "Pseudotargionia glandulosa" OR "Pseudovalsa viticola" OR "Psychomorpha epimenis" OR "Pulvinaria vini" OR "Pulvinaria vinifera" OR "Pulvinaria vitis" OR "Pulvinaria vitis" OR "Pyrenophora phaeocomes" OR "Pyrenophora phaeocomoides" OR "Pyrenophora phaeocomoides f. vitis" OR "Pyrigemmula aurantiaca" OR "Pyrrhalta luteola" OR "Pythium acanthicum" OR "Pythium amasculinum" OR "Pythium aphanidermatum" OR "Pythium coloratum" OR "Pythium cryptoirregulare" OR "Pythium debaryanum" OR "Pythium echinulatum" OR "Pythium helicoides" OR "Pythium heterothallicum" OR "Pythium irregulare" OR "Pythium kunmingense" OR "Pythium mamillatum" OR "Pythium parasiticum" OR "Pythium paroecandrum" OR "Pythium periilum" OR "Pythium perplexum" OR "Pythium pyrilobum" OR "Pythium recalcitrans" OR "Pythium rostratifingens" OR "Pythium rostratum" OR "Pythium spinosum" OR "Pythium splendens" OR "Pythium sylvaticum" OR "Pythium torulosum" OR "Pythium ultimum" OR "Pythium ultimum var. ultimum" OR "Pythium vanterpoolii" OR "Pythium vexans" OR "Pythium violae" OR "Quambalaria cyanescens" OR "Ramularia mali" OR "Ramularia vitis" OR "Raphanus raphanistrum" OR "Raspberry bushy dwarf virus" OR "Raspberry ringspot virus" OR "Rastrococcus iceryoides" OR "Rastrococcus iceryoides" OR "Reptalus panzeri" OR "Reptalus panzeri" OR "Retithrips syriacus" OR "Rhabdospora ampelina" OR "Rhabdospora mueggenburgii" OR "Rhabdospora vitis" OR "Rhacodiella vitis" OR "Rhaphigaster nebulosa" OR "Rhinocladiella atrovirens" OR "Rhipiphorothrips cruentatus" OR "Rhizobium radiobacter" OR "Rhizobium rhizogenes" OR "Rhizobium vitis" OR "Rhizoctonia solani" OR "Rhizoecus cacticans" OR

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"Rhizoecus falcifer" OR "Rhizoglyphus echinopus" OR "Rhizopus arrhizus" OR "Rhizopus nigricans" OR "Rhizopus stolonifer" OR "Rhizopus stolonifer" OR "Rhopalus tigrinus" OR "Ricania speculum" OR "Richardia brasiliensis" OR "Robillarda vitis" OR "Roesleria pallida" OR "Roesleria subterranea" OR "Rosellinia akulovii" OR "Rosellinia amblystoma" OR "Rosellinia aquila" OR "Rosellinia necatrix" OR "Rosellinia rosarum" OR "Rotylenchulus macrodoratus" OR "Rotylenchulus parvus" OR "Rotylenchulus reniformis" OR "Rotylenchulus reniformis" OR "Rotylenchus buxophilus" OR "Rotylenchus robustus" OR "Rotylenchus vitis" OR "Rumex crispus" OR "Russellaspis pustulans" OR "Russelliana solanicola" OR "Saharaspis ceardi" OR "Saissetia coffeae" OR "Saissetia coffeae" OR "Saissetia oleae oleae" OR "Sarocladium strictum" OR "Sarocladium terricola" OR "Scaphoideus titanus" OR "Schistocerca gregaria" OR "Schistocerca nitens" OR "Schizonobia sycophanta" OR "Schizonobia viticola" OR "Schizophyllum commune" OR "Schizophyllum commune" OR "Scirtothrips aurantii" OR "Scirtothrips citri" OR "Scirtothrips dorsalis" OR "Scirtothrips mangiferae" OR "Sclerotinia fuckeliana" OR "Sclerotinia sclerotiorum" OR "Sclerotinia sclerotiorum" OR "Sclerotium echinatum" OR "Sclerotium rolfsii" OR "Scolicotrichum vitiphyllum" OR "Scutellonema brachyurum" OR "Scutellonema brachyurus" OR "Scutellonema clathricaudatum" OR "Scytinostroma aluta" OR "Seimatosporium botan" OR "Seimatosporium hysterioides" OR "Seimatosporium lichenicola" OR "Seimatosporium lonicerae" OR "Seimatosporium luteosporum" OR "Seimatosporium marivanicum" OR "Seimatosporium parasiticum" OR "Seimatosporium vitifusiforme" OR "Seimatosporium vitis" OR "Seimatosporium vitis-viniferae" OR "Seiridium ceratosporum" OR "Seiridium pezizoides" OR "Selenaspidus articulatus" OR "Selenaspidus articulatus" OR "Selenothrips rubrocinctus" OR "Senecio inaequidens" OR "Senecio vulgaris" OR "Senna macranthera" OR "Septobasidium tanakae" OR "Septocylindrium dissiliens" OR "Septoria ampelina" OR "Septoria ampelina" OR "Septoria badhamii" OR "Septoria buharica" OR "Septoria melanopsis" OR "Septoria vineae" OR "Septoria viticola" OR "Septoria vitis" OR "Septosporium heterosporum" OR "Setaria faberi" OR "Setaria verticillata" OR "Setaria viridis" OR "Sida cordifolia" OR "Sida galheirensis" OR "Sida rhombifolia" OR "Sidastrum micranthum" OR "Silene latifolia subsp. alba" OR "Sinapis arvensis" OR "Sinoxylon perforans" OR "Sitona lineatus" OR "Solanum elaeagnifolium" OR "Solanum nigrum" OR "Sonchus arvensis" OR "Sonchus oleraceus" OR "Sordaria fimicola" OR "Sowbane mosaic virus" OR "Sparganothis pilleriana" OR "Sparganothis sulfureana" OR "Spencermartinsia plurivora" OR "Spencermartinsia viticola" OR "Spencermartinsia westrale" OR "Sphaceloma ampelinum" OR "Sphaeraspis vitis" OR "Sphaeropsis ampelos" OR "Sphaeropsis malorum" OR "Sphaeropsis peckiana" OR "Sphaeropsis poros" OR "Sphaeropsis viticola" OR "Sphaeropsis vitigena" OR "Sphecodina abbottii" OR "Spilosoma virginica" OR "Spissistilus festinus" OR "Spodoptera eridania" OR "Spodoptera frugiperda" OR "Spodoptera frugiperda" OR "Spodoptera littoralis" OR "Spodoptera litura" OR "Spodoptera litura" OR "Spodoptera ornithogalli" OR "Spodoptera praefica" OR "Spodoptera praefica" OR "Sporocadus kurdistanicus" OR "Sporocadus rhododendri" OR "Sporocadus rosigena" OR "Sporormiella intermedia" OR "Stachybotrys lobulata" OR "Stagonospora bulgarica" OR "Stegonsporium viticola" OR "Stelidota geminata" OR "Stellaria media" OR "Stemphylium viticola" OR "Stereum hirsutum" OR "Stereum hirsutum" OR "Stictocephala alta" OR "Stigmina esfandiari" OR "Stigmina esfandiarii" OR "Stralarivirus fragariae" OR "Strawberry latent ringspot virus" OR "Strickeria sylvana" OR "Strickeria trabicola" OR "Sultanimyces vitiphyllus" OR "Syllepte ovialis" OR "Synanthedon tipuliformis" OR "Syromastus rhombeus" OR "Tagetes minuta" OR "Talaromyces purpureogenus" OR "Talinum paniculatum" OR "Tanymecus dilaticollis" OR "Tanymecus palliatus" OR "Taraxacum officinale complex" OR "Targionia vitis" OR "Teloxys aristata" OR "Temfrudevirus temperatum" OR "Tenuipalpus granati" OR "Tetranychus cinnabarinus" OR "Tetranychus kanzawai" OR "Tetranychus kanzawai" OR "Tetranychus ludeni" OR "Tetranychus mcdanieli" OR "Tetranychus mcdanieli" OR "Tetranychus mexicanus" OR "Tetranychus mexicanus" OR "Tetranychus neocaledonicus" OR "Tetranychus pacificus" OR "Tetranychus pacificus" OR "Tetranychus piercei" OR "Tetranychus schoenei" OR "Tetranychus truncatus" OR "Tetranychus turkestani" OR "Tetranychus urticae" OR "Tetranychus urticae" OR "Thanatephorus cucumeris" OR "Thanatephorus cucumeris" OR "Thaumatotibia leucotreta" OR "Theba pisana" OR "Thelonectria aurea" OR "Thelonectria blackeriella" OR "Thelonectria olida" OR "Theresimima ampellophaga" OR "Theretra alecto" OR "Theretra capensis" OR "Theretra clotho" OR "Theretra japonica" OR "Theretra latreillii" OR "Theretra oldenlandiae" OR "Thinopteryx crocoptera" OR "Thrips angusticeps" OR "Thrips hawaiiensis" OR "Thrips imaginis" OR "Thrips palmi" OR "Thrips setosus" OR "Thrips tabaci" OR "Thyris sepulchralis" OR "Tilletiopsis minor" OR "Tilletiopsis washingtonensis" OR "Tobacco necrosis virus" OR "Tobacco ringspot virus" OR "Tobamovirus fructirugosum" OR "Togninia austroafricana" OR "Togninia fraxinopennsylvanica" OR "Togninia krajdenii" OR "Togninia minima" OR "Togninia viticola" OR "Toleria romanovi" OR "Tomato black ring virus" OR "Tomato ringspot virus" OR "Tomentella atramentaria" OR "Tomentella bryophila" OR "Torula antennata" OR "Trametes versicolor" OR "Trametes zonata" OR "Trematosphaeria communis" OR "Triblidium rophalascum" OR "Tribulus terrestris" OR "Trichithecium roseum" OR "Trichocladium asperum" OR "Trichoderma asperellum" OR "Trichoderma atroviride" OR "Trichoderma aureoviride" OR "Trichoderma harzianum" OR "Trichoderma harzianum" OR "Trichoderma koningii AN" OR "Trichoderma longibrachiatum" OR "Trichoderma viride" OR "Trichodorus andalusicus" OR "Trichodorus onubensis" OR "Trichodorus paragiennensis" OR "Trichodorus porosus" OR "Trichodorus primitivus" OR "Trichodorus similis" OR "Trichodorus viruliferus" OR "Trichoferus campestris" OR "Trichothecium roseum" OR "Trichothecium roseum" OR "Trichovirus necroacini" OR "Trichovirus pinovitis" OR "Trijuba oculata" OR "Trogoderma granarium" OR "Trullula melanochlora" OR "Truncatella angustata" OR "Truncatella pitospora" OR "Tylenchorhynchus acutus" OR "Tylenchorhynchus capitatus" OR "Tylenchorhynchus clarus" OR "Tylenchorhynchus claytoni" OR "Tylenchorhynchus cylindricus" OR "Tylenchorhynchus mashhoodi" OR "Tylenchorhynchus mediterraneus" OR "Tylenchulus semipenetrans" OR "Tylenchulus semipenetrans" OR "Ulocladium atrum" OR "Umbelopsis isabellina NR" OR "Uncinula americana" OR "Uncinula necator" OR "Uncinula necator var. necator" OR "Uredo vitis" OR "Urophorus humeralis" OR "Urtica urens" OR "Uzbekistanica vitis-viniferae" OR "Valsa vitis" OR "Valsaria insitiva" OR "Vermicularia compacta" OR "Veronica persica" OR "Verpa bohemica" OR "Verticillium albo-atrum" OR "Verticillium cinnabarinum" OR "Verticillium dahliae" OR "Verticillium dahliae" OR "Vicia villosa" OR "Vitacea cupressi" OR "Vitacea polistiformis" OR "Vitacea polistiformis" OR "Vitacea scepsiformis" OR "Viteus vitifoliae" OR "Viteus vitifolii" OR "Vitivirus alphavitis" OR "Vitula serratilineella" OR "Waltheria communis" OR "Xanthomonas campestris pv. viticola" OR "Xanthomonas citri pv. viticola" OR "Xenococcus acropygae" OR "Xenoseimatosporium kurdistanicum" OR "Xeromyces bisporus" OR "Xestia c-nigrum" OR "Xiphinema aceri" OR "Xiphinema americanum" OR "Xiphinema americanum" OR "Xiphinema americanum sensu stricto" OR "Xiphinema brevicolle" OR "Xiphinema bricolense" OR "Xiphinema californicum" OR "Xiphinema californicum" OR "Xiphinema diversicaudatum" OR "Xiphinema diversicaudatum" OR "Xiphinema index" OR "Xiphinema index" OR "Xiphinema insigne" OR "Xiphinema italiae" OR "Xiphinema mediterraneum" OR "Xiphinema melitense" OR "Xiphinema monohysterum" OR "Xiphinema pachtaicum" OR "Xiphinema pyrenaicum" OR "Xiphinema rivesi" OR "Xiphinema vuittenezi" OR "Xylaria arbuscula" OR "Xylaria hypoxylon" OR "Xyleborus atratus" OR "Xyleborus dispar" OR "Xylella fastidiosa" OR "Xylella fastidiosa" OR "Xylella fastidiosa subsp. fastidiosa" OR "Xylella fastidiosa subsp. multiplex" OR "Xylophilus ampelinus" OR "Xylosandrus crassiusculus" OR "Xylosandrus germanus" OR "Xylotrechus chinensis" OR "Xylotrechus pyrrhoderus" OR "Xyphon fulgidum" OR "Xyphon nudum" OR "Zaprionus indianus" OR "Zaprionus indianus" OR "Zaprionus tuberculatus" OR "Zetiasplozna thuemenii" OR "Zeuzera coffeae" OR "Zygina nivea" OR "Zygina rhamni" OR "Zyginidia pullula" OR "Zygophiala jamaicensis" OR "Zygorhynchus moelleri" OR "Zygotylenchus guevarai")

APPENDIX C

Excel file with the pest list of *Vitis* spp.

Appendix C can be found in the online version of this output (in the 'Supporting information' section).