SCIENTIFIC OPINION

EFSA Journal

ADOPTED: 31 March 2022

doi: 10.2903/j.efsa.2022.7300

Commodity risk assessment of *Jasminum polyanthum* unrooted cuttings from *Uganda*

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Abstract

The European Commission requested the EFSA Panel on Plant Health to prepare and deliver risk assessments for commodities listed in Commission Implementing Regulation EU/2018/2019 as 'High risk plants, plant products and other objects'. This Scientific Opinion covers plant health risks posed by unrooted cuttings of *Jasminum polyanthum* that are imported from Uganda, taking into account the available scientific information, including the technical information provided by the NPPO of Uganda. The relevance of any pest for this opinion was based on evidence following defined criteria. Six species, two EU-regulated pests *(Bemisia tabaci,* non-European populations and *Scirtothrips dorsalis)* and four EU non-regulated pests (*Coccus viridis, Diaphania indica, Pulvinaria psidii* and *Selenaspidus articulatus)*, fulfilled all relevant criteria and were selected for further evaluation. For these pests, the risk mitigation measures proposed in the technical dossier from Uganda were evaluated taking into account the possible limiting factors. For these pests, an expert judgement is given on the likelihood of pest freedom taking into consideration the risk mitigation measures acting on the pest, including uncertainties associated with the assessment. The estimated degree of pest freedom varies among the pests evaluated, with *B. tabaci* and *S. dorsalis* being the pests most frequently expected on the imported plants. The Expert Knowledge Elicitation indicated, with 95% certainty, that between 9,950 and 10,000 plants per 10,000 would be free of *B. tabaci*.

Keywords: jasminum, plants for planting, plant health, plant pest, quarantine, European Union

Requestor: European Commission

Question number: EFSA-Q-2021-00403

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Declarations of interest: The declarations of interest of all scientific experts active in EFSA's work are available at https://ess.efsa.europa.eu/doi/doiweb/doisearch.

Acknowledgments: EFSA wishes to acknowledge the important contribution of the trainees Laura Carotti and Patricia Nascimento.

Suggested citation: EFSA PLH Panel (EFSA Panel on Plant Health), Bragard C, Chatzivassiliou E, Di Serio F, Baptista P, Gonthier P, Jaques Miret JA, Fejer Justesen A, MacLeod A, Magnusson CS, Milonas P, Navas-Cortes JA, Parnell S, Reignault PL, Stefani E, Thulke H-H, Van der Werf W, Vicent Civera A, Yuen J, Zappalà L, Debode J, Manceau C, Gardi C, Mosbach-Schulz O and Potting R, 2022. Scientific Opinion on the commodity risk assessment of *Jasminum polyanthum* unrooted cuttings from *Uganda*. EFSA Journal 2022;20(5):7300, 83 pp. https://doi.org/10.2903/j.efsa.2022.7300

ISSN: 1831-4732

The EFSA Journal is a publication of the European Food Safety Authority, a European agency funded by the European Union.

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1. Introduction

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

1.1.1. Background

The new Plant Health Regulation (EU) 2016/2031[1], on the protective measures against pests of plants, has been applied from December 2019. Provisions within the above Regulation are in place for the listing of 'high risk plants, plant products and other objects' (Article 42) on the basis of a preliminary assessment, and to be followed by a commodity risk assessment. A list of 'high risk plants, plant products and other objects' has been published in (EU) 2018/2019[2]. Scientific opinions are therefore needed to support the European Commission and the Member States in the work connected to Article 42 of Regulation (EU) 2016/2031, as stipulated in the terms of reference.

1.1.2. Terms of Reference

In view of the above and in accordance with Article 29 of Regulation (EC) No 178/2002[3], the Commission asks EFSA to provide scientific opinions in the field of plant health.

In particular, EFSA is expected to prepare and deliver risk assessments for commodities listed in the relevant Implementing Act as "High risk plants, plant products and other objects". Article 42, paragraphs 4 and 5, establishes that a risk assessment is needed as a follow-up to evaluate whether the commodities will remain prohibited, removed from the list and additional measures will be applied or removed from the list without any additional measures. This task is expected to be on-going, with a regular flow of dossiers being sent by the applicant required for the risk assessment.

Therefore, to facilitate the correct handling of the dossiers and the acquisition of the required data for the commodity risk assessment, a format for the submission of the required data for each dossier is needed.

Furthermore, a standard methodology for the performance of "commodity risk assessment" based on the work already done by Member States and other international organizations needs to be set.

In view of the above and in accordance with Article 29 of Regulation (EC) No 178/2002, the Commission asks EFSA to provide scientific opinion in the field of plant health for *Jasminum polyanthum* from Uganda taking into account the available scientific information, including the technical dossier provided by Uganda.

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 *Jasminum polyanthum* unrooted cuttings from Uganda 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 Uganda.

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

Annex II of Commission Implementing Regulation (EU) 2019/2072 lists certain pests as non-European populations or isolates or species. These pests are regulated quarantine pests. Consequently, the respective European populations, or isolates, or species are non-regulated pests.

Annex VII of the same Regulation, in certain cases (e.g. point 32) makes reference to the following countries that are excluded from the obligation to comply with specific import requirements for those

[1] Regulation (EU) 2016/2031 of the European Parliament of the Council of 26 October 2016 on protective measures against pests of plants, amending Regulations (EU) 228/2013, (EU) 652/2014 and (EU) 1143/2014 of the European Parliament and of the Council and repealing Council Directives 69/464/EEC, 74/647/EEC, 93/85/EEC, 98/57/EC, 2000/29/EC, 2006/91/EC and 2007/33/EC. OJ L 317, 23.11.2016, pp. 4–104.

[2] Commission Implementing Regulation (EU) 2018/2019 of 18 December 2018 establishing a provisional list of high risk plants, plant products or other objects, within the meaning of Article 42 of Regulation (EU) 2016/2031 and a list of plants for which phytosanitary certificates are not required for introduction into the Union, within the meaning of Article 73 of that Regulation C/2018/8877. OJ L 323, 19.12.2018, pp. 10–15.

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

non-European populations, or isolates, or species: Albania, Andorra, Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Canary Islands, Faeroe Islands, Georgia, Iceland, Liechtenstein, Moldova, Monaco, Montenegro, North Macedonia, Norway, Russia (only the following parts: Central Federal District (Tsentralny federalny okrug), Northwestern Federal District (SeveroZapadny federalny okrug), Southern Federal District (Yuzhny federalny okrug), North Caucasian Federal District (Severo-Kavkazsky federalny okrug) and Volga Federal District (Privolzhsky federalny okrug), San Marino, Serbia, Switzerland, Turkey, Ukraine and United Kingdom (except Northern Ireland). Those countries are historically linked to the reference to 'non-European countries' existing in the previous legal framework, Directive 2000/29/EC.

Consequently, for those countries,

i) any pests identified, which are listed as non-European species in Annex II of Commission Implementing Regulation (EU) 2019/2072 should be investigated as any other non-regulated pest.
ii) any pest found in a European country that belongs to the same denomination as the pests listed as non-European populations or isolates in Annex II of Commission Implementing Regulation (EU) 2019/2072, should be considered as European populations or isolates and should not be considered in the assessment of those countries.

Pests listed as 'Regulated Non-Quarantine Pest' (RNQP)' in Annex IV of the Commission Implementing Regulation (EU) 2019/2072, and deregulated pests (i.e. pests which were listed as quarantine pests in the Council Directive 2000/29/EC and were deregulated by Commission Implementing Regulation (EU) 2019/2072) were not considered for further evaluation. In case a pest is at the same time regulated as an RNQP and as a Protected Zone Quarantine pest, in the Opinion, it is evaluated as quarantine pest.

In its evaluation, the Panel:

- Checked whether the information in the technical dossier (hereafter referred to as 'the Dossier') provided by the applicant (The National Plant Protection Organization of Uganda, Ministry of Agriculture and Forestry, Ministry of Agriculture Animal Industry and Fisheries (MAAIF) – NPPO of Uganda) 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[4], hereafter referred to as 'EU quarantine pests') and other relevant pests present in Uganda and associated with the commodity.
- 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 specific applicant country and other relevant pests present in applicant country and associated with the commodity.
- The risk assessment and its conclusions are based on the information provided in the submitted technical dossier (specific place and procedure of production). Any difference in the production process (site, procedures) may change the overall risk estimated.

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 proposed by the NPPO of Uganda.

2. Data and methodologies

2.1. Data provided by the NPPO of Uganda

The Panel considered all the data and information (hereafter called 'the Dossier') provided by the NPPO of Uganda and received from the European Commission on 5 July 2021. Additional information was provided upon requests from EFSA, on 25 October 2021 and on 3 November 2021.The Dossier is managed by EFSA.

[4] 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.

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	Filename
1.0	Technical dossier on *Jasminum polyanthum* – General requirements	EFSA_Dossier - Q-2021-00403_Uganda_Jasminum polyanthum.docx
2.0	Technical dossier on *Jasminum polyanthum* – Information on Commodity Data	EFSA_Dossier - Q-2021-00403_Uganda_Jasminum polyanthum.docx
3.0	Technical dossier on *Jasminum polyanthum* – Information on Production area	EFSA_Dossier - Q-2021-00403_Uganda_Jasminum polyanthum.docx
4.0	Technical dossier on *Jasminum polyanthum* – Production, Cultivation and Packaging practices	EFSA_Dossier - Q-2021-00403_Uganda_Jasminum polyanthum.docx
5.0	Technical dossier on *Jasminum polyanthum* – Pest Lists	EFSA_Dossier - Q-2021-00403_Uganda_Jasminum polyanthum.docx
6.0	Technical dossier on *Jasminum polyanthum* – Pest and disease control at Production Site	EFSA_Dossier - Q-2021-00403_Uganda_Jasminum polyanthum.docx
7.0	Technical dossier on *Jasminum polyanthum* – Current phytosanitary certification system (field inspection, sampling, additional notification)	EFSA_Dossier - Q-2021-00403_Uganda_Jasminum polyanthum.docx
8.0	Technical dossier to support the request for import of high-risk plant *Jasminum Polyanthum* from Uganda-Second Submission	Jasminum Technical Dossier-Uganda - Second Submission 25012021 BK
9.0	Clarification on *Thrips palmi*	Re EFSA High Risk Plant request for additional information - risk assessment for the EU territory of Jasminum polyanthum_V2

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

The databases shown in Table 2 and the resources and references listed below are the main sources used by the NPPO of Uganda to compile the Dossier (details on literature searches can be found in the Dossier Section 4.0:

Table 2: Database sources used in the literature searches by NPPO of Uganda

Acronym/ Short title	Database name and service provider	URL of database	Justification for choosing database
CABI ISC	CABI Invasive Species Compendium Provider: CAB International	https://www.cabi.org/ISC	Internationally recognised database
CABI CPC	CABI Crop Protection Compendium	https://www.cabi.org/cpc/	Internationally recognised database
EPPO GD	EPPO Global Database Provider: European and Mediterranean Plant Protection Organization	https://gd.eppo.int/	Internationally recognised database
EFSA	European Food Safety Authority	https://efsa.onlinelibrary.wiley.com	Internationally recognised database
HEAR	Hawaiian Ecosystems at Risk project: Invasive species information for Hawaii and the Pacific	http://www.hear.org/pier/species/jasminum_polyanthum.htm	Jasminum specific information

Other resources used by the NPPO of Uganda

Beringen R, Duined G, Hoop L, Hullu P, Mathews J, Ode B, Van Valkenburg J, Van der Veld, G and Leuven R, 2017. Risk assessment of the alien Staff-vine (*Celastrus orbitculatus*). Reports Environmental Science, Radboud University, The Netherlands.

Bolland H, Guiterrez J and Flechtmann C, 1998. World catalogue of the spider mite family (Acari: Tetranychidae). Leiden, The Netherlands, Brill.

Bureau of Animal and Plant Health Inspection and quarantine Council of Agriculture, 2011. Quarantine Requirements for importation of plants and plant products into the Republic of China. Executive Yaun, The Republic of China.

Collins L, Korycinska A and Baker R, 2014. Rapid pest risk analysis for *Chrysodeixis chalcites*. The Food and Environment Research Agency.

Grousset F, Petter F, Suffert M and Roy A, 2012. EPPO Study on the risk of imports of plants for planting: description and details of the first outcomes. EPPO Bulletin, 42, 185–190.

Kairo M, Ali B, Cheesman O, Haysom K and Murphy S, 2003. Invasive species threats in the Caribbean Region. Report to the Nature conservancy, CABI Bioscience/CAB International.

Mulumphy C and Anderson H, 2011. Rapid assessment of the need for a detailed pest risk analysis for *Ceroplastes rusci* Takahashi. The Food and Environment Research Agency.

Niemiera A and Holle B, 2009. Management of Invasive Weeds - Invasive Plant Species and the Ornamental Horticulture Industry. The Netherlands, Springer.

Plant Protection Service, 2008. Pest Risk Analysis: *Anoplophora chinensis*. The Netherlands, Wageningen University.

2.2. Literature searches performed by EFSA

Literature searches were undertaken by EFSA to complete a list of pests potentially associated with *Jasminum*. Two searches were combined: (i) a general search to identify pests of *Jasminum* in different databases and (ii) a tailored search to identify whether these pests are present or not in Uganda and the European Union (EU). The searches were run between 8 November 2019 and 10 August 2021. No language, date or document type restrictions were applied in the search strategy. The Panel used the databases indicated in Table 3 to compile the list of pests associated with *Jasminum*. 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.

The list of pests potentially associated with *Jasminum* already used for the opinion 'Commodity risk assessment of *Jasminum polyanthum* plants from Israel' was updated on 10/8/2021 checking all the databases indicated in Table 3.

Table 3: Databases used by EFSA for the compilation of the pest list associated with the genus *Jasminum*

Database	Platform/Link
Aphids on World Plants	http://www.aphidsonworldsplants.info/C_HOSTS_AAIntro.htm
CABI Crop Protection Compendium	https://www.cabi.org/cpc/
Database of Insects and their Food Plants	http://www.brc.ac.uk/dbif/hosts.aspx
Database of the World's Lepidopteran Hostplants	https://www.nhm.ac.uk/our-science/data/hostplants/search/index.dsml
EPPO Global Database	https://gd.eppo.int/
Leaf-miners	http://www.leafmines.co.uk/html/plants.htm
Nemaplex	http://nemaplex.ucdavis.edu/Nemabase2010/PlantNematodeHostStatusDDQuery.aspx
Plant Viruses Online	http://bio-mirror.im.ac.cn/mirrors/pvo/vide/famindex.htm
International Committee on Taxonomy of Viruses (ICTV) - Master Species List	https://talk.ictvonline.org/files/master-species-lists/m/msl/9601
Scalenet	http://scalenet.info/associates/
Spider Mites Web	https://www1.montpellier.inra.fr/CBGP/spmweb/advanced.php
USDA ARS Fungi Database	https://nt.ars-grin.gov/fungaldatabases/fungushost/fungushost.cfm
Index Fungorum	http://www.indexfungorum.org/Names/Names.asp
Mycobank	https://www.mycobank.com

Database	Platform/Link
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)	https://www.webofknowledge.com
World Agroforestry	http://www.worldagroforestry.org/treedb2/speciesprofile.php?Spid=1749
Catalog of the Cecidomyiidae (Diptera) of the world	https://www.ars.usda.gov/ARSUserFiles/80420580/Gagne_2014_World_Cecidomyiidae_Catalog_3rd_Edition.pdf
Catalog of the Eriophoidea (Acarina: Prostigmata) of the world.	https://www.cabi.org/isc/abstract/19951100613
Global Biodiversity Information Facility (GBIF)	https://www.gbif.org/

Additional searches, limited to retrieve documents, were run when developing the opinion. The available scientific information, including previous EFSA opinions on the relevant pests and diseases (see pest data sheets 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-regulated pests and other pests) that may require risk mitigation measures were identified. The EU non-regulated pests not known to occur in the EU 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 pest was determined and uncertainties identified using expert judgements.

Pest freedom was assessed by estimating the number of bags containing infested/infected unrooted cuttings out of 10,000 exported bags. Each bag contains 50 unrooted cuttings.

The information provided in some sections of the Opinion are results of the Panel interpretation of the text of the applicant Dossier.

2.3.1. Commodity data

Based on the information provided by the NPPO of Uganda, the characteristics of the commodity are summarised below.

2.3.2. Identification of pests potentially associated with the commodity

To evaluate the pest risk associated with the importation of *J. polyanthum* plants from Uganda, the pest list used for a previous dossier on the same commodity species (EFSA PLH Panel, 2020) was updated. The pest list is a compilation of all identified plant pests associated with *Jasminum* (*Jasminum* sp., *Jasminum* spp., *Jasminum polyanthum*) based on information provided in the Dossier Section 5.0 and 8.0 and on searches performed by the Panel.

The pest list (see Microsoft Excel® file in Appendix D) is a document that includes pests that use the host plant at a genus level (*Jasminum*), retrieved from EPPO Global Database, CABI Crop Protection Compendium and other databases. An overview of the consulted sources is listed in Table 3.

EUROPHYT and TRACES-NT were investigated by searching for the interceptions associated with *Jasminum* commodities imported from Uganda for the periods from 1994 to May 2020 and May 2020 to January 2022, respectively.

The evaluation of the compiled pest list was done in two steps: first, the relevance of the EU-regulated pests was evaluated (Section 4.1); second, the relevance of any other plant pest was evaluated (Section 4.2).

Pests for which limited information was available on one or more criteria used to identify them as relevant for this Opinion, e.g. on potential impact, are listed in Appendix C (List of pests that can potentially cause an effect not further assessed).

2.3.3. Listing and evaluation of risk mitigation measures

The proposed risk mitigation measures were listed and evaluated. When evaluating the likelihood of pest freedom at origin, the following types of potential infection/infestation sources for *J. polyanthum* in nurseries and relevant risk mitigation measures were considered (see also Figure 1):

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

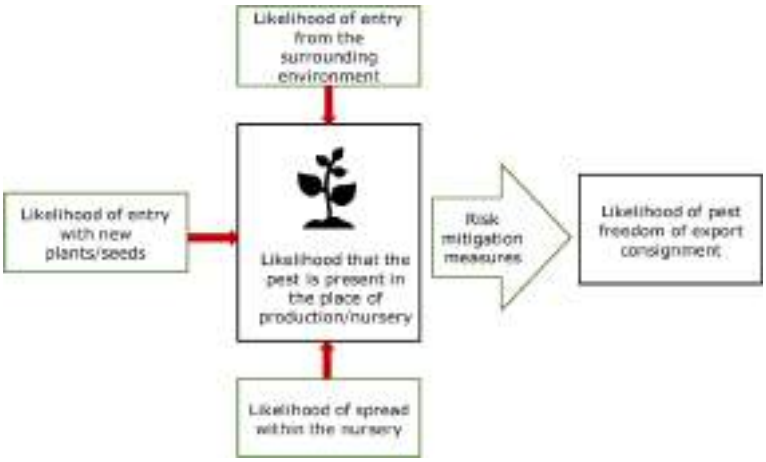


Figure 1: Conceptual framework to assess likelihood that plants are exported free from relevant pests. Source: EFSA PLH Panel (2019)

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

2.3.4. Expert Knowledge Elicitation

To estimate the pest freedom of the commodities, an Expert Knowledge Elicitation (EKE) was performed following EFSA guidance (Annex B.8 of EFSA Scientific Committee, 2018).

The specific question for EKE was defined as follows: 'Taking into account (i) the risk mitigation measures listed in the Dossier, and (ii) other relevant information (reported in the specific pest datasheets), how many of 10,000 bags of *J. polyanthum* unrooted cuttings will be infested with the relevant pest/pathogen when arriving in the EU?'.

The risk assessment uses bags containing 50 unrooted cuttings each as the most suitable unit. The following reasoning is given:

i) There is no quantitative information available regarding clustering of plants during production.
ii) For the pests under consideration, a cross infestation between bags during transport is not likely.

Before the elicitation, the list of pests was screened to identify pests with similar characteristics, risks, host–pest interactions, management practices in the production system. Similar pests were grouped for a common assessment.

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 data

3.1. Description of the commodity

The commodities to be imported are *J. polyanthum* (common name: jasmine; family: Oleaceae) unrooted cuttings (stem and leaves). The cuttings have a stem with a maximum length of 3 cm, with two pairs of leaves (Figure 2). These cuttings are up to 1 year old.

After taking the cuttings from the mother plants, these are cooled down to 7°C and packed in plastic bags, 50 pieces per bag. Afterwards, the cuttings are to be packed in boxes (30 bags per box), transported by refrigerated trucks to the airport and delivered to EU nurseries for planting (Belgium and Netherlands). Upon export, the *J. polyanthum* unrooted cuttings are entirely free from soil or roots. At the time of arrival in the EU, the cuttings are at maximum 3 days old.

According to ISPM 36 (FAO, 2019), the commodity can be classified as 'unrooted cuttings'.

Figure 2: *Jasminum polyanthum* cuttings as they are exported in the EU. Source: NPPO of Uganda

3.2. Description of the production area

The *J. polyanthum* plants from which the cuttings are generated for export, are grown inside a closed greenhouse of JP Cuttings (U) Ltd, in a controlled and regulated environment (no cuttings are produced outside or in open cultivation) and no other crops or varieties are produced or cultivated in the greenhouse, ensuring that *J. polyanthum* is physically separated from other crops. JP Cuttings is enclosed by a narrow tree belt on three sides, and Lake Victoria in the southeast corner (Figure 3).

Figure 3: Production areas of the *Jasminum polyanthum* unrooted cuttings for export. The greenhouse (on the right) where the jasmine plants are cultivated is located on Garuga peninsula, on the coast of Lake Victoria (Uganda). Source: NPPO of Uganda

3.3. Production and handling processes

3.3.1. Growing conditions

The jasmine mother plants are cultivated in a dedicated closed greenhouse where they remain throughout the cultivation period.

Mother plants are planted in certified growing media used to make plugs. Ready-made plugs are also imported from the Netherlands. No Ugandan soil is used as growing medium. The mother plants are grown in pots with granules (kabala stones) which are steamed every time the mother stock is renewed.

3.3.2. Source of planting material

The plant material used to build up the mother stock has EU-origin (Netherlands) and is inspected by NAKtuinbouw. Every year the mother stock is renewed.

3.3.3. Production cycle

The unrooted cuttings of *J. polyanthum* are harvested and exported all year round, with a peak between the months of March and October.

3.3.4. Pest monitoring during production

The greenhouses are monitored for pests and diseases using traps and visual observation. The nursery has to submit weekly pest scouting data to the NPPO. These records are regularly verified by the Ministry of Agriculture Animal Industry and Fisheries (MAAIF). The catches are analysed and recorded to inform on applications of plant protective measures. Inspection data are verified by laboratory diagnosis. The NPPO carries out surveillance at a 3-week interval. The operations in the nursery have a strict hygiene protocol that includes disinfectants like ethanol, dodecyl dimethyl ammonium chloride products, disinfection of knives and scissors, the use of protective gear, quarantine rooms for imported plant material, regular working groups and excluding intrusion as much as possible. This is inspected by the farm's quality control unit and the NPPO. The phytosanitary certification is done by NPPO inspectors who ensure the plant health requirements of the importing country are met. The farm is MPS GAP certified and audits take place annually in November.

Cultural, chemical and biological control is used on the farm. Only registered pesticides are applied and these are alternated to prevent pesticide resistance development.

3.3.5. Post-harvest processes and export procedure

The unrooted cuttings are harvested with desinfected knives. The cuttings are harvested during the day, usually during the morning before temperatures rise. *J. polyanthum* is normally harvested in large quantities (up to 1,000 cuttings) directly in the greenhouse in plastic bags and taken to the quality control area under controlled temperature. The presence of quarantine pests and diseases is also checked, along with harvest instructions such as size, stem, weight, leaves, etc. After the quality control check, the cuttings are packed in plastic bags (50 unrooted cuttings) and then packed in a box that contains a plastic sheet that is then folded over the pile of cuttings in order to avoid dehydration during transport.

The cuttings are transported in refrigerated trucks to the airport where the boxes are placed in a cold store where Uganda NPPO Inspectors pick samples for inspection to inform the issuance of phytosanitary certificates. *J. polyanthum* cuttings are transported to the EU through cargo planes or scheduled flights. These are then transported by refrigerated trucks to a cold store or distribution hall. Temperature is controlled during transportation from the nursey to the destination point. The cuttings are also inspected upon entry in the EU-Identification of pests potentially associated with the commodity.

4. Identification of pests potentially associated with the commodity

The search for potential pests associated with *Jasminum* resulted in 457 species (see Microsoft Excel® file in Appendix D).

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

The EU listing of Union quarantine pests and protected zone quarantine pests (Commission Implementing Regulation (EU) 2019/2072) is based on assessments concluding that the pests can enter, establish, spread and have potential impact in the EU.

Fifteen EU-quarantine species that are reported to use *Jasminum* as a host plant were evaluated for their relevance of being included in this opinion (Table 4).

The relevance of an EU-quarantine pest for this opinion was based on evidence that:

a) the pest is present in Uganda;
b) *Jasminum* is a host of the pest;
c) one or more life stages of the pest can be associated with the specified commodity

Two of the 15 EU-quarantine pest species evaluated fulfilled the criteria to be selected for further evaluation (Table 4).

Table 4: Overview of the evaluation of the eight EU-quarantine pest species known to use Jasminum as a host plant for their relevance for this Opinion

Number	Pest name according to the EU legislation[(a)]	EPPO Code	Group	*Jasminum* confirmed as a host (reference)	Presence in Uganda	Pest can be associated with the commodity	Pest relevant for the opinion
1	Ageratum enation virus	AEVOOO	Virus	WoS	No data	Yes	No
2	*Bemisia tabaci* (non-European populations)	BEMITA	Insect	CABI, online	Yes	Yes	Yes
3	Cotton leaf curl Kokhran virus	1BADNG	Virus	WoS	No data	Yes	No
4	*Scirtothrips dorsalis*	SCITDO	Insect	EPPO, online	Yes	Yes	Yes
5	*Spodoptera litura*	PRODLI	Insect	Database of the World's Lepidopteran Hostplants	No	Yes	No
6	Tobacco ringspot virus	TRSV00	Virus	Waterworth, H.E. (1971)	No	Yes	No
7	Tomato leaf curl New Delhi virus	TOLCND	Virus	Moriones et al. (2017)	No	Yes	No
8	Tomato ringspot virus	TORSV0	Virus	Gera, Zeidan (2006). New and Emerging virus disease in ornamental crop	No	Yes	No
9	*Xiphinema americanum* sensu stricto	XIPHAA	Nematodes	Nemaplex	No	No	No
10	*Xiphinema bricolense*	XIPHBC	Nematodes	Nemaplex	No	No	No
11	*Xiphinema californicum*	XIPHCA	Nematodes	Nemaplex	No	No	No
12	*Xiphinema intermedium*	XIPHIM	Nematodes	Nemaplex	No	No	No
13	*Xiphinema neoamericanum*	XIPHNA	Nematodes	Nemaplex	No	No	No
14	*Xiphinema rivesi*	XIPHRI	Nematodes	Nemaplex	No	No	No
15	*Xiphinema tarjanense*	XIPHTA	Nematodes	Nemaplex	No	No	No

(a): Commission Implementing Regulation (EU) 2019/2072.
(b): The question if the pest can be associated with the commodity is evaluated if the previous two questions are answered with 'yes'.

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

The information provided by the NPPO of Uganda, integrated with the search EFSA performed, was evaluated in order to assess whether there are other potentially relevant pests of *Jasminum,* present in the country of export. For these potential pests that are not regulated in the EU, pest risk assessment information on the probability of introduction, establishment, spread and impact is usually lacking. Therefore, these non-regulated pests that are potentially associated with *Jasminum* were also evaluated to determine their relevance for this opinion based on evidence that:

a) the pest is present in Uganda;
b) the pest (i) is absent or (ii) has a limited distribution in the EU and it is under official control at least in one of the MSs where it is present;
c) *Jasminum* is a host of the pest;
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.

Pests that fulfilled all five criteria were selected for further evaluation.

Based on the information collected, 443 potential pests not regulated in the EU, known to be associated with *Jasminum* were evaluated for their relevance to this opinion. Species were excluded from further evaluation when at least one of the conditions listed above (a-e) was not met. Details can be found in Appendix D (Microsoft Excel® file). Of the evaluated EU non-regulated pests, four insect species (*Coccus viridis, Diaphania indica, Pulvinaria psidi, Selenaspidus articultus)* were selected for further evaluation, because these met all the selection criteria. More information on these pest species can be found in the pest datasheets (Appendix A).

4.3. Overview of interceptions

Data on the interception of harmful organisms on plants of *Jasminum* can provide information on some of the organisms that can be present on *Jasminum* plants in trade. According to EUROPHYT, online (accessed on 21 January 2022) and TRACES NT, online (accessed on 21 January 2022), there were no records of interceptions for plants for planting of *Jasminum* from Uganda (1994 to January 2022).

4.4. Summary of pests selected for further evaluation

Six pests that were identified to be present in Uganda and having potential for association with *Jasminum* destined for export are listed in Table 5. The efficacy of the risk mitigation measures applied to the commodity was evaluated for these selected pests.

Table 5: List of relevant pests selected for further evaluation

Number	Current scientific name	EPPO code	Taxonomic information	Group	Regulatory status
1	*Bemisia tabaci*	BEMITA	Hemiptera Aleyrodidae	Insects	EU Quarantine pest (non-European populations)
2	*Coccus viridis*	COCCVI	Hemiptera Coccidae	Insects	Not regulated in the EU
3	*Diaphanica indica*	DPHNIN	Lepidoptera Crambidae	Insects	Not regulated in the EU
4	*Pulvinaria psidii*	PULVPS	Hemiptera Coccidae	Insects	Not regulated in the EU
5	*Scirtothrips dorsalis*	SCITDO	Thysanoptera Thripidae	Insects	EU Quarantine pest
6	*Selenaspidus articulatus*	SELSAR	Hemiptera Diaspididae	Insects	Not regulated in the EU

5. Risk mitigation measures

For each selected pest (Table 5), the Panel assessed the possibility that it could be present in nurseries producing *J. polyanthum* plants and assessed the probability that pest freedom of a consignment is achieved by the proposed risk mitigation measures acting on the pest under evaluation.

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

5.1. Possibility of pest presence in the export nurseries

For each selected pest (Table 5), the Panel evaluated the likelihood that the pest could be present in a *J. polyanthum* nursery by evaluating the possibility that *J. polyanthum* plants in the export nursery are 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.

5.2. Risk mitigation measures proposed

- With the information provided by the NPPO Uganda (Dossier sections 3 and 5), the Panel summarised the risk mitigation measures (see Table 6) that are currently applied in the production nursery.

Table 6: Overview of currently applied risk mitigation measures for *J. polyanthum* cuttings designated for export to the EU from Uganda

	Risk reduction option	Current measures in Uganda
1	Growing plants in isolation	The mother plants used for cutting production are grown in dedicated greenhouses. The greenhouses are enclosed with plastic on the roofs and walls. Ventilation areas (in the roof structure and in the greenhouses walls) are all screened. The screen and plastic is checked twice per week for holes or cuts. All greenhouses have double doors with an air stream flowing out of the greenhouse (electrical fans) when a door is opened.
2	Soil treatment	Plants are grown in bags with growing media (RHP-certified) and granules ('kabala stones'). The growing medium is steamed during 1.5 hrs at 80°C at least, before rooted cuttings are sticked into the bags.
3	Pesticide treatment	There are insecticide and fungicide treatments applied on Jasminum plants on a weekly basis based on scouting data. An overview of the applied pesticides is given in Table 7.
4	Pest monitoring and inspections by the nursery staff during the production process	Competent scouts employed at the farm collect pest and disease data by visual inspection and monitoring traps. Scouting data are reported on a weekly basis to the NPPO. Treatment decisions are based on the scouting data.
5	Packing and handling procedures	The unrooted cuttings are harvested with a disinfested knife, 50 cuttings are placed into a plastic bag. The plastic bags are placed inside a carton box. All these steps are done inside the greenhouse. The boxes are stored in a cold room at 7°C. A sample of the harvested bags is taken into the quality and control area, where the cuttings are visually inspected for pest and diseases, and product specifications (size, weight, colour, etc.).
6	Official Supervision by NPPO	The NPPO indicated that they ensures compliance to the import requirements as specified in Annex IV of 2000/29/EU, and in particular for *Bemisia tabaci* (point 45.1b and 46.6b).
7	Inspections of nurseries that export plants	Before export a sample is taken from the export consignment and inspected by the NPPO
8	Surveillance of production area	The NPPO includes the surrounding area of the production facility in its surveillance. No further details.

Table 7: List of pesticides used in the nursery producing *Jasminum polyanthum* unrooted cuttings

Pests	Pesticide treatments
Thrips	Movento, Mainspring, Spinosad
Fungi	Ridopmil, Daconil, Rovral, Topsin
Spidermites	Floramite, Kanemite, Milberknock,Nissorum
Other Insects	Tracer, Steward, Match

5.3. Evaluation of the current measures for the selected pests including uncertainties

The relevant risk mitigation measures acting on the selected pests were identified. Any limiting factors on the efficacy 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 the pest datasheets provided in Appendix A.

Based on this information, an expert judgement has been given for the likelihood of pest freedom of the commodity taking into consideration the risk mitigation measures acting on the pest and their combination.

An overview of the evaluation of the selected pests is given in the sections below (Sections 5.3.1–5.3.6). The outcome of EKE on pest freedom after the evaluation of the proposed risk mitigation measures is summarised in Section 5.3.7.

5.3.1. Overview of the evaluation of *Bemisia tabaci*

Rating of the likelihood of pest freedom	**Pest free with few exceptional cases** (based on the Median)				
Percentile of the distribution	5%	25%	Median	75%	95%
Proportion of pest free bags	9,950 out of 10,000 bags	9,980 out of 10,000 bags	9,990 out of 10,000 bags	9,994 out of 10,000 bags	9,998 out of 10,000 bags
Proportion of infested bags	2 out of 10,000 bags	6 out of 10,000 bags	10 out of 10,000 bags	20 out of 10,000 bags	50 out of 10,000 bags
Summary of the information used for the evaluation	**Possibility that the pest could become associated with the commodity** *Bemisia tabaci* is a polyphagous whitefly present in Uganda and reported occurring in many horticultural crops. Certain *Jasminum* species are reported as field-verified host plants for *B. tabaci*. The pest can be present on host plant species present in the neighbouring environment of the nursery producing *J. polyanthum* cuttings for export to the EU. The pest is very small (1 mm) and can enter the production greenhouse through defects in the greenhouse structure or through hitchhiking on nursery workers. Eggs and nymphs may be present on the harvested cuttings. **Measures taken against the pest and their efficacy** The mother plants used for cutting production are grown in dedicated greenhouses, enclosed with plastic on the roofs and walls. Ventilation areas are all screened. The plastic cover and screens are checked twice per week for holes or cuts. All greenhouses have double doors with an air stream flowing out of the greenhouse when a door is opened. There are hygienic measures in place for nursery workers entering the production unit. The production place is monitored for the presence of pests on a weekly basis by nursery staff. There are regular insecticide treatments with products effective against *B. tabaci*. The NPPO does regular inspections in the greenhouse ensuring the compliance to the EU import requirements for *B. tabaci*. **Interception records** *Bemisia tabaci* is the most intercepted pest species on plants for planting in the EU, including unrooted cuttings. There were 29 interceptions of *B. tabaci* on different commodities imported into the EU from Uganda. There are no records of interceptions of *B. tabaci* on *Jasminum* plants from Uganda.				

	Shortcomings of current measures/procedures No shortcomings were identified in the evaluation. If all the described measures are implemented correctly it is unlikely that the pest is present on the harvested and exported *J. polyanthum* cuttings. **Main uncertainties** No details about the results of surveillance activities on the presence and population pressure of *B. tabaci* in the neighbouring environment of the nursery were provided. The presence of defects in the greenhouse structure. There is no detailed information on inspection frequency and design prevalence.

5.3.2. Overview of the evaluation of *Coccus viridis*

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 bags	**9,990** out of 10,000 bags	**9,994** out of 10,000 bags	**9,997** out of 10,000 bags	**9,998** out of 10,000 bags	**9,999.5** out of 10,000 bags
Proportion of infested bags	**0.5** out of 10,000 bags	**2** out of 10,000 bags	**3** out of 10,000 bags	**6** out of 10,000 bags	**10** out of 10,000 bags
Summary of the information used for the evaluation	**Possibility that the pest could become associate with the commodity** *Coccus viridis* is a polyphagous soft scale that can be present on *Jasminum polyanthum* cuttings. It is the most serious of coccid pests on coffee and is now present in most of the major coffee-producing countries of the world. A wide range of important crop plants are attacked, including Arabica and Robusta coffee, citrus, tea, mango, cassava and guava. The pest is known to be present in Uganda with no further details. *Jasminum polyanthum* cuttings are produced in a greenhouse facility. Introduction of scale insects into the greenhouse is possible through holes in the netting or roof of the greenhouse structure, by passive wind transfer through an open door or as a hitchhiker on clothing of nursery staff. **Measures taken against the pest and their efficacy** *C. viridis* has no quarantine status in Uganda. *Jasminum polyanthum* plants are grown in a greenhouse with plastic on the roofs and walls. Ventilation areas are all screened. The screen and plastic are checked twice per week for holes or cuts. Greenhouse has double doors with an air stream flowing out of the greenhouse (electrical fans) when a door is opened. Only *Jasminum* plants are present in the greenhouse. There are hygienic measures in place for nursery workers entering the production unit. Insecticides are applied every week based on scouting data. Nursery staff scout once a week for the presence of pests and inspections take place when cuttings are harvested for export. Before export, a sample is taken from the export consignment and inspected by the NPPO. The pest is relatively easy to detect (honeydew). **Interception records** There are no records of interceptions of *C. viridis* from Uganda. **Shortcomings of current measures/procedures** *C. viridis* has no quarantine status in Uganda and nursery staff may be unaware of the presence of the pest in the production area. **Main uncertainties** No details about the results of surveillance activities on the presence and population pressure of *C. viridis* in the neighbouring environment of the nursery were provided. The presence of defects in the greenhouse structure. There is no detailed information on inspection frequency and design prevalence.				

5.3.3. Overview of the evaluation of *Diaphania indica*

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 bags	**9,990** out of 10,000 bags	**9,994** out of 10,000 bags	**9,996** out of 10,000 bags	**9,998** out of 10,000 bags	**9,999.5** out of 10,000 bags
Proportion of infested bags	**0.5** out of 10,000 bags	**2** out of 10,000 bags	**4** out of 10,000 bags	**6** out of 10,000 bags	**10** out of 10,000 bags
Summary of the information used for the evaluation	**Possibility that the pest could become associated with the commodity** *Diaphania indica* is a lepidopteran leafroller present in Uganda. *D. indica* is a serious pest of cucurbitaceous crops in Africa and *Jasminum* is reported as a host plant for this pest. It is possible that local populations of *D. indica* are present in the neighbouring environment of the greenhouses with Jasminum plants destined for export. Flying adults of *D. indica*, can enter the nursery through openings in the plastic cover of the greenhouse. **Measures taken against the pest and their efficacy** The mother plants used for cutting production are grown in dedicated greenhouses, enclosed with plastic on the roofs and walls. Ventilation areas are all screened. The plastic cover and screens are checked twice per week for holes or cuts. All greenhouses have double doors with an air stream flowing out of the greenhouse when a door is opened. There are hygienic measures in place for nursery workers entering the production unit. The production place is monitored for the presence of pests on a weekly basis by nursery staff. There are regular insecticide treatments with products effective against *D. indica*. **Interception records** There are no interceptions of *D. indica* on plants from Uganda. **Shortcomings of current measures/procedures** *D. indica* has no quarantine status in Uganda and nursery staff may be unaware of the presence of the pest in the production area. **Main uncertainties** No details about the results of surveillance activities on the presence and population pressure of *D. indica* in the neighbouring environment of the nursery were provided. The presence of defects in the greenhouse structure. There is no detailed information on inspection frequency and design prevalence.				

5.3.4. Overview of the evaluation of *Pulvinaria psidii*

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 bags	**9,990** out of 10,000 bags	**9,994** out of 10,000 bags	**9,997** out of 10,000 bags	**9,998** out of 10,000 bags	**9,999.5** out of 10,000 bags
Proportion of infested bags	**0.5** out of 10,000 bags	**2** out of 10,000 bags	**3** out of 10,000 bags	**6** out of 10,000 bags	**10** out of 10,000 bags

Summary of the information used for the evaluation	**Possibility that the pest could become associated with the commodity** *Pulvinaria psidii* is a polyphagous soft scale that can be present on *Jasminum polyanthum* cuttings. In Egypt, *P. psidii* is described as one of the most important pests of mango and guava. It is also a serious pest of *Citrus* spp., *Ficus* spp., coffee plants and *Capsicum* spp. in tropical South Pacific region. The pest is known to be present in Uganda with no further details. *J. polyanthum* cuttings are produced in a greenhouse facility. Introduction of scale insects into the greenhouse is possible through holes in the netting or roof of the greenhouse structure, by passive wind transfer through an open door or as a hitchhiker on clothing of nursery staff. **Measures taken against the pest and their efficacy** *P. psidii* has no quarantine status in Uganda. *J. polyanthum* plants are grown in a greenhouse with plastic on the roofs and walls. Ventilation areas are all screened. The screen and plastic are checked twice per week for holes or cuts. The greenhouse has double doors with an air stream flowing out of the greenhouse (electrical fans) when a door is opened. Only *Jasminum* plants are present in the greenhouse. There are hygienic measures in place for nursery workers entering the production unit. Insecticides are applied every week based on scouting data. Nursery staff scout once a week for the presence of pests and further inspections take place when cuttings are harvested for export. Before export, a sample is taken from the export consignment and inspected by the NPPO. The pest is relatively easy to detect (honeydew). **Interception records** There are no records of interceptions of *P. psidii* from Uganda. **Shortcomings of current measures/procedures** *P. psidii* has no quarantine status in Uganda and nursery staff may be unaware of the presence of the pest in the production area. **Main uncertainties** No details about the results of surveillance activities on the presence and population pressure of *P. psidii* in the neighbouring environment of the nursery were provided. The presence of defects in the greenhouse structure. There is no detailed information on inspection frequency and design prevalence.

5.3.5. Overview of the evaluation of *Scirtothrips dorsalis*

Rating of the likelihood of pest freedom	**Pest free with a few exceptional cases** (based on the Median)				
Percentile of the distribution	5%	25%	Median	75%	95%
Proportion of pest free bags	**9,960** out of 10,000 bags	**9,980** out of 10,000 bags	**9,990** out of 10,000 bags	**9,994** out of 10,000 bags	**9,999** out of 10,000 bags
Proportion of infested bags	**1** out of 10,000 bags	**6** out of 10,000 bags	**10** out of 10,000 bags	**20** out of 10,000 bags	**40** out of 10,000 bags
Summary of the information used for the evaluation	**Possibility that the pest could become associated with the commodity** *Scirtothrips dorsalis* is a polyphagous thrips species present in Uganda. Given the wide host range of this pest it is possible that local populations of *S. dorsalis* are present in the neighbouring environment of the greenhouses with Jasminum plants destined for export. *J. polyanthum* plants destined for export to the EU are grown in a protected environment (i.e. greenhouse). Introduction of thrips into a greenhouse is possible through holes in the netting or roof of the greenhouse structure or by flying or passive wind transfer through an open door or as a hitchhiker on clothing of nursery staff. **Measures taken against the pest and their efficacy** The mother plants used for cutting production are grown in dedicated greenhouses, enclosed with plastic on the roofs and walls. Ventilation areas are all screened. The plastic cover and screens are checked twice per week for holes or cuts. All greenhouses				

	have double doors with an air stream flowing out of the greenhouse when a door is opened. There are hygienic measures in place for nursery workers entering the production unit. The production place is monitored for the presence of pests on a weekly basis by nursery staff. There are regular insecticide treatments with products effective against *S. dorsalis*. The NPPO does regular inspections in the greenhouse ensuring the compliance to the EU import requirements for *S. dorsalis*. **Interception records** There are no interceptions of *S. dorsalis* on plants from Uganda. **Shortcomings of current measures/procedures** No shortcomings were identified in the evaluation. If all the described measures are implemented correctly, it is unlikely that the pest is present on the harvested and exported *J. polyanthum* cuttings. **Main uncertainties** No details about the results of surveillance activities on the presence and population pressure of *S. dorsalis* in the neighbouring environment of the nursery were provided. The presence of defects in the greenhouse structure. There is no detailed information on inspection frequency and design prevalence.

5.3.6. Overview of the evaluation of *Selenaspidus articulatus*

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 bags	**9,990** out of 10,000 bags	**9,994** out of 10,000 bags	**9,997** out of 10,000 bags	**9,998** out of 10,000 bags	**9,999.5** out of 10,000 bags
Proportion of infested bags	**0.5** out of 10,000 bags	**2** out of 10,000 bags	**3** out of 10,000 bags	**6** out of 10,000 bags	**10** out of 10,000 bags
Summary of the information used for the evaluation	**Possibility that the pest could become associate with the commodity** *Selenaspidus articulatus* is a polyphagous armoured scale that can be present on *Jasminum polyanthum* cuttings. It is mainly a pest of citrus in several regions. It has been also recorded a pest of other crops such as coffee, cocoa, avocado, mango, banana and palms. In California, it was rated as a high impact pest. The pest is known to be present in Uganda with no further details. *Jasminum polyanthum* cuttings are produced in a greenhouse facility. Introduction of scale insects into the greenhouse is possible through holes in the netting or roof of the greenhouse structure, by passive wind transfer or through an open door as a hitchhiker on clothing of nursery staff. **Measures taken against the pest and their efficacy** *S. articulatus* has no quarantine status in Uganda. *Jasminum polyanthum* plants are grown in a greenhouse with plastic on the roofs and walls. Ventilation areas are all screened. The screen and plastic is checked twice per week for holes or cuts. Greenhouse has double doors with an air stream flowing out of the greenhouse (electrical fans) when a door is opened. Only *Jasminum* plants are present in the greenhouse. There are hygienic measures in place for nursery workers entering the production unit. Insecticides are applied every week based on scouting data. Nursery staff scout once a week for the presence of pests and further inspections take place when cuttings are harvested for export. Before export, a sample is taken from the export consignment and inspected by the NPPO. **Interception records** There are no records of interceptions of *S. articulatus* from Uganda. **Shortcomings of current measures/procedures** *S. articulatus* has no quarantine status in Uganda and nursery staff may be unaware of the presence of the pest in the production area.				

	Main uncertainties No details about the results of surveillance activities on the presence and population pressure of *S. articulatus* in the neighbouring environment of the nursery were provided. The presence of defects in the greenhouse structure. There is no detailed information on inspection frequency and design prevalence.

5.3.7. Outcome of Expert Knowledge Elicitation

Table 8 and Figure 4 show the outcome of the EKE regarding pest freedom after the evaluation of the currently proposed risk mitigation measures for the selected pests.

Figure 5 provides an explanation of the descending distribution function describing the likelihood of pest freedom after the evaluation of the currently proposed risk mitigation measures for *B. tabaci* on *J. polyanthum* unrooted cuttings designated for export to the EU.

Table 8: Assessment of the likelihood of pest freedom following evaluation of current risk mitigation measures against *Bemisia tabaci*, *Coccus viridis*, *Diaphania indica*, *Pulvinaria psidii*, *Scirtothrips dorsalis*, *Selenaspidus articulatus* on *Jasminum polyanthum* unrooted cuttings 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

Pest species	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
Bemisia tabaci						LM		U
Scirtothrips dorsalis						LM		U
Diaphania indica							L	MU
Pulvinaria psidii							L	MU
Coccus viridis							L	MU
Selenaspidus articulatus							L	MU

PANEL A

	Pest freedom category	Pest fee plans out of 10,000		Legend of pest freedom categories	
	Sometimes pest free	≤ 5,000		L	Pest freedom category includes the elicited lower bound of the 90% uncertainty range
	More often that not pest free	5,000–≤ 9,000		M	Pest freedom category includes the elicited median
	Frequently pest free	9,000–≤ 9,500		U	Pest freedom category includes the elicited upper bound of the 90% uncertainty range
	Very frequently pest free	9,500–≤ 9,900			
	Extremely frequently pest free	9,900–≤9,950			
	Pest free with some exceptional cases	9,950–≤ 9,990			
	Pest free with few exceptional cases	9,990–≤ 9,995			
	Almost always pest free	9,995–≤ 10,000			

PANEL B

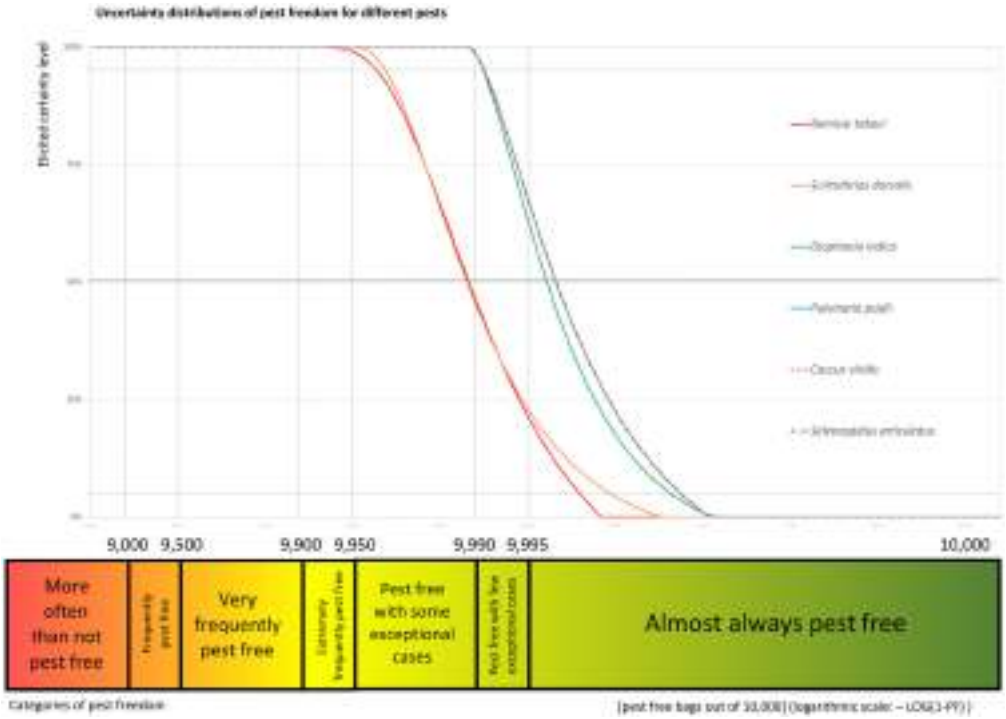


Figure 4: Elicited certainty (y-axis) of the number of pest-free *J. polyanthum* bags (x-axis; log-scaled) out of 10,000 bags designated for export to the EU introduced from Uganda for all evaluated pests visualised as descending distribution function. Horizontal lines indicate the percentiles (starting from the bottom 5%, 25%, 50%, 75%, 95%)

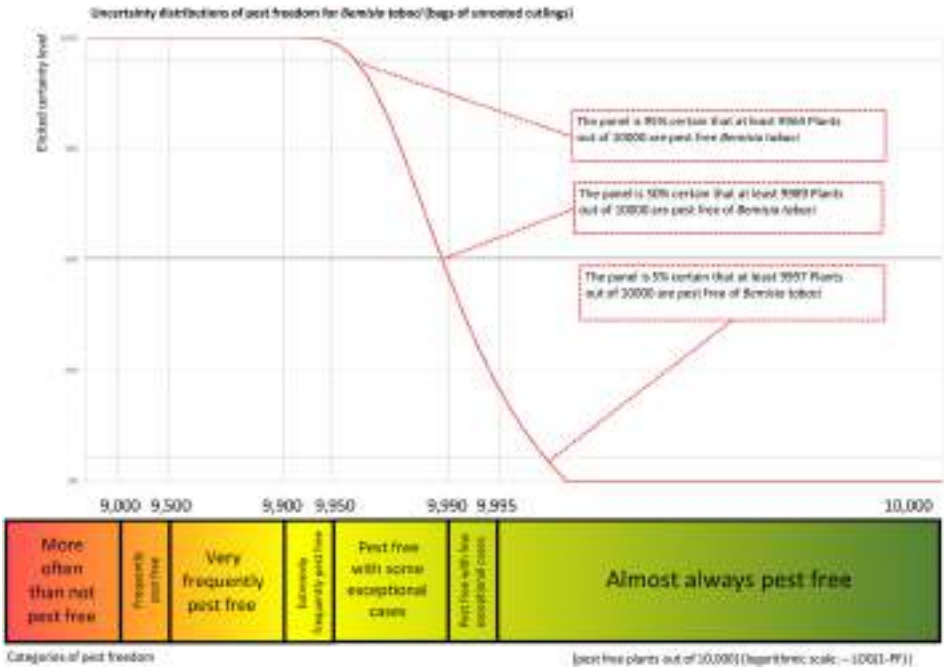


Figure 5: Explanation of the descending distribution function describing the likelihood of pest freedom after the evaluation of the currently proposed risk mitigation measures for plants designated for export to the EU based on based on the example of *B. tabaci*

6. Conclusions

There are six pests identified to be present in Uganda and considered to be potentially associated with unrooted cuttings of *Jasminum polyanthum* imported from Uganda and relevant for the EU. The likelihood of the pest freedom after the evaluation of the implemented risk mitigation measures for unrooted cuttings of *J. polyanthum* designated for export to the EU was estimated.

For *Bemisia tabaci,* the likelihood of pest freedom following evaluation of current risk mitigation measures was estimated *as* 'Pest free with few exceptional cases' with the 90% uncertainty range reaching from 'Pest free with some exceptional cases' to 'Almost always pest free'. The Expert Knowledge Elicitation indicated, with 95% certainty, that between 9,950 and 10,000 plants per 10,000 will be free from *B. tabaci*.

For *Coccus viridis*, 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 9,990 and 10,000 plants per 10,000 will be free from *C. viridis*.

For *Diaphania indica,* 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 9,990 and 10,000 plants per 10,000 will be free from *D. indica*.

For *Pulvinaria psidii*, 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 9,990 and 10,000 plants per 10,000 will be free from *P. psidii*.

For *Scirtothrips dorsalis*, the likelihood of pest freedom following evaluation of current risk mitigation measures was estimated as 'Pest free with few exceptional cases' with the 90% uncertainty range reaching from 'Pest free with some exceptional cases' to 'Almost always pest free'. The Expert Knowledge Elicitation indicated, with 95% certainty, that between 9,960 and 10,000 plants per 10,000 will be free from *S. dorsalis*.

For *Selenaspidus articulatus,* 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 9,990 and 10,000 plants per 10,000 will be free from *S. articulatus*.

References

CABI (Centre for Agriculture and Bioscience International), online. CABI Crop Protection Compendium. Available online: https://www.CABI..org/cpc/ [Accessed: 15 September 2021].

EFSA PLH Panel (EFSA Panel on Plant Health), 2018. Guidance on quantitative Pest Risk Assessment. EFSA Journal 2018;16(8):5350, 86 pp. https://doi.org/10.2903/j.efsa.2018.5350

EFSA PLH Panel (EFSA Panel on Plant Health), 2019. Guidance on commodity risk assessment for the evaluation of high risk plants dossiers. EFSA Journal 2019;17(4):5668, 20 pp. https://doi.org/10.2903/j.efsa.2019.5668

EFSA PLH Panel (EFSA Panel on Plant Health), 2020. Scientific Opinion on the commodity risk assessment of *Jasminum polyanthum* plants from Israel. EFSA Journal 2020;18(8):6225, 78 pp. https://doi.org/10.2903/j.efsa.2020.6225

EFSA Scientific Committee, 2018. Scientific Opinion on the principles and methods behind EFSA's Guidance on Uncertainty Analysis in Scientific Assessment. EFSA Journal 2018;16(1):5122, 235 pp. https://doi.org/10.2903/j.efsa.2018.5122

EPPO (European and Mediterranean Plant Protection Organization), online. EPPO Global Database. Available online: https://www.eppo.int/ [Accessed: 15 September 2021].

EUROPHYT, online. European Union Notification System for Plant Health Interceptions – EUROPHYT. Available online: https://ec.europa.eu/food/plant/plant_health_biosecurityeurophyt/index_en.htm [Accessed: 21 January 2021].

FAO (Food and Agriculture Organization of the United Nations), 1995. ISPM (International standardsforphytosanitary measures) No 4. Requirements for the establishment of pest free areas. Available online: https://www.ippc.int/en/publications/614/

FAO (Food and Agriculture Organization of the United Nations), 2017. ISPM (International standardsforphytosanitary measures) No. 5. Glossary of phytosanitary terms. FAO, Rome. Available online: https://www.ippc.int/en/publications/622/

FAO (Food and Agriculture Organization of the United Nations), 2019. ISPM (International standards for phytosanitary measures) No. 36. Integrated measures for plants for planting. FAO, Rome, 22 pp. Available online: https://www.ippc.int/en/publications/636/

TRACES-NT, online. TRAde Control and Expert System. Available online: https://webgate.ec.europa.eu/tracesnt [Accessed: 21 January 2021].

Glossary

Control (of a pest)	Suppression, containment or eradication of a pest population (FAO, 1995, 2017)
Entry (of a pest)	Movement of a pest into an area where it is not yet present, or present but not widely distributed and being officially controlled (FAO, 2017)
Establishment (of a pest)	Perpetuation, for the foreseeable future, of a pest within an area after entry (FAO, 2017)
Greenhouse	A walk-in, static, closed place of crop production with a usually translucent outer shell, which allows controlled exchange of material and energy with the surroundings and prevents release of plant protection products (PPPs) into the environment.
Impact (of a pest)	The impact of the pest on the crop output and quality and on the environment in the occupied spatial units
Introduction (of a pest)	The entry of a pest resulting in its establishment (FAO, 2017)
Measures	Control (of a pest) is defined in ISPM 5 (FAO, 2017) as 'Suppression, containment or eradication of a pest population' (FAO, 1995). Control measures are measures that have a direct effect on pest abundance. Supporting measures are organisational measures or procedures supporting the choice of appropriate risk mitigation measures that do not directly affect pest abundance.
Pathway	Any means that allows the entry or spread of a pest (FAO, 2017)
Phytosanitary measures	Any legislation, regulation or official procedure having the purpose to prevent the introduction or spread of quarantine pests, or to limit the economic impact of regulated non-quarantine pests (FAO, 2017)
Protected 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, 2017)
Regulated non-quarantine pest	A non-quarantine pest whose presence in plants for planting affects the intended use of those plants with an economically unacceptable impact and which is therefore regulated within the territory of the importing contracting party (FAO, 2017)
Risk 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, 2017)

Abbreviations

CABI	Centre for Agriculture and Bioscience International
EKE	Expert knowledge elicitation
EPPO	European and Mediterranean Plant Protection Organization
FAO	Food and Agriculture Organization
MAAIF	Ministry of Agriculture Animal Industry and Fisheries
PPIS	Plant Protection & Inspection Services
PLH	Plant Health
PRA	Pest Risk Assessment
RNQPs	Regulated Non-Quarantine Pests

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

A.1. *Bemisia tabaci*

A.1.1. Organism information

Taxonomic information	Current valid scientific name: *Bemisia tabaci* (Gennadius, 1889) Synonyms: *Aleurodes inconspicua*, *Aleurodes tabaci*, *Bemisia achyranthes*, *Bemisia bahiana*, *Bemisia costa-limai*, *Bemisia emiliae*, *Bemisia goldingi*, *Bemisia gossypiperda*, *Bemisia gossypiperda mosaicivectura*, *Bemisia hibisci*, *Bemisia inconspicua*, *Bemisia longispina*, *Bemisia lonicerae*, *Bemisia manihotis*, *Bemisia minima*, *Bemisia minuscula*, *Bemisia nigeriensis*, *Bemisia rhodesiaensis*, *Bemisia signata*, *Bemisia vayssieri* Name used in the EU legislation: *Bemisia tabaci* Genn. (non-European populations) known to be vector of viruses [BEMITA] Order: Hemiptera Family: Aleyrodidae Common name: tobacco whitefly Name used in the Dossier: *Bemisia tabaci*
Group	Insects
EPPO code	BEMITA
Regulated status	The pest is listed in Annex II/A of Regulation (EU) 2019/2072 as *Bemisia tabaci* Genn. (non-European populations) known to be vector of viruses [BEMITA], and in Annex III as Protected Zone Quarantine Pest (European populations).
Pest status in Uganda	Widespread (EPPO global database), the formerly defined Biotypes B and Q (now species considered as MEAM1 and MED) are present in Uganda (EFSA, 2013, EPPO).
Pest status in the EU	*B. tabaci* has a quarantine status in the EU. Twenty-six morphocryptic biotypes belonging to the *Bemisia tabaci* complex are not known to occur in the Union territory (EFSA PLH Panel, 2013; Regulation (EU) 2019/2072).
Host status on *Jasminum polyanthum*	Certain *Jasminum* species are reported as field-verified host plants for *B. tabaci* (Bayhan et al. 2006; EFSA, 2013). EPPO does not mention *J. polyanthum* as *B. tabaci* host. CABI mentions that several *Jasminum* species are hosts of *B. tabaci*. *B. tabaci* is a polyphagous insect (see below), and therefore, the Panel assumes that *J. polyanthum* is a host.
PRA information	Scientific Opinion on the risks to plant health posed by *Bemisia tabaci* species complex and viruses it transmits for the EU territory (EFSA PLH Panel, 2013).
Other relevant information for the assessment	
Biology	During oviposition, females insert eggs with the pedicel directly into leaf tissue (Paulson and Beardsley, 1985). It has four instars. The first instar with legs, called crawler, finds a permanent spot on a leaf and stays there for the rest of its nymphal development (Walker et al., 2009). The pest is a phloem-feeder and can be found mainly on leaves (Cohen et al., 1996). *B. tabaci* has a high reproductive potential and each female can lay an average of 80 to more than 300 eggs during their lifetime. The number of eggs laid depends on temperature and the host plant, but generally under favourable conditions (e.g. average temperature of 25–30°C and HR) even the introduction of only a few founding insects will lead to a massive upsurge in insect densities. In the EU, four to five insect generations per year can develop (EFSA, 2013). *B. tabaci* adults can have directional and active flights. Whiteflies seldom need to fly more than a few centimetres to a few metres to find suitable host plants. However, they may cover distances of a few kilometres. *B. tabaci* adults can spread over longer distances by passive transport with wind.

Symptoms	**Main type of symptoms**	Wide range of symptoms can occur on plants due to direct feeding of the pest, contamination of honeydew and sooty moulds, transmitted viruses and phytotoxic responses. Plants exhibit one or more of these symptoms: chlorotic spotting, vein yellowing, intervein yellowing, leaf yellowing, yellow blotching of leaves, yellow mosaic of leaves, leaf curling, leaf crumpling, leaf vein thickening, leaf enations, leaf cupping, stem twisting, plant stunting, wilting, leaf loss and silvering of leaves (CABI, online; EPPO, 2004).
	Presence of asymptomatic plants	No asymptomatic period is known to occur in the infested plants. However, eggs and first instar larvae are difficult to detect. Symptoms of the infestation by the insect are visible.
	Confusion with other pathogens/pests	*B. tabaci* can be easily confused with other species such as glasshouse whitefly *Trialeurodes vaporariorum*, *B. afer*, *T. lauri*, *T. packardi*, *T. ricini* and *T. variabilis*. A microscopic slide is needed for morphological identification (EPPO, 2004).
Host plant range	*B. tabaci* is a polyphagous pest with a wide host range, including more than 1000 different plant species (Abd-Rabou and Simmons, 2010). Some species of *Jasminum* are hosts of the pest.	
Evidence that the commodity can be a pathway	All life stages of *B. tabaci* (eggs, larvae and adults) could be present on the leaves of *J. polyanthum* cuttings exported from Uganda to the EU.	
Surveillance information	The NPPO conducts surveillance of pests of quarantine significance on the plants, inside the production facility and the surroundings of the green houses as per the MAAIF surveillance protocol	

A.1.2. Possibility of pest presence in the nursery

A.1.2.1. Possibility of entry from the surrounding environment

Bemisia tabaci is a polyphagous species that is widespread in Uganda and reported occurring in many horticultural crops. Flying adults of *B. tabaci,* able to fly or be transferred by the wind over kilometres, can enter the nursery from host plants that might be present in the surrounding environment. *B. tabaci* adults are around 1 mm long, and so even very small holes in the plastic cover can allow the entry of the pest. The pest may also hitchhike on nursery workers; however, hygienic procedures in place aim to prevent this.

Uncertainties:

- It is not known what is the *B. tabaci* population pressure in the surrounding environment of the nursery.
- The presence of defects in the greenhouse structure.
- The proximity of the greenhouses to possible sources of populations of *B. tabaci* is unknown.

Taking into consideration the above evidence and uncertainties, the Panel considers that it is possible for the pest to enter the nursery from the surrounding environment.

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

Mother plants are initiated from rooted cuttings imported from the Netherlands. *B. tabaci* is present in the Netherlands. However, it is unlikely that *B. tabaci* is present on the imported material (unrooted cuttings).

Uncertainties:

No uncertainties

Taking into consideration the above evidence and uncertainties, the Panel considers it is unlikely that the pest could enter the nursery with new mother plants.

A.1.2.3. Possibility of spread within the nursery

Around 60 plants genera are produced by the exporting company. Therefore, it is possible that *Bemisia* population is present in some of the greenhouses of the company. The production unit of *Jasminum,* however, is physically separated from the other units. When present, flying adults can spread from infested host plants within the nursery. The pest may also hitchhike on nursery workers; however, hygienic procedures in place aim to prevent this.

Uncertainties:

- The likelihood that nursey staff will visit different production units on the same day without following the hygienic procedures mentioned above.
- The likelihood that the hygienic procedures in place are not strong enough to prevent spread within the nursery.

Taking into consideration the above evidence and uncertainties, the Panel considers that the transfer of the pest within the nursery is possible.

A.1.3. Information from interceptions

Bemisia tabaci is the most intercepted pest species on plants for planting in the EU, including unrooted cuttings. There were 29 interceptions of *B. tabaci* on different commodities imported into the EU from Uganda. Considering imports of *Jasminum* plants from Uganda to the EU, between 1994 and 2021, there are no records of interceptions of *B. tabaci* (EUROPHYT and TRACES, online).

A.1.4. Evaluation of the risk mitigation options

In the table below, all risk mitigation measures currently applied in Uganda are listed and described and an indication of their effectiveness on *B. tabaci* is provided:

	Risk mitigating measure	**Effect Y/N**	**Evaluation and uncertainties**
1	Growing plants in isolation	Yes	Description The mother plants used for cutting production are grown in dedicated greenhouses. Only *Jasminum* plants are present in this greenhouse. The greenhouses are enclosed with plastic on the roofs and walls. Ventilation areas (in the roof structure and in the greenhouses walls) are all screened. The screen and plastic are checked twice per week for holes or cuts. All greenhouses have double doors with an air stream flowing out of the greenhouse (electrical fans) when a door is opened. Evaluation Plants are protected from *B. tabaci* flying adults that may enter from the surrounding environment. Uncertainties: – Presence of defects in the greenhouse structure
2	Soil treatment	No	Description Plants are grown in bags with growing media (RHP-certified) and granules ('kabala stones'). The growing medium is steamed during 1.5 h at 80 °c at least, before rooted cuttings are sticked into the bags. Evaluation Not relevant
3	General hygiene procedures for nursery staff and visitors	Yes	Description When a person is entering the production unit, after the first door there is a disinfection area, with a disinfection pond/bath. After that, the person opens the second door, which can only be opened after the first door is closed. After the second door, the person is in the area where disinfested aprons, gloves and other tools are kept. From here, the person prepares and dresses up, after which the third door leads to the actual greenhouse and the beds.

	Risk mitigating measure	Effect Y/N	Evaluation and uncertainties
			Evaluation If applied correctly the hygienic measures should prevent the entry of hitchhiking *B. tabaci*. Uncertainties The level of coverage by the protecting clothing.
4	Insecticide treatment	Yes	Description There are insecticide and fungicide treatments applied on *Jasminum* plants on a weekly basis based on scouting data. An overview of the applied pesticides is given in Table 7 Evaluation The insecticides Mainspring (a.i. Cyantraniliprole) and Movento (a.i. spirotetramat) are expected to have a good efficacy against *B. tabaci*. The other insecticides used may also have an effect on *B. tabaci*. Uncertainties The presence of insecticide resistant populations of *B. tabaci* in Uganda. The frequency of the applications given the life cycle of the pest.
5	Pest monitoring and inspections by the nursery staff during the production process	Yes	Description Competent scouts employed at the farm collect pest and diseases data by visual inspection and monitoring traps (yellow sticky traps). Scouting data are reported on a weekly basis to the NPPO. Treatment decisions are based on the scouting data. Evaluation *B. tabaci* is expected to be detected if present in the greenhouse. Uncertainties Early infestations are difficult to detect.
6	Packing and handling procedures	Yes	Description The unrooted cuttings are harvested with a harvesting knife, after which 50 cuttings are placed into a plastic bag. The plastic bags are placed inside a carton box. All these steps are done inside the greenhouse. The boxes are stored in a cold room at 7 °c. A sample of the harvested bags is taken into the quality and control area, where the cuttings are visually inspected for pest and diseases, and product specifications (size, weight, colour, etc.). Evaluation Cuttings with symptoms of infestation are expected not to be packed for export. Infestation after packing (in plastic bags) is highly unlikely. Uncertainties Early infestations are difficult to detect (eggs).
7	Official Supervision by NPPO	Yes	Description The export company is officially registered by the NPPO. The NPPO does regular inspections in the greenhouse ensuring the compliance to the import requirements as specified in Annex IV of 2000/29/EU, and in particular for *Bemisia tabaci* (point 45.1b and 46.6b) as specified in the Dossier. Evaluation If the EU requirements are followed, *B. tabaci* will be eradicated under official control before export of *Jasminum* plants is allowed. Uncertainties There is no detailed information on inspection frequency and design prevalence. There is no detailed information on the presence of *B. tabaci* on the production facility.

	Risk mitigating measure	Effect Y/N	Evaluation and uncertainties
8	Export inspections of consignments	Yes	Description Before export, a sample is taken from the export consignment and inspected by the NPPO. Evaluation *B. tabaci* is expected to be detected if present in the sample. Uncertainties There is no detailed information on inspection frequency and design prevalence.
9	Surveillance of production area	Yes	Description The NPPO includes the surrounding area of the production facility in its surveillance. Evaluation Population sources of *B. tabaci* could be detected if an appropriate survey design is implemented. Uncertainties There is no detailed information on inspection frequency and design prevalence.

A.1.5. Overall likelihood of pest freedom for *Bemisia tabaci* on *Jasminum polyanthum* cuttings

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

- There are no reports that *J. polyanthum* is a host for *B. tabaci*
- *B. tabaci* is not able to enter the greenhouse (no holes in screen), defects in the greenhouse structure are detected and repaired.
- There are targeted inspections and treatments for *B. tabaci*.
- Following EU requirements, the eradication of *B. tabaci* in the production unit is officially approved by the NPPO.
- The pest population pressure in the surrounding environment is very low (suitable hosts are not widely distributed in the production area).
- Cuttings with symptoms are sorted out in the packing process.
- Hygienic procedures are effective in preventing entering and spread of the pest.

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

- Due to its polyphagous nature, *B. tabaci* is expected to use *J. polyanthum* as a host.
- *B. tabaci* is present in high populations in the surrounding environment of the nursery (there are many suitable hosts in the production area, in close proximity to the greenhouse).
- Presence of undetected defects in the greenhouse structure.
- Pest could go undetected during inspections of the nursery (eggs, first instars) and packing of the cuttings.
- Insecticide-resistant *B. tabaci* populations could be present.
- Hygienic procedures are not very effective in preventing entering and spread of the pest.
- Giving the high number of plant genera produced by the company, it is possible that *B. tabaci* is present in one of the production units.

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

- The protective effect of the greenhouse structure and the hygienic measures.
- There are very few interceptions of *B. tabaci* on plant produce from Uganda to the EU, indicating that population pressure is low.

- *B. tabaci* is an EU-regulated pest; therefore, the exporting company is taking precautionary measures and paying particular attention to its detection.

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

- The main uncertainty is the population pressure of *B. tabaci* in the surrounding environment.

A.1.5.5. Elicitation outcomes of the assessment of the pest freedom for *Bemisia tabaci* non-European populations on *Jasminum polyanthum*

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

Table A.1: Elicited and fitted values of the uncertainty distribution of pest infestation by *Bemisia tabaci* complex per 10,000 plastic bags (containing 50 unrooted cuttings per bag)

Percentile	1%	2.5%	5%	10%	17%	25%	33%	50%	67%	75%	83%	90%	95%	97.5%	99%
Elicited values	2					6		10		20					50
EKE	2.01	2.20	2.52	3.21	4.21	5.58	7.10	10.8	15.8	19.2	23.8	29.3	36.2	42.5	49.9

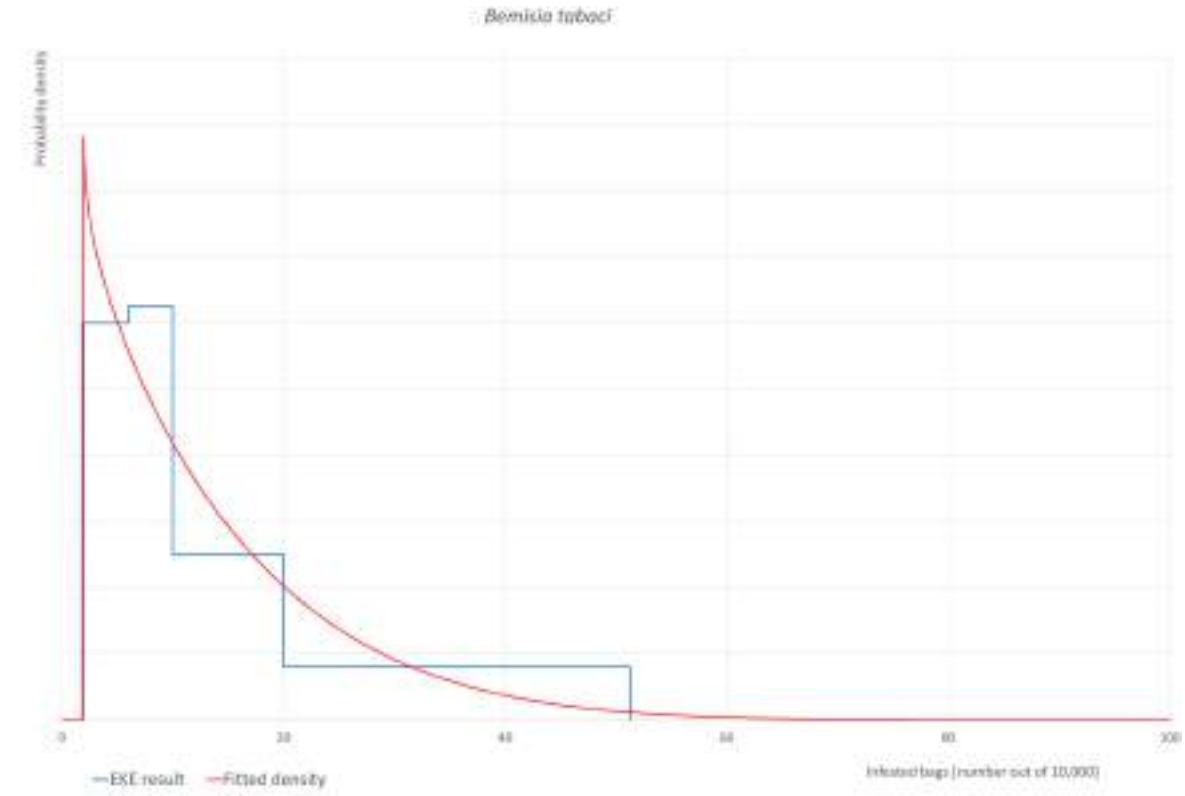
The EKE results are *BetaGeneral(0.95258, 7.1931, 1.9, 105)fitted* with @Risk version 7.6.

Based on the numbers of estimated infested bags, the pest freedom was calculated (i.e. =10,000 – the number of infested plastic bags (containing 50 unrooted cuttings per bag) per 10,000). The fitted values of the uncertainty distribution of the pest freedom are shown in Table A.2.

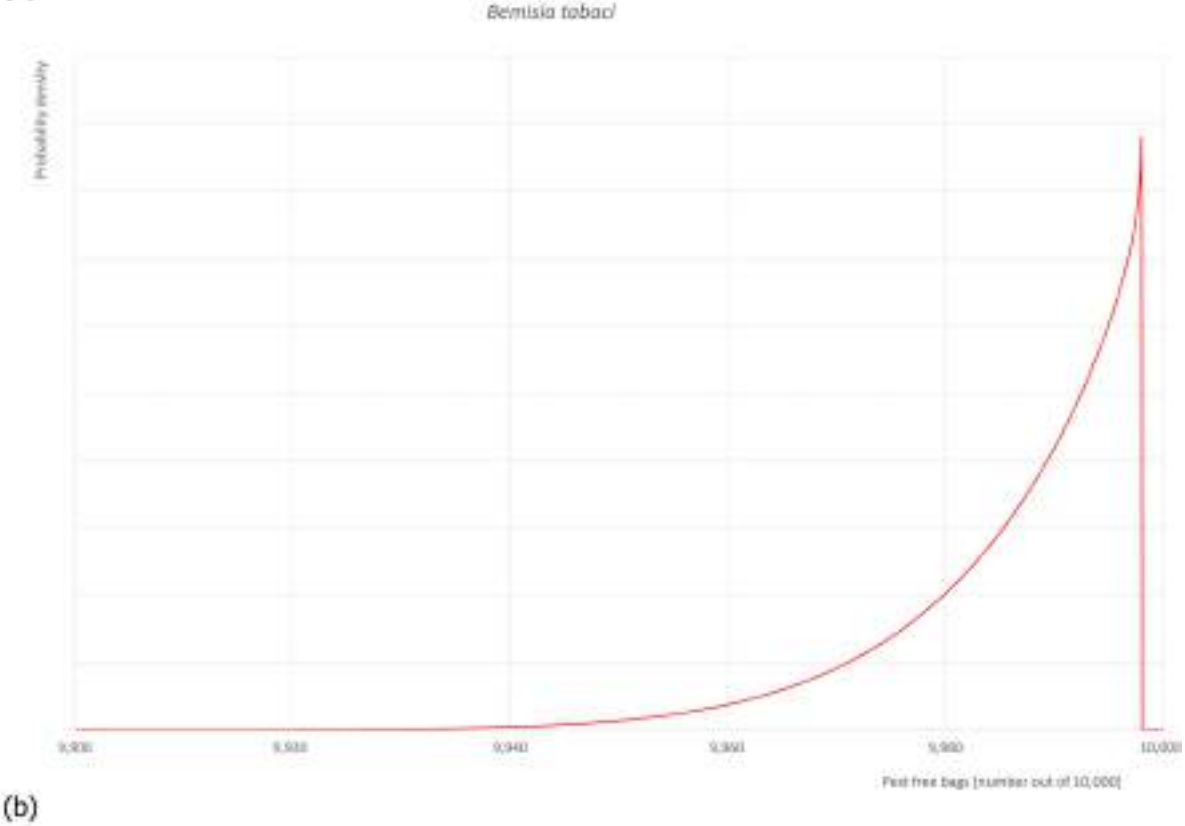
Table A.2: The uncertainty distribution of plants free of *Bemisia tabaci complex* per 10,000 bags calculated by Table A.1.

Percentile	1%	2.5%	5%	10%	17%	25%	33%	50%	67%	75%	83%	90%	95%	97.5%	99%
Values	9,950					9,980		9,990		9,994					9,998
EKE results	9,950	9,958	9,964	9,971	9,976	9,981	9,984	9,989	9,993	9,994	9,996	9,997	9,997	9,998	9,998

The EKE results are the fitted values.



(a)



(b)

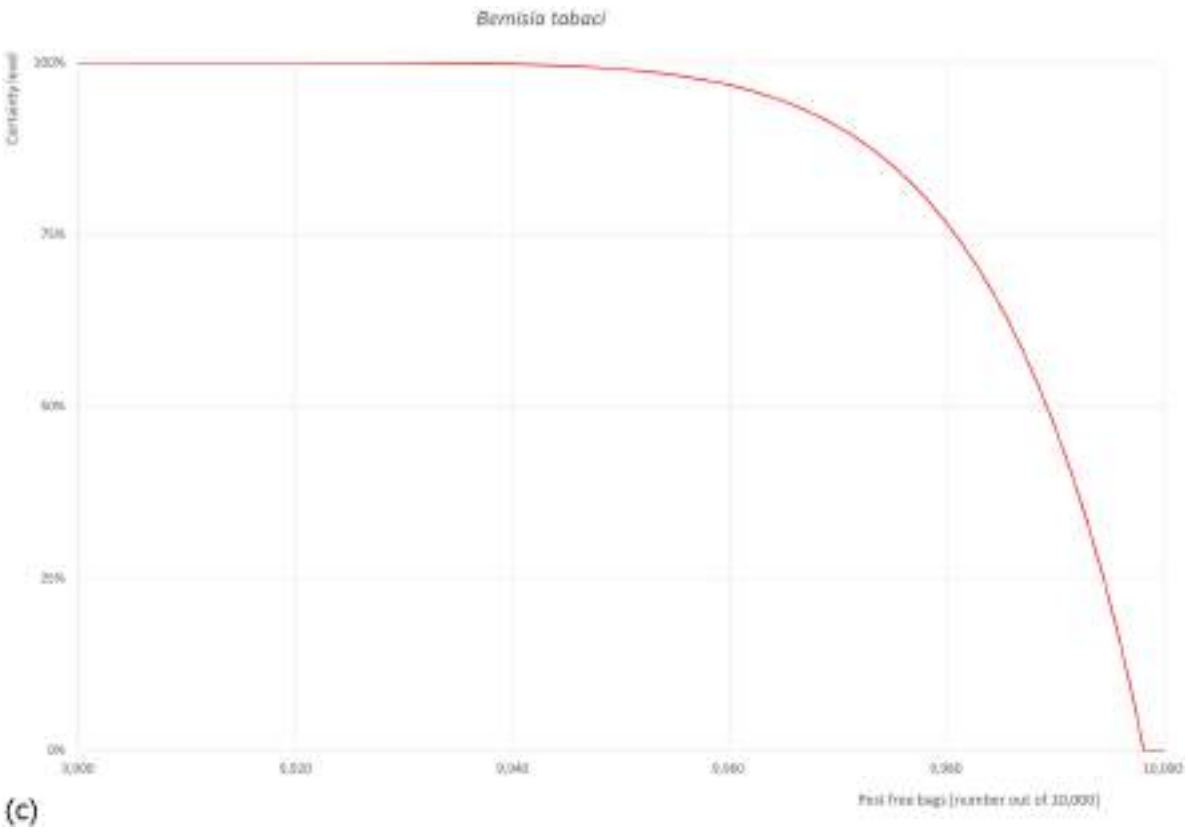


Figure A.1: (a) Elicited uncertainty of pest infestation per 10,000 bags (containing 50 unrooted cuttings per bag) for *Bemisia tabaci* complex (histogram in blue – vertical blue line indicates the elicited percentile in the following order: 1%, 25%, 50%, 75%, 99%) and distributional fit (red line); (b) uncertainty of the proportion of pest-free bags per 10,000 (i.e. = 1 – pest infestation proportion expressed as percentage); (c) descending uncertainty distribution function of pest infestation per 10,000 bags

A.1.6. References List

Abd-Rabou S and Simmons AM, 2010. Survey of reproductive host plants of *Bemisia tabaci* (Hemiptera: Aleyrodidae) in Egypt, including new host records. Entomological News, 121, 456–465. https://doi.org/10.3157/021.121.0507

Bayhan E, Ulusoy MR and Brown JK, 2006. Host range, distribution, and natural enemies of Bemisia tabaci 'B biotype' (Hemiptera: Aleyrodidae) in Turkey. Journal of Pest Science, 79, 233–240. https://doi.org/10.1007/s10340-006-0139-4

CABI (Centre for Agriculture and Bioscience International), online. Datasheet *Bemisia tabaci* (tobacco whitefly). Available online: https://www.cabi.org/cpc/datasheet/8927

CABI (Centre for Agriculture and Bioscience International), online. Datasheet *Bemisia tabaci* MEAM10 (silverleaf whitefly). Available online: https://www.cabi.org/cpc/datasheet/8925

Cohen AC, Henneberry TJ and Chu CC, 1996. Geometric relationships between whitefly feeding behavior and vascular bundle arrangements. Entomologia experimentalis et applicata, 78, 135–142. https://doi.org/10.1111/j.1570-7458.1996.tb00774.x

De Barro PJ, Liu S-s, Boykin LM and Dinsdale AB, 2011. Bemisia tabaci: a Statement of Species Status. Annual Review of Entomology, 56, 1-19. https://doi.org/10.1146/annurev-ento-112408-085504

EFSA PLH Panel (EFSA Panel on Plant Health), 2013. Scientific Opinion on the risks to plant health posed by Bemisia tabaci species complex and viruses it transmits for the EU territory. EFSA Journal 2013;11(4):3162, 45 pp. https://doi.org/10.2903/j.efsa.2013.3162

EPPO (European and Mediterranean Plant Protection Organization), 2004. PM 7/35. *Bemisia tabaci*. OEPP/EPPO Bulletin, 34, 155–157.

EUROPHYT, online. European Union Notification System for Plant Health Interceptions - EUROPHYT Available online: https://ec.europa.eu/food/plant/plant_health_biosecurity/europhyt/index_en.htm [Accessed: 21 January 2022].

Li SJ, Xue X, Ahmed MZ, Ren SX, Du YZ, Wu JH, Cuthbertson AGS and Qiu BL, 2011. Host plants and natural enemies of *Bemisia tabaci* (Hemiptera: Aleyrodidae) in China. Insect Science, 18, 101–120. https://doi.org/10.1111/j.1744-7917.2010.01395.x

Paulson GS and Beardsley JW, 1985. Whitefly (Hemiptera: Aleyrodidae) egg pedicel insertion into host plant stomata. Annals of the Entomological Society of America, 78, 506–508. https://doi.org/10.1093/aesa/78.4.506

TRACES-NT, online. TRAde Control and Expert System. Available online: https://webgate.ec.europa.eu/tracesnt [Accessed: 21 January 2022].

Yassin MA and Bendixen LE, 1982. Weed hosts of the cotton whitefly (*Bemisia tabaci* (Genn.)) Homoptera Aleyrodidae. Research Bulletin 1144. The Ohio State University – Ohio Agricultural Research and Development Center. Available online: https://kb.osu.edu/bitstream/handle/1811/62967/1/OARDC_research_bulletin_n1144.pdf

Walker GP, Perring TM and Freeman TP, 2009. Life history, functional anatomy, feeding and mating behavior. In Stansly PA and Naranjo SE (eds.). *Bemisia*: Bionomics and management of a global pest. Springer, Dordrecht, Netherlands. pp. 109–160.https://doi.org/10.1007/978-90-481-2460-2_4

A.2. *Coccus viridis*

A.2.1. Organism information

Taxonomic information	Current valid scientific name: *Coccus viridis* (Green 1889) Synonyms: *Lecanium viride* Green 1889; *Eulecanium viridis*; *Lecanium viridis*; Name used in the EU legislation: N/A. Order: Hemiptera Family: Coccidae Common name: soft green scale; green coffee scale Name used in the Dossier: *Coccus viridis*
Group	Insects
EPPO code	COCCVI
Regulated status	*Coccus viridis* is not regulated in EU neither listed by EPPO. It is a quarantine pest in United States of America, and included in A1 list of Argentina and Jordan.
Pest status in Uganda	It is reported as present with no further details (CABI, EPPO, García Morales et al. 2016).
Pest status in the EU	Present, restricted distribution. It has been recorded in Portugal in Madeira and Azores Islands (Franco et al. 2011).
Host status on *Jasminum polyanthum*	*Jasminum* sp., have been reported as hosts for *C. viridis* (Malumphy and Treseder, 2012). There are no records that *Jasminum polyanthum* is a host of *C. viridis*.
PRA information	No pest risk assessment is currently available.
Other relevant information for the assessment	
Biology	The body shape of *C. viridis* adult female is elongated oval and is 2.35–3.3 mm in length and 1.35–1.65 mm in width. *C. viridis* is parthenogenetic and oviparous. Males are usually absent; however, Kohler (1976) studying the life history of *C. viridis* in Cuba, observed males that was correlated with population density. The eggs are laid singly and remain under the adult females' body until hutch. Egg hutch start few minutes to several hours after oviposition (Fredrick 1943). Nymphs go through three instars. First-instar nymphs (crawler) are 0.7 mm long, second instar 0.74 mm and the third one 0.78 mm (Fernandes et al 2009). Crawler is very active and move around the plant searching and choosing their feeding location. The older instar nymphs move very short distances, whereas adults are sessile (Fernandes et al., 2009; Moreira et al., 2007). However, Fredrick (1943) reported that all stages can change their feeding position searching for fresh foliage. It prefers feeding on the under surface of leaves and on green shoots, but at high population densities, they will move onto the main twigs and fruits (Murphy 1997). Adults and nymphs feed on the plant sap, excrete honeydew and inject toxins into the vascular

	system. Infestation causes stunted growth of the leaves, premature leaves' abscission and falling, plant weakening and yield reduction. In addition, honeydew accumulates on the leaves and branches of infested trees, and it becomes infested with sooty moulds which can reduce photosynthesis (Murphy, 1997; Fernandes et al., 2009; CABI 2021). In Florida, each female lays more than 85 eggs during the period of September–November on citrus. In late summer months, the average time to complete one generation varies from 50 to 70 days (Fredrick, 1943). In Queensland, Australia, it develops three to four generations per year (Smith et al., 1997).	
Symptoms	**Main type of symptoms**	Infestation causes stunted growth, premature abscission of leaves, leaf falling, plant weakening and yield reduction. In addition, honeydew accumulates on the leaves and branches of infested trees, and it becomes infested with sooty moulds which can reduce photosynthesis (Murphy, 1997; Fernandes et al., 2009; CABI 2021).
	Presence of asymptomatic plants	No asymptomatic period is known to occur in the infested plants. Plant damage might not be obvious in early infestation, but the presence of scales on the plants could be observed because of honeydew presence. During the crawler stage, infestation is difficult to be noted.
	Confusion with other pathogens/pests	*Although it may be confused with other* coccid species such as the *C. hesperidum* and *C. celatus, a slide mounted female can be distinguished* using taxonomic keys (Miller et al., 2014; Choi et al., 2018).
Host plant range	*C. viridis* has a very wide range of host plants: It has been recorded from hosts belonging to 158 genera in 65 plant families (García Morales et al., 2016).	
Reported evidence of impact	*It* is the most serious of coccid pests on coffee and is now present in most of the major coffee-producing countries of the world. A wide range of important crop plants are attacked, including Arabica and Robusta coffee, citrus, tea, mango, cassava and guava (Murphy, 1997).	
Evidence that the commodity can be a pathway	Eggs, nymphs and adults of *C. viridis* can be present on the leaves and stems of *J. polyanthum* cuttings.	
Surveillance information	There is no information available to assess whether the pest has ever been found in the nurseries or surrounding environment of the nurseries.	

A.2.2. Possibility of pest presence in the nursery

A.2.2.1. Possibility of entry from the surrounding environment

C. viridis is polyphagous species that is reported to be present in Uganda. Given the wide host range of this pest, it is possible that local populations of *C. viridis* are present in the neighbouring environment.

After hatching, crawlers may be carried to neighbouring plants by wind, or by hitchhiking on clothing, equipment or animals.

In Africa, *C. viridis* has only been recorded from low altitudes (below 1,200 m) and is not considered to be a serious pest (Murphy, 1997).

Introduction of scale insects into a greenhouse is possible through holes in the netting or roof of the greenhouse structure, by passive wind transfer or through an open door as a hitchhiker on clothing of nursery staff.

Uncertainties:

- There is no information on the presence and population pressure of *C. viridis* in the neighbouring environment of the nursery.
- The presence of defects in the greenhouse structure.
- It is not clear whether the hygienic procedures are sufficient to prevent that the pest can hitchhike on nursery workers.

Taking into consideration the above evidence and uncertainties, the Panel considers that it is possible for the pest to enter the nursery from the surrounding environment.

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

Mother plants are initiated from rooted cuttings imported from the Netherlands. It is unlikely that *C. viridis* is present on the imported material.

Uncertainties:

- Taking into consideration the above evidence and uncertainties, the Panel considers it is not possible that the pest could enter the nursery with new plants.

A.2.2.3. Possibility of spread within the nursery

Nymphs and adults could spread in the neighbouring plants and further by hitchhiking on clothing of nursery staff.

Uncertainties:

- Taking into consideration the above evidence and uncertainties, the Panel considers that the transfer of the pest within the nursery is possible.

A.2.3. Information from interceptions

There were no interceptions of *C. viridis* on different commodities imported into the EU from Uganda as well as other third countries. (EUROPHYT and TRACES, online).

This species was intercepted 5,332 times at US ports-of-entry on a variety of hosts between 1995 and 2012, and is the most commonly intercepted soft scale taken at U S borders (Miller et al., 2014).

A.2.4. Evaluation of the risk mitigation options

In the table below, all risk mitigation measures currently applied in Uganda are listed and described and an indication of their effectiveness on *C. viridis* is provided:

	Risk mitigating measure	**Effect Y/N**	**Evaluation and uncertainties**
1	Growing plants in isolation	Yes	Description The mother plants used for cutting production are grown in dedicated greenhouses. Only *Jasminum* plants are present in this greenhouse. The greenhouses are enclosed with plastic on the roofs and walls. Ventilation areas (in the roof structure and in the greenhouses walls) are all screened. The screen and plastic are checked twice per week for holes or cuts. All greenhouses have double doors with an air stream flowing out of the greenhouse (electrical fans) when a door is opened. Evaluation Plants are protected from *C. viridis* nymphs that may enter from the surrounding environment. Uncertainties: – Presence of defects in the greenhouse structure
2	Soil treatment	No	Description Plants are grown in bags with growing media (RHP-certified) and granules ('kabala stones'). The growing medium is steamed during 1.5 h at 80 °c at least, before rooted cuttings are sticked into the bags. Evaluation Not relevant
3	General hygiene procedures for nursery staff and visitors	Yes	Description When a person is entering the production unit, after the first door there is a disinfection area, with a disinfection pond/bath. After that, the person opens the second door, which can only be opened after the first door is closed. After the second door, the person is in the area where disinfected aprons, gloves and other tools are kept. From here, the person prepares and dresses up, after which the third door leads to the actual greenhouse and the beds.

	Risk mitigating measure	Effect Y/N	Evaluation and uncertainties
			Evaluation If applied correctly the hygienic measures should prevent the entry of hitchhiking *C. viridis*. Uncertainties The level of coverage by the protecting clothing.
4	Insecticide treatment	Yes	Description There are insecticide and fungicide treatments applied on *Jasminum* plants on a weekly basis based on scouting data. An overview of the applied pesticides is given in Table 7. Evaluation The insecticides Mainspring (a.i. Cyantraniliprole), Movento (a.i. spirotetramat) are expected to have a good efficacy against *C. viridis*. The other insecticides used may also have an effect on *C. viridis*. Uncertainties The frequency of the applications given the life cycle of the pest.
5	Pest monitoring and inspections by the nursery staff during the production process	Yes	Description Competent scouts employed at the farm collect pest and disease data by visual inspection and monitoring traps (yellow sticky traps). Scouting data are reported on a weekly basis to the NPPO. Treatment decisions are based on the scouting data. Evaluation *C. viridis* is expected to be detected if present in the greenhouse Early infestations are difficult to detect.
6	Packing and handling procedures	Yes	Description The unrooted cuttings are harvested with a harvesting knife, after which 52 cuttings are placed into a plastic bag. The plastic bags are placed inside a carton box. All these steps are done inside the greenhouse. The boxes are stored in a cold room at 7 °c. A sample of the harvested bags is taken into the quality and control area, where the cuttings are visually inspected for pest and diseases, and product specifications (size, weight, colour, etc.). Evaluation Cuttings with symptoms of infestation likely to be detected and are expected not to be packed for export. Infestation after packing (in plastic bags) is highly unlikely.
7	Official Supervision by NPPO	Yes	Description The NPPO regular inspections in the greenhouse ensures compliance to the import requirements as specified in Annex IV of 2000/29/EU, as specified in the Dossier. Evaluation *C. viridis* is expected to be detected if present in the greenhouse Early infestations are difficult to detect. Uncertainties There is no detailed information on inspection frequency and design prevalence.
8	Export inspections of consignments	Yes	Description Before export a sample is taken from the export consignment and inspected by the NPPO Evaluation *C. viridis* is expected to be detected if present in the sample. Uncertainties There is no detailed information on inspection frequency and design prevalence.

	Risk mitigating measure	Effect Y/N	Evaluation and uncertainties
9	Surveillance of production area	Yes	Description The NPPO includes the surrounding area of the production facility in its surveillance. Evaluation Population sources of *C. viridis* could be detected if an appropriate survey design is implemented. Uncertainties There is no detailed information on inspection frequency and design prevalence

A.2.5. Overall likelihood of pest freedom for *C. viridis* on *Jasminum polyanthum* species

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

- *C. viridis* has been reported on *Jasminum* sp., but not on *J. polyanthum*.
- *Jasminum* is not a preferred host.
- *C. viridis* has never been intercepted on products imported from Uganda.
- Dispersal capacity of *C. viridis* is limited to the first-instar stage (crawler).
- Low population pressure of *C. viridis* in the surrounding environment, because of active natural enemies or absence of preferred host plants.
- Transfer of *C. viridis* from sources in the surrounding environment to the greenhouse plants is very difficult because dispersal is mainly dependent on human-assisted movement of the first-instar stage (crawler).
- Greenhouse structure is insect-proof and entrance is unlikely.
- The scouting monitoring regime is effective (detection of scale insects).
- Insects are expected to be easily detected by the production of honeydew.
- Application of the insectisides Mainspring (a.i. Cyantraniliprole) and Movento (a.i. spirotetramat) is expected to have a good efficacy against the scale insect *C. viridis*.
- At harvest and packing cuttings with symptoms will be detected.

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

- *C. viridis* is present throughout Uganda and the insect species has a wide host range; therefore, it is likely that host plants are present in the surrounding environment.
- Greenhouses are located in areas where *C. viridis* is present and abundant (e.g. coffee plantation) and natural enemies activity is low.
- Presence of scales species in the environment is not monitored.
- It cannot be excluded that there are defects in the greenhouse structure or scale insects hitchhike on greenhouse staff.
- Asexual reproduction of the pest increases the probability of its establishment in the nursery.
- Insecticide treatments are not targeting scale insects.
- Even if there is no evidence that *J. polyanthum* is a host plant for *C. viridis*, given the polyphagous nature of this scale insects it is likely that *J. polyanthum* is a suitable host plant.

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

- The protective effect of the greenhouse structure.
- The insecticides treatments are not targeting scale insects but are moderately effective.
- There are no records of interceptions from Uganda.

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

- The main uncertainty is the population pressure in the surrounding environment.

A.2.6. Elicitation outcomes of the assessment of the pest freedom for *Coccus viridis* on *Jasminum polyanthum*

Table A.3: Elicited and fitted values of the uncertainty distribution of pest infestation by *Coccus viridis* per 10,000 plastic bags (containing 50 unrooted cuttings per bag

Percentile	1%	2.5%	5%	10%	17%	25%	33%	50%	67%	75%	83%	90%	95%	97.5%	99%
Elicited values	0.5					2		3		6					10
EKE	0.501	0.559	0.665	0.900	1.25	1.72	2.24	3.43	4.88	5.74	6.76	7.79	8.80	9.49	10.1

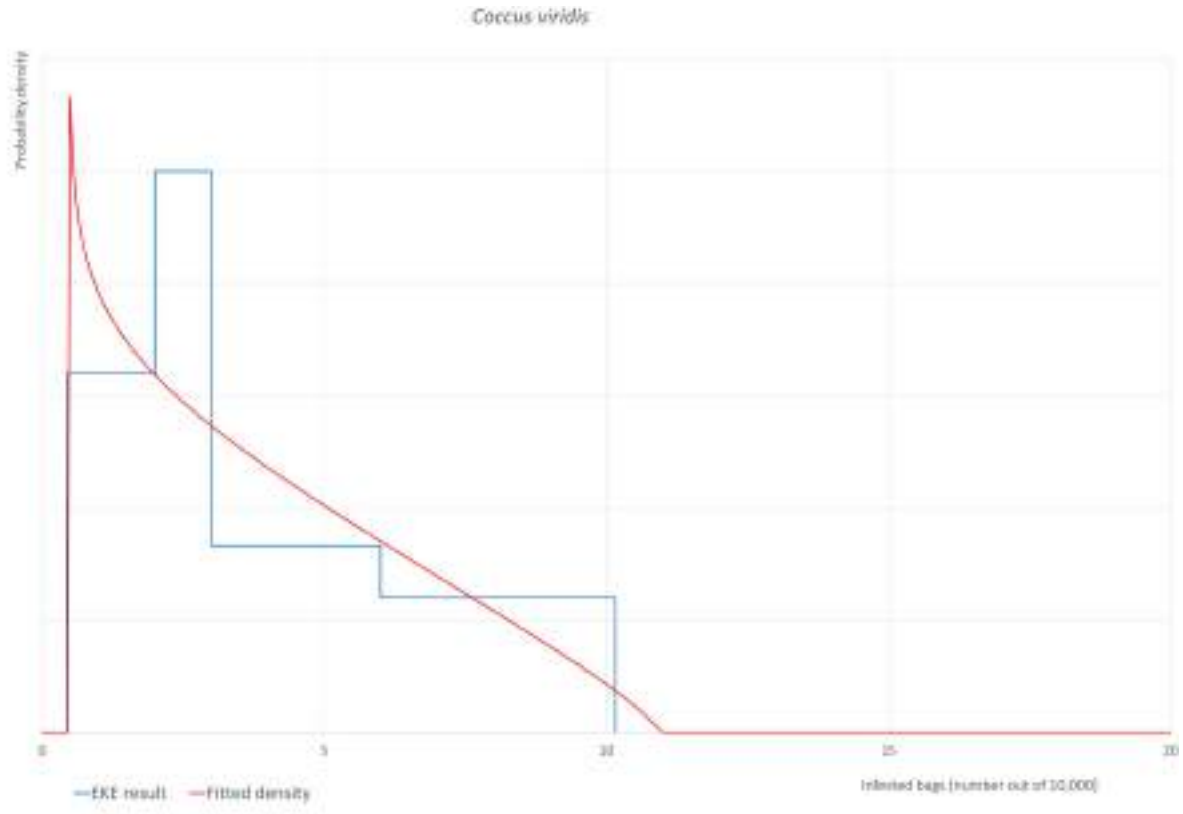
The EKE results are *BetaGeneral(0.88579, 1.8158, 0.47, 11) fitted* with @Risk version 7.6.

Based on the numbers of estimated infested bags the pest freedom was calculated (i.e. =10,000 – the number of infested plastic bags (containing 50 unrooted cuttings per bag) per 10,000). The fitted values of the uncertainty distribution of the pest freedom are shown in Table A.3.

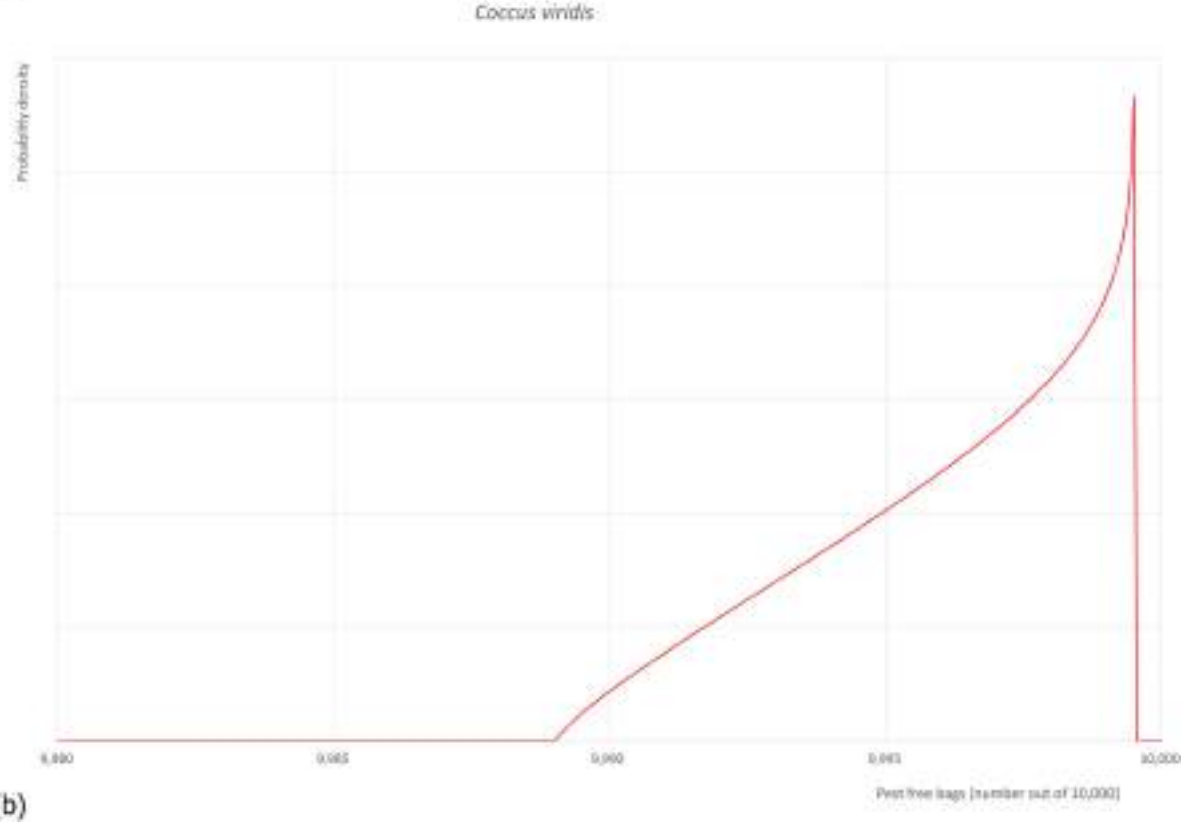
Table A.4: The uncertainty distribution of plants free of *Coccus viridis* per 10,000 bags calculated by Table A.3.

Percentile	1%	2.5%	5%	10%	17%	25%	33%	50%	67%	75%	83%	90%	95%	97.5%	99%
Values	9,990					9,994		9,997		9,998					9,999.5
EKE results	9,990	9,991	9,991	9,992	9,993	9,994	9,995	9,997	9,998	9,998	9,998.8	9,999.1	9,999.3	9,999.4	9,999.5

The EKE results are the fitted values.



(a)



(b)

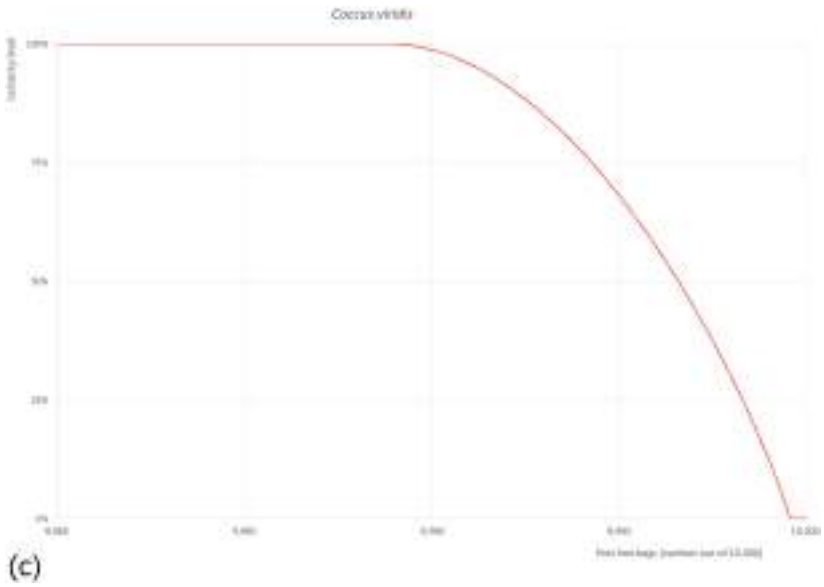


Figure A.2: (a) Elicited uncertainty of pest infestation per 10,000 bags (containing 50 unrooted cuttings per bag) for *Coccus viridis* (histogram in blue – vertical blue line indicates the elicited percentile in the following order: 1%, 25%, 50%, 75%, 99%) and distributional fit (red line); (b) uncertainty of the proportion of pest free bags per 10,000 (i.e. = 1 – pest infestation proportion expressed as percentage); (c) descending uncertainty distribution function of pest infestation per 10,000 bags

A.2.7. References List

CABI. 2021. Plant Wise Knowledge Bank. Available online: https://www.plantwise.org/knowledgebank/datasheet/14670

Choi J, Soysouvanh P, Lee S and Hong KJ, 2011. Review of the family Coccidae (Hemiptera: Coccomorpha) in Laos. *Zootaxa*, *4460*, 1–62.

Fernandes FL, Picanço MC, Fernandes ME, Galdino TV and Tomaz AC, 2009. Perdas Causadas por Coccus viridis (Green) (Hemiptera: Coccidae) em Mudas de Coffea arabica L. [Injuries caused by Coccus viridis (Green) (Hemiptera: Coccidae) on seedlings of Coffea arabica L.]. EntomoBrasilis, 2, 49–53.

EUROPHYT, online. European Union Notification System for Plant Health Interceptions - EUROPHYT Available online: https://ec.europa.eu/food/plant/plant_health_biosecurity/europhyt/index_en.htm [Accessed: 21 January 2022].

Franco JC, Russo A and Marotta S, 2011. An annotated checklist of scale insects (Hemiptera: Coccoidea) of Portugal, including Madeira and Azores archipelagos. Zootaxa, 3004, 1–32.

Fredrick JM, 1943. Some preliminary investigations of the green scale, *Coccus viridis* (Green), in south Florida. Florida Entomologist, 26, 12–15; 25–29.

García Morales G, Denno BD, Miller DR, Miller GL, Ben-Dov Y and Hardy NB, 2016. ScaleNet: a literature-based model of scale insect biology and systematics. Database. https://doi.org/10.1093/database/bav118. https://scalenet.info. [Accessed: 15 December 2021].

Köhler G, 1976. Beitrag zur Kenntnis des Männchens der Grünen Kaffeeschildlaus, Coccus viridis (Green) (Hemiptera: Coccinea-Coccidae). *Beiträge zur Entomologie, 26*, 471–477.

Malumphy CP and Treseder K, 2012. Green Coffee Scale *Coccus viridis* (Hemiptera: Coccidae), new to Britain. British Journal of Entomology and Natural History 25, 217–226.

Miller D, Rung A, Parikh G, Venable G, Redford AJ, Evans GA and Gill RJ, 2014. Scale Insects, Edition 2. USDA APHIS Identification Technology Program (ITP). Fort Collins, CO. Available online: https://idtools.org/id/scales/ [Accessed: 13 December 2021].

Moreira M D, Fernandes FL, Fernandes MES, Bacci L, Martins JC and Picanço MC, 2007. Características rastreáveis do manejo integrado das pragas do cafeeiro [Traceable characteristics of the coffee integrated pest management]. In L. Zambolim (ed.), Rastreabilidade da cadeia produtiva do café. Rio Branco: Suprema LTDA.

Murphy ST, 1997. 3.3.14 Coffee. 367–380. In: Ben-Dov Y and Hodgson CJ (ed.), Soft Scale Insects - Their Biology, Natural Enemies and Control [Vol. 7B]. Elsevier, Amsterdam & New York. 442 pp.

Smith D, Beattie GAC and Broadley RH, 1997. *Citrus Pests and their Natural Enemies: Integrated Pest Management in Australia*. State of Queensland, Dept. of Primary Industries, and Horticultural Research and Development Corp. Brisbane, Australia, 263 pp.

TRACES-NT, online. TRAde Control and Expert System. Available online: https://webgate.ec.europa.eu/tracesnt [Accessed: 21 January 2022].

A.3. *Diaphania indica*

A.3.1. Organism information

Taxonomic information	Current valid scientific name: *Diaphania indica* (Saunders, 1851) Synonyms: Botys hyalinalis, Boisduval 1833; Eudioptis capensis Zeller, 1852; Eudioptis indica; Glyphodes indica Saunders; Hedylepta indica Saunders; Margaronia indica Saunders; Palpita indica Saunders; Phacellura indica Saunders; Phakellura curcubitalis Guenée, 1862; Phakellura gazorialis Guenée, 1854; Phakellura indica; Phakellura zygaenalis Guenée, 1854 Name used in the EU legislation: N/A Order: Lepidoptera Family: Crambidae Common name: cucumber moth; cucurbit caterpillar; melon moth; pumpkin caterpillar; cotton caterpillar Name used in the Dossier: *Diaphania indica*	
Group	Insects	
EPPO code	DPHNIN	
Regulated status	*D. indica* is not regulated in EU neither listed by EPPO. It is a quarantine pest in United States of America and listed in A1 list of Brazil and Chile.	
Pest status in Uganda	It is reported as present with no further details (CABI, EPPO).	
Pest status in the EU	Present, restricted distribution. It is present in Portugal (Madeira) (EPPO).	
Host status on *Jasminum polyanthum*	There are no records that *Jasminum polyanthum* is a host of *D. indica*. *Jasminum sambac* has been reported as host for *D. indica* in Thailand (NHM, undated). Uncertainties: the host status of *J. polyanthum to D. indica*.	
PRA information	There is a pest risk analysis for *D. indica* by the Department for Environment, Food and Rural Affairs: Central Science Laboratory Sand Hutton, York, YO41 1LZ UK (Everatt, A. 2015).	
Other relevant information for the assessment		
Biology	*D. indica* is a leafroller. Eggs are laid singly or in small clusters of 2–7 eggs on the underside of leaves and on the soft stems of host plants (Ganehiarachchi, 1997; Choi et al., 2003). In laboratory conditions, Pilania et al. (2021) observed females of *D. indica* to lay eggs on both surfaces of leaves, tendrils, and on fruits of bitter gourd. The larvae feed on leaves, soft stems, fruits and occasionally they damage flowers (Nagaraju et al., 2018; Brown, 2015). The larvae passed through five larval instars and pupate inside the webbed leaves (Rai et al., 2014; Pilania et al., 2021). In South Korea, on *Cucumis sativus,* the lower developmental threshold for egg, larvae, pupae and total immature development estimated at 13.4, 10.6, 11.6 and 11.5°C and the development requires 55.3, 251.5, 183.3 479.8 degrees days, respectively. Females laid 98, 230 and 139 eggs at 17.5, 25 and 35°C (Shin et al., 2000). In South Korea, *the adults* emerge by *mid-June* and give 4 generations per year with higher population level to occur on late September. They hibernate as pupa into the soil at a depth of 5–10 cm (Choi et al., 2003).	
Symptoms	**Main type of symptoms**	The young larvae cluster around the main veins, folding or binding leaves together. Early symptoms of infestation are the development of lace-like patches of networks of intact small leaf veins. On fruits, larvae puncture the skin of young fruit, particularly where they touch leaves or the soil (Patel & Kulkarny, 1956; Pilania et al., 2021).

	Presence of asymptomatic plants	No asymptomatic period is known to occur in the infested plants.
	Confusion with other pathogens/pests	Adults of *D. indica* can be confused with *D. hyalinata*. *D. hyalinata* is not present in Uganda.
Host plant range	*D. indica* is a polyphagous species and is particularly a major pest of cucurbitaceous plants. It has also been reported to feed on plants in the families of *Fabaceae*, *Malvaceae*, *Annonaceae*, *Cruciferae*, *Passifloraceae*, *Solanaceae*, *Amaranthaceae, Phocaea* and *Oleaceae* (Peter and David, 1991; MacLeod, 2005; Hosseinzade et al., 2014; Jalali et al., 2019; Kravchenko, 2020; NHM, Undated)	
Reported evidence of impact	*D. indica is considered a serious pest in Africa and Asia, and greatly reduces fruit yield on some hosts in some years*.	
Evidence that the commodity can be a pathway	Eggs, larvae and pupae of *D. indica* can be present on the leaves and stems of *J. polyanthum* cuttings (Everatt, 2015 (revised)).	
Surveillance information	There is no information available to assess whether the pest has ever been found in the nurseries or surrounding environment of the nurseries.	

A.3.2. Possibility of pest presence in the nursery

A.3.2.1. Possibility of entry from the surrounding environment

D. indica is polyphagous species that is reported to be present in Uganda. Given the wide host range of this pest, it is possible that local populations of *D. indica* are present in the neighbouring environment.

Flying adults of *D. indica,* can enter the nursery through openings in the plastic cover of the greenhouse.

Uncertainties:

There is no surveillance information on the presence and population pressure of *D. indica* in the neighbouring environment of the nursery.

The presence of defects in the greenhouse structure.

Taking into consideration the above evidence and uncertainties, the Panel considers that it is possible for the pest to enter the nursery from the surrounding environment.

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

Mother plants are initiated from rooted cuttings imported from the Netherlands. *D. indica* is not present in the Netherlands.

Uncertainties:

- Taking into consideration the above evidence and uncertainties, the Panel considers it is not possible that the pest could enter the nursery with new plants.

A.3.2.3. Possibility of spread within the nursery

When present, flying adults can spread from infested host plants within the nursery.

Uncertainties: there are no uncertainties.

Taking into consideration the above evidence and uncertainties, the Panel considers that the transfer of the pest within the nursery is possible.

A.3.3. Information from interceptions

In the Europhyt database, there are 113 records of interception of *D. indica* on fruits imported to the EU.

There were no interceptions of *D. indica* on different commodities imported into the EU from Uganda. (EUROPHYT and TRACES, online).

A.3.4. Evaluation of the risk mitigation options

In the table below, all risk mitigation measures currently applied in Uganda are listed and described and an indication of their effectiveness on *D. indica* is provided:

	Risk mitigating measure	Effect Y/N	Evaluation and uncertainties
1	Growing plants in isolation	Yes	Description The mother plants used for cutting production are grown in dedicated greenhouses. Only Jasminum plants are present in this greenhouse. The greenhouses are enclosed with plastic on the roofs and walls. Ventilation areas (in the roof structure and in the greenhouses walls) are all screened. The screen and plastic are checked twice per week for holes or cuts. All greenhouses have double doors with an air stream flowing out of the greenhouse (electrical fans) when a door is opened. Evaluation Plants are protected from *D. indica* adults that may enter from the surrounding environment. Uncertainties: – Presence of defects in the greenhouse structure
2	Soil treatment	No	Description Plants are grown in bags with growing media (RHP-certified) and granules ('kabala stones'). The growing medium is steamed during 1.5 hrs at 80°c at least, before rooted cuttings are sticked into the bags. Evaluation Not relevant
3	General hygiene procedures for nursery staff and visitors	No	
4	Insecticide treatment	Yes	Description There are insecticide and fungicide treatments applied on Jasminum plants on a weekly basis based on scouting data. An overview of the applied pesticides is given in Table 7. Evaluation The insecticides Steward Match and Tracer (a.i. indoxacarb, lufenuron, spinosad) are expected to have a good efficacy against *D. indica*. The other insecticides used may also have an effect on *D. indica*. Uncertainties The frequency of the applications given the life cycle of the pest.
5	Pest monitoring and inspections by the nursery staff during the production process	Yes	Description Competent scouts employed at the farm collect pest and disease data by visual inspection and monitoring traps (yellow sticky traps). Scouting data are reported on a weekly basis to the NPPO. Treatment decisions are based on the scouting data. Evaluation *D. indica* is expected to be detected if present in the greenhouse.
6	Packing and handling procedures	Yes	Description The unrooted cuttings are harvested with a harvesting knife, after which 50 cuttings are placed into a plastic bag. The plastic bags are placed inside a carton box. All these steps are done inside the greenhouse. The boxes are stored in a cold room at 7°c.

	Risk mitigating measure	Effect Y/N	Evaluation and uncertainties
			A sample of the harvested bags is taken into the quality and control area, where the cuttings are visually inspected for pest and diseases, and product specifications (size, weight, colour, etc.). Evaluation Cuttings with symptoms of infestation are likely to be detected and expected not to be packed for export. Infestation after packing (in plastic bags) is highly unlikely.
7	Official Supervision by NPPO	Yes	Description The NPPO does regular inspections in the greenhouse and the surrounding environment. Evaluation *D. indica* is expected to be detected if present in the greenhouse. Uncertainties There is no detailed information on inspection frequency and design prevalence.
8	Export inspections of consignments	Yes	Description Before export, a sample is taken from the export consignment and inspected by the NPPO. Evaluation *D. indica* is expected to be detected if present in the sample. Uncertainties There is no detailed information on inspection frequency and design prevalence.
9	Surveillance of production area	Yes	Description The NPPO includes the surrounding area of the production facility in its surveillance. Evaluation Population sources of *D. indica* could be detected if an appropriate survey design is implemented. Uncertainties There is no detailed information on inspection frequency and design prevalence.

A.3.5. Overall likelihood of pest freedom for *D. indica* on *Jasminum polyanthum* species

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

- *D. indica* has been reported on *J. sambac*, but not on *J. polyanthum*.
- *D. indica* is not able to enter the greenhouse (no holes in screen), defects in the greenhouse structure are detected and repaired.
- The presence of *D. indica* in the greenhouse will be detected and appropriate treatments will be applied.
- The pest population pressure in the surrounding environment is very low (suitable hosts (*Cucurbitaceae*) are not widely distributed in the production area.
- Cuttings with symptoms are sorted out in the packing process.
- *D. indica* has never been intercepted on produce from Uganda.

A.3.5.2. Reasoning for a scenario which would lead to a reasonably high number of infested consignments (deciduous species)

- *D. indica* is present in Uganda and has a wide host range; therefore, it is likely that host plants are present in the surrounding environment, in close proximity to the greenhouse.

- Due to its polyphagous nature *D. indica* is expected to use *J. polyanthum* as a host.
- Presence of undetected defects in the greenhouse structure.
- P *D. indica* could go undetected during inspections of the nursery (eggs) and packing of the cuttings

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

- The pest *D. indica* is relatively easy to be detect if present in the greenhouse.
- The greenhouse structure is protective against *D. indica*.

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

- The main uncertainty is the population pressure of *D. indica* in the surrounding environment.

A.3.6. Elicitation outcomes of the assessment of the pest freedom for *D. indica* on *Jasminum polyanthum*

Table A.5: Elicited and fitted values of the uncertainty distribution of pest infestation by *D. indica* per 10,000 plastic bags (containing 50 unrooted cuttings per bag)

Percentile	1%	2.5%	5%	10%	17%	25%	33%	50%	67%	75%	83%	90%	95%	97.5%	99%
Elicited values	0.5					2		4		6					10
EKE	0.500	0.598	0.760	1.08	1.51	2.06	2.63	3.87	5.29	6.11	7.06	7.99	8.89	9.50	10.0

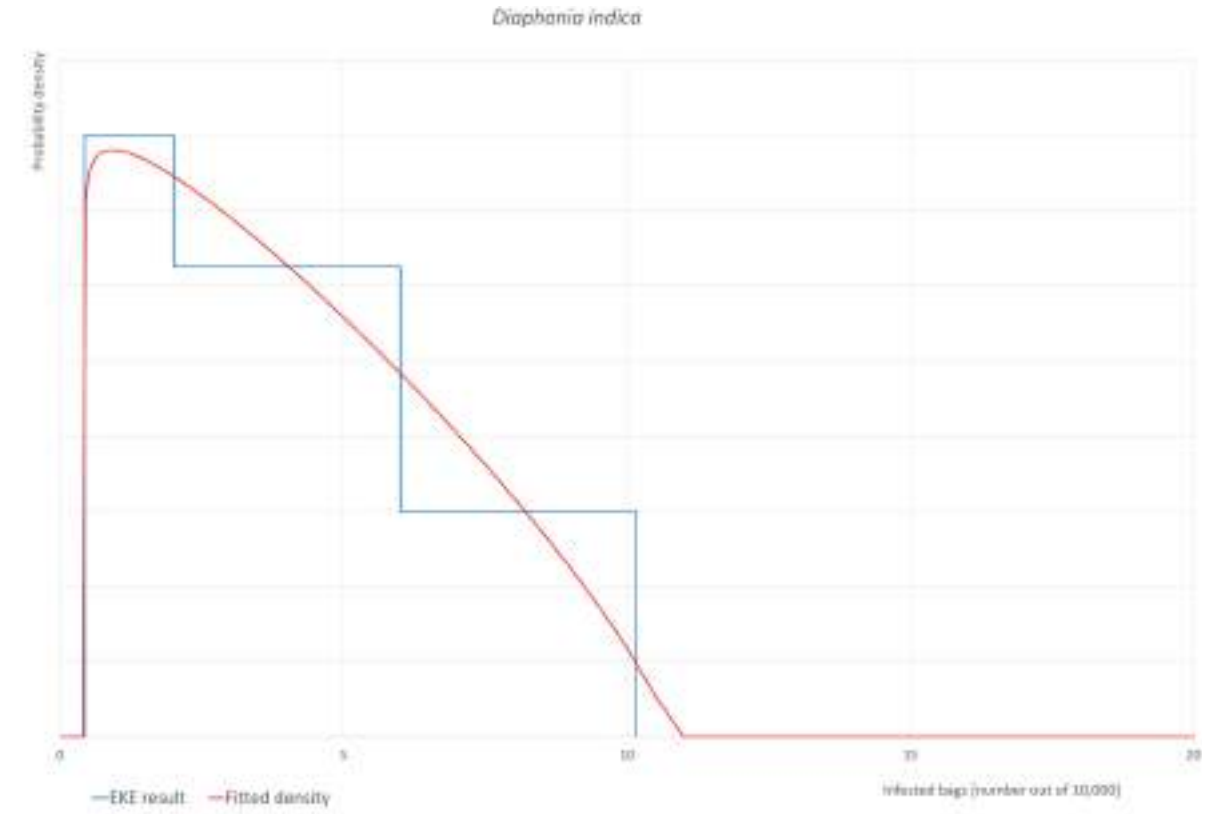
The EKE results are *BetaGeneral(0.88579, 1.8158, 0.47, 11)fitted* with @Risk version 7.6.

Based on the numbers of estimated infested grafted plants, the pest freedom was calculated (i.e. = 10,000 – the number of infested plastic bags (containing 50 unrooted cuttings per bag) per 10,000). The fitted values of the uncertainty distribution of the pest freedom are shown in Table A.6.

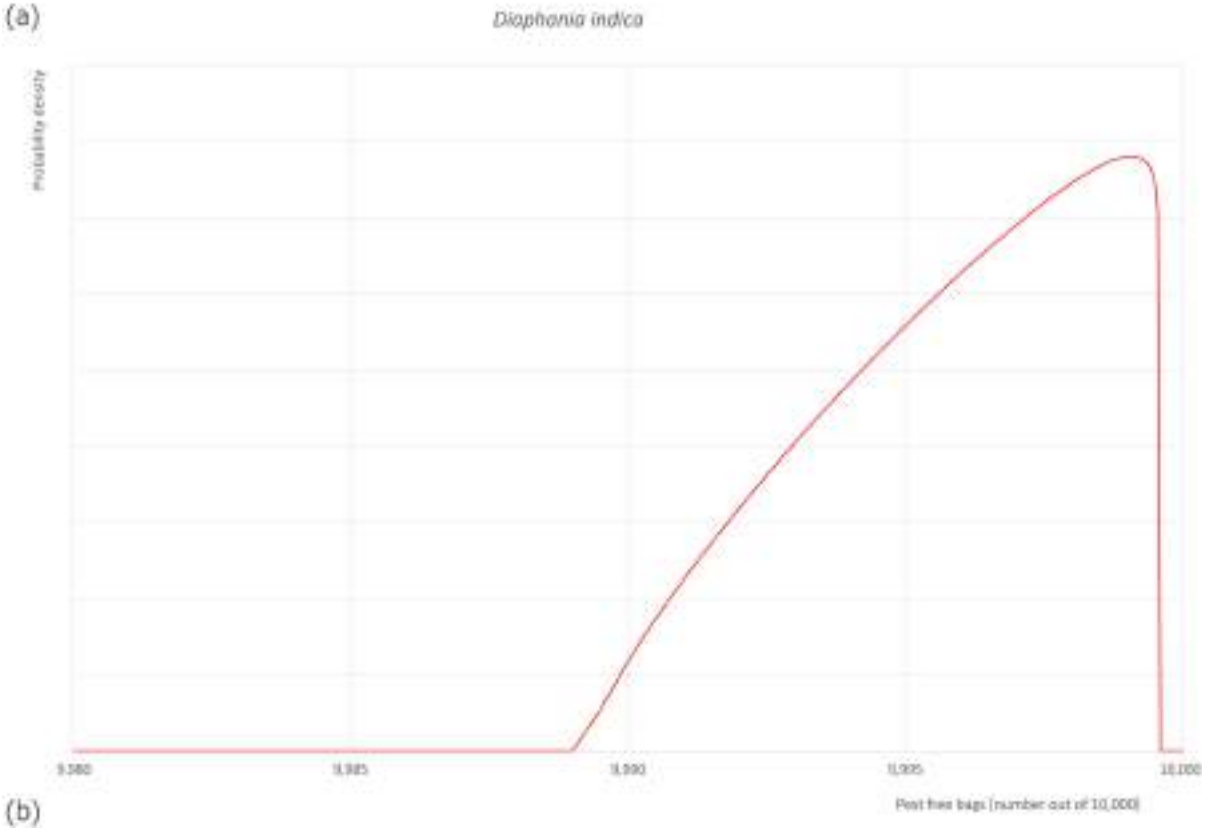
Table A.6: The uncertainty distribution of plants free of *D. indica complex* per 10,000 plastic bags calculated by Table A.5.

Percentile	1%	2.5%	5%	10%	17%	25%	33%	50%	67%	75%	83%	90%	95%	97.5%	99%
Values	9,990					9,994		9,996		9,998					9,999.5
EKE results	9,990	9,990	9,991	9,992	9,993	9,994	9,995	9,996	9,997	9,998	9,998.5	9,998.9	9,999.2	9,999.4	9,999.5

The EKE results are the fitted values.



(a)



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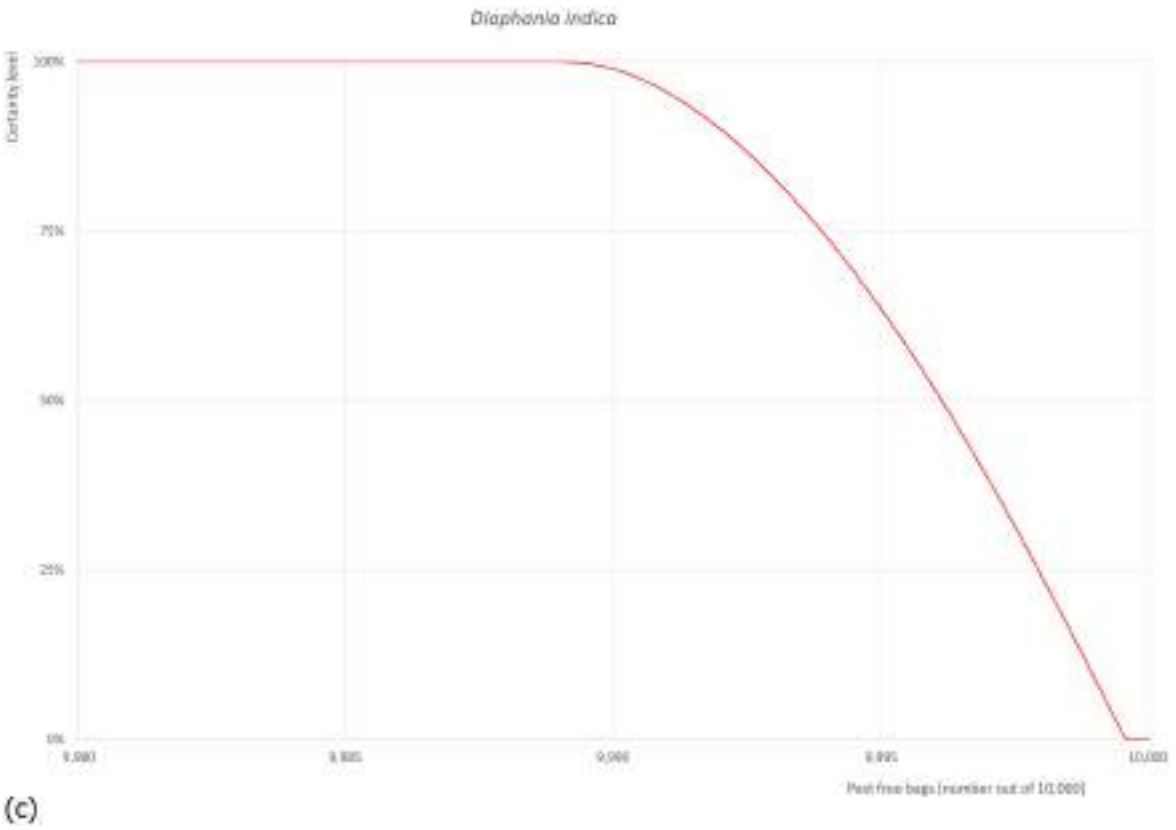


Figure A.3: (a) Elicited uncertainty of pest infestation per 10,000 deciduous plants for *D. indica* complex (histogram in blue – vertical blue line indicates the elicited percentile in the following order: 1%, 25%, 50%, 75%, 99%) and distributional fit (red line); (b) uncertainty of the proportion of pest-free bags per 10,000 (i.e. = 1 – pest infestation proportion expressed as percentage); (c) descending uncertainty distribution function of pest infestation per 10,000 deciduous plants

A.3.7. Reference List

Brown H, 2015. Common insect pests of cucurbits. Agnote, Northern territory government. Available online: https://industry.nt.gov.au/__data/assets/pdf_file/0006/233628/805.pdf [Accessed: 19 December 2021].

CABI (Centre for Agriculture and Bioscience International), online. Datasheet *Diaphania indica* (cucumber moth). Available online: https://www.cabi.org/isc/datasheet/19657 [Accessed: 16 December 2021].

Choi D, Noh J and Choe K, 2003. Oviposition and feeding preference of the cotton caterpillar, *Palpita indica* (Lepidoptera: Pyralidae), in Cucurbitaceae. Kor. J. Appl. Entomol, 42: 119–124.

Choi DC, Noh JJ, Lee KK and Kim HS, 2003. Hibernation and seasonal occurrence of the cotton caterpillar, *Palpita indica* (Lepidoptera: Pyralidae), in watermelon. *Korean Journal of Applied Entomology*.

EPPO (European and Mediterranean Plant Protection Organization), online. *Diaphania indica* (BEMITA). Available online: https://gd.eppo.int/taxon/DPHNIN [Accessed: 16 December 2021].

EUROPHYT, online. European Union Notification System for Plant Health Interceptions - EUROPHYT Available online: http://ec.europa.eu/food/plant/plant_health_biosecurity/europhyt/index_en.htm [Accessed: 11 December 2021].

Ganehiarachchi GASM, 1997. Aspects of the biology of *Diaphania indica* (Lepidoptera: Crambidae). Journal of the National Science Council of Sri Lanka, 25, 203–209.

Hosseinzade S, Izadi H and Pyman Namvar MAS, 2014. Biology, temperature thresholds, and degree-day requirements for development of the cucumber moth, Diaphania indica, under laboratory conditions. *Journal of Insect Science*, *14*.

Jalali MA, Gharaei AM, Ziaaddini M, Jalali M and Frerot B, 2019. Oviposition preference and olfactory response of *Diaphania indica* (Lepidoptera: Pyralidae) to volatiles of uninfested and infested cucurbitaceous host plants. *European Journal of Entomology*, *116*, 392–401.

Kravchenko VD, Poltavsky A, Segerer A, Speidel W and Müller GC, 2020. An annotated checklist of the Crambidae (Lepidoptera: Pyraloidea) of Israel, with remarks on their distribution and phenology. Israel Journal of Entomology, *50*, 85–129.

Landry B, 2020. Taxonomic revision of the Spilomelinae (Lepidoptera, Pyralidae sl) of the Galápagos Islands, Ecuador. *Revue suisse de Zoologie*, *123*, 315–399.

MacLeod A, 2005 (revised). Pest risk analysis for *Diaphania indica*. Department for Environment, Food and Rural Affairs: Central Science Laboratory Sand Hutton, York, YO41 1LZ UK.

Nagaraju M, Nadagouda S, Hosamani A and Hurali S, 2018. Field evaluation of insecticides for the management of cucumber moth, Diaphania indica (Saunders)(Lepidoptera: Crambidae) on bitter gourd. *J. Entomol. Zool. Stud*, *6*, 79-82.

NHM, Undated. Specimen record from the collection in the Natural History Museum (London, UK)., London, UK: Natural History Museum (London).

Patel RC, Kulkarny HL, 1956. Bionomics of the pumpkin caterpillar, *Margaronia indica* Saunders (Pyralidae: Lepidoptera). J Bombay Nat History Soc 54, 18–127.

Peter C and David BV, 1991. Population dynamics of the pumpkin caterpillar, *Diaphania indica* (Saunders) (Lepidoptera: Pyralidae). International Journal of Pest Management, *37*, 75–79.

Pilania S, Yadav SS, Yadav S, Rolania K, Kumar L, Indora J and Kumar A, 2021. Biometric assessment of cucumber moth, *Diaphania indica* (Saunders) on bitter gourd (Momordica charantia L.). *International Journal of Tropical Insect Science*, 1–12.

Rai AB, Loganathan M, Halder J, Venkataravanappa V and Naik PS, 2014. Ecofriendly approaches for sustainable management of vegetable pests. IIVR Technical Bulletin No. 53, IIVR, Varansi, 15–16.

Shin WK, Kim GH, Song C, Kim JW and Cho KY, 2000. Effect of temperature on development and reproduction of the cotton caterpillar, *Palpita indica* (Lepidoptera: Pyralidae). *Korean journal of applied entomology*, *39*, 135–140.

TRACES-NT, online. TRAde Control and Expert System. Available online: https://webgate.ec.europa.eu/tracesnt [Accessed: 11 December 2021].

A.4. *Pulvinaria psidii*

A.4.1. Organism information

Taxonomic information	Current valid scientific name: *Pulvinaria psidii* Maskell, 1893 Synonyms: *Chloropulvinaria psidii;* Borchsenius, 1957; *Lecanium vacuolatum* Green Dash, 1916; *Pulvinaria cupaniae* Cockerell, 1893; *Pulvinaria cussoniae* Hall, 1932; *Pulvinaria darwiniensis* Froggatt, 1915; *Pulvinaria gymnosporiae* Hall, 1932; *Pulvinaria psidii philippina* Cockerell, 1905 Name used in the EU legislation: N/A Order: Hemiptera Family: Coccidae Common name: green shield scale; guava mealy scale; guava pulvinaria; mango scale. Name used in the Dossier: *Pulvinaria psidii*
Group	Insects
EPPO code	PULVPS
Regulated status	*Pulvinaria psidii* is not regulated in EU.
Pest status in Uganda	Present, no further details (CABI, online).
Pest status in the EU	Absent, intercepted only. According to Fauna Europea *P. psidii* is present in the Netherlands, however after consulting the NPPO of the Netherlands the record was based on an interception.
Host status on *Jasminum polynanthum*	There are no records that *Jasminum polyanthum* is a host of *P. psidii*. *Jasminum* sp. and *Jasminum humile* have been reported as hosts for *P. psidii* (Nakahara, 1981; Stocks, 2013). *P. psidii* is a polyphagous insect (see below) and therefore the Panel assumes that *J. polyanthum* is a host.
PRA information	No pest risk assessment is currently available.

Other relevant information for the assessment		
Biology	Adult females are between 2.0 and 4.5 mm long and between 1.5 to 3.0 mm wide. Females are oval, smooth and moderately convex before egg deposition and deep green becoming gradually lighter in colour. After egg deposition, the female gradually shrivels and the surface forms into ridges and valley. The ovisac at first projects only to the posterior, but eventually more or less can surround the adult female on all sides causing the elevation of the abdomen. The full life cycle takes 2–3 months, but the formation of ovisac and egg deposition takes place in only 5 days (Hamon, 1984). The pest can spread only as a first instar nymph (crawler). The insect secrets honeydew that cover the upper surface of the leaves reducing the photosynthesis and the respiration. The result is a crop of poor quality and quantity.	
Symptoms	**Main type of symptoms**	*P. psidii* feeds on the phloem of leaves and tender young stems of the host plant. Under severe infestation, feeding causes yellowing, defoliation, reduction in fruit set and loss in plant vigour. The pest excretes honeydew, which serves as a medium for sooty mould. Sooty mould blackens the leaf and decrease the photosynthesis (Abd-Rabou, 2011)
	Presence of asymptomatic plants	The damage due to the feeding of an individual scale is small (Abd-Rabou, 2011)
	Confusion with other pests	In the field, adult *P. psidii* can easily be confused with other *Pulvinaria* species, such as *P. floccifera* and *P. urbicola*. For a corrected identification, slide-mounted adult female must be examined under a compound light microscope and the use of taxonomic keys (CABI CPC, online).
Host plant range	*P. psidii* has a very wide host range: it has been recorded on 52 different families of host plants (Bhuiya et al., 1998).	
Reported evidence of impact	In Egypt, *P. psidii* is described as one of the most important pests of mango and guava (Bakr, 2012). It is also a serious pest of *Citrus* spp., *Ficus* spp., coffee plants and *Capsicum* spp. in tropical South Pacific region (Bhuiya, 1998).	
Evidence that the commodity can be a pathway	Eggs, nymphs and adults of *P. psidii* can be present on the leaves and stems of *J. polyanthum* cuttings.	
Surveillance information	There is no information available to assess whether the pest has ever been found in the nurseries or surrounding environment of the nurseries.	

A.4.2. Possibility of pest presence in the nursery

A.4.2.1. Possibility of entry from the surrounding environment

Given the wide host range of this pest, it is possible that local populations of *P. psidii* are present in the neighbouring environment of the greenhouses with *Jasminum* plants destined for export.

After hatching, crawlers may be carried to neighbouring plants by wind, or by hitchhiking on clothing, equipment or animals.

J. polyanthum plants destined for export to the EU are grown in a protected environment (i.e. greenhouse). Introduction of the scale insects into a greenhouse is possible through holes in the netting or roof of the greenhouse structure or by hitchhiking on clothing of nursery staff. The success rate of one of these events is only likely to occur in case of a high (local) density of *P. psidii* in the neighbouring environment of the greenhouse.

Uncertainties:

- There is no surveillance information on the presence and population pressure of *P. psidii* in the neighbouring environment of the greenhouse.
- The presence of defects in the greenhouse structure
- There is no information on the presence of suitable host plants (e.g. mango orchards) and other sources of population of *P. psidii* in the area surrounding the greenhouse.
- It is not clear whether the hygienic procedures are sufficient to prevent that the pest can hitchhike on nursery workers

Taking into consideration the above evidence and uncertainties, the Panel considers that it is possible that *P. psidii* can enter a greenhouse from the surrounding area.

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

Mother plants are initiated from rooted cuttings imported from the Netherlands. *P. psidii* is not present in the Netherlands.

Uncertainties:

- Taking into consideration the above evidence, the Panel considers it is not possible that the insect enters the nursery with new plants/seeds.

A.4.2.3. Possibility of spread within the nursery

Around 60 plants genera are produced by the exporting company. Therefore, it is possible that a *Pulvinaria* population is present in one of the greenhouses of the company. The production unit of *J. polyanthum,* however, is physically separated from the other units. *P. psidii* can spread within the greenhouse by hitchhiking on clothing of nursery staff; however, hygienic procedures are in place aiming to prevent this.

Uncertainties:

- the likelihood that nursey staff will visit different production units on the same day and that hygienic procedures are sufficient to prevent that the pest can hitchhike on nursery workers

Taking into consideration the above evidence and uncertainties, the Panel considers that the transfer of the pest within the greenhouse is possible.

A.4.3. Information from interceptions

There are no interceptions of *P. psidii* on plants from Uganda (EUROPHYT and TRACES, online, [Accessed: 21 January 2022].

A.4.4. Evaluation of the risk mitigation options

In the table below, all the risk mitigation measures (RROs) currently applied in Uganda are summarised and an indication of their effectiveness on *P. psidii* is provided. The description of the risk mitigation measures currently applied in Uganda is provided in Table 7.

	Risk mitigating measure	**Effect Y/N**	**Evaluation and uncertainties**
1	Growing plants in isolation	Yes	Description The mother plants used for cutting production are grown in dedicated greenhouses. Only *J. polyanthum* plants are present in this greenhouse. The greenhouses are enclosed with plastic on the roofs and walls. Ventilation areas (in the roof structure and in the greenhouses walls) are all screened. The screen and plastic are checked twice per week for holes or cuts. All greenhouses have double doors with an air stream flowing out of the greenhouse (electrical fans) when a door is opened. Evaluation Plants in the greenhouse are protected from dispersing crawlers of *P. psidii* that may enter from the surrounding environment. Crawlers may be introduced in the greenhouse as hitchhikers on clothing of greenhouse staff. Uncertainties: – Presence of defects in the greenhouse structure
2	Soil treatment	No	Description Plants are grown in bags with growing media (RHP-certified) and granules ('kabala stones'). The growing medium is steamed during 1.5 hrs at 80°c at least, before rooted cuttings are sticked into the bags.

	Risk mitigating measure	Effect Y/N	Evaluation and uncertainties
			Evaluation Not relevant, pest is present only on above ground parts of the plants
3	General hygiene procedures for nursery staff and visitors	Yes	Description When a person is entering the production unit, after the first door there is a disinfection area, with a disinfection pond/bath. After that, the person opens the second door, which can only be opened after the first door is closed. After the second door, the person is in the area where disinfected aprons, gloves and other tools are kept. From here, the person prepares and dresses up, after which the third door leads to the actual greenhouse and the beds. Evaluation If applied correctly the hygienic measures should prevent the entry of hitchhiking *P. psidii*. Uncertainties The level of coverage by the protecting clothing
4	Insecticide treatment	Yes	Description There are insecticide and fungicide treatments applied on J. *polyanthum* plants on a weekly basis based on scouting data. An overview of the applied pesticides is given in Table 7. Evaluation The insectides Mainspring (a.i. Cyantraniliprole) and Movento (a.i. spirotetramat) are expected to have a good efficacy against the scale insect *P. psidii*. The other insecticides used may also have an effect on *P. psidii*. Uncertainties The frequency of the applications given the life cycle of the pest.
5	Pest monitoring and inspections by the nursery staff during the production process	Yes	Description Competent scouts employed at the farm collect pest and disease data by visual inspection and monitoring traps (yellow sticky traps). Scouting data are reported on a weekly basis to the NPPO. Treatment decisions are based on the scouting data. Evaluation *P. psidii* is expected to be detected (honeydew induced sooty mould symptoms on leaves) if present in the greenhouse. Uncertainties Early infestations are difficult to detect
6	Packing and handling procedures	Yes	Description The unrooted cuttings are harvested with a harvesting knife, after which 50 cuttings are placed into a plastic bag. The plastic bags are placed inside a carton box. All these steps are done inside the greenhouse. The boxes are stored in a cold room at 7°c. A sample of the harvested bags is taken into the quality and control area, where the cuttings are visually inspected for pest and diseases, and product specifications (size, weight, colour, etc.). Evaluation Cuttings with symptoms of infestation are likely to be detected and expected not to be packed for export. Infestation after packing (in plastic bags) is highly unlikely. Uncertainties Early infestations are difficult to detect.
6	Official Supervision by NPPO	Yes	Description As specified in the Dossier, the NPPO does regular inspections in the greenhouse ensures compliance to the import requirements as specified in Annex IV of 2000/29/EU.

	Risk mitigating measure	Effect Y/N	Evaluation and uncertainties
			Evaluation *P. psidii* has no EU-quarantine status, and therefore, it is unlikely to be a target for official nursery inspections. Uncertainties There is no detailed information on inspection frequency and design prevalence.
7	Export inspections of consignments	Yes	Description Before export, a sample is taken from the export consignment and inspected by the NPPO. Evaluation *P. psidii* is expected to be detected if present in the sample, although early infestations may be difficult to detect. Uncertainties There is no detailed information on inspection frequency and design prevalence.
8	Surveillance of production area	Yes	Description The NPPO includes the surrounding area of the production facility in its surveillance. Evaluation Population sources of *P. psidii* could be detected if an appropriate survey design is implemented. Uncertainties There is no detailed information on surveillance frequency and design prevalence.

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

- *P. psidii* has been reported on *Jasminum* sp., but not on *J. polyanthum*.
- *Jasminum* is not a preferred host.
- *P. psidii* has never been intercepted on produce from Uganda.
- Dispersal capacity of *P. psidii* is limited to the first instar stage (crawler).
- Low population pressure of *P. psidii* in the surrounding environment, because of active natural enemies or absence of preferred host plants.
- Transfer of *P. psidii* from sources in the surrounding environment to the greenhouse plants is very difficult because dispersal is mainly dependent on human-assisted movement of the first instar stage (crawler) and hygienic measures are in place to prevent this.
- Greenhouse structure is insect-proof and entrance is thus unlikely.
- The scouting monitoring regime is effective, insects are expected to be easily detected because of the production of honeydew.
- Application of the insectides Mainspring (a.i. Cyantraniliprole) and Movento (a.i. spirotetramat) have a good efficacy against the scale insect *P. psidii*.
- At harvest and packing, cuttings with symptoms will be detected.

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

- *P. psidii* is present throughout Uganda and the insect species has a wide host range, therefore it is likely that host plants are present in the surrounding environment.
- Greenhouses are located in areas where *P. psidii* is present and abundant (e.g., mango plantation) and natural enemy activity is low.
- Presence of scales species in the environment is not monitored.

- It cannot be excluded that there are defects in the greenhouse structure or scales insects hitchhike on greenhouse staff.
- Asexual reproduction of the pest increases the probability of its establishment in the nursery.
- Insecticide treatments are not targeting scales insects.
- Although there is no evidence that *J. polyanthum* is a host plant for *P. psidii*, given the polyphagous nature of this scale insect it is likely that *J. polyanthum* is a suitable host plant.

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

- The protective effect of the greenhouse structure.
- The insecticides treatments are not targeting scale insects but are moderately effective.
- There are no records of interceptions from Uganda.

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

- The main uncertainty is the population pressure in the surrounding environment.

A.4.5.5. Elicitation outcomes of the assessment of the pest freedom for *Pulvinaria psidii*

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

Table A.7: Elicited and fitted values of the uncertainty distribution of pest infestation by *Pulvinaria psidii* per 10,000 plants

Percentile	1%	2.5%	5%	10%	17%	25%	33%	50%	67%	75%	83%	90%	95%	97.5%	99%
Elicited values	0.5					2		3		6					10
EKE	0.501	0.559	0.665	0.900	1.25	1.72	2.24	3.43	4.88	5.74	6.76	7.79	8.80	9.49	10.1

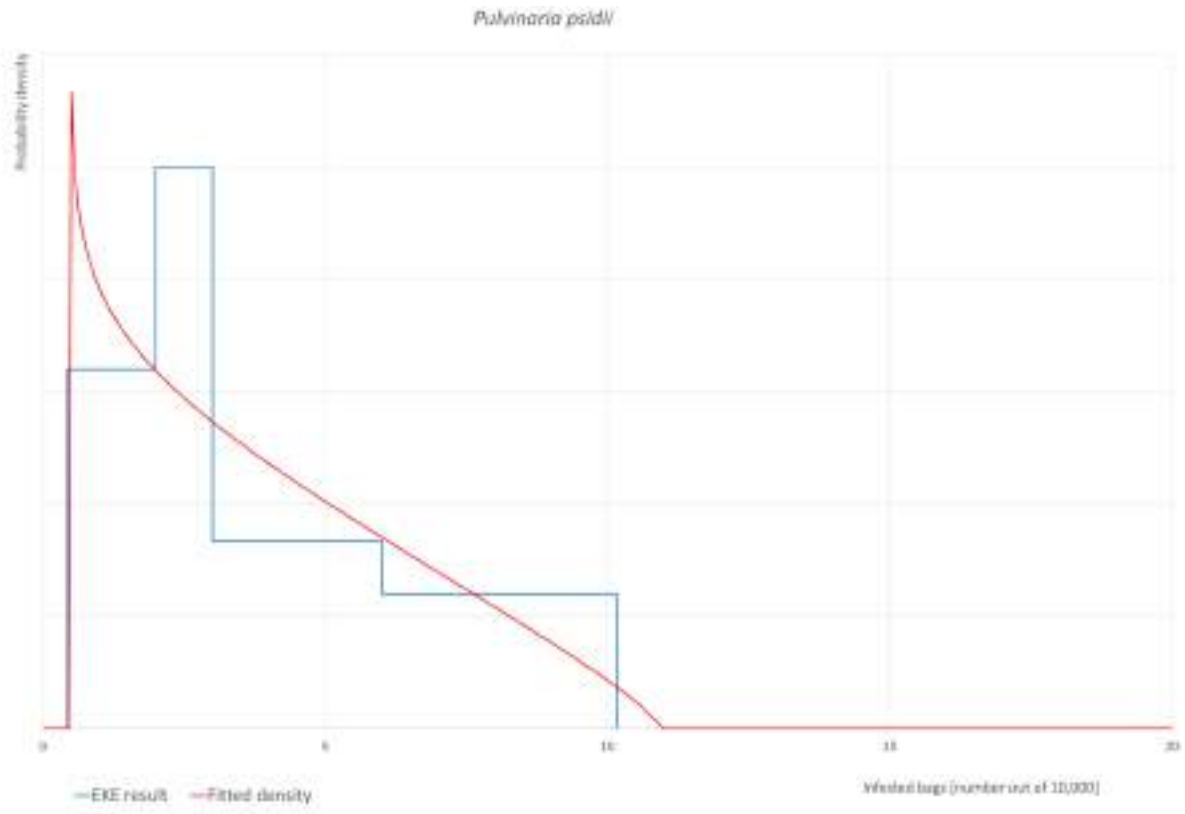
The EKE results are the *BetaGeneral*(*0.88579, 1.8158, 0.47, 11)* fitted with @Risk version 7.6.

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.

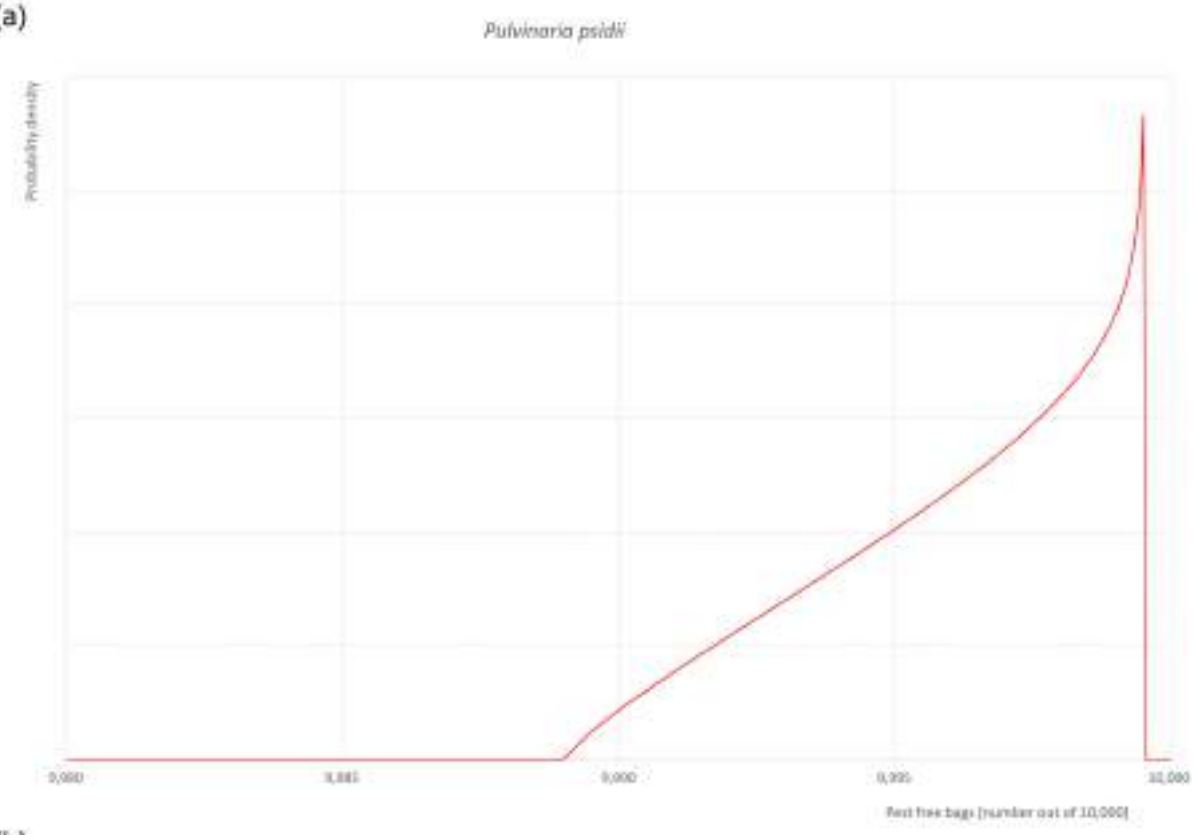
Table A.8: The uncertainty distribution of plants free of *Pulvinaria psidii* per 10,000 plants calculated by Table A.7

Percentile	1%	2.5%	5%	10%	17%	25%	33%	50%	67%	75%	83%	90%	95%	97.5%	99%
Values	9,990					9,994		9,997		9,998					9,999.5
EKE results	9,990	9,991	9,991	9,992	9,993	9,994	9,995	9,997	9,998	9,998	9,998.8	9,999.1	9,999.3	9,999.4	9,999.5

The EKE results are the fitted values.



(a)



(b)

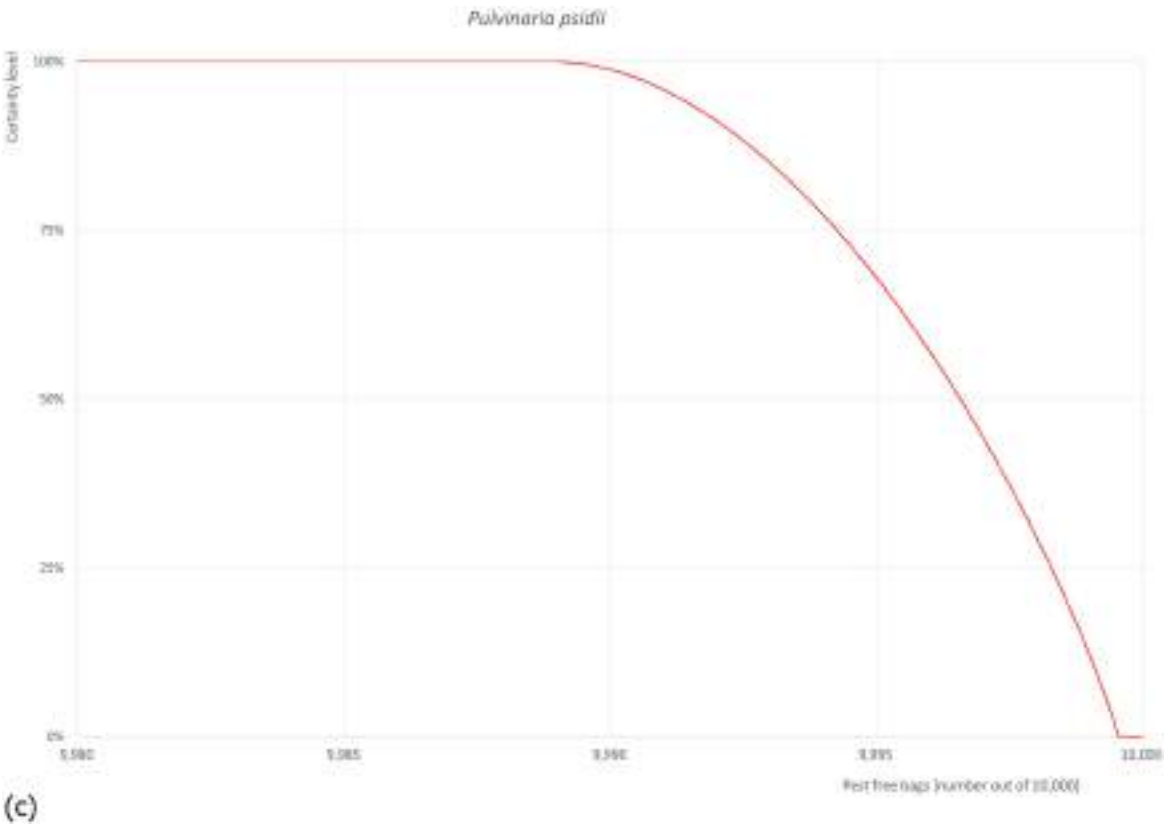


Figure A.4: (a) Elicited uncertainty of pest infestation per 10,000 bags (histogram in blue – vertical blue line indicates the elicited percentile in the following order: 1%, 25%, 50%, 75%, 99%) and distributional fit (red line); (b) uncertainty of the proportion of pest free bags per 10,000 (i.e. =1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

A.4.6. References List

Abd-rabou S, 2011. Field efficacy of parasitoid, *Coccophagus scutellaris* (Hymenoptera: Aphelinidae) and the predator, *Exochomus flavipes* (Coleoptera: Coccinellidae) against *Pulvinaria psidii* (Hymenopgtera: Coccidae) in Egypt. Journal of Biological Control, 25, 85–91. https://doi.org/10.18311/jbc/2011/3729

Bhuiya BA, 1998. Two new species of Encyrtidae (Hymenoptera: Chalcidoidea) from Bangladesh attacking *Pulvinaria psidii* Maskell (Homoptera: Coccidae) on guava, Oriental Insects, 32, 267–277. https://doi.org/10.1080/00305316.1998.10433779

CABI CPC (Centre for Agriculture and Bioscience International), online. *Pulvinaria psidii*. Available online: https://www.cabi.org/cpc/datasheet/39201 [Accessed: 12 June 2020].

EPPO (European and Mediterranean Plant Protection Organization), online. EPPO Global Database: *Pulvinaria psidii*. Available online: https://gd.eppo.int/taxon/ PULVPS [Accessed: 12 June 2020].

EUROPHYT, online. European Union Notification System for Plant Health Interceptions - EUROPHYT Available online: https://ec.europa.eu/food/plant/plant_health_biosecurity/europhyt/index_en.htm [Accessed: 21 January 2022].

European Commission, online. EUROPHYT (European Union Notification System for Plant Health Interceptions). Available online: https://ec.europa.eu/food/plant/plant_health_biosecurity/europhyt/index_en.htm [Accessed: 15 June 2020].

Fauna Europaea, online. Museum für Naturkunde Leibniz-Institut für Evolutions- und Biodiversitätsforschung, Berlin, Germany: *Pulvinaria psidii*. Available online: https://fauna-eu.org/cdm_dataportal/taxon/9dc7d6ca-c088-4209-a7dd-0fd413620145 [Accessed: 15 June 2020].

Hamon AB and William ML, 1984. The soft scale insects of Florida (Homoptera: Coccoidea: Coccidae). Arthropods of Florida and Neighboring Land Areas. Florida Department of Agriculture and Consumer services. Division of Plant Industry, Gainesville. 194 pp.

Nakahara S, 1981. List of the Hawaiian Coccoidea (Homoptera: Sternorhyncha). Proceedings of the Hawaiian Entomological Society 23, 387–424.
Stocks IC, 2013. Recent Adventive Scale Insects (Hemiptera: Coccoidea) and Whiteflies (Hemiptera: Aleyrodidae) in Florida and the Caribbean Region. In: Peña JE (ed.). Potential Invasive Pests of Agricultural Crops. CAB International, USA. pp. 342–362.
TRACES-NT, online. TRAde Control and Expert System. Available online: https://webgate.ec.europa.eu/tracesnt [Accessed: 21 January 2022].

A.5. *Scirtothrips dorsalis*

A.5.1. Organism information

Taxonomic information	Current valid scientific name: *Scirtothrips dorsalis* Synonyms: *Anaphothrips andreae*, *Anaphothrips dorsalis*, *Anaphothrips fragariae*, *Heliothrips minutissimus*, *Neophysopus fragariae*, *Scirtothrips andreae*, *Scirtothrips dorsalis padmae*, *Scirtothrips fragariae*, *Scirtothrips minutissimus*, *Scirtothrips padmae* Name used in the EU legislation: *Scirtothrips dorsalis* Hood [SCITDO] Order: Thysanoptera Family: Thripidae Common name: Assam thrips, chilli thrips, flower thrips, strawberry thrips, yellow tea thrips, castor thrips Name used in the Dossier: *Scirtothrips dorsalis*
Group	Insects
EPPO code	SCITDO
Regulated status	The pest is listed in Annex II/A of Regulation (EU) 2019/2072 as *Scirtothrips dorsalis* Hood [SCITDO].
Pest status in Uganda	Present, no details (EPPO, online_b).
Pest status in the EU	Not relevant for EU Quarantine pest
Host status on *Jasminum polyanthum*	There are no host plant records for *Jasminum polyanthum*. There is one host plant record for *Jasminum sambac* (Scott-Brown et al., 2018). *S. dorsalis* is a polyphagous insect (see below) and therefore the Panel assumes that *J. polyanthum* is a host.
PRA information	Available Pest Risk Assessments: – CSL Pest Risk Analysis for *Scirtothrips dorsalis* (MacLeod and Collins, 2006), – Pest Risk Assessment *Scirtothrips dorsalis* (Vierbergen and van der Gaag, 2009). – Scientific Opinion on the pest categorisation of *Scirtothrips dorsalis* (EFSA PLH Panel, 2014).
Other relevant information for the assessment	
Biology	The pest can have up to 8 generations annually in temperate regions and up to 18 generations in warm subtropical and tropical areas (Kumar et al., 2013). The stages of the life cycle include egg, first and second instar larva, prepupa, pupa and adult (Kumar et al., 2013). They can be found on all the aboveground plant parts (Kumar et al., 2014). Temperature threshold for development is 9.7°C and 32°C, with 265 degree-days required for development from egg to adult (Tatara, 1994). The adult can live up to 13 to 15 days (Kumar et al., 2013). Females can lay between 60 and 200 eggs in their lifetime (Seal and Klassen, 2012). Females develop from fertilised and males from unfertilised eggs (Kumar et al., 2013). The eggs are inserted into soft plant tissues and hatching nymphs appear between two to seven days (Kumar et al., 2014). Larvae and adults tend to gather near the mid-vein or near the damaged part of leaf tissue. Pupae are found in the leaf litter, on the axils of the leaves, in curled leaves or under the calyx of flowers and fruits (Kumar et al., 2013; MacLeod and Collins, 2006). The pest cannot overwinter, if the temperature remains below -4°C for five or more days the pest dies (Nietschke et al., 2008).

	Adults fly actively for short distances and are transported passively by wind currents, which enables long-distance spread (EFSA PLH Panel, 2014). *S. dorsalis* is a vector of plant viruses including peanut necrosis virus (PBNV), groundnut bud necrosis virus (GBNV), watermelon silver mottle virus (WsMoV), capsicum chlorosis virus (CaCV) and melon yellow spot virus (MYSV) (Kumar et al., 2013).	
Symptoms	**Main type of symptoms**	The pest damages young leaves, buds, tender stems and fruits by puncturing tender tissues with their stylets and extracting the contents of individual epidermal cells leading to necrosis of tissue (Kumar et al., 2013). Main symptoms are: – 'sandy paper lines' on the epidermis of the leaves, – leaf crinkling and upwards leaf curling, – leaf size reduction, – discoloration of buds, flowers and young fruits, – silvering of the leaf surface, – linear thickenings of the leaf lamina, – brown frass markings on the leaves and fruits, – fruits develop corky tissues, – grey to black markings on fruits, – fruit distortion and early senescence of leaves, – defoliation (Kumar et al., 2013; Kumar et al., 2014).
	Presence of asymptomatic plants	– eggs and early stages of infestation may be difficult to detect – there are no baits/pheromones reported
	Confusion with other pathogens/pests	Due to small size and morphological similarities within the genus, the identification of *S. dorsalis,* using traditional taxonomic keys, is difficult. The most precise identification of the pest is combination of molecular and morphological methods (Kumar et al., 2013). Sometimes, infested plants appear similar to plant damaged by broad mites (Kumar et al., 2013)
Host plant range	*S. dorsalis* is a polyphagous pest with over 225 host plant species (see section 3.4.1 of EFSA (2014)	
Evidence that the commodity can be a pathway	All life stages, besides pupae, of *S. dorsalis* (eggs, larvae, and adults) could be present on the leaves of *J. polyanthum* cuttings exported from Uganda to the EU.	
Surveillance information	The NPPO conducts surveillance of pests of quarantine significance on the plants, inside the production facility and the surroundings of the green houses.	

A.5.2. Possibility of pest presence in the nurseries

A.5.2.1. Possibility of entry from the surrounding environment

In Uganda *S. dorsalis* is reported to be present with no details (EPPO, online a). Given the wide host range of this pest it is possible that local populations of *S. dorsalis* are present in the neighbouring environment of the greenhouses with *Jasminum* plants destined for export. There is no evidence that the nurseries are located in a pest-free area for *S. dorsalis,* so the Panel assumes that *S. dorsalis* can be present in the production areas of *J. polyanthum* destined for export to the EU.

J. polyanthum plants destined for export to the EU are grown in a protected environment (i.e. greenhouse). Introduction of thrips into a greenhouse is possible through holes in the netting or roof of the greenhouse structure or by flying or passive wind transfer through an open door or as a hitchhiker on clothing of nursery staff, however hygienic procedures are in place to prevent this. The success rate of one of these events is only likely to occur in case of a high (local) density of S. dorsalis in the neighbouring environment of the greenhouse.

Uncertainties:

- There is no surveillance information on the presence and population pressure of *S. dorsalis* in the area where the greenhouse is located.
- The proximity of the greenhouses to possible sources of populations of *S. dorsalis* is unknown.
- The presence of defects in the greenhouse structure

Taking into consideration the above evidence and uncertainties, the Panel considers that it is possible that *S. dorsalis* can enter greenhouses from the surrounding area.

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

Mother plants are initiated from rooted cuttings imported from the Netherlands. S. dorsalis is not present in the Netherlands; therefore, it is unlikely that the pest is present on the imported material.

Uncertainties:

- Taking into consideration the above evidence and uncertainties, the Panel considers it is not possible that the pest could enter the nursery with new plants.

A.5.2.3. Possibility of spread within the nursery

Around 60 plants genera are produced by the exporting company. Therefore, it is possible that Scirtothrips population is present in one of the greenhouses of the company. The production unit of Jasminum, however, is physically separated from the other units. When present, flying adults can spread from infested host plants within the nursery. The pest may also hitchhike on nursery workers, however hygienic procedures in place to prevent this.

Uncertainties: the likelihood that nursey staff will visit different production units on the same day.

Taking into consideration the above evidence and uncertainties, the Panel considers that the transfer of the pest within the nursery is possible.

A.5.3. Information from interceptions

There are no interceptions of *S. dorsalis* on plants from Uganda. (EUROPHYT and TRACES, online).

A.5.4. Evaluation of the risk reduction options

In the table below, all the risk mitigation measures currently applied in Uganda are summarised and an indication of their effectiveness on *S. dorsalis* is provided. The description of the risk mitigation measures currently applied in Uganda is provided in Table 7.

	Risk mitigating measure	**Effect Y/N**	**Evaluation and uncertainties**
1	Growing plants in isolation	Yes	Description The mother plants used for cutting production are grown in dedicated greenhouses. Only Jasminum plants are present in this greenhouse. The greenhouses are enclosed with plastic on the roofs and walls. Ventilation areas (in the roof structure and in the greenhouses walls) are all screened. The screen and plastic are checked twice per week for holes or cuts. All greenhouses have double doors with an air stream flowing out of the greenhouse (electrical fans) when a door is opened. Evaluation Plants are protected from *S. dorsalis* flying adults that may enter from the surrounding environment. Uncertainties: – Presence of defects in the greenhouse structure
2	Soil treatment	No	Description Plants are grown in bags with growing media (RHP-certified) and granules ('kabala stones'). The growing medium is steamed during 1.5 hrs at 80 °c at least, before rooted cuttings are sticked into the bags. Evaluation Not relevant

	Risk mitigating measure	Effect Y/N	Evaluation and uncertainties
3	General hygiene procedures for nursery staff and visitors	Yes	Description When a person is entering the production unit, after the first door there is a disinfection area, with a disinfection pond/bath. After that, the person opens the second door, which can only be opened after the first door is closed. After the second door, the person is in the area where disinfected aprons, gloves and other tools are kept. From here, the person prepares and dresses up, after which the third door leads to the actual greenhouse and the beds. Evaluation If applied correctly the hygienic measures should prevent the entry of hitchhiking *S. dorsalis*. Uncertainties The level of coverage by the protecting clothing.
4	Insecticide treatment	Yes	Description There are insecticide and fungicide treatments applied on Jasminum plants on a weekly basis based on scouting data. An overview of the applied pesticides is given in Table 7. Evaluation The insectides used (Tracer, a.i. Spinosad, Match, a.i lufenuron, Mainstring, a.i. cyantraniliprole) are expected to have a good efficacy against *S. dorsalis*. The other insecticides used may also have an effect on *S. dorsalis*. Uncertainties The presence of insecticide resistant populations of *S. dorsalis* in Uganda. The frequency of the applications given the life cycle of the pest
5	Pest monitoring and inspections by the nursery staff during the production process	Yes	Description Competent scouts employed at the farm collect pest and disease data by visual inspection and monitoring traps (yellow sticky traps). Scouting data are reported on a weekly basis to the NPPO. Treatment decisions are based on the scouting data. Evaluation *S. dorsalis* is expected to be detected if present in the greenhouse Uncertainties – Identification of *S. dorsalis* requires detailed examination of morphological characters and it could be confused with other similar species
6	Packing and handling procedures	Yes	Description The unrooted cuttings are harvested with a harvesting knife, after which 50 cuttings are placed into a plastic bag. The plastic bags are placed inside a carton box. All these steps are done inside the greenhouse. The boxes are stored in a cold room at 7°c. A sample of the harvested bags is taken into the quality and control area, where the cuttings are visually inspected for pest and diseases, and product specifications (size, weight, colour, etc.). Evaluation Cuttings with symptoms of infestation are likely to be detected and expected not to be packed for export. Infestation after packing (in plastic bags) is highly unlikely. Uncertainties – Eggs and first instar larvae will be difficult to detect.
7	Official Supervision by NPPO	Yes	Description The NPPO does regular inspections in the greenhouse and the surrounding environment.

	Risk mitigating measure	Effect Y/N	Evaluation and uncertainties
			Evaluation Official inspections are likely to detect infested cuttings and not allow export of the commodity. Uncertainties There is no detailed information on inspection frequency and design prevalence.
8	Export inspections of consignments	Yes	Description Before export a sample is taken from the export consignment and inspected by the NPPO Evaluation *S. dorsalis* is expected to be detected if present in the sample Uncertainties – There is no detailed information on inspection frequency and design prevalence – Eggs and first instar larvae will be difficult to detect.
9	Surveillance of production area	Yes	Description The NPPO includes the surrounding area of the production facility in its surveillance Evaluation Population sources of *S. dorsalis* could be detected if an appropriate survey design is implemented. Uncertainties There is no detailed information on inspection frequency and design prevalence – Eggs and first instar larvae will be difficult to detect.

A.5.5. Overall likelihood of the pest freedom

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

- *S. dorsalis* has been reported on *J. sambac*, but not on *J. polyanthum*
- *Jasminum* is not a preferred host
- *S. dorsalis* is not able to enter the greenhouse (no holes in screen), defects in the greenhouse structure are detected and repaired.
- There are targeted inspections and treatments for *S. dorsalis,*
- The pest population pressure in the surrounding environment is very low (suitable hosts are not widely distributed in the production area).
- Cuttings with symptoms are sorted out in the packing process
- *S. dorsalis* has never been intercepted on produce from Uganda
- *S. dorsalis* is not a good flyer and dispersal is mainly dependent on wind or human assisted movement
- Hygienic procedures are effective in preventing entering and spread of the pest

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

- *S. dorsalis* is present in Uganda and has a wide host range; therefore, it is likely that host plants are present in the surrounding environment, in close proximity to the greenhouse).
- Due to its polyphagous nature *S. dorsalis* is expected to use *Jasminum polyanthum* as a host
- Presence of undetected defects in the greenhouse structure
- Pest could go undetected during inspections of the nursery (eggs, first instars) and packing of the cuttings
- Insecticide resistant populations could be present

- Giving the high number of plant genera produced by the company it is possible that Scirtothrips is present in one of the production units

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

- The protective effect of the greenhouse structure and the hygienic measures
- There are no interceptions of Scirtothrips on plant produce from Uganda to the EU, indicating that population pressure is low
- *Scirtothrips dorsalis* is an EU regulated pest, therefore the exporting company is taking precautionary measures and paying particular attention to the detection

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

- The main uncertainty is the population pressure of *S. dorsalis* in the surrounding environment.

A.5.5.5. Elicitation outcomes of the assessment of the pest freedom for *Scirtothrips dorsalis*

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 *Scirtothrips dorsalis* per 10,000 bags

Percentile	1%	2.5%	5%	10%	17%	25%	33%	50%	67%	75%	83%	90%	95%	97.5%	99%
Elicited values	1					6		10		20					40
EKE	1.01	1.26	1.68	2.55	3.77	5.37	7.09	11.1	16.1	19.2	23.2	27.5	32.3	36.1	40.0

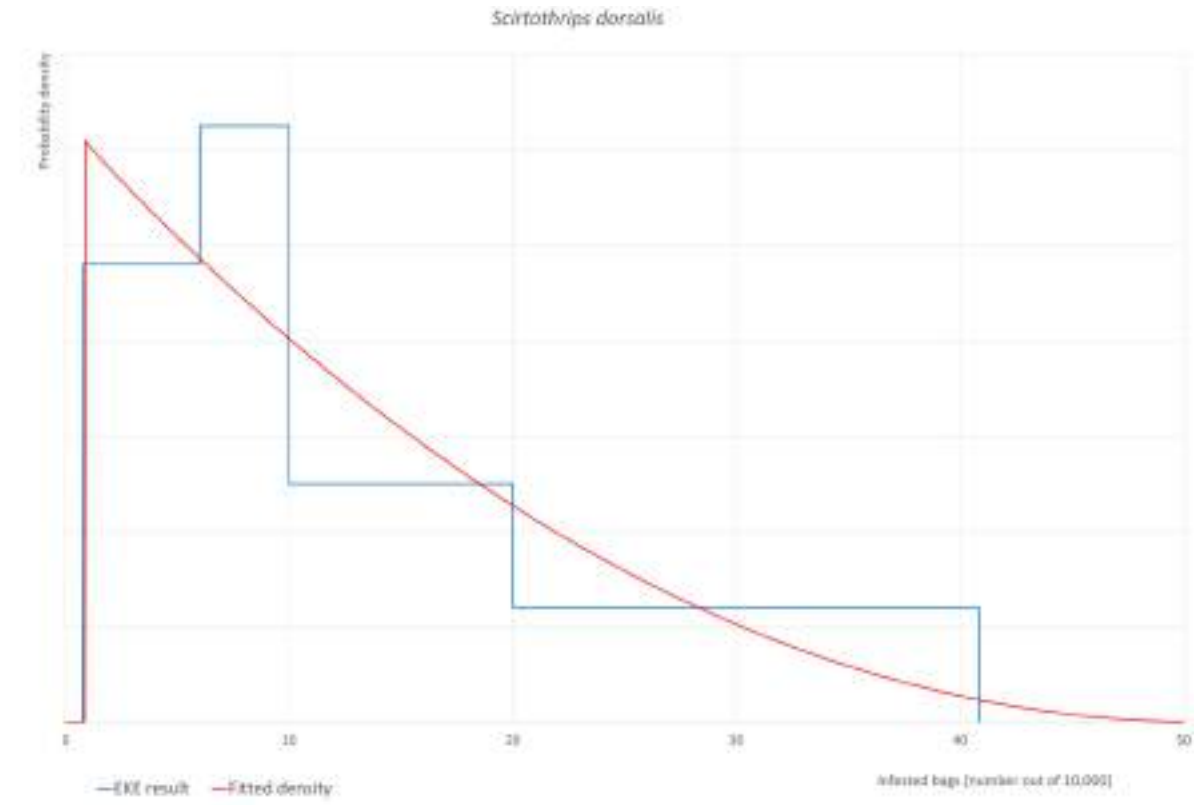
The EKE results are the Lognormal distribution (*0.99836, 3.0389, 0.85, 51*) fitted with @Risk version 7.6.

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

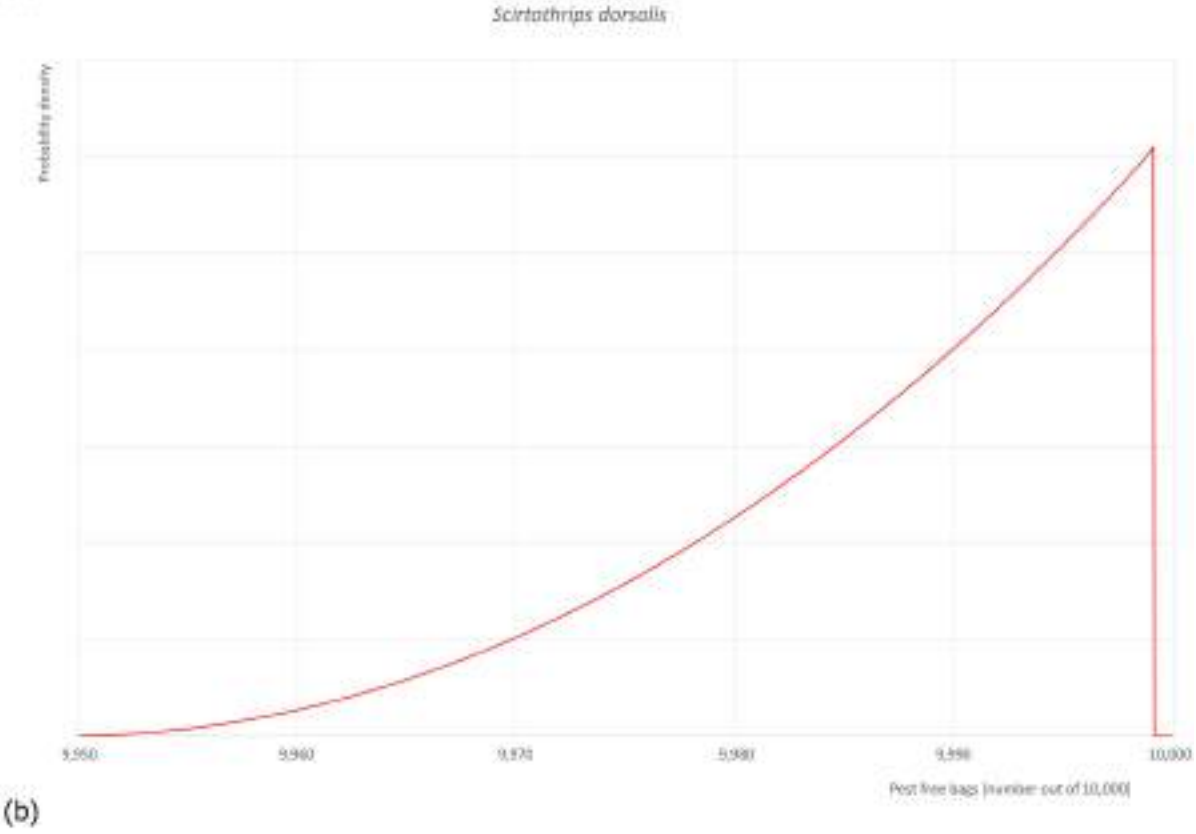
Table A.10: The uncertainty distribution of plants free of *Scirtothrips dorsalis* per 10,000 bags calculated by Table A.9

Percentile	1%	2.5%	5%	10%	17%	25%	33%	50%	67%	75%	83%	90%	95%	97.5%	99%
Values	9,960					9,980		9,990		9,994					9,999
EKE results	9,960	9,964	9,968	9,973	9,977	9,981	9,984	9,989	9,993	9,995	9,996	9,997	9,998	9,999	9,999

The EKE results are the fitted values.



(a)



(b)

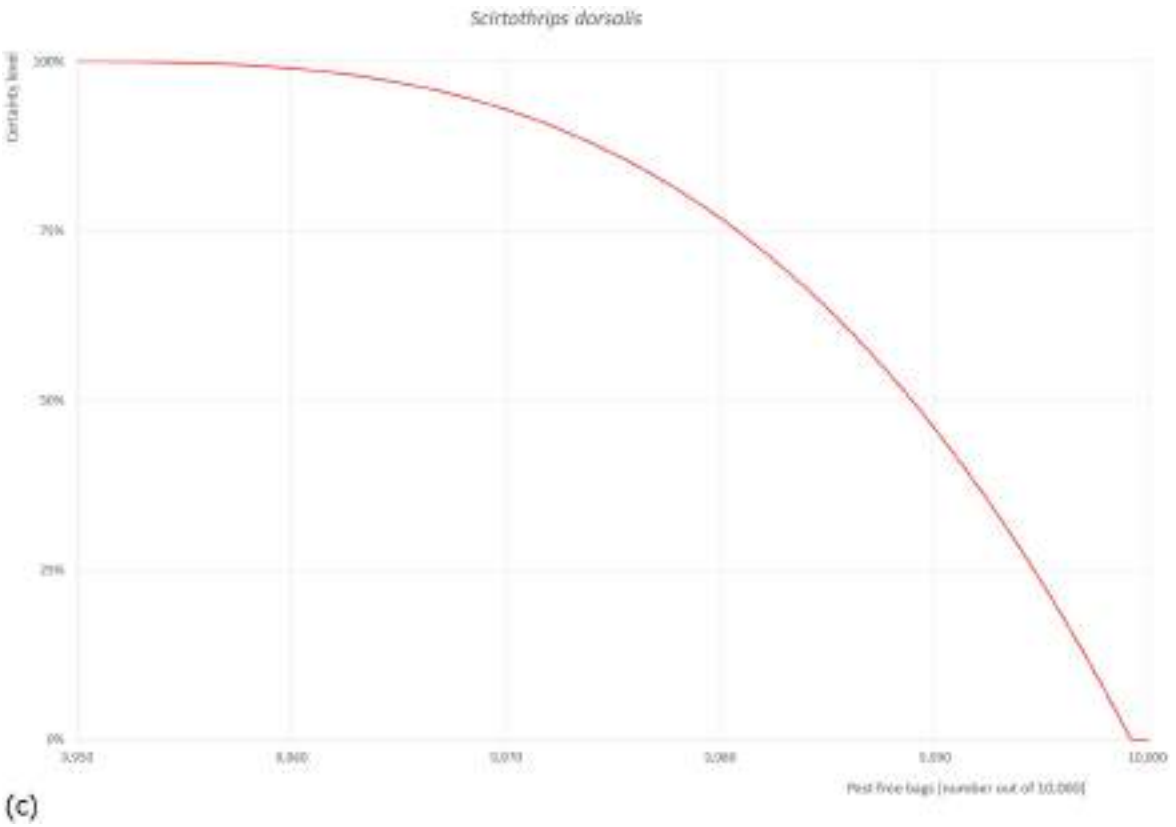


Figure A.5: (a) Elicited uncertainty of pest infestation per 10,000 bags (histogram in blue – vertical blue line indicates the elicited percentile in the following order: 1%, 25%, 50%, 75%, 99%) and distributional fit (red line); (b) uncertainty of the proportion of pest free bags per 10,000 (i.e. =1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

A.5.6. References List

CABI (Centre for Agriculture and Bioscience International), online. *Scirtothrips dorsalis*. Available online: https://www.cabi.org/cpc/datasheet/49065 [Accessed: 5 October 2021].

EFSA PLH Panel (EFSA Panel on Plant Health), 2014. Scientific Opinion on the pest categorisation of *Scirtothrips dorsalis*. EFSA Journal 2014;12(12):3915, 29 pp.https://doi.org/10.2903/j.efsa.2014.3915

EPPO (European and Mediterranean Plant Protection Organization), online_a. EPPO A2 List of pests recommended for regulation as quarantine pests, version 2019-09. Available online: https://www.eppo.int/ACTIVITIES/plant_quarantine/A2_list [Accessed: 5 October 2021].

EPPO (European and Mediterranean Plant Protection Organization), online_b. EPPO Global Database: *Scirtothrips dorsalis*. Available online: https://gd.eppo.int/taxon/SCITDO [Accessed: 10 April 2020].

EUROPHYT, online. European Union Notification System for Plant Health Interceptions - EUROPHYT Available online: http://ec.europa.eu/food/plant/plant_health_biosecurity/europhyt/index_en.htm [Accessed: 21 January 2022].

Kumar V, Kakkar G, McKenzie CL, Seal DR and Osborne LS, 2013. An overview of chilli thrips, *Scirtothrips dorsalis* (Thysanoptera: Thripidae) biology, distribution and management. Weed and pest control-Conventional and new challenges, 53–77. https://doi.org/10.5772/55045

Kumar V, Seal DR and Kakkar G, 2014. Chilli thrips *Scirtothrips dorsalis* Hood (Insecta: Thysanoptera: Thripidae). University of Florida IFAS Extension publication EENY463. Gainesville, Florida: University of Florida. https://doi.org/10.5772/55045

MacLeod A and Collins D, 2006. CSL pest risk analysis for *Scirtothrips dorsalis*. CSL (Central Science Laboratory), 8 pp.

Nietschke BS, Borchert DM, Magarey RD and Ciomperlik MA, 2008. Climatological potential for *Scirtothrips dorsalis* (Thysanoptera: Thripidae) establishment in the United States. Florida Entomologist, 91, 79–86. https://doi.org/10.1653/0015-4040(2008)091[0079:cpfsdt]2.0.co;2

Scott-Brown AS, Hodgetts J, Hall J, Simmonds MJS, Collins DW, 2018. Potential role of botanic garden collections in predicting hosts at risk globally from invasive pests: a case study using Scirtothrips dorsalis. Journal of Pest Science 91, 601–611. https://doi.org/10.1007/s10340-017-0916-2

Seal DR and Klassen W, 2012. Chilli thrips (castor thrips, Assam thrips, yellow tea thrips, strawberry thrips), *Scirtothrips dorsalis* Hood, provisional management guidelines. University of Florida, Gainesville, FL, 3 pp.

Tatara A, 1994. Effect of temperature and host plant on the development, fertility and longevity of *Scirtothrips dorsalis* Hood (Thysanoptera: Thripidae). Applied Entomology and Zoology, 29, 31–37. https://doi.org/10.1303/aez.29.31

TRACES-NT, online. TRAde Control and Expert System. Available online: https://webgate.ec.europa.eu/tracesnt [Accessed: 21 January 2022].

Vierbergen B and van der Gaag DJ, 2009. Pest Risk Assessment Scirtothrips dorsalis. Plant Protection Service, the Netherlands. pp. 9. Available online: https://pra.eppo.int/getfile/ddcf51cf-df6d-40f9-9d28-46f447652ed7

A.6. *Selenaspidus articulatus*

A.6.1. Organism information

Taxonomic information	Current valid scientific name: *Selenaspidus articulatus* (Morgan) Synonyms: *Aspidiotus (Selanaspidus) articulatus* Morgan, Cockerell, 1897; *Aspidiotus (Selenaspidus) articulatus v. simplex* de Charmoy, 1899; *Aspidiotus articulatus* Morgan, 1889; *Aspidiotus rufescens* Lindinger, 1932; Aspidiotus simplex Ferris, 1941; *Pseudaonidia articulatus* (Morgan) Marlatt, 1908; *Selenaspis articulatus* (Morgan) Ferris, 1903 Name used in the EU legislation: N/A Order: Hemiptera Family: Diaspididae Common name: West Indian red scale; rufous scale; Name used in the Dossier: *Selenaspidus articulatus*
Group	Insects
EPPO code	SELSAR
Regulated status	*Selenaspidus articulatus* is not regulated in EU.
Pest status in Uganda	Present, no details (CABI).
Pest status in the EU	Absent, According to CABI is present in Croatia, however the record was based on a detection of *S. articulatus* in imported fresh fruits of *Citrus aurantiifolia* from Chile in supermarkets (Milek et al., 2009).
Host status on *Jasminum polyanthum*	There are no records that *Jasminum polyanthum* is a host of *S. articulatus* *Jasminum* sp. have been reported as hosts for *S. articulatus* (García Morales et al., 2016) *S. articulatus* is a polyphagous insect (see below) and therefore the Panel assumes that *J. polyanthum* is a host.
PRA information	No pest risk assessment is currently available.
Other relevant information for the assessment	
Biology	Adult female is about 0.85 mm long, strongly sclerotised. Scale cover of adult female is circular and flat and that of male is elongate oval, smaller than that of female (Davidson and Miller, 1990) *S. articulatus* is ovoviviparous and emergence from the eggs takes place immediately after the eggs are laid. The life cycle from egg to adult takes 30 days for the male and 45 days for the female (Beingolea, 1969). Each female produces 71–124 eggs on *citrus*. High temperature and humidity favour population development (Perruso and Cassino 1993, Watanabe et al. 2000). The optimal developmental temperature is 28 ^{0}C and the upper threshold temperatures for male and female are 30.3 and 30.2 ^{0}C, respectively (Moraes et al 2000). According to Loayza et al (2003), the developmental time of *S. articulatus* reared on various *Citrus sinensis* varieties at 25 $\pm$ 2 ^{0}C and 60 $\pm$ 10% RH varied from 25.4 to 42.1 days for female and from 24.4 to 39.9 days for male depending on orange variety. Crawlers are the primary dispersal stage, moving to new areas of the plant or are dispersed by wind or animals.

Symptoms	**Main type of symptoms**	*S. articulatus* is found on both sides of leaves, with a preference for upper leaf surfaces. Occasionally it is found on fruits, growing points and stems, but very rarely on bark. The damage is caused by sap-depletion, and through injection of toxic saliva, which causes chlorosis and death of plant tissue in the area of stylet penetration (Davidson and Miller, 1990)
	Presence of asymptomatic plants	No asymptomatic period is known to occur in the infested plants. Plant damage might not be obvious in early infestation.
	Confusion with other pathogens/pests	In the field, *S. articulatus* can easily be confused with other *diaspidid* species. For a corrected identification slide-mounted adult female must be examined under a compound light microscope and use of taxonomic keys.
Host plant range	*S. articulatus* has a very wide range of host plants: it has been recorded from hosts belonging to 105 genera in 53 plant families (García Morales et al., 2016). It is an important pest of citrus in several regions of the world (Davidson and Miller 1990).	
Reported evidence of impact	According to Morales et al. 2016, it is mainly a pest of citrus in several regions. It has been also recorded a pest of other crops such as coffee, cocoa, avocado, mango, banana and palms. In California, it was rated as a high impact pest (CDFA 2022 online).	
Evidence that the commodity can be a pathway	Eggs, nymphs and adults of *S. articulatus* can be present on the leaves and stems of *J. polyanthum* cuttings.	
Surveillance information	There is no information available to assess whether the pest has ever been found in the nurseries or surrounding environment of the nurseries.	

A.6.2. Possibility of pest presence in the nursery

A.6.2.1. Possibility of entry from the surrounding environment

S. articulatus is polyphagous species that is reported to be present in Uganda. Given the wide host range of this pest, it is possible that local populations of *S. articulatus* are present on host plants in the neighbouring environment.

Introduction of scale insects into a greenhouse is possible through holes in the netting or roof of the greenhouse structure, by passive wind transfer or through an open door as a hitchhiker on clothing of nursery staff.

Uncertainties:

There is no surveillance information on the presence and population pressure of *S. articulatus* in the neighbouring environment of the nursery.

The presence of defects in the greenhouse structure

Taking into consideration the above evidence and uncertainties, the Panel considers that it is possible for the pest to enter the nursery from the surrounding environment.

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

Mother plants are initiated from rooted cuttings imported from the Netherlands. *S. articulatus* is not present in the Netherlands. It is unlikely that *S. articulatus* is present on the imported material.

Uncertainties:

Taking into consideration the above evidence and uncertainties, the Panel considers it is not possible that the pest could enter the nursery with new plants.

A.6.2.3. Possibility of spread within the nursery

Within the greenhouse, crawlers can spread by walking or hitchhiking on clothing of nursery staff.

Uncertainties: There are no uncertainties.

Taking into consideration the above evidence and uncertainties, the Panel considers that the transfer of the pest within the nursery is possible.

A.6.3. Information from interceptions

There were no interceptions of *S. articulatus* on different commodities imported into the EU from Uganda. (EUROPHYT and TRACES, online).

In the Europhyt database, there are three records of interception of *S. articulatus* on *Citrus sinensis* fruits imported to EU from Peru.

A.6.4. Evaluation of the risk mitigation options

In the table below, all risk mitigation measures currently applied in Uganda are listed and described and an indication of their effectiveness on *S. articulatus* is provided:

	Risk mitigating measure	**Effect Y/N**	**Evaluation and uncertainties**
1	Growing plants in isolation	Yes	Description The mother plants used for cutting production are grown in dedicated greenhouses. Only Jasminum plants are present in this greenhouse. The greenhouses are enclosed with plastic on the roofs and walls. Ventilation areas (in the roof structure and in the greenhouses walls) are all screened. The screen and plastic are checked twice per week for holes or cuts. All greenhouses have double doors with an air stream flowing out of the greenhouse (electrical fans) when a door is opened. Evaluation Plants are protected from *S. articulatus* nymphs that may enter from the surrounding environment. Uncertainties: – Presence of defects in the greenhouse structure
2	Soil treatment	No	Description Plants are grown in bags with growing media (RHP-certified) and granules ('kabala stones'). The growing medium is steamed during 1.5 hrs at 80°c at least, before rooted cuttings are sticked into the bags. Evaluation Not relevant
3	General hygiene procedures for nursery staff and visitors	Yes	Description When a person is entering the production unit, after the first door there is a disinfection area, with a disinfection pond/bath. After that, the person opens the second door, which can only be opened after the first door is closed. After the second door, the person is in the area where disinfected aprons, gloves and other tools are kept. From here, the person prepares and dresses up, after which the third door leads to the actual greenhouse and the beds. Evaluation If applied correctly the hygienic measures should prevent the entry of hitchhiking *S. articulatus*. Uncertainties The level of coverage by the protecting clothing
4	Insecticide treatment	Yes	Description There are insecticide and fungicide treatments applied on Jasminum plants on a weekly basis based on scouting data. An overview of the applied pesticides is given in Table 7. Evaluation The insecticides Movento (a.i. spirotetramat) is expected to have a good efficacy against *S. articulatus*. The other insecticides used may also have an effect on *S. articulatus*. Uncertainties The frequency of the applications given the life cycle of the pest

	Risk mitigating measure	Effect Y/N	Evaluation and uncertainties
5	Pest monitoring and inspections by the nursery staff during the production process	Yes	Description Competent scouts employed at the farm collect pest and disease data by visual inspection and monitoring traps (yellow sticky traps). Scouting data are reported on a weekly basis to the NPPO. Treatment decisions are based on the scouting data. Evaluation *S. articulatus* is expected to be detected if present in the greenhouse Early infestations are difficult to detect.
6	Packing and handling procedures	Yes	Description The unrooted cuttings are harvested with a harvesting knife, after which 50 cuttings are placed into a plastic bag. The plastic bags are placed inside a carton box. All these steps are done inside the greenhouse. The boxes are stored in a cold room at 7°c. A sample of the harvested bags is taken into the quality and control area, where the cuttings are visually inspected for pest and diseases, and product specifications (size, weight, colour, etc.). Evaluation Cuttings with symptoms of infestation likely to be detected and are expected not to be packed for export. Infestation after packing (in plastic bags) is highly unlikely.
7	Official Supervision by NPPO	Yes	Description The NPPO regular inspections in the greenhouse ensures compliance to the import requirements as specified in Annex IV of 2000/29/EU, Evaluation *S. articulatus* is expected to be detected if present in the greenhouse Uncertainties There is no detailed information on inspection frequency and design prevalence methods.
8	Export inspections of consignments	Yes	Description Before export a sample is taken from the export consignment and inspected by the NPPO Evaluation *S. articulatus* is expected to be detected if present in the sample Uncertainties There is no detailed information on inspection frequency and design prevalence methods
9	Surveillance of production area	Yes	Description The NPPO includes the surrounding area of the production facility in its surveillance Evaluation Population sources of *S. articulatus* could be detected if an appropriate survey design is implemented. Uncertainties There is no detailed information on inspection frequency and design prevalence methods

A.6.5. Overall likelihood of pest freedom for *Selenaspidus articulatus* on Jasminum polyanthum species

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

- *S. articulatus* has been reported on *Jasminum* sp., but not on *J. polyanthum*
- *Jasminum* is not a preferred host
- *S. articulatus* has never been intercepted on produce from Uganda
- Dispersal capacity of *S. articulatus* is limited to the first instar stage (crawler)
- Low population pressure of *S. articulatus* in the surrounding environment, because of active natural enemies or absence of preferred host plants.
- Transfer of *S. articulatus* from sources in the surrounding environment to the greenhouse plants is very difficult because dispersal is mainly dependent on human-assisted movement of the first instar stage (crawler)
- Greenhouse structure is insect-proof and entrance is unlikely
- The scouting monitoring regime is effective (detection of scale insects)
- Application of the insectides Mainspring (a.i. Cyantraniliprole) and Movento (a.i. spirotetramat) are expected to have a good efficacy against the scale insect *S. articulatus*.
- At harvest and packing cuttings with symptoms will be detected

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

- *S. articulatus* is present throughout Uganda and the insect species has a wide host range, therefore it is likely that host plants are present in the surrounding environment
- Greenhouses are located in areas where *S. articulatus* is present and abundant (e.g. citrus plantation) and natural enemies activity is low
- Presence of scales species in the environment is not monitored
- It cannot be excluded that there are defects in the greenhouse structure or scale insects hitchhike on greenhouse staff
- Insecticide treatments are not targeting scale insects
- Even if there is no evidence that *J. polyanthum* is a host plant for *S. articulatus*, given the polyphagous nature of this scale insects it is likely that *J. polyanthum* is a suitable host plant.

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

- Limited dispersal capacity of *S. articulatus*.
- Green house protection adequate against *S. articulatus*.
- Cuttings with symptoms of *S. articulatus* are likely t

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

- The main uncertainty is the population pressure in the surrounding environment.

A.6.5.5. Elicitation outcomes of the assessment of the pest freedom for *Selenaspidus articulatus*

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 *S. articulatus* per 10,000 bags

Percentile	1%	2.5%	5%	10%	17%	25%	33%	50%	67%	75%	83%	90%	95%	97.5%	99%
Elicited values	0.5					2		3		6					10
EKE	0.501	0.559	0.665	0.900	1.25	1.72	2.24	3.43	4.88	5.74	6.76	7.79	8.80	9.49	10.1

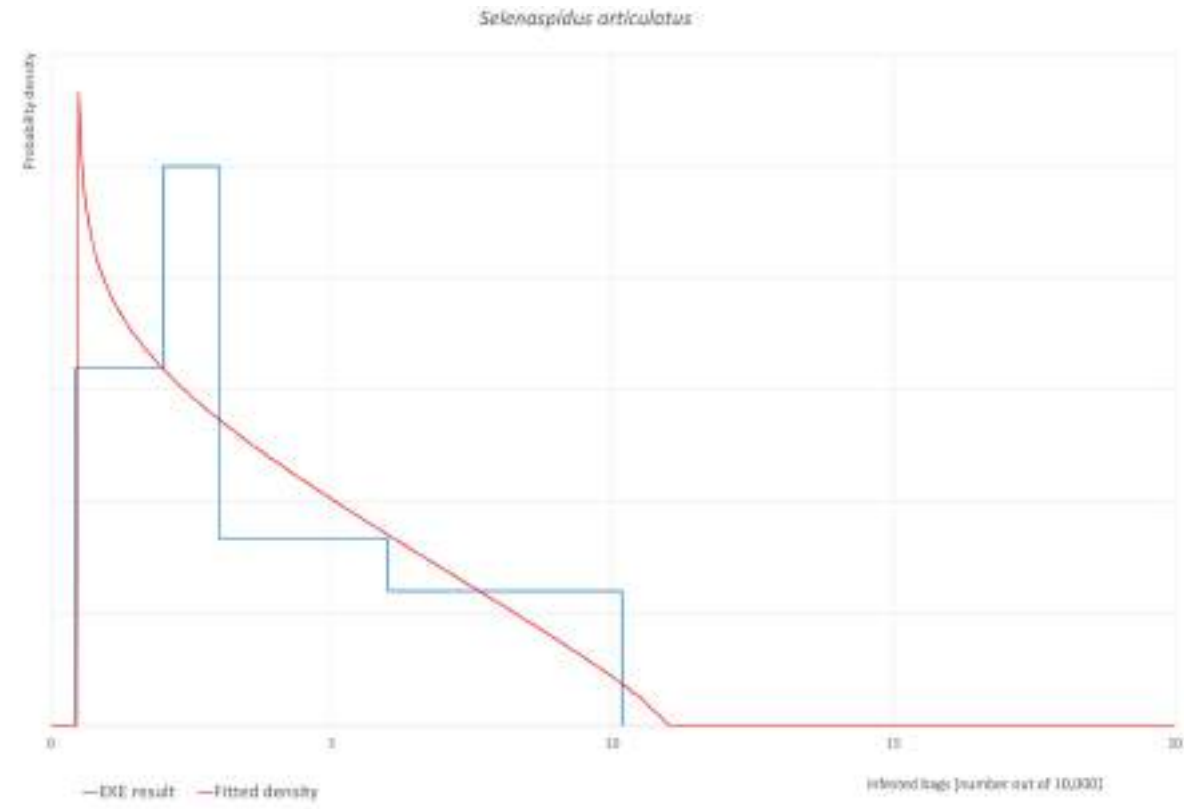
The EKE results are the Lognormal distribution (*0.99836, 3.0389, 0.85, 51*) fitted with @Risk version 7.6.

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

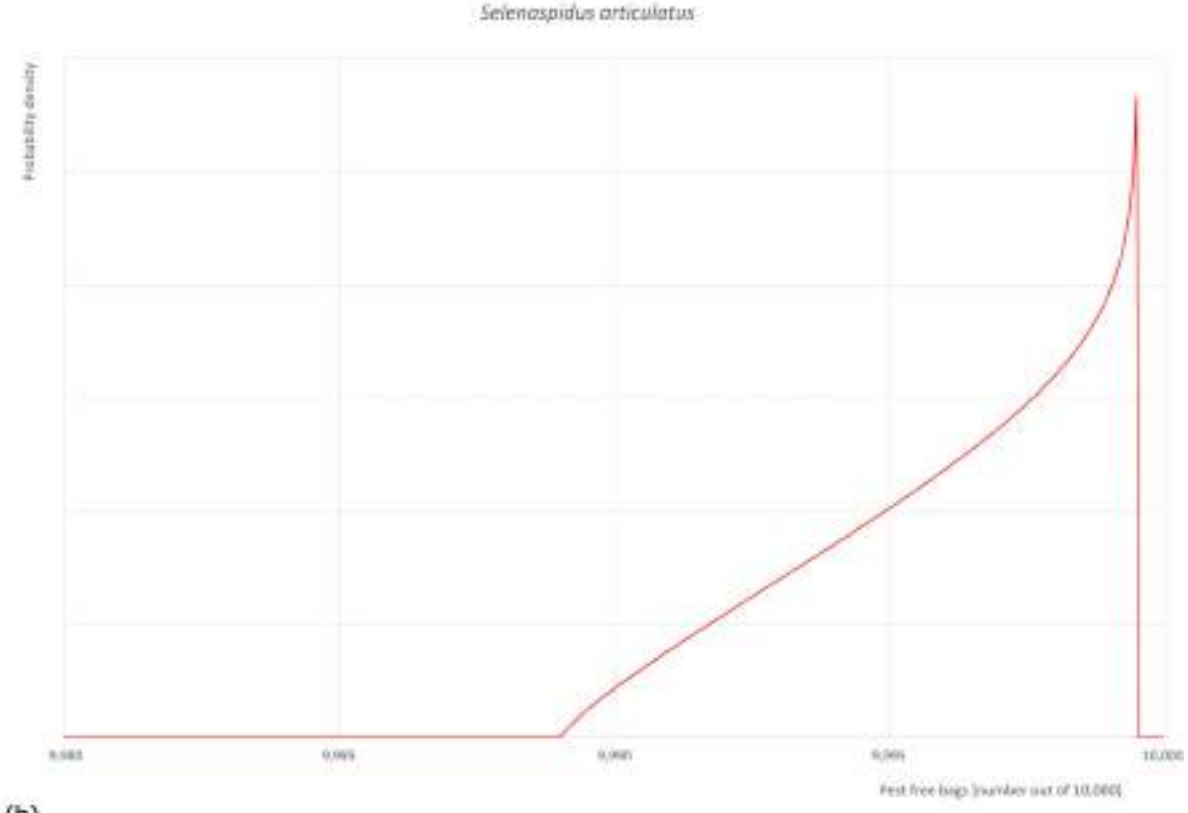
Table A.12: The uncertainty distribution of plants free of *S. articulatus* per 10,000 bags calculated by Table A.11.

Percentile	1%	2.5%	5%	10%	17%	25%	33%	50%	67%	75%	83%	90%	95%	97.5%	99%
Values	9,990					9,994		9,997		9,998					9,999.5
EKE results	9,990	9,991	9,991	9,992	9,993	9,994	9,995	9,997	9,998	9,998	9,998.8	9,999.1	9,999.3	9,999.4	9,999.5

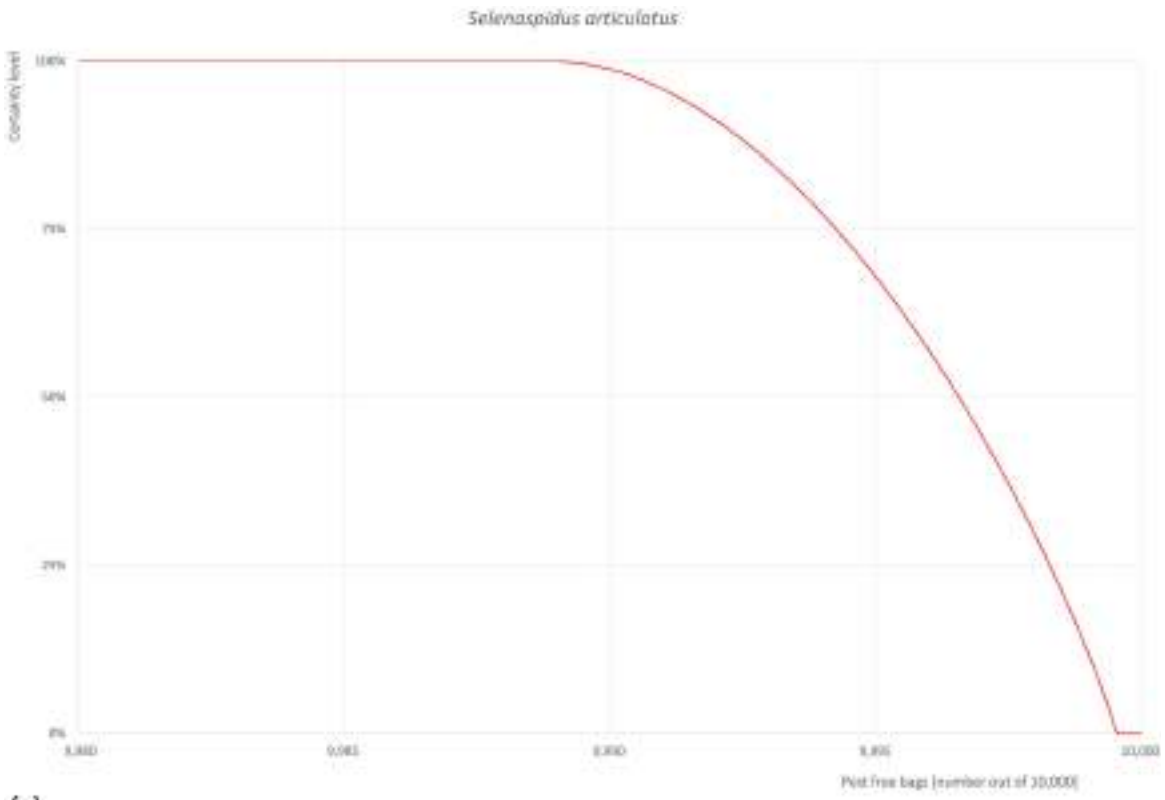
The EKE results are the fitted values.



(a)



(b)



(c)

Figure A.6: (a) Elicited uncertainty of pest infestation per 10,000 bags for *S. articulatus* (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 bags per 10,000 (i.e. = 1 – pest infestation proportion expressed as percentage); (c) descending uncertainty distribution function of pest infestation per 10,000 bags

A.6.6. References List

CABI (Centre for Agriculture and Bioscience International), online. Datasheet *Selenaspidus articulates* (West Indian red scale). Available online: https://www.cabi.org/isc/datasheet/49511 [Accessed: 16 December 2021].

Beingolea G, 1969. Notas sobre la biología de *Selenaspidus articulatus* Morgan, queresa redonda de los cítricos. Review of Peruvian Entomology, 19, 119–129.

Davidson JA, and Miller DR, 1990. Ornamental plants. In: Rosen D (ed.), armoured scale insects, their biology, natural enemies and control. Vol. 4B. Elsevier, Amsterdam, the Netherlands: 603–632.

EUROPHYT, online. European Union Notification System for Plant Health Interceptions - EUROPHYT Available online: http://ec.europa.eu/food/plant/plant_health_biosecurity/europhyt/index_en.htm [Accessed: 10 December 2021].

García Morales G, Denno BD, Miller DR, Miller GL, Ben-Dov Y, Hardy NB, 2016. ScaleNet: A literature-based model of scale insect biology and systematics. Database. https://doi.org/10.1093/database/bav118. Available online: http://scalenet.info. [Accessed 10 December 2021].

Loayza MR, Para JRP and Vendramim JD, 2003. Biologia Comparada de *Selenaspidus articulatus* (Morgan) (Hemiptera: Diaspididae) em Cultivares de *Citrus sinensis* e em *Citrullus silvestris*. Neotropical Entomology, 32, 493–496.

Milek T, Masten T, Šimala M, Tatjana and Koric B, 2009. The scale insects (Hemiptera: Coccoidea) of imported fruits in Croatia. *Zbornik predavanj in referatov 9. Slovenskega Posvetovanja o Varstvu Rastlin, Nova Gorica, Slovenije, 4-5 marec 2009*, 385–388.

Moraes RCB, Moraes RCB, Haddad M de L, Loayza RM and Parra JRP, 2000. Determination of the optimal and upper threshold of temperature for the development of *Selenaspidus articulatus* in citrus. Documentos. Centro Nacional de Pesquisa de Soja, 143, 698.

Perruso JC and Cassino PCR, 1993. Population fluctuations of *Selenaspidus articulatus* Morg. (Hemiptera: Diaspididae) on *Citrus sinensis* L. in Rio de Janeiro state. Anais da Sociedade Entomologica do Brasil, 22, 401–404.

TRACES-NT, online. TRAde Control and Expert System. Available online: https://webgate.ec.europa.eu/tracesnt [Accessed: 10 December 2021].

Watanabe MA, Tambasco FJ, Nardo EAB, Viana R I and Pereira GD, 2000. Competição entre as cochonilhas *Selenaspidus articulatus* e *Parlatoria ziziphi* em pomares da região citrícola paulista. Laranja, 21, 81–97.

Appendix B – Web of Science All Databases Search String

In the table below, the search string used in Web of Science is reported. Totally, 460 papers were retrieved. Titles and abstracts were screened, and 41 pests were added to the list of pests (see Appendix D).

Web of Science All databases	**TOPIC:** "Jasminum" OR "Jasminum polyanthum" OR "J.polyanthum" OR "Jasminum sp." OR "Jasminum spp." **AND** **TOPIC:** "pathogen" OR "pathogenic bacteria" OR "fung*" OR oomycet* OR myce* OR bacteri* OR virus* OR viroid* OR insect$ OR mite$ OR phytoplasm* OR arthropod* OR nematod* OR disease$ OR infecti* OR damag* OR symptom* OR pest$ OR vector OR hostplant$ OR "host plant$" OR "host" OR "root lesion$" OR decline$ OR infestation$ OR damage$ OR symptom$ OR dieback* OR "die back*" 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 "root feeder$" OR caterpillar$ OR "foliar feeder$" OR virosis OR viroses OR blight$ OR wilt$ OR wilted OR canker OR scab$ OR "rot" OR "rots" OR "rotten" OR "damping off" OR "damping-off" OR blister$ OR "smut" OR "mould" OR "mold" OR "damping syndrome$" OR mildew OR scald$ OR "root knot" OR "root-knot" OR rootknot OR cyst$ OR "dagger" OR "plant parasitic" OR "parasitic plant" OR "plant$parasitic" OR "root feeding" OR "root$feeding" **NOT** **TOPIC**: "fertil" OR "Mulching" OR "Nutrient" OR "Pruning" OR "drought" 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 "toxicity" OR "weed control" OR "salt stress" OR "salinity" OR "cancer" OR "pharmacology" OR "glucoside" OR "metabolites" OR "cross compatibility" OR "volatile" OR "anti-inflammatory activity" OR "shelf life" OR "synthesis" OR "scent volatile" **NOT** **TOPIC:** "Achatina fulica" OR "Acherontia atropos" OR "Acherontia styx" OR "Adoxophyes perstricta" OR "Alecanochiton marquesi" OR "Aleurodicus dispersus" OR "Andaspis hawaiiensis " OR "Aonidiella aurantii" OR "Aonidiella aurantii " OR "Aonidiella citrina" OR "Aonidiella inornata" OR "Aonidiella orientalis" OR "Aphis (Toxopetra) aurantii" OR "Aphis craccivora " OR "Aphis fabae" OR "Aphis gossypii" OR "Aphis nerii" OR "Aphis spiraecola " OR "Aphis spiraecola (Syn.: Aphis citricola)" OR "Armillaria tabescens" OR "Aspidiotus destructor" OR "Aspidiotus hederae" OR "Aspidiotus hederae " OR "Aspidiotus nerii" OR "Athelia rolfsii (Syn.: Sclerotium rolfsii)" OR "Brachymyzus jasmini " OR "Cacoecimorpha pronubana" OR "Caloptilia syringella" OR "Cercospora jasminicola" OR "Ceroplastes japonicus" OR "Chionaspis salicis" OR "Chrysomphalus aonidum" OR "Chrysomphalus dictyospermi" OR "Chrysomphalus pinnulifer" OR "Clavaspidiotus tayabanus" OR "Coccus hesperidum" OR "Coccus hesperidum hesperidum" OR "Coccus viridis" OR "Contarinia maculipennis" OR "Corythauma ayyari" OR "Daphnis nerii " OR "Dialeurodes citri" OR "Dialeurodes kirkaldyi" OR "Diaspidiotus forbesi" OR "Diaspidiotus perniciosus" OR "Diaspidiotus perniciosus (Syn.: Comstockaspis perniciosa)" OR "Dynaspidiotus britanicus" OR "Dynaspidiotus britannicus" OR "Epiphyas postvittana" OR "Erythricium salmonicolor" OR "Eucalymnatus tessellatus" OR "Ferrisia virgata" OR "Fiorinia phantasma" OR "Glomerella cingulata" OR "Glomerella cingulata (Syn.: Colletotrichum gloeosporioides)" OR "Helicotylenchus dihystera" OR "Hemiberlesia cyanophylli" OR "Hemiberlesia lataniae" OR "Hemithea aestivaria" OR "Hoplolaimus seinhorsti" OR "Howardia biclavis" OR "Hypocrea rufa" OR "Hypocrea rufa (Syn.: Trichoderma viride)" OR "Icerya purchasi" OR "Icerya seychellarum" OR "Ischnaspis longirostris" OR "Jasmine chlorotic ringspot agent" OR "Jasmine infectious variegation agent" OR "Jasmine phyllody agent" OR "Jasmine yellow ring mosaic agent" OR "Kilifia acuminata" OR "Lankacoccus ornatus" OR "Lepidosaphes corni" OR "Lepidosaphes malicola" OR "Lepidosaphes tapleyi" OR "Lichtensia viburni" OR "Maconellicoccus hirsutus" OR "Macroglossum stellatarum" OR "Macrophomina phaseolina" OR "Macrosiphum euphorbiae" OR

	"Melanaspis inopinata" OR "Meloidogyne incognita" OR "Meloidogyne javanica" OR "Menophra abruptaria" OR "Milviscutulus mangiferae" OR "Morganella longispina" OR "Mycetaspis personata" OR "Myzus ornatus " OR "Myzus persicae" OR "Nausinoe geometralis" OR "Neopinnaspis harperi" OR "Octaspidiotus stauntoniae" OR "Orgyia leucostigma" OR "Palinaspis quohogiformis" OR "Palpita unionalis " OR "Palpita vitrealis" OR "Palpita vitrealis (Syn.: Glyphodes unionalis)" OR "Parabemisia myricae" OR "Paracoccus marginatus" OR "Paraputo jasmini" OR "Paratachardina pseudolobata" OR "Parlatoreopsis longispina" OR "Parlatoria blanchardi" OR "Parlatoria camelliae" OR "Parlatoria cinerea" OR "Parlatoria crypta" OR "Parlatoria oleae" OR "Parlatoria pergandii" OR "Parlatoria proteus" OR "Parthenolecanium corni" OR "Parthenolecanium corni corni" OR "Parthenolecanium corni " OR "Phenacoccus perillustris" OR "Phenacoccus solenopsis" OR "Phyllocnistis citrella" OR "Phyllophaga" OR "Phytonemus pallidus" OR "Phytonemus pallidus " OR "Phytoplasma oryzae" OR "Pinnaspis strachani" OR "Planchonia arabidis" OR "Planococcus citri" OR "Planococcus minor" OR "Pleospora herbarum (Syn.:Stemphylium botryosum)" OR "Polyphagotarsonemus latus" OR "Prays oleae" OR "Protopulvinaria pyriformis" OR "Pseudaonidia trilobitiformis" OR "Pseudaulacaspis cockerelli" OR "Pseudaulacaspis pentagona" OR "Pseudaulacaspis prunicola prunicola" OR "Pseudischnaspis bowreyi" OR "Pseudococcus concavocerarii" OR "Pseudococcus cryptus" OR "Pseudococcus jackbeardsleyi" OR "Pseudococcus longispinus" OR "Pseudococcus viburni" OR "Pseudomonas syringae pv. syringae" OR "Pseudoparlatoria ostreata" OR "Pseudoparlatoria parlatorioides" OR "Pulvinaria floccifera" OR "Pulvinaria psidii" OR "Rhizoecus falcifer" OR "Rhizoecus floridanus" OR "Rhizopulvinaria artemisiae" OR "Rhizopulvinaria turkestanica" OR "Rosellinia bunodes" OR "Rosellinia bunodes " OR "Rosellinia necatrix" OR "Russellaspis pustulans pustulans" OR "Saissetia coffeae" OR "Saissetia oleae oleae" OR "Scirtothrips dorsalis" OR "Selenaspidus articulatus" OR "Steneotarsonemus pallidus" OR "Tenthredo vespa Retzius" OR "Tetranychus urticae RF" OR "Thanatephorus cucumeris (Syn.: Rhizoctonia solani)" OR "Tinocallis platani " OR "Tobacco streak virus" OR "Trichoderma harzianum" OR "Unaspis euonymi" OR "Varicaspis fiorineides" OR "Zygogramma bicolorata" OR "Paratrichodorus minor" OR "Meloidogyne sp" OR "Xiphinema americanum" OR "Meloidogyne hapla" OR "Radopholus similis" OR "Pratylenchus crenatus" OR "Rotylenchulus reniformis" OR "Paratylenchus jasmineae" OR "Hyphantria cunea" OR "Spilosoma vestalis" OR "Ganisa postica" OR "Hoplojana rhodoptera" OR "Jana tantalus" OR "Stegasta variana" OR "Celerena vulgaris" OR "Odontopera similaria" OR "Problepsis sp. " OR "Problepsis delphiaria" OR "Problepsis digammata" OR "Scopula remotata" OR "Somatina omicraria" OR "Somatina virginalis" OR "Caloptilia cuculipennella" OR "Telamoptilia cathedraea" OR "Euglyphis nocens" OR "Phobetron hipparchia" OR "Artaxa guttata" OR "Leucoptera sp." OR "Paectes delineata" OR "Serrodes partita" OR "Spodoptera litura" OR "Methona themisto" OR "Anaphaeis aurota" OR "Cadra cautella" OR "Diaphania indica" OR "Elophila responsalis" OR "Glyphodes caesalis" OR "Hendecasis duplifascialis" OR "Monoctenocera brachiella" OR "Arabic mosaic nepovirus" OR "Palpita unionalis" OR "Parapoynx diminutalis" OR "Phycita eulepidella" OR "Phycita jasminophaga" OR "Polythlipta cerealis" OR "Attacus atlas" OR "Automeris aurantiaca" OR "Automeris complicata" OR "Holocerina smilax" OR "Acherontia lachesis" OR "Cephonodes picus" OR "Coelonia fulvinotata" OR "Daphnis nerii" OR "Manduca rustica" OR "Pseudosphinx tetrio" OR "Psilogramma menephron" OR "Palaeodes samealis" OR "Adoxophyes privatana" OR "Archips machlopis" OR "Lobesia fetialis" OR "Loboschiza koenigiana" OR "Platynota rostrana" OR "Bryobia praetiosa" OR "Eutetranychus orientalis" OR "Panonychus citri" OR "Schizotetranychus undulatus" OR "Tetranychus lombardinii" OR "Tetranychus ludeni" OR "Tetranychus merganser" OR "Tetranychus neocaledonicus " OR "Tetranychus puschelii" OR "Tetranychus turkestani" OR "Tetranychus urticae" OR "Abropelta fusarioides" OR "Acarocybella jasminicola" OR "Actinopelte sp." OR "Aecidium jasminicola" OR "Aecidium longaense" OR "Aecidium sp." OR "Aecidium tylophorae" OR "Aithaloderma setosum" OR "Ajrekarella polychaetriae" OR "Alina jasmini" OR "Gracillaria syringella" OR "Alternaria dianthi" OR "Alternaria ellisii" OR "Alternaria sp." OR "Aplosporella jasmini" OR "Armillariella mellea" OR "Armillariella tabescens " OR "Aschersonia philippinensis" OR "Ascochyta jasminicola" OR "Asterina erysiphoides (Phillipsiella atra)" OR "Asterina jasmini" OR "Asterina jasminicola" OR "Asterina lawsoniae" OR "Asterina sp." OR "Asterina spissa" OR "Asterinella jasmini" OR "Asteromella jasminicola" OR "Atractina jasmini" OR "Bagnisiella jasmini" OR "Bartalinia robillardoides" OR "Botryodiplodia theobromae (Lasiodiplodia theobromae)" OR

	"Botryosphaeria ribis (Neofusicoccum ribis)" OR "Botrytis cinerea" OR "Botrytis sp." OR "Calonectria jasmini" OR "Calonectria polythalama" OR "Calopeltis jasmini" OR "Camarosporium polymorphum" OR "Capnodium jasmini" OR "Capnodium sp." OR "Cercospora jasminae" OR "Cercospora jasmini (Pseudocercospora butleri)" OR "Cercospora jasminicola (Acarocybella jasminicola):" OR "Cercospora jasminicola var. khandalensis (Pseudocercospora butleri)" OR "Cercospora odoratissimi (Pseudocercospora butleri)" OR "Cercospora sp." OR "Ceuthospora jasminacea" OR "Chaconia butleri" OR "Chaetothyrium guaraniticum" OR "Chaetothyrium jasminicola" OR "Choanephora infundibulifera" OR "Cicinnobella abyssinica" OR "Cladosporium herbarum" OR "Cladosporium maculans" OR "Cladosporium staurophorum" OR "Clitocybe tabescens (Desarmillaria tabescens)" OR "Cochliobolus geniculatus (Curvularia geniculata)" OR "Cochliobolus lunatus (Curvularia lunata)" OR "Colletotrichum acutatum" OR "Colletotrichum capsici (Colletotrichum truncatum)" OR "Colletotrichum dematium" OR "Colletotrichum gloeosporioides" OR "Colletotrichum jasmini-sambac (Colletotrichum siamense)" OR "Colletotrichum jasminicola" OR "Colletotrichum jasminigenum" OR "Colletotrichum siamense" OR "Colletotrichum sp." OR "Colletotrichum truncatum" OR "Coniothyrium castagnei" OR "Coniothyrium fuckelii (Paraconiothyrium fuckelii)" OR "Coniothyrium jasmini" OR "Coniothyrium sp." OR "Corticium centrifugum (Fibulorhizoctonia centrifuga)" OR "Corticium galactinum (Scytinostroma galactinum)" OR "Corticium salmonicolor (Erythricium salmonicolor)" OR "Corticium solani - (Rhizoctonia solani):" OR "Corynespora cassiicola" OR "Corynespora jasminicola" OR "Corynespora pruni" OR "Corynespora sp." OR "Curvularia prasadii" OR "Curvularia senegalensis" OR "Cytospora jasmini" OR "Dendrophoma jasmini" OR "Diaporthe culta" OR "Diatrypella jasmini" OR "Dictyodothis jasmini" OR "Dictyodothis macrocarpa:" OR "Didymosphaeria jasmini" OR "Didymosphaeria muelleri" OR "Dimerium piceum" OR "Diplodia jasmini" OR "Diplodia seriata" OR "Diplodia sp." OR "Dothidastromella brevilobi" OR "Elsinoe jasminae (Elsinoe jasmini)" OR "Elsinoe jasmini" OR "Elsinoe jasminicola" OR "Eremotheca rufula (Schizothyrium rufulum)" OR "Erysiphe sp." OR "Eutypa lata (Eutypa lata var. lata)" OR "Eutypa spinosa" OR "Ferrarisia jasmini" OR "Fomes pectinatus var. jasmini" OR "Fusarium equiseti" OR "Fusarium oxysporum" OR "Fusarium semitectum (Fusarium incarnatum)" OR "Fusarium sp." OR "Fusicoccum jasminicola" OR "Gibberella pulicaris (Fusarium sambucinum)" OR "Glomerella cingulata (Colletotrichum gloeosporioides)" OR "Guignardia jasminicola" OR "Gymnosporangium sp." OR "Helminthosporium sp." OR "Hemileia hansfordii" OR "Hemileia jasmini" OR "Hemileia wakefieldii (Hemileia hansfordii)" OR "Hendersonia obtusa" OR "Hypocrea lactea (Trichoderma citrinum)" OR "Lambertella jasmini" OR "Lambertella tewarii" OR "Lentomita jasmini" OR "Leptosphaeria artemisiae" OR "Leptosphaeria castagnei" OR "Leptosphaeria emiliana" OR "Leptosphaeria sp." OR "Macrophoma jasminicola" OR "Marasmiellus scandens" OR "Marasmius ramealis (Marasmiellus ramealis)" OR "Massaria inquinans" OR "Massarina jasminicola" OR "Meliola busogensis" OR "Meliola daviesii" OR "Meliola gemellipoda" OR "Meliola jasmini" OR "Meliola jasmini var. floribundi" OR "Meliola jasmini var. major" OR "Meliola jasminicola" OR "Meliola jasminicola var. africana" OR "Meliola jasminicola var. indica" OR "Meliola jasminicola var. jasminicola" OR "Meliola ngongensis" OR "Meliola oleicola var. jasmini" OR "Meliola sp." OR "Meliola xumenensis" OR "Microdiplodia jasmini" OR "Moellerodiscus lentus" OR "Mycosphaerella jasminicola" OR "Mycostevensonia jasmini" OR "Nectriella pironii" OR "Neocapnodium tanakae (Capnodium tanakae)" OR "Nodulosphaeria dolioloides" OR "Oidium jasmini (Pseudoidium jasmini)" OR "Ophiobolus sp." OR "Paraphaeosphaeria castagnei" OR "Pellicularia rolfsii (Athelia rolfsii)" OR "Periconiella jasmini" OR "Pestalotiopsis sp." OR "Pestalotiopsis versicolor" OR "Phaeochaetia rosea" OR "Phaeodimeriella papillifera" OR "Phaeodothis cordifolii" OR "Phaeoseptoria sp." OR "Phaeosphaeria nigrans" OR "Phoma domestica" OR "Phoma jasmini-sambac" OR "Phoma jasminicola" OR "Phoma jasminomacrospora" OR "Phoma sorghina (Epicoccum sorghinum)" OR "Phoma sp." OR "Phomopsis brachyceras" OR "Phomopsis jasmini" OR "Phomopsis pavgii" OR "Phomopsis sp." OR "Phyllactinia corylea (Phyllactinia guttata)" OR "Phyllactinia suffulta (Phyllactinia guttata)" OR "Phylloporia ephedrae" OR "Phylloporia ribis f. euonymi" OR "Phyllosticta jasminensis" OR "Phyllosticta jasmini" OR "Phyllosticta jasminicola" OR "Phyllosticta jasminina" OR "Phyllosticta sp." OR "Physalospora jasmini" OR "Physalospora obtusa (Diplodia seriata)" OR "Phytophthora cactorum" OR "Phytophthora nicotianae var. parasitica (Phytophthora nicotianae)" OR "Phytophthora parasitica (Phytophthora nicotianae)" OR "Phytophthora plurivora" OR "Phytophthora

	sp." OR "Phytophthora syringae" OR "Pithomyces cupaniae" OR "Pleonectria aurigera (Thyronectria aurigera)" OR "Pleospora coronata (Cilioplea coronata)" OR "Pleospora herbarum (Stemphylium vesicarium)" OR "Pleospora herbarum var. occidentalis" OR "Pleospora njegusensis" OR "Pleospora subalpina" OR "Pseudocercospora butleri" OR "Pseudocercospora jasminicola - (Pseudocercospora butleri):" OR "Pseudocercospora jasminicola var. effusa - (Pseudocercospora butleri var. effusa):" OR "Pseudoidium jasmini" OR "Puccinia abyssinica" OR "Puccinia chrysopogi (Puccinia chrysopogoni)" OR "Puccinia chrysopogoni" OR "Puccinia exhauriens" OR "Puccinia jasmini" OR "Puccinia jasmini-humilis" OR "Puccinia jasminicola" OR "Puccinia ugandana" OR "Pucciniosira deightonii" OR "Pythium sp." OR "Pythium splendens (Globisporangium splendens)" OR "Rhabdospora jasmini" OR "Rhizoctonia solani" OR "Rhizoctonia sp." OR "Sclerotinia sp." OR "Sclerotium coffeicola" OR "Sclerotium rolfsii (Athelia rolfsii)" OR "Scolecobonaria filiformis" OR "Septoria aitchisoni (Septoria aitchisonii)" OR "Septoria orni" OR "Sirococcus butleri" OR "Sphaerotheca pannosa (Podosphaera pannosa)" OR "Sphaerulina saccardiana" OR "Sporidesmium jasminicola" OR "Stemphylium sp." OR "Strickeria coronata" OR "Sydowia agharkarii" OR "Thyrostroma mori" OR "Titaeopsis ugandae" OR "Trichothyrium asterophorum" OR "Trichothyrium dubiosum" OR "Trichothyrium oleaceae" OR "Tripospermum jasmini" OR "Tryblidaria azarae" OR "Uromyces comedens" OR "Uromyces hobsoni (Uromyces hobsonii)" OR "Uromyces hobsonii" OR "Valsa cypri (Cytospora pruinosa)" OR "Valsella jasminicola" OR "Verticillium dahliae" OR "Xylaria aristata" OR "Zasmidium jasminicola" OR "Zignoella rhois"

Appendix C – List of pests that can potentially cause an effect not further assessed

Table C.1: List of potential pests not further assessed

Pest name	EPPO code	Group	Pest present in Uganda	Present in the EU	Pest can be associated with the commodity	Impact	Justification for inclusion in this list
Ferrisia virgata	PSECVI	Insect	Yes	No	Yes	Uncertain	Recorded in Italy and France (Scalenet), no official measures taken in these two member States.
Pseudaonidia trilobitiformis	PSDATR	Insect	Yes	No	Yes	Uncertain	No records in the EU. Reported as a tropical pest of cashew nuts, citrus and cacao. Limited information.
Pseudococcus concavocerarii	–	Insect	Yes	No	Yes	Uncertain	No records in the EU. Reported from coffee and cacao. Limited information.

Appendix D – Excel file with the pest list of Jasminum

Appendix D can be found in the online version of this output (in the 'Supporting information' section): https://doi.org/10.2903/j.efsa.2022.7300