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Commodity risk assessment of *Acer campestre* plants from the UK

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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 plants of *Acer campestre* imported from the UK as: (a) 1- to 7-year-old bare root plants for planting, (b) 1- to 15-year-old plants in pots and (c) bundles of 1- to 2-year-old whips and seedlings, taking into account the available scientific information, including the technical information provided by the UK. All pests associated with the commodity were evaluated against specific criteria for their relevance for this opinion. Six EU quarantine pests and four pests not regulated in the EU fulfilled all relevant criteria and were selected for further evaluation. For the selected pests, the risk mitigation measures implemented in the technical dossier from the UK 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. In the assessment of risk, the age of the plants was considered, reasoning that older trees are more likely to be infested mainly due to longer exposure time and larger size. The degree of pest freedom varies among the pests evaluated, with *Phytophthora ramorum* being the pest most frequently expected on the imported plants. The expert knowledge elicitation indicated with 95% certainty that 9,757 or more 1- to 15-year-old plants in pots per 10,000 will be free from *P. ramorum*.

Keywords: maple, European Union, commodity risk assessment, plant health, plant pest

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Declarations of interest: If you wish to access the declaration of interests of any expert contributing to an EFSA scientific assessment, please contact interestmanagement@efsa.europa.eu.

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1. Introduction

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

1.1.1. Background

The 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 Regulation (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 *Acer campestre* from the UK taking into account the available scientific information, including the technical dossier provided by the UK.

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 *Acer campestre* from the UK 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 the UK.

In accordance with the Agreement on the withdrawal of the United Kingdom of Great Britain and Northern Ireland from the European Union and the European Atomic Energy Community, and in particular Article 5(4) of the Protocol on Ireland/Northern Ireland in conjunction with Annex 2 to that Protocol, for the purposes of this Opinion, references to the United Kingdom do not include Northern Ireland.

[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.

The EU quarantine pests that are regulated as a group in the Commission Implementing Regulation (EU) 2019/2072[4] were considered and evaluated separately at species level.

Annex II of 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 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, Türkiye, Ukraine and the United Kingdom (except Northern Ireland[5]).

Consequently, for those countries,

i) any pests identified, which are listed as non- European species in Annex II of 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 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. pest 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 a RNQP and as a Protected Zone Quarantine pest, in this Opinion it should be evaluated as Quarantine pest.

In its evaluation the Panel:

- Checked whether the provided information in the technical dossier (hereafter referred to as 'the Dossier') provided by the applicant (United Kingdom, Department for Environment Food and Rural Affairs – hereafter referred to as 'DEFRA') was sufficient to conduct a commodity risk assessment. When necessary, additional information was requested to the applicant.
- Selected the relevant Union quarantine pests and protected zone quarantine pests (as specified in Commission Implementing Regulation (EU) 2019/2072, hereafter referred to as 'EU quarantine pests') and other relevant pests present in the UK and associated with the commodity.
- Did not assess the effectiveness of measures for Union quarantine pests for which specific measures are in place for the import of the commodity from the UK in Commission Implementing Regulation (EU) 2019/2072 and/or in the relevant legislative texts for emergency measures and if the specific country is in the scope of those emergency measures. The assessment was restricted to whether or not the applicant country implements those measures.
- 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 importation of the commodity from the UK and other relevant pests present in the UK and associated with the commodity.

Risk management decisions are not within EFSA's remit. Therefore, the Panel provided a rating based on expert judgment regarding the likelihood of pest freedom for each relevant pest given the risk mitigation measures proposed by DEFRA of the UK.

[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.

[5] In accordance with the Agreement on the withdrawal of the United Kingdom of Great Britain and Northern Ireland from the European Union and the European Atomic Energy Community, and in particular Article 5(4) of the Protocol on Ireland/ Northern Ireland in conjunction with Annex 2 to that Protocol, for the purposes of this Opinion, references to Member States include the United Kingdom in respect of Northern Ireland.

2. Data and Methodologies

2.1. Data provided by DEFRA of the UK

The Panel considered all the data and information (hereafter called 'the Dossier') provided by DEFRA of the UK in May 2022 including the additional information provided by DEFRA of the UK in January 2023, after EFSA's request. The Dossier is managed by EFSA.

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

Table 1: Structure and overview of the Dossier

Dossier section	Overview of contents	Filename
1.0	Technical dossier	Acer campestre commodity information FINAL draft
2.0	Pest list	Acer_pest_list_final_checked
3.0	Additional information: answers	Acer campestre additional information 3 Nov 2022
4.0	Additional information: distribution of *Acer campestre* plants	Acer_campestre_distribution (1)
5.0	Additional information: Pest details	Acer_campestre-EFSA_pest_detail_request_Jan23
6.0	Additional information: producers sample product list	A.campestre_producers_sample_product_list

The data and supporting information provided by DEFRA of the UK formed the basis of the commodity risk assessment. Table 2 shows the main data sources used by DEFRA of the UK to compile the Dossier (Dossier Sections 1.0 and 2.0).

Table 2: Databases used in the literature searches by DEFRA of the UK

Database	Platform/Link
Aphids on the world's plants	https://www.aphidsonworldsplants.info/
Aphid Species File	http://aphid.speciesfile.org/HomePage/Aphid/HomePage.aspx
APS (The American Phytopathological Society)	https://www.apsnet.org/Pages/default.aspx
Bark and Ambrosia Beetles of the Americas	https://www.barkbeetles.info/
Biological Records Centre	https://www.brc.ac.uk/
British Bugs	https://www.britishbugs.org.uk/
British Leafminers	http://www.leafmines.co.uk/
CABI Crop Protection Compendium	https://www.cabi.org/cpc/
CABI Plantwise Knowledge Bank	https://www.plantwise.org/knowledgebank/
Checklist of Aphids of Britain	https://www.influentialpoints.com/aphid/Checklist_of_aphids_in_Britain.htm
Database of the World's Lepidopteran Host Plants	https://www.nhm.ac.uk/our-science/data/hostplants/
EPPO Global Database	https://gd.eppo.int/
Fauna Europaea	https://www.fauna-eu.org/t/
Forest Pests of North America	https://www.forestpests.org/
FRDBI (The Fungal Records Database of Britain and Ireland)	http://www.frdbi.info/
GBIF (Global Biodiversity Information Facility)	https://www.gbif.org/
HANTSMOTHS - The Lepidoptera (Moths and Butterflies) of Hampshire and Isle of Wight	https://www.hantsmoths.org.uk/
ICAR – National Bureau of Agricultural Insect Resources	https://www.nbair.res.in/
Index Fungorum	http://www.indexfungorum.org/
Lepiforum e. V.	https://www.lepiforum.org/
L'Inventaire national du patrimoine naturel (INPN)	https://inpn.mnhn.fr/accueil/index
MycoBank	https://www.mycobank.org/

Database	Platform/Link
NBN Atlas	https://nbnatlas.org/
Nemaplex	http://nemaplex.ucdavis.edu/Nemabase2010/PlantNematodeHostStatusDDQuery.aspx
New Disease Reports	https://www.ndrs.org.uk/
Norfolk moths	https://www.norfolkmoths.co.uk/
Plant Parasites of Europe	https://www.bladmineerders.nl/
Royal Entomological Society	https://www.royensoc.co.uk/
Scalenet	http://scalenet.info/associates/
Spider Mites Web	https://www1.montpellier.inra.fr/CBGP/spmweb/advanced.php
Thaer-Institut für Agrar- und Gartenbauwissenschaften	https://www.agrar.hu-berlin.de/de
The leaf and stem mines of British flies and other insects	https://www.ukflymines.co.uk/index.php
Tortricid.net	http://www.tortricidae.com/
UK Beetle Recording	https://www.coleoptera.org.uk/
UKmoths	https://www.ukmoths.org.uk/
UK Plant Health Risk Register	https://planthealthportal.defra.gov.uk/pests-and-diseases/uk-plant-health-risk-register/
USDA fungal database	https://www.ars.usda.gov/northeast-area/beltsville-md-barc/beltsville-agricultural-research-center/mycology-and-nematology-genetic-diversity-and-biology-laboratory/docs/us-national-fungus-collections-bpi/us-national-fungus-collections-databases/
Zobodat	https://www.zobodat.at/index.php
3I Interactive Keys and Taxonomic Databases	http://dmitriev.speciesfile.org/

2.2. Literature searches performed by EFSA

Literature searches in different databases were undertaken by EFSA to complete a list of pests potentially associated with *A. campestre*. The following searches were combined: (i) a general search to identify pests reported on *A. campestre* and *Acer* species reported as *Acer* sp. and *Acer* spp. in the databases, (ii) a search to identify any EU quarantine pest reported on *Acer* as genus and subsequently and (iii) a tailored search to identify whether the above pests are present or not in the UK. The searches were run between July and August 2022. No language, date or document type restrictions were applied in the search strategy.

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

Database	Platform/Link
Aphids on World Plants	https://www.aphidsonworldsplants.info/C_HOSTS_AAIntro.htm
BIOTA of New Zealand	https://biotanz.landcareresearch.co.nz/
CABI Crop Protection Compendium	https://www.cabi.org/cpc/
Database of Insects and their Food Plants	https://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/
EUROPHYT	https://www.webgate.ec.europa.eu/europhyt/
Leaf-miners	https://www.leafmines.co.uk/html/plants.htm
Nemaplex	http://nemaplex.ucdavis.edu/Nemabase2010/PlantNematodeHostStatusDDQuery.aspx
Plant Pest Information Network	https://www.mpi.govt.nz/news-and-resources/resources/registers-and-lists/plant-pest-information-network/
Plant Viruses Online	https://www1.biologie.uni-hamburg.de/b-online/e35/35tmv.htm#Range

Database	Platform/Link
Scalenet	http://scalenet.info/associates/
Spider Mites Web	https://www1.montpellier.inra.fr/CBGP/spmweb/advanced.php
USDA ARS Fungal Database	https://www.ars.usda.gov/northeast-area/beltsville-md-barc/beltsville-agricultural-research-center/mycology-and-nematology-genetic-diversity-and-biology-laboratory/docs/mycology-and-nematology-genetic-diversity-and-biology-laboratory-beltsville-md/
Web of Science: All Databases (Web of Science Core Collection, CABI: CAB Abstracts, BIOSIS Citation Index, Chinese Science Citation Database, Current Contents Connect, Data Citation Index, FSTA, KCI-Korean Journal Database, Russian Science Citation Index, MEDLINE, SciELO Citation Index, Zoological Record)	Web of Science https://www.webofknowledge.com
World Agroforestry	https://www.worldagroforestry.org/treedb2/speciesprofile.php?Spid=1749

The Panel used the databases indicated in Table 3 to compile the list of pests associated with the tree species listed above. 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.

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-quarantine pests and other pests) that may require risk mitigation measures are identified. The EU non-quarantine 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 implemented risk mitigation measures for each relevant pest were evaluated.

A conclusion on the pest freedom status of the commodity for each of the relevant pests was determined and uncertainties identified using expert judgements.

Pest freedom was assessed by estimating the number of infested/infected units out of 10,000 exported units. Further details on the methodology used to estimate the likelihood of pest freedom are provided in Section 2.3.4.

2.3.1. Commodity data

Based on the information provided by DEFRA of the UK, the characteristics of the commodity were summarised.

2.3.2. Identification of pests potentially associated with the commodity

To evaluate the pest risk associated with the importation of the commodity from the UK, a pest list was compiled. The pest list is a compilation of all identified plant pests reported as associated with *A. campestre*, *Acer* sp., *Acer* spp. and all EU quarantine pests reported as associated with *Acer* as a genus based on information provided in the Dossier Sections 1.0, 2.0, 3.0, 4.0 and 5.0 and on searches performed by the Panel. The search strategy and search syntax were adapted to each of the databases listed in Table 3, according to the options and functionalities of the different databases and CABI keyword thesaurus.

The scientific names of the host plants (i.e. *Acer*, *Acer* sp., *Acer* spp., *A. campestre*) were used when searching in the EPPO Global database and CABI Crop Protection Compendium. The same strategy was applied to the other databases excluding EUROPHYT and Web of Science.

EUROPHYT was investigated by searching for the interceptions associated with *A. campestre* species imported from the whole world from 1995 to May 2020 and TRACES-NT from May 2020 to 22 December 2022, respectively. For the pests selected for further evaluation, a search in the EUROPHYT and/or TRACES-NT was performed for the years between 1995 and December 2022 for the interceptions from the whole world, at species level.

The search strategy used for Web of Science Databases was designed combining English common names for pests and diseases, terms describing symptoms of plant diseases and the scientific and English common names of the commodity and excluding pests which were identified using searches in other databases. The established search strings are detailed in Appendix B and they were run on 28 and 29 June 2022.

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

The compiled pest list (see Microsoft Excel® in Appendix F) includes all identified pests that use as hosts *Acer* sp., *Acer* spp. and *A. campestre*.

The evaluation of the compiled pest list was done in two steps: first, the relevance of the EU-quarantine 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 E (List of pests that can potentially cause an effect not further assessed).

2.3.3. Listing and evaluation of risk mitigation measures

All implemented risk mitigation measures were listed and evaluated. When evaluating the likelihood of pest freedom of the commodity, the following types of potential infection/infestation sources for *A. campestre* in export nursery were considered (see also Figure 1):

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

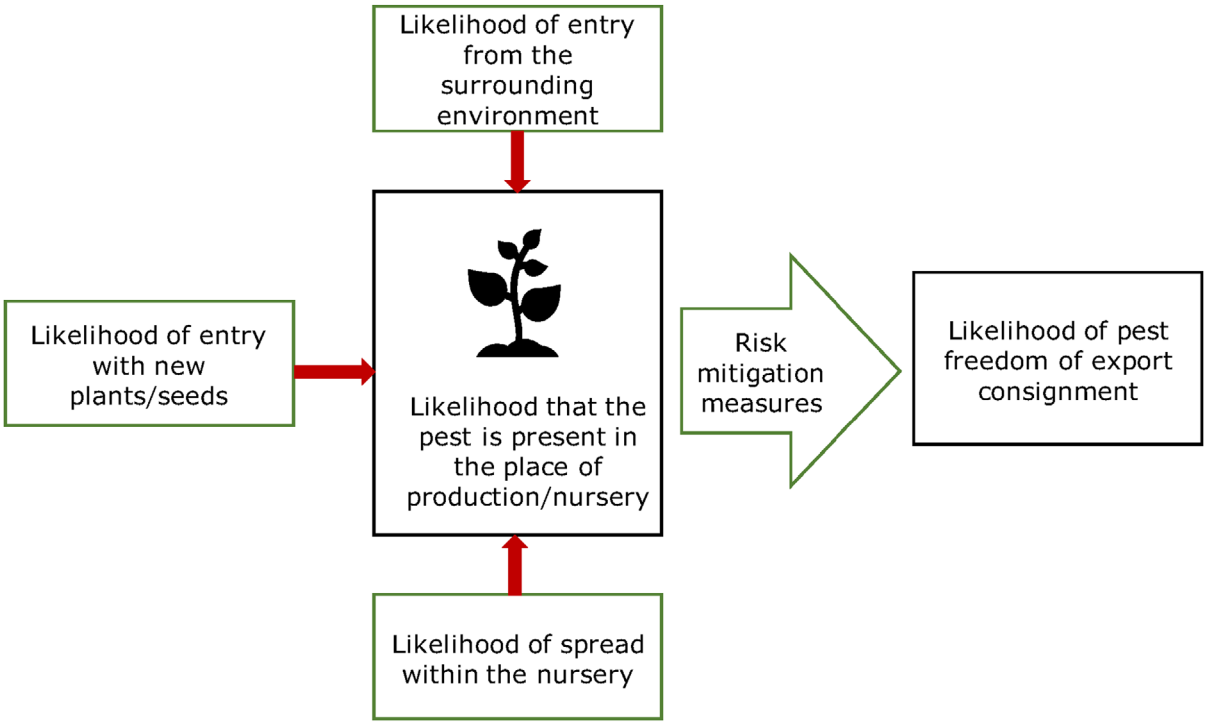

Figure 1: Conceptual framework to assess likelihood that plants are exported free from relevant pests. (Source: EFSA PLH Panel, 2019)

The risk mitigation measures proposed by DEFRA of the UK were evaluated with expert knowledge elicitation (EKE) according to the Guidance on uncertainty analysis in scientific assessment (EFSA Scientific Committee, 2018).

Information on the biology, likelihood of entry of the pest to the export nursery, of its spread inside the nursery and the effect of measures on the specific pests were summarised in data sheets of pests selected for further evaluation (see Appendix A).

2.3.4. Expert knowledge elicitation

To estimate the pest freedom of the commodity an EKE was performed following EFSA guidance (Annex B.8 of EFSA Scientific Committee, 2018). The specific question for EKE was: 'Taking into account (i) the risk mitigation measures in place in the nurseries and (ii) other relevant information, how many of 10,000 commodity units, either single plants or bundles of plants will be infested with the relevant pest when arriving in the EU?'

The risk assessment considers bundles of 5–15 bare root whips and 1- to 2-year-old seedlings, 1- to 7-year-old bare root single plants and 1- to 15-year-old single plants in pots.

The following reasoning is given for considering bundles of whips and seedlings:

i) There is no quantitative information available regarding clustering of plants during production.
ii) Plants are grouped in bundles of 5, 10 or 15 after sorting.
iii) For the pests under consideration, a cross-contamination during transport is possible.

The following reasoning is given for considering single plants (bare root or in pots):

i) The inspections before export are targeted on individual plants.
ii) It is assumed that the product will be distributed in the EU as individual plants to the consumer.

The EKE question was common to all pests for which the pest freedom of the commodity was estimated.

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

3. Commodity data

3.1. Description of the commodity

The commodities of *A. campestre* (common name: field maple; family: Sapindaceae) to be imported from the UK to EU are whips, bare root plants, rooted plants in pots and rooted plants in container bags (Dossier Sections 1.0 and 3.0). According to the Dossier Section 3.0, *A. campestre* imported varieties are: 'Streetwise', 'Elsrijk' and 'William Caldwell'.

The commodities are as follows:

- Whips: the age of plants is between 1 and 2 years (Dossier Section 1.0). The diameter is between 4 and 10 mm. Whips are slender, unbranched trees. Whips can be bare root or containerised. Bare root whips may have some leaves at the time of export, particularly when exported in November (Dossier Section 3.0).
- Bare root plants: the age of plants is between 1 and 7 years (Dossier Section 1.0). The diameter is between 30 and 40 mm for 7-year-old plants. Bare root plants may have some leaves at the time of export, particularly when exported in November (Dossier Section 3.0).
- Rooted plants in pots: the age of plants is between 1 and 15 years (Dossier Section 1.0). The diameter is between 4–88 mm. The plants in pots may be exported with leaves, depending on the timing of the export (Dossier Section 3.0).

Plants could be either grafted or not, depending on the variety and production nurseries (see Section 3.3.2). Small plants which are not grafted can be considered as seedlings.

The growing media is virgin peat or peat-free compost (a mixture of coir, tree bark, wood fibre, etc.) (Dossier Sections 1.0 and 3.0) complying with the requirements for growing media as specified in the Annex VII of the Commission Implementing Regulation 2019/2072.

According to ISPM 36 (FAO, 2016), the commodities can be classified as 'bare root plants' and 'rooted plants in pots'.

According to the Dossier Section 1.0, the trade volume is up to 10,000 bare root plants and 5,000 rooted plants in pots per year. The trade of these plants will mainly be to Northern Ireland and the Republic of Ireland.

According to the Dossier Section 1.0, plants are supplied direct to professional operators and traders. Uses may include propagation, growing-on, onward trading or direct sales to final consumers but will generally fall into two categories:

- Tree production and further growing-on by professional operators or
- Direct sales to final users as ornamental plants.

3.2. Description of the production areas

There are five known nurseries in the UK that are producing *A. campestre* plants for the export to the EU (Dossier Section 3.0). The nurseries are shown in Figure 2.

Figure 2: Nurseries in the UK of *Acer campestre* plants for the export to the EU (Source: Dossier Section 3.0)

Acer species are grown in Great Britain in line with the Plant Health (Amendment etc.) (EU Exit) Regulations 2020[6] and the Plant Health (Phytosanitary Conditions) (Amendment) (EU Exit) Regulations 2020.[7] These regulations are broadly similar to EU phytosanitary regulation (Dossier Section 1.0). Producers do not set aside separate areas for export production. All plants within UK nurseries are grown under the same phytosanitary measures, meeting the requirements of the UK Plant Passporting regime (Dossier Section 1.0).

The size of the nurseries is between 8 and 150 ha for container stock (plants in pots) and up to 325 ha for field grown stock (Dossier Section 3.0).

The nurseries also grow other plant species as shown in the Appendix C. The minimum and maximum proportion of *A. campestre* compared to the other plant species grown in the nurseries is between 1% and 3%. Most of the nurseries intending to export to the EU also produce plants for the local market, and there is no distancing between production areas for the export and the local market (Dossier Section 3.0).

The nurseries are kept clear of non-cultivated herbaceous plants. In access areas, non-cultivated herbaceous plants are kept to a minimum and only exist at nursery boundaries. Non-cultivated herbaceous plants grow on less than 1% of the nursery area. The predominant species is rye grass (*Lolium* sp.). Other identified species include dandelions (*Taraxacum officinale*), hairy bittercress (*Cardamine hirsuta*), common daisy (*Bellis perennis*), creeping cinquefoil (*Potentilla reptans*) and bluebells (*Hyacinthoides non-scripta*). These are all extremely low in number (Dossier Section 3.0).

There are hedges surrounding the export nurseries made up of a range of species including hazel (*Corylus avellana*), yew (*Taxus baccata*), holly (*Ilex*), ivy (*Hedera*), alder (*Alnus glutinosa*), cherry laurel (*Prunus laurocerasus*), hawthorn (*Crataegus*), blackthorn (*Prunus spinosa*) and leylandii (*Cupressus* × *leylandii*) (Dossier Section 3.0).

The closest *Acer* plants grown in the surroundings are 20 metres away from the nurseries (Dossier Section 3.0).

Nurseries are predominately situated in the rural areas. The surrounding land would tend to be arable farmland with some pasture for animals and small areas of woodland. Hedges are often used to define field boundaries and grown along roadsides (Dossier Section 3.0).

Arable crops within a radius of 2 km from the nurseries are rotated in line with good farming practice and could include oilseed rape (*Brassica napus*), wheat (*Triticum*), barley (*Hordeum vulgare*), turnips (*Brassica rapa* subsp. *rapa*), potatoes (*Solanum tuberosum*) and maize (*Zea mays*) (Dossier Section 3.0).

Pastures are present within a radius of 2 km from the nurseries and are predominantly ryegrass (*Lolium* sp.) (Dossier Section 3.0).

Woodland is present within a radius of 2 km from the nurseries. Woodlands tend to be a standard UK mixed woodland, with a range of UK native trees such as oak (*Quercus robur*), pine (*Pinus*), poplar (*Populus*), ash (*Fraxinus*), sycamore (*Acer pseudoplatanus*), holly (*Ilex*), Norway maple (*Acer platanoides*) and field maple (*Acer campestre*). The nearest woodland in one of the nurseries borders the boundary fence (Dossier Section 3.0).

It is not possible to identify what plant species are growing within the gardens of private dwellings within a radius of 2 km from the nurseries (Dossier Section 3.0).

Other plants likely to be present in the surroundings of the nurseries (within 2 km radius) are: *Abies* spp., *Aesculus* spp., *Allium porrum*, *Alnus* spp., *Beta vulgaris*, *Betula* spp., *Camellia* spp., *Capsicum annuum*, *Castanea* spp., *Daucus carota*, *Fagus* spp., *Hordeum vugare*, *Juglans regia*, *Lolium multiflorum*, *Magnolia* spp., *Malus* spp., *Morus* spp., *Picea* spp., *Pinus* spp., *Populus* spp., *Prunus* spp., *Quercus* spp., *Rhododendron* spp., *Rosa* spp., *Salix* spp., *Sambucus* spp., *Solanum lycopersicum*, *Solanum tuberosum*, *Sorbus* spp., *Syringa* spp., *Ulmus* spp., *Viburnum* spp. and *Wisteria* spp. (Dossier Section 3.0).

Based on the global Köppen–Geiger climate zone classification (Kottek et al., 2006), the climate of the production areas of *A. campestre* in the UK is classified as Cfb, i.e. main climate (C): warm temperate; precipitation (f): fully humid; temperature (b): warm summer.

[6] Plant Health (Amendment etc.) (EU Exit) Regulations 2020 of 14 December 2020, No 1482, 80 pp. Available online: https://www.legislation.gov.uk/uksi/2020/1482/contents/made

[7] Plant Health (Phytosanitary Conditions) (Amendment) (EU Exit) Regulations 2020, No 1527, 276 pp. Available online: https://www.legislation.gov.uk/uksi/2020/1527/contents/made

3.3. Production and handling processes

3.3.1. Source of planting material

The starting material of the commodities is a mix of seeds, seedlings and scion woods/buds depending on the nursery (Dossier Section 3.0).

Seeds purchased in the UK are certified under The Forest Reproductive Material (Great Britain) Regulations 2002. Seedlings sourced in the UK are certified with UK Plant Passports. Seedlings from the EU countries are certified with phytosanitary certificates. Many plants are obtained from EU (mostly the Netherlands) and New Zealand. These are the only two sources of the plants obtained from abroad (Dossier Section 3.0).

None of the nurseries expected to export to the EU have mother plants of *A. campestre* present in the nurseries. Where chip budding is used, the scion wood is taken from 2- to 3-year-old growing stock (Dossier Section 3.0).

3.3.2. Production cycle

Plants are either grown in containers (cells, pots, tubes, etc.) or in field. Cell grown trees may be grown in greenhouses, however most plants will be field grown or field grown in containers (Dossier Section 1.0). The nurseries intending to export to the EU do not grow *A. campestre* in greenhouses, apart from initial seed germination and young plants/seedlings where there is an increased vulnerability due to climatic conditions including frost. Plants grown under protection are maintained in plastic polytunnels or in glasshouses which typically consist of a metal or wood frame construction and glass panels (Dossier Section 3.0). The PLH Panel assumes that potted plants could be cultivated for the whole period in pots or grown in the field and then transplanted in pots at a later stage. In this last case it is assumed that the roots will be washed before potting and soil removed as required by the legislation for a commodity to be exported to the EU.

Planting could take place any time during the year in response to customer orders. Grafting onto rootstocks typically takes place during the spring (March-April) and repotting in the autumn (September-November) (Dossier Section 1.0).

According to the Dossier Section 1.0, bare root plants are harvested in winter (November to March/ April) to be able to lift plants from the field and because this is the best time to move dormant plants. Rooted plants in pots can be moved at any point in the year to fulfil consumer demand, but more usually September to May. These will likely be destined for garden centre trade rather than nurseries.

Acer campestre cultivars 'Streetwise', 'Elsrijk' and 'William Caldwell' are chip budded onto *A. campestre* seedling rootstocks in July/August. The grafting procedure is as follows: a chip of wood containing a bud is cut out of scion. A similarly shaped chip is cut out of the rootstock, and the scion bud is placed in the cut, in such a way that the cambium layers match. The new bud is fixed in place using grafting tape (Dossier Section 3.0).

The growing media is virgin peat or peat-free compost. This compost is heat-treated by commercial suppliers during production to eliminate pests and diseases. It is supplied in sealed bulk bags or shrink-wrapped bales and stored off the ground on pallets, these are free from contamination. Where delivered in bulk, compost is kept in a dedicated bunker, either indoors or covered by tarpaulin outdoors and with no risk of contamination with soil or other material (Dossier Section 1.0).

The irrigation is done on the need basis and could be overhead, sub irrigation or drip irrigation. Water used for irrigation can be drawn from several sources, the mains supply, bore holes or from rainwater collection or watercourses (Dossier Section 3.0). Additional information on water used for irrigation is provided in the Appendix D. Regardless of the source of the water used to irrigate, none of the nurseries have experienced the introduction of a pest/disease as a result of contamination of the water supply (Dossier Section 3.0).

Growers are required to assess water sources, irrigation and drainage systems used in the plant production for the potential to harbour and transmit plant pests. Water is routinely sampled and sent for analysis. No quarantine pests have been found (Dossier Section 1.0).

Growers must assess weeds and volunteer plants for the potential to host and transmit plant pests and have an appropriate programme of weed management in place on the nursery (Dossier Section 1.0).

General hygiene measures are undertaken as part of routine nursery production, including disinfection of tools and equipment between batches/lots and different plant species (Dossier Sections 1.0 and 3.0). The tools are dipped and wiped with a clean cloth between trees to reduce the risk of

virus and bacterial transfer between subjects. There are various disinfectants available, with Virkon S (active substance: potassium peroxymonosulfate and sodium chloride) being a common example (Dossier Section 3.0).

Growers keep records to allow traceability for all plant material handled. These records must allow a consignment or consignment in transit to be traced back to the original source, as well as forward to identify all trade customers to which those plants have been supplied (Dossier Section 1.0).

3.3.3. Pest monitoring during production

All producers are registered as professional operators with the UK Competent Authority via the Animal and Plant Health Agency (APHA) for England and Wales or with the Science and Advice for Scottish Agriculture (SASA) for Scotland and are authorised to issue the UK plant passports, verifying they meet the required national sanitary standards. The Competent Authority inspect crops at least once a year to check they meet the standards set out in the guides. Assessments are normally made based on visual examinations, but samples may be taken for laboratory analysis to get a definitive diagnosis (Dossier Section 1.0).

The Plant Health and Seeds Inspectorate (PHSI), part of APHA, execute plant health policy, except forestry matters, in England and Wales under a Memorandum of Understanding with DEFRA and with the Welsh Government. In Scotland, this role is carried out by inspectors in the Rural Payments and Inspections Division and the Horticulture and Marketing Unit, in SASA. PHSI and Scottish inspectors carry out import, export, monitoring and survey inspections, issue phytosanitary certificates and oversee import controls, issuing of plant passports and eradication campaigns (Dossier Section 1.0).

The sanitary status of production areas is controlled by the producers as part of these schemes, as well as via official inspections by APHA Plant Health and Seeds Inspectors (PHSI) or with SASA (Scotland) (Dossier Section 1.0).

All producers are subject to regular inspections by plant health inspectors as part of either Plant Passporting audits or a programme of general surveillance of all registered producers (Dossier Section 1.0).

The UK plant health inspectors monitor for pests and diseases during crop certification and passporting inspections. In addition, the PHSI (in England and Wales) carry out a programme of Quarantine Surveillance in registered premises, inspecting plants grown and moving within the UK market. Similar arrangements operate in Scotland (Dossier Section 1.0).

According to the Dossier Section 1.0 the objective of the quarantine surveillance is to ensure that:

- the plant passport regime is being operated effectively.
- quarantine organisms are not spread on plants and plant produce which are not subject to plant passporting.
- the UK plant health authorities have early warning of any new threat from a previously unknown pest or disease which has become established within the UK.
- plant health authorities can take informed decisions on the scope and operation of the plant passport regime.

According to the Dossier Section 1.0 the quarantine surveillance programme centres on a risk-based selection of premises to visit, based on size, types of plants grown, source of plants and the producer's track record of pest and disease issues. Guidance on visit frequency is given to inspectors to ensure that those sites which present the greatest risk are visited more frequently than those of lower risk. The risk category assigned to a premise determines the frequency of visit:

- very high risk (multiple visits per year);
- high risk (two/three visits per year);
- medium risk (annual visit);
- low risk (once every 3 years).

Inspections are targeted both at the plants or products which present the greatest risk, and also a wider range of plants and plant products which are monitored for more general risks, including those highly polyphagous pests whose range may be unknown or still increasing. The UK inspectors receive comprehensive training on the full range of symptoms caused by pests and diseases, to allow them to detect any new and emerging risks and during a visit to a nursery they are free to inspect any plants on that nursery. Samples of pests and plants showing any suspicious symptoms are routinely sent to the laboratory for testing (Dossier Section 1.0).

In the last 3 years, there has been a substantial level of inspection of registered *Acer* producers, both in support of the Plant Passporting scheme (checks are consistent with EU legislation, with a minimum of one a year for authorised operators) and as part of the Quarantine Surveillance programme (Great Britain uses the same framework for its surveillance programme as the EU) (Dossier Section 1.0).

Plant material is regularly monitored for plant health issues. Pest monitoring is carried out by trained nursery staff via crop walking and records kept of this monitoring. Qualified agronomists also undertake crop walks to verify the producer's assessments. Curative or preventative actions are implemented together with an assessment of phytosanitary risk. Unless a pest can be immediately and definitively identified as non-quarantine, growers are required to treat it as a suspect quarantine pest and notify the competent authority (Dossier Section 1.0).

The crops are inspected visually on a regular basis by competent nursery staff as part of the growing process. All plants are also carefully inspected by nurseries on arrival and dispatch for any plant health issues (Dossier Section 3.0).

It is a legal requirement under the UK Plant Health law for any person in charge of a premise to notify the Competent Authority of the presence or suspected presence, of a plant pest. The requirement is not limited to those organisms listed in the UK legislation but is also required for any organism not normally present in the UK which is likely to be injurious to plants (Dossier Section 1.0).

The nurseries follow the Plant Health Management Standard issued by the Plant Healthy Certification Scheme of which DEFRA, the Royal Horticultural Society and others contribute to via The Plant Health Alliance Steering Group (Dossier Section 3.0).

The UK surveillance is based on visual inspection with samples taken from symptomatic material, and where appropriate, samples taken from asymptomatic material (e.g. plants, tubers, soil, watercourses). According to the Dossier Section 3.0, for sites with the likelihood of multiple pest and host combinations (e.g. ornamental and retail sites) standard methods are used for site selection and visit frequency, whereby clients are assessed taking into account business activity, size of business and source material, so for example a large propagator using third country material receives 10 visits per year whilst a small retailer selling locally sourced material is visited once every second year. Where pest specific guidelines are absent Inspectors select sufficient plants to give a 95% probability of detecting symptoms randomly distributed on 1.5% of plants in a batch/consignment. For inspections of single hosts, possibly with multiple pests, survey site selection is often directed to specific locations identified by survey planners, for example 0.5% of ware potato production land is annually sampled for potato cyst nematode (PCN) with farms randomly selected and sampled at a rate of 50 cores per hectare (Dossier Section 3.0).

During production, in addition to the general health monitoring of the plants by the nurseries, official growing season inspections are undertaken by the UK Plant Health Service at an appropriate time, taking into consideration factors such as the likelihood of pest presence and growth stage of the crop. Where appropriate this could include sampling and laboratory analysis. Official sampling and analysis could also be undertaken nearer to the point of export depending on the type of analysis and the import requirements of the country being exported to. Samples are generally taken on a representative sample of plants, in some cases however where the consignment size is quite small all plants are sampled. Magnification equipment is provided to all inspectors as part of their standard equipment and is used during inspections when appropriate (Dossier Section 3.0).

All residues or waste materials shall be assessed for the potential to host, harbour and transmit pests (Dossier Section 1.0).

Incoming plant material and other goods such as packaging material and growing media, that have the potential to be infected or harbour pests, are checked on arrival. Growers have procedures in place to quarantine any suspect plant material and to report findings to the authorities (Dossier Section 1.0).

3.3.4. Pest management during production

Crop protection is achieved using a combination of measures including approved plant protection products, biological control or physical measures. Plant protection products are only used when necessary and records of all plant protection treatments are kept (Dossier Section 1.0).

Pest and disease pressure varies from season to season. Product application takes place only when required and depends on situation (disease pressure, growth stage, etc., and environmental factors) at that time. Subject to this variation in pest pressure, in some seasons few, if any, pesticides are applied; in others it is sometimes necessary to apply preventative and/or control applications of pesticides. In many circumstances also, biological control is used to control outbreaks, rather than using chemical treatments.

Examples of typical treatments used against mildew, *Botrytis*, spider mites, aphids and thrips are detailed in the Dossier Section 3. These would be applied at the manufacturers recommended rate and intervals (Dossier Section 3.0).

There are no specific measures/treatments against the soil pests. However, containerised plants are grown in trays on top of protective plastic membranes to prevent contact with soil. Membranes are regularly refreshed when needed. Alternatively, plants may be grown on raised galvanised steel benches stood on gravel as a barrier between the soil and bench feet and/or concreted surfaces (Dossier Section 3.0).

Post-harvest and through the autumn and winter, nursery management is centred on pest and disease prevention and maintaining good levels of nursery hygiene. Leaves, pruning residues and weeds are all removed from the nursery to reduce the number of overwintering sites for pests and diseases (Dossier Section 1.0).

3.3.5. Inspections before export

The UK NPPO carries out inspections and testing where required by the country of destination's plant health legislation, to ensure all requirements are fulfilled and a valid phytosanitary certificate with the correct additional declarations is issued (Dossier Section 1.0).

Separate to any official inspection, plant material is checked by growers for plant health issues prior to dispatch (Dossier Section 1.0).

A final pre-export inspection is undertaken as part of the process of issuing a phytosanitary certificate. These inspections are generally undertaken as near to the time of export as possible, usually within 1-2 days, and not more than 2 weeks before export. Phytosanitary certificates are only issued if the commodity meets the required plant health standards after inspection and/or testing according to appropriate official procedures (Dossier Section 3.0).

The protocol for plants infested by pests during inspections before export is to treat the plants, if they are on site for a sufficient period of time or to destroy any plants infested by pests otherwise. All other host plants in the nursery would be treated. The phytosanitary certificate for export will not be issued until the UK Plant Health inspectors confirm that the plants are free from pests (Dossier Section 3.0).

3.3.6. Export procedure

Bare root plants are lifted, washed free from soil with a low-pressure washer in the outdoors nursery area away from packing/cold store area (Dosser Section 3.0).

The maximum time from the harvesting of bare root plants to the export is up to 5 months. Plants are stored in cold store or heeled into soil (but before export they would be washed to ensure freedom from soil). Most plants for export would be kept in cold store (Dossier Section 3.0).

The preparation of the commodities for export is carried out inside the nurseries in a closed environment, e.g. packing shed (Dossier Section 3.0).

The commodities are sent by lorry and can be exported either between November and April or any time of the year, depending on the type of the commodity. Bare root plants are exported from November and April, while rooted plants in pots are mainly exported between September and May, although these can be moved at any point in the year to fulfil consumer demand. Sensitive plants are occasionally transported by temperature-controlled lorry if weather conditions during transit are likely to be very cold (Dossier Section 1.0).

According to the Dossier Section 3.0, the commodities are dispatched as single bare root trees or in bundles as follows:

- 25 or 50 for seedlings or transplants;
- 5, 10 or 15 for whips.

Bare root plants are placed in bundles, wrapped in polythene and packed and distributed on ISPM 15 certified wooden pallets or metal pallets. Alternatively, they may be placed in pallets which are then wrapped in polythene. Small volume orders may be packed in waxed cardboard cartons or polythene bags and dispatched via courier (Dossier Sections 1.0 and 3.0).

Rooted plants in pots are transported on Danish trolleys for smaller containers or certified pallets or individually in pots for larger containers (Dossier Section 1.0).

4. Identification of pests potentially associated with the commodity

The search for potential pests associated with the commodity rendered 1,816 species (see Microsoft Excel® file in Appendix F).

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.

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

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

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

Pests that fulfilled all criteria were selected for further evaluation.

Table 4 presents an overview of the evaluation of the 36 EU-quarantine pest species that are reported as associated with the commodity.

Of these 36 EU-quarantine pest species evaluated, six species are present in the UK and all six species (*Bemisia tabaci* (European populations), *Cryphonectria parasitica*, *Entoleuca mammata*, *Meloidogyne fallax*, *Phytophthora ramorum* and *Scirtothrips dorsalis*) can be associated with the commodity and hence were selected for further evaluation.

Table 4: Overview of the evaluation of the 36 EU-quarantine pest species known to use *Acer* spp. as a host plant for their relevance for this opinion

No.	Pest name according to EU legislation[(a)]	EPPO code	Group	Pest present in the UK	*Acer* confirmed as a host (reference)	Pest can be associated with the commodity	Pest relevant for the Opinion
1	*Anisandrus maiche* as Scolytinae spp. (non-European)	ANIDMA	Insects	No	*Acer barbinerve*, *A. mandshuricum*, *A. pictum* var. *mono* (EPPO, online)	Not assessed	No
2	*Anoplophora chinensis*	ANOLCN	Insects	No	*Acer campestre*, *A. palmatum*, *A. platanoides*, *A. pseudoplatanus* (EPPO, online)	Not assessed	No
3	*Anoplophora glabripennis*	ANOLGL	Insects	No	*Acer platanoides*, *A. pseudoplatanus* (EPPO, online)	Not assessed	No
4a	*Bemisia tabaci* (non-European populations)	BEMITA	Insects	No	*Acer palmatum* (CABI, online)	Not assessed	No
4b	*Bemisia tabaci* (European populations)	BEMITA	Insects	Yes	*Acer palmatum* (CABI, online)	Yes	Yes
5	*Candidatus* Phytoplasma fragariae related strains (YN-169, YN-10G)	PHYPFG	Phytoplasmas	No (for the related strains)	*Acer* (EPPO, online)	Not assessed	No
6	*Choristoneura conflictana*	ARCHCO	Insects	No	*Acer negundo* (Robinson et al., online)	Not assessed	No
7	*Choristoneura parallela*	CHONPA	Insects	No	*Acer rubrum* (Robinson et al., online)	Not assessed	No
8	*Choristoneura rosaceana*	CHONRO	Insects	No	*Acer palmatum* (EPPO, online)	Not assessed	No
9	*Cnestus mutilatus* as Scolytinae spp. (non-European)	XYLSMU	Insects	No	*Acer palmatum* (EPPO, online)	Not assessed	No
10	*Corthylus punctatissimus* as Scolytinae spp. (non-European)	CORHPU	Insects	No	*Acer platanoides* (CABI, online)	Not assessed	No
11	*Cryphonectria parasitica*	ENDOPA	Fungi	Yes	*Acer palmatum* (Farr and Rossman, online)	Yes	Yes
12	*Davidsoniella virescens*	CERAVI	Fungi	No	*Acer campestre* (CABI, online)	Not assessed	No
13	*Diabrotica undecimpunctata undecimpunctata*	DIABUN	Insects	No	*Acer* (EPPO, online)	Not assessed	No
14	*Entoleuca mammata*	HYPOMA	Fungi	Yes	*Acer* (Hawksworth, 1972)	Yes	Yes
15	*Euwallacea fornicatus* sensu lato (including: *Euwallacea fornicatus* sensu stricto, *Euwallacea fornicatior*, *Euwallacea kuroshio* and *Euwallacea perbrevis*)	XYLBFO EUWAWH EUWAFO EUWAKU EUWAPE	Insects	No	*Acer palmatum* (EPPO, online)	Not assessed	No
16	*Euwallacea interjectus* as Scolytinae spp. (non-European)	XYLBIN	Insects	No	*Acer negundo* (EPPO, 2020)	Not assessed	No

No.	Pest name according to EU legislation[(a)]	EPPO code	Group	Pest present in the UK	*Acer* confirmed as a host (reference)	Pest can be associated with the commodity	Pest relevant for the Opinion
17	*Euwallacea validus* as Scolytinae spp. (non-European)	XYLBVA	Insects	No	*Acer pensylvanicum* (EPPO, 2020)	Not assessed	No
18	*Longidorus diadecturus*	LONGDI	Nematodes	No	*Acer* (Xu and Zhao, 2019)	Not assessed	No
19	*Lopholeucaspis japonica*	LOPLJA	Insects	No	*Acer palmatum* (CABI, online; García Morales et al., online)	Not assessed	No
20	*Lycorma delicatula*	LYCMDE	Insects	No	*Acer palmatum, A. platanoides, A. pseudoplatanus* (EPPO, online)	Not assessed	No
21	*Meloidogyne chitwoodi*	MELGCH	Nematodes	No	*Acer palmatum* (Ferris, online)	Not assessed	No
22	*Meloidogyne fallax*	MELGFA	Nematodes	Yes	*Acer palmatum* (Ferris, online)	Yes	Yes
23	*Monarthrum mali* as Scolytinae spp. (non-European)	MNTHMA	Insects	No	*Acer rubrum* (EPPO, 2020)	Not assessed	No
24	*Neocosmospora ambrosia*	FUSAAM	Fungi	No	Uncertain	Not assessed	No
25	*Neocosmospora euwallaceae*	FUSAEW	Fungi	No	*Acer palmatum* (EPPO, online)	Not assessed	No
26	*Oemona hirta*	OEMOHI	Insects	No	*Acer palmatum* (EPPO, online)	Not assessed	No
27	*Phymatotrichopsis omnivora*	PHMPOM	Fungi	No	*Acer negundo*, *A. saccharinum* (Farr and Rossman, online)	Not assessed	No
28a	*Phytophthora ramorum* (EU isolates)	PHYTRA	Oomycetes	No	*Acer pseudoplatanus* (EPPO, online)	Not assessed	No
28b	*Phytophthora ramorum* (non-EU isolates)	PHYTRA	Oomycetes	Yes	*Acer pseudoplatanus* (EPPO, online)	Yes	Yes
29	*Popillia japonica*	POPIJA	Insects	No	*Acer palmatum, A. platanoides* (EPPO, online)	Not assessed	No
30	*Scirtothrips dorsalis*	SCITDO	Insects	Yes	*Acer palmatum* (CABI, online)	Yes	Yes
31	*Stenoscelis hylastoides* as Scolytinae spp. (non-European)	STEWHY	Insects	No	*Acer* (Plant Pest Information Network, online)	Not assessed	No
32	*Trirachys sartus*	AELSSA	Insects	No	*Acer* (EPPO, online)	Not assessed	No
33	*Xiphinema americanum* sensu stricto	XIPHAA	Nematodes	No	*Acer negundo*, *A. saccharum* (Xu and Zhao, 2019)	Not assessed	No
34	*Xiphinema rivesi* (non-EU populations)	XIPHRI	Nematodes	No	*Acer palmatum* (Xu and Zhao, 2019)	Not assessed	No
35	*Xylella fastidiosa*	XYLEFA	Bacteria	No	*Acer platanoides* (CABI, online), *A. pseudoplatanus*	Not assessed	No
36	*Xylosandrus compactus* as Scolytinae spp. (non-European)	XYLSCO	Insects	No	*Acer pseudoplatanus* (Francardi et al., 2017)	Not assessed	No

(a): Commission Implementing Regulation (EU) 2019/2072.

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

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

a) the pest is present in the UK;
b) the pest is (i) absent or (ii) has a limited distribution in the EU;
c) the commodity 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.

For non-regulated species with a limited distribution (i.e. present in one or a few EU MSs) and fulfilling the other criteria (i.e. c, d and e), either one of the following conditions should be additionally fulfilled for the pest to be further evaluated:

- official phytosanitary measures have been adopted in at least one EU MS;
- any other reason justified by the working group (e.g. recent evidence of presence).

Pests that fulfilled the above listed criteria were selected for further evaluation.

Based on the information collected, 1,774 potential pests known to be associated with the species commodity 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 the Appendix F (Microsoft Excel® file). Of the evaluated EU non-quarantine pests, four pests (*Coniella castaneicola*, *Eulecanium excrescens*, *Meloidogyne mali* and *Takahashia japonica*) were selected for further evaluation because they met all of the selection criteria. More information on these four pests can be found in the pest datasheets (Appendix A).

4.3. Overview of interceptions

Data on the interception of harmful organisms on plants of *A. campestre* can provide information on some of the organisms that can be present on *A. campestre* despite the current measures taken. According to EUROPHYT, online (accessed on 22 December 2022) and TRACES-NT, online (accessed on 22 December 2022), there were no interceptions of plants for planting of *A. campestre* from the UK destined to the EU Member States due to the presence of harmful organisms between the years 1995 and 22 December 2022.

4.4. List of potential pests not further assessed

From the list of pests not selected for further evaluation, the Panel highlighted 10 species (see Appendix E) for which currently available evidence provides no reason to select these species for further evaluation in this Opinion. A specific justification of the inclusion in this list is provided for each species in Appendix E.

4.5. Summary of pests selected for further evaluation

The 10 pests satisfying all the relevant criteria listed above in the Sections 4.1 and 4.2 are included in Table 5. The effectiveness 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	Name used in the EU legislation	Taxonomic information	Group	Regulatory status
1	*Bemisia tabaci*	BEMITA	*Bemisia tabaci* Genn. (European populations)	Hemiptera Aleyrodidae	Insects	EU Protected Zone quarantine pest according to Commission Implementing Regulation (EU) 2019/2072
2	*Coniella castaneicola*	–	–	Diaporthales Schizoparmaceae	Fungi	Not regulated in the EU
3	*Cryphonectria parasitica*	ENDOPA	*Cryphonectria parasitica* (Murrill) Barr	Diaporthales Cryphonectriaceae	Fungi	EU Protected Zone quarantine pest according to Commission Implementing Regulation (EU) 2019/2072
4	*Entoleuca mammata*	HYPOMA	*Entoleuca mammata* (Wahlenb.) Rogers and Ju	Xylariales Xylariaceae	Fungi	EU Protected Zone quarantine pest according to Commission Implementing Regulation (EU) 2019/2072
5	*Eulecanium excrescens*	–	–	Hemiptera Coccidae	Insects	Not regulated in the EU
6	*Meloidogyne fallax*	MELGFA	*Meloidogyne fallax* Karssen	Rhabditida Meloidogynidae	Nematodes	EU Quarantine Pest according to Commission Implementing Regulation (EU) 2019/2072
7	*Meloidogyne mali*	MELGMA	–	Rhabditida Meloidogynidae	Nematodes	Not regulated in the EU
8	*Phytophthora ramorum*	PHYTRA	*Phytophthora ramorum* (non-EU isolates) Werres, De Cock & Man in 't Veld	Peronosporales Peronosporaceae	Oomycetes	EU Quarantine Pest according to Commission Implementing Regulation (EU) 2019/2072
9	*Scirtothrips dorsalis*	SCITDO	*Scirtothrips dorsalis* Hood	Thysanoptera Thripidae	Insects	EU Quarantine Pest according to Commission Implementing Regulation (EU) 2019/2072
10	*Takahashia japonica*	TAKAJA	–	Hemiptera Coccidae	Insects	Not regulated in the EU

5. Risk mitigation measures

For the selected pests (Table 5), the Panel evaluated the likelihood that they could be present in the *A. campestre* nurseries by evaluating the possibility that the commodity in the export nurseries is infested either by:

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

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

5.1. Risk mitigation measures applied in the UK

With the information provided by the UK (Dossier Sections 1.0 and 3.0), the Panel summarised the risk mitigation measures (see Table 6) that are implemented in the production nursery.

Table 6: Overview of implemented risk mitigation measures for *Acer campestre* plants designated for export to the EU from the UK

Number	Risk mitigation measure	Implementation in the UK
1	Registration of production sites	All producers are registered as professional operators with the UK Competent Authority via APHA for England and Wales or SASA for Scotland and are authorised to issue the UK plant passports, verifying they meet the required national sanitary standards (Dossier Section 1.0).
2	Physical separation	Producers do not set aside separate areas for export production. All plants within the UK nurseries are grown under the same phytosanitary measures, meeting the requirements of the UK Plant Passporting regime (Dossier Section 1.0).
3	Certified plant material	Seeds purchased in the UK are certified under The Forest Reproductive Material (Great Britain) Regulations 2002. Seedlings sourced in the UK are certified with UK Plant Passports. Seedlings from the EU countries are certified with phytosanitary certificates. Many plants are obtained from EU (mostly the Netherlands) and New Zealand. These are the only two sources of the plants obtained from abroad (Dossier Section 3.0).
4	Growing media	The growing media is virgin peat or peat-free compost. This compost is heat-treated by commercial suppliers during production to eliminate pests and diseases. It is supplied in sealed bulk bags or shrink-wrapped bales and stored off the ground on pallets, these are free from contamination. Where delivered in bulk, compost is kept in a dedicated bunker, either indoors or covered by tarpaulin outdoors and with no risk of contamination with soil or other material (Dossier Section 1.0).
5	Surveillance, monitoring and sampling	For additional information see Section 3.3.3 Pest monitoring during production.
6	Hygiene measures	Growers must assess weeds and volunteer plants for the potential to host and transmit plant pests and have an appropriate programme of weed management in place on the nursery (Dossier Section 1.0). General hygiene measures are undertaken as part of routine nursery production, including disinfection of tools and equipment between batches/lots (Dossier Section 1.0) and different plant species (Dossier Sections 1.0 and 3.0). The tools are dipped and wiped with a clean cloth between trees to reduce the risk of virus and bacterial transfer between subjects. There are various disinfectants available, with Virkon S being a common example (Dossier Section 3.0).
7	Removal of infested plant material	Post-harvest and through the autumn and winter, nursery management is centred on pest and disease prevention and maintaining good levels of nursery hygiene. Leaves, pruning and weeds are all removed from the nursery to reduce the number of over wintering sites for pests and diseases (Dossier Section 1.0).
8	Irrigation water	Water for irrigation is routinely sampled and sent for analysis (Dossier Section 1.0).
9	Application of pest control products	Crop protection is achieved using a combination of measures including approved plant protection products, biological control or physical measures. Plant protection products are only used when necessary and records of all plant protection treatments are kept (Dossier Section 1.0). Examples of typical treatments used against mildew, *Botrytis*, spider mites, aphids and thrips are detailed in the Dossier Section 3. These would be applied at the manufacturers recommended rate and intervals (Dossier Section 3.0).
10	Measures against soil pests	There are no specific measures/treatments against the soil pests. However, containerised plants are grown in trays on top of protective plastic membranes to prevent contact with soil. Membranes are regularly refreshed when needed. Alternatively, plants may be grown on raised galvanised steel benches stood on gravel as a barrier between the soil and bench feet and/or concreted surfaces (Dossier Section 3.0).
11	Inspections and management of plants before export	The UK NPPO carries out inspections and testing where required by the country of destination's plant health legislation, to ensure all requirements are fulfilled and a valid phytosanitary certificate with the correct additional declarations is issued (Dossier Section 1.0).

Number	Risk mitigation measure	Implementation in the UK
		Separate to any official inspection, plant material is checked by growers for plant health issues prior to dispatch (Dossier Section 1.0). A final pre-export inspection is undertaken as part of the process of issuing a phytosanitary certificate. These inspections are generally undertaken as near to the time of export as possible, usually within 1-2 days, and not more than 2 weeks before export. Phytosanitary certificates are only issued if the commodity meets the required plant health standards after inspection and/or testing according to appropriate official procedures (Dossier Section 3.0). The protocol for plants infested by pests during inspections before export is to treat the plants, if they are on site for a sufficient period of time or to destroy any plants infested by pests otherwise. All other host plants in the nursery would be treated. The phytosanitary certificate for export will not be issued until the UK Plant Health inspectors confirm that the plants are free from pests (Dossier Section 3.0).
12	Separation during transport to the destination	According to the Dossier Section 3.0, the commodities are dispatched as single bare root trees or in bundles as follows: – 25 or 50 for seedlings or transplants; – 5, 10 or 15 for whips. Bare root plants are placed in bundles, wrapped in polythene and packed and distributed on ISPM 15 certified wooden pallets or metal pallets. Alternatively, they may be placed in pallets which are then wrapped in polythene. Small volume orders may be packed in waxed cardboard cartons or polythene bags and dispatched via courier (Dossier Sections 1.0 and 3.0). Rooted plants in pots are transported on Danish trolleys for smaller containers or certified pallets or individually in pots for larger containers (Dossier Section 1.0).

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

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

All the relevant information including the related uncertainties deriving from the limiting factors used in the evaluation are summarised in a pest data sheet provided in Appendix A. Based on this information, for each selected relevant pest, an expert judgement is given for the likelihood of pest freedom taking into consideration the risk mitigation measures and their combination acting on the pest.

An overview of the evaluation of each relevant pest is given in the sections below (Sections 5.2.1–5.2.9). The outcome of the EKE regarding pest freedom after the evaluation of the currently proposed risk mitigation measures is summarised in Section 5.2.10.

5.2.1. Overview of the evaluation of *Bemisia tabaci* (European populations) (Hemiptera; Aleyrodidae)

Overview of the evaluation of *Bemisia tabaci* (European populations) for bundles of whips and seedlings					
Rating of the likelihood of pest freedom	Pest free with some exceptional cases (based on the Median).				
Percentile of the distribution	5%	25%	Median	75%	95%
Proportion of pest-free bundles	**9,967** out of 10,000 bundles	**9,981** out of 10,000 bundles	**9,989** out of 10,000 bundles	**9,995** out of 10,000 bundles	**9,999.2** out of 10,000 bundles

Percentile of the distribution	5%	25%	Median	75%	95%
Proportion of infested bundles	**0.8** out of 10,000 bundles	**5** out of 10,000 bundles	**11** out of 10,000 bundles	**19** out of 10,000 bundles	**33** out of 10,000 bundles
Summary of the information used for the evaluation	**Possibility that the pest could become associated with the commodity** The pest is present in the UK, with few occurrences but continuously intercepted. The UK outbreaks of *B. tabaci* have been restricted to greenhouses. The pest is extremely polyphagous. Other traded plants present in the surroundings of the nursery could be a source of the pest. Polytunnels and glasshouses in the nurseries could act as a reservoir of the pest. The pest could go undetected during inspections. **Measures taken against the pest and their efficacy** General measures taken by the nurseries are effective against the pest. These measures include (a) inspections, surveillance, monitoring, sampling and laboratory testing; (b) hygiene measures; (c) application of pest control products and (d) removal of infested plant material. **Interception records** In the EUROPHYT/TRACES-NT database there are no records of notification of *Acer* plants for planting neither from the UK nor from other countries due to the presence of *B. tabaci* between the years 1995 and December 2022 (EUROPHYT/TRACES-NT, online). There were four interceptions of *B. tabaci* from the UK in 2007 and 2015 on other plants already planted likely produced under protected conditions (EUROPHYT, online). **Shortcomings of current measures/procedures** None. **Main uncertainties** – Possibility of development of the pest outside greenhouses. – Pest abundance in the nursery and the surroundings. – The precision of surveillance and the application of measures targeting the pest. – Host suitability of *Acer* spp. to the pest.				

Overview of the evaluation of *Bemisia tabaci* (European populations) for bare root plants/trees up to 7 years old					
Rating of the likelihood of pest freedom	Pest free with some exceptional cases (based on the Median).				
Percentile of the distribution	5%	25%	Median	75%	95%
Proportion of pest-free plants	**9,951** out of 10,000 plants	**9,971** out of 10,000 plants	**9,984** out of 10,000 plants	**9,993** out of 10,000 plants	**9,999** out of 10,000 plants
Percentile of the distribution	5%	25%	Median	75%	95%
Proportion of infested plants	**1** out of 10,000 plants	**7** out of 10,000 plants	**16** out of 10,000 plants	**29** out of 10,000 plants	**49** out of 10,000 plants
Summary of the information used for the evaluation	**Possibility that the pest could become associated with the commodity** The pest is present in the UK, with few occurrences but continuously intercepted. The UK outbreaks of *B. tabaci* have been restricted to greenhouses. The pest is extremely polyphagous. Other traded plants present in the surroundings of the nursery could be a source of the pest. Polytunnels and glasshouses in the nurseries could act as a reservoir of the pest. The pest could go undetected during inspections.				

	Measures taken against the pest and their efficacy General measures taken by the nurseries are effective against the pest. These measures include (a) inspections, surveillance, monitoring, sampling and laboratory testing; (b) hygiene measures; (c) application of pest control products and (d) removal of infested plant material. **Interception records** In the EUROPHYT/TRACES-NT database there are no records of notification of *Acer* plants for planting neither from the UK nor from other countries due to the presence of *B. tabaci* between the years 1995 and December 2022 (EUROPHYT/TRACES-NT, online). There were four interceptions of *B. tabaci* from the UK in 2007 and 2015 on other plants already planted likely produced under protected conditions (EUROPHYT, online). **Shortcomings of current measures/procedures** None. **Main uncertainties** – Possibility of development of the pest outside greenhouses. – Pest abundance in the nursery and the surroundings. – The precision of surveillance and the application of measures targeting the pest. – Host suitability of *Acer* spp. to the pest.

Overview of the evaluation of *Bemisia tabaci* (European populations) for plants in pots up to 15 years old

Rating of the likelihood of pest freedom	Pest free with some exceptional cases (based on the Median).				
Percentile of the distribution	5%	25%	Median	75%	95%
Proportion of pest-free plants	**9,927** out of 10,000 plants	**9,956** out of 10,000 plants	**9,974** out of 10,000 plants	**9,988** out of 10,000 plants	**9,997** out of 10,000 plants
Percentile of the distribution	5%	25%	Median	75%	95%
Proportion of infested plants	**3** out of 10,000 plants	**12** out of 10,000 plants	**26** out of 10,000 plants	**44** out of 10,000 plants	**73** out of 10,000 plants
Summary of the information used for the evaluation	**Possibility that the pest could become associated with the commodity** The pest is present in the UK, with few occurrences but continuously intercepted. The UK outbreaks of *B. tabaci* have been restricted to greenhouses. The pest is extremely polyphagous. Other traded plants present in the surroundings of the nursery could be a source of the pest. Polytunnels and glasshouses in the nurseries could act as a reservoir of the pest. The pest could go undetected during inspections. **Measures taken against the pest and their efficacy** General measures taken by the nurseries are effective against the pest. These measures include (a) inspections, surveillance, monitoring, sampling and laboratory testing; (b) hygiene measures; (c) application of pest control products and (d) removal of infested plant material. **Interception records** In the EUROPHYT/TRACES-NT database there are no records of notification of *Acer* plants for planting neither from the UK nor from other countries due to the presence of *B. tabaci* between the years 1995 and December 2022 (EUROPHYT/TRACES-NT, online). There were four interceptions of *B. tabaci* from the UK in 2007 and 2015 on other plants already planted likely produced under protected conditions (EUROPHYT, online). **Shortcomings of current measures/procedures** None.				

	Main uncertainties – Possibility of development of the pest outside greenhouses. – Pest abundance in the nursery and the surroundings. – The precision of surveillance and the application of measures targeting the pest. – Host suitability of *Acer* spp. to the pest.

For more details, see relevant pest data sheet on *Bemisia tabaci* (European populations) (Section A.1 in Appendix A).

5.2.2. Overview of the evaluation of *Coniella castaneicola* (Diaporthales; Schizoparmaceae)

Overview of the evaluation of *Coniella castaneicola* for bundles of whips and seedlings					
Rating of the likelihood of pest freedom	Pest free with some exceptional cases (based on the Median).				
Percentile of the distribution	5%	25%	Median	75%	95%
Proportion of pest-free bundles	**9,847** out of 10,000 bundles	**9,920** out of 10,000 bundles	**9,955** out of 10,000 bundles	**9,977** out of 10,000 bundles	**9,994** out of 10,000 bundles
Percentile of the distribution	5%	25%	Median	75%	95%
Proportion of infected bundles	**6** out of 10,000 bundles	**23** out of 10,000 bundles	**45** out of 10,000 bundles	**80** out of 10,000 bundles	**153** out of 10,000 bundles
Summary of the information used for the evaluation	**Possibility that the pest could become associated with the commodity** *Coniella castaneicola* is present in the UK, although reports are still scattered. Despite there is uncertainty on the host status of *A. campestre*, *Acer* sp. is reported as a host of the pathogen. Infection may occur by means of conidia through wounds. Infection courts represented by wounds and injuries of biotic and abiotic origin are expected to be present. The hosts can be present either inside or in the surroundings of the nurseries. Altogether, this suggests that the association with the commodity may be possible. **Measures taken against the pest and their efficacy** General measures taken by the nurseries are effective against the pathogen. These measures include (a) the use of certified plant material; (b) the treatment of the growing media; (c) inspections, surveillance, monitoring, sampling and laboratory testing; (d) the removal of infected plant material and (e) application of pest control products. **Interception records** In the EUROPHYT/TRACES-NT database there are no records of notification of *Acer* plants for planting neither from the UK nor from other countries due to the presence of *C. castaneicola* between the years 1995 and December 2022 (EUROPHYT/TRACES-NT, online). **Shortcomings of current measures/procedures** None observed. **Main uncertainties** – The level of susceptibility of *Acer* spp. to the pathogen. – Whether symptoms on *Acer* spp. are recognisable and may be promptly detected. – The presence/abundance of the pathogen in the area where the nurseries is located. – How accurate is the removal of infected leaves which may represent a source of inoculum from the ground. – Effect of fungicide treatments against the pathogen.				

Overview of the evaluation of *Coniella castaneicola* for bare root plants/trees up to 7 years old					
Rating of the likelihood of pest freedom	Pest free with some exceptional cases (based on the Median).				
Percentile of the distribution	5%	25%	Median	75%	95%
Proportion of pest-free plants	**9,841** out of 10,000 plants	**9,922** out of 10,000 plants	**9,958** out of 10,000 plants	**9,981** out of 10,000 plants	**9,996** out of 10,000 plants
Percentile of the distribution	5%	25%	Median	75%	95%
Proportion of infected plants	**4** out of 10,000 plants	**19** out of 10,000 plants	**42** out of 10,000 plants	**78** out of 10,000 plants	**159** out of 10,000 plants
Summary of the information used for the evaluation	**Possibility that the pest could become associated with the commodity** *Coniella castaneicola* is present in the UK, although reports are still scattered. Despite there is uncertainty on the host status of *A. campestre*, *Acer* sp. is reported as a host of the pathogen. Infection may occur by means of conidia through wounds. Infection courts represented by wounds and injuries of biotic and abiotic origin are expected to be frequent. The hosts can be present either inside or in the surroundings of the nurseries. Altogether, this suggests that the association with the commodity may be possible. **Measures taken against the pest and their efficacy** General measures taken by the nurseries are effective against the pathogen. These measures include (a) the use of certified plant material; (b) the treatment of the growing media; (c) inspections, surveillance, monitoring, sampling and laboratory testing; (d) the removal of infected plant material and (e) application of pest control products. **Interception records** In the EUROPHYT/TRACES-NT database there are no records of notification of *Acer* plants for planting neither from the UK nor from other countries due to the presence of *C. castaneicola* between the years 1995 and December 2022 (EUROPHYT/TRACES-NT, online). **Shortcomings of current measures/procedures** None observed. **Main uncertainties** – The level of susceptibility of *Acer* spp. to the pathogen. – Whether symptoms on *Acer* spp. are recognisable and may be promptly detected. – The presence/abundance of the pathogen in the area where the nurseries is located. – How accurate is the removal of infected leaves which may represent a source of inoculum from the ground. – Effect of fungicide treatments against the pathogen.				

Overview of the evaluation of *Coniella castaneicola* for plants in pots up to 15 years old					
Rating of the likelihood of pest freedom	Extremely frequently pest free (based on the Median).				
Percentile of the distribution	5%	25%	Median	75%	95%
Proportion of pest-free plants	**9,794** out of 10,000 plants	**9,882** out of 10,000 plants	**9,926** out of 10,000 plants	**9,958** out of 10,000 plants	**9,984** out of 10,000 plants
Percentile of the distribution	5%	25%	Median	75%	95%
Proportion of infected plants	**16** out of 10,000 plants	**42** out of 10,000 plants	**74** out of 10,000 plants	**118** out of 10,000 plants	**206** out of 10,000 plants

Summary of the information used for the evaluation	**Possibility that the pest could become associated with the commodity** *Coniella castaneicola* is present in the UK, although reports are still scattered. Despite there is uncertainty on the host status of *A. campestre*, *Acer* sp. is reported as a host of the pathogen. Infection may occur by means of conidia through wounds. Infection courts represented by wounds and injuries of biotic and abiotic origin are expected to be frequent. Plants can be exported during the vegetation period (with leaves). The hosts can be present either inside or in the surroundings of the nurseries. Altogether, this suggests that the association with the commodity may be possible. **Measures taken against the pest and their efficacy** General measures taken by the nurseries are effective against the pathogen. These measures include (a) the use of certified plant material; (b) the treatment of the growing media; (c) inspections, surveillance, monitoring, sampling and laboratory testing; (d) the removal of infected plant material and (e) application of pest control products. **Interception records** In the EUROPHYT/TRACES-NT database there are no records of notification of *Acer* plants for planting neither from the UK nor from other countries due to the presence of *C. castaneicola* between the years 1995 and December 2022 (EUROPHYT/TRACES-NT, online). **Shortcomings of current measures/procedures** None observed. **Main uncertainties** – The level of susceptibility of *Acer* spp. to the pathogen. – Whether symptoms on *Acer* spp. are recognisable and may be promptly detected. – The presence/abundance of the pathogen in the area where the nurseries is located. – How accurate is the removal of infected leaves which may represent a source of inoculum from the ground. – Effect of fungicide treatments against the pathogen.

For more details, see relevant pest data sheet on *Coniella castaneicola* (Section A.2 in Appendix A).

5.2.3. Overview of the evaluation of *Cryphonectria parasitica* (Diaporthales; Cryphonectriaceae)

Overview of the evaluation of *Cryphonectria parasitica* for bundles of whips and seedlings					
Rating of the likelihood of pest freedom	Pest free with some exceptional cases (based on the Median).				
Percentile of the distribution	5%	25%	Median	75%	95%
Proportion of pest-free bundles	**9,963** out of 10,000 bundles	**9,981** out of 10,000 bundles	**9,989** out of 10,000 bundles	**9,995** out of 10,000 bundles	**9,999** out of 10,000 bundles
Percentile of the distribution	5%	25%	Median	75%	95%
Proportion of infected bundles	**1** out of 10,000 bundles	**5** out of 10,000 bundles	**11** out of 10,000 bundles	**19** out of 10,000 bundles	**37** out of 10,000 bundles
Summary of the information used for the evaluation	**Possibility that the pest could become associated with the commodity** *Cryphonectria parasitica* is present in the UK, although not widely distributed, while its main host, i.e. *Castanea* spp., has scattered distribution in the UK. Despite there is high uncertainty on the level of susceptibility of *Acer* spp. to the pathogen, infection courts (e.g. pruning and grafting wounds, accidental breaking of twigs before export) are expected to be present. The main hosts can be present either inside or in the surroundings of the nurseries. Altogether, this suggests that the association with the commodity, although unlikely, may be possible.				

	Measures taken against the pest and their efficacy General measures taken by the nurseries are effective against the pathogen. These measures include (a) the use of certified plant material; (b) inspections, surveillance, monitoring, sampling and laboratory testing; (c) hygiene measures with particular reference to the disinfection of tools and (d) application of pest control products. **Interception records** In the EUROPHYT/TRACES-NT database there are no records of notification of *Acer* plants for planting neither from the UK nor from other countries due to the presence of *C. parasitica* between the years 1995 and December 2022 (EUROPHYT/TRACES-NT, online). **Shortcomings of current measures/procedures** None observed. **Main uncertainties** – The level of susceptibility of *Acer* spp. to the pathogen. – Whether symptoms may be promptly detected. – The presence/abundance of the pathogen in the area where the nurseries is located. – Effect of fungicide treatments against the pathogen. – Whether disinfection of tools is performed using products active against the pathogen.

Overview of the evaluation of *Cryphonectria parasitica* for bare root plants/trees up to 7 years old

Rating of the likelihood of pest freedom	Pest free with some exceptional cases (based on the Median).				
Percentile of the distribution	5%	25%	Median	75%	95%
Proportion of pest-free plants	**9,954** out of 10,000 plants	**9,975** out of 10,000 plants	**9,985** out of 10,000 plants	**9,992** out of 10,000 plants	**9,997** out of 10,000 plants
Percentile of the distribution	5%	25%	Median	75%	95%
Proportion of infected plants	**3** out of 10,000 plants	**8** out of 10,000 plants	**15** out of 10,000 plants	**25** out of 10,000 plants	**46** out of 10,000 plants
Summary of the information used for the evaluation	**Possibility that the pest could become associated with the commodity** *Cryphonectria parasitica* is present in the UK, although not widely distributed, while its main host, i.e. *Castanea* spp., has scattered distribution in the UK. Despite there is high uncertainty on the level of susceptibility of *Acer* spp. to the pathogen, infection courts (e.g. pruning and grafting wounds, accidental breaking of twigs before export) are expected to be present. The main hosts can be present either inside or in the surroundings of the nurseries. Altogether, this suggests that the association with the commodity, although unlikely, may be possible. **Measures taken against the pest and their efficacy** General measures taken by the nurseries are effective against the pathogen. These measures include (a) the use of certified plant material; (b) inspections, surveillance, monitoring, sampling and laboratory testing; (c) hygiene measures with particular reference to the disinfection of tools and (d) application of pest control products. **Interception records** In the EUROPHYT/TRACES-NT database there are no records of notification of *Acer* plants for planting neither from the UK nor from other countries due to the presence of *C. parasitica* between the years 1995 and December 2022 (EUROPHYT/TRACES-NT, online). **Shortcomings of current measures/procedures** None observed.				

	Main uncertainties – The level of susceptibility of *Acer* spp. to the pathogen. – Whether symptoms may be promptly detected. – The presence/abundance of the pathogen in the area where the nurseries is located. – Effect of fungicide treatments against the pathogen. – Whether disinfection of tools is performed using products active against the pathogen.

Overview of the evaluation of *Cryphonectria parasitica* for plants in pots up to 15 years old					
Rating of the likelihood of pest freedom	Pest free with some exceptional cases (based on the Median).				
Percentile of the distribution	5%	25%	Median	75%	95%
Proportion of pest-free plants	**9,940** out of 10,000 plants	**9,967** out of 10,000 plants	**9,981** out of 10,000 plants	**9,990** out of 10,000 plants	**9,997** out of 10,000 plants
Percentile of the distribution	5%	25%	Median	75%	95%
Proportion of infected plants	**3** out of 10,000 plants	**10** out of 10,000 plants	**19** out of 10,000 plants	**33** out of 10,000 plants	**60** out of 10,000 plants
Summary of the information used for the evaluation	**Possibility that the pest could become associated with the commodity** *Cryphonectria parasitica* is present in the UK, although not widely distributed, while its main host, i.e. *Castanea* spp., has scattered distribution in the UK. Despite there is high uncertainty on the level of susceptibility of *Acer* spp. to the pathogen, infection courts (e.g. pruning and grafting wounds, accidental breaking of twigs before export) are expected to be present. The main hosts can be present either inside or in the surroundings of the nurseries. Altogether, this suggests that the association with the commodity, although unlikely, may be possible. **Measures taken against the pest and their efficacy** General measures taken by the nurseries are effective against the pathogen. These measures include (a) the use of certified plant material; (b) inspections, surveillance, monitoring, sampling and laboratory testing; (c) hygiene measures with particular reference to the disinfection of tools and (d) application of pest control products. **Interception records** In the EUROPHYT/TRACES-NT database there are no records of notification of *Acer* plants for planting neither from the UK nor from other countries due to the presence of *C. parasitica* between the years 1995 and December 2022 (EUROPHYT/TRACES-NT, online). **Shortcomings of current measures/procedures** None observed. **Main uncertainties** – The level of susceptibility of *Acer* spp. to the pathogen. – Whether symptoms may be promptly detected. – The presence/abundance of the pathogen in the area where the nurseries is located. – Effect of fungicide treatments against the pathogen. – Whether disinfection of tools is performed using products active against the pathogen.				

For more details, see relevant pest data sheet on *Cryphonectria parasitica* (Section A.3 in Appendix A).

5.2.4. Overview of the evaluation of *Entoleuca mammata* (Xylariales; Xylariaceae)

Overview of the evaluation of *Entoleuca mammata* for bundles of whips and seedlings					
Rating of the likelihood of pest freedom	Pest free with some exceptional cases (based on the Median).				
Percentile of the distribution	5%	25%	Median	75%	95%
Proportion of pest-free bundles	**9,942** out of 10,000 bundles	**9,967** out of 10,000 bundles	**9,983** out of 10,000 bundles	**9,993** out of 10,000 bundles	**9,999.1** out of 10,000 bundles
Percentile of the distribution	5%	25%	Median	75%	95%
Proportion of infected bundles	**0.9** out of 10,000 bundles	**7** out of 10,000 bundles	**17** out of 10,000 bundles	**33** out of 10,000 bundles	**58** out of 10,000 bundles
Summary of the information used for the evaluation	**Possibility that the pest could become associated with the commodity** *Entoleuca mammata* is present in the UK, although not widely distributed. Despite there is uncertainty on the host status of *A. campestre*, other *Acer* spp. are reported as hosts of the pathogen. Mechanical wounds including pruning wounds are expected to be present and may represent infection courts. The hosts can be present either inside or in the surroundings of the nurseries. Altogether, this suggests that the association with the commodity may be possible. **Measures taken against the pest and their efficacy** General measures taken by the nurseries are effective against the pathogen. These measures include (a) the use of certified plant material; (b) inspections, surveillance, monitoring, sampling and laboratory testing; (c) the removal of infected plant material and (d) application of pest control products. **Interception records** In the EUROPHYT/TRACES-NT database there are no records of notification of *Acer* plants for planting neither from the UK nor from other countries due to the presence of *E. mammata* between the years 1995 and December 2022 (EUROPHYT/TRACES-NT, online). **Shortcomings of current measures/procedures** None observed. **Main uncertainties** – The level of susceptibility of *Acer* spp. to the pathogen. – Whether symptoms on *Acer* spp. are recognisable and may be promptly detected. – The presence/abundance of the pathogen in the area where the nurseries is located. – Effect of fungicide treatments against the pathogen.				

Overview of the evaluation of *Entoleuca mammata* for bare root plants/trees up to 7 years old					
Rating of the likelihood of pest freedom	Pest free with some exceptional cases (based on the Median).				
Percentile of the distribution	5%	25%	Median	75%	95%
Proportion of pest-free plants	**9,927** out of 10,000 plants	**9,961** out of 10,000 plants	**9,979** out of 10,000 plants	**9,991** out of 10,000 plants	**9,998** out of 10,000 plants
Percentile of the distribution	5%	25%	Median	75%	95%
Proportion of infected plants	**2** out of 10,000 plants	**9** out of 10,000 plants	**21** out of 10,000 plants	**39** out of 10,000 plants	**73** out of 10,000 plants

Summary of the information used for the evaluation	**Possibility that the pest could become associated with the commodity** *Entoleuca mammata* is present in the UK, although not widely distributed. Despite there is uncertainty on the host status of *A. campestre*, other *Acer* spp. are reported as hosts of the pathogen. Mechanical wounds including pruning wounds are expected to be present and may represent infection courts. The hosts can be present either inside or in the surroundings of the nurseries. Altogether, this suggests that the association with the commodity may be possible. **Measures taken against the pest and their efficacy** General measures taken by the nurseries are effective against the pathogen. These measures include (a) the use of certified plant material; (b) inspections, surveillance, monitoring, sampling and laboratory testing; (c) the removal of infected plant material and (d) application of pest control products. **Interception records** In the EUROPHYT/TRACES-NT database there are no records of notification of *Acer* plants for planting neither from the UK nor from other countries due to the presence of *E. mammata* between the years 1995 and December 2022 (EUROPHYT/TRACES-NT, online). **Shortcomings of current measures/procedures** None observed. **Main uncertainties** – The level of susceptibility of *Acer* spp. to the pathogen. – Whether symptoms on *Acer* spp. are recognisable and may be promptly detected. – The presence/abundance of the pathogen in the area where the nurseries is located. – Effect of fungicide treatments against the pathogen.

Overview of the evaluation of *Entoleuca mammata* for plants in pots up to 15 years old					
Rating of the likelihood of pest freedom	Pest free with some exceptional cases (based on the Median).				
Percentile of the distribution	5%	25%	Median	75%	95%
Proportion of pest-free plants	**9,893** out of 10,000 plants	**9,942** out of 10,000 plants	**9,970** out of 10,000 plants	**9,987** out of 10,000 plants	**9,998** out of 10,000 plants
Percentile of the distribution	5%	25%	Median	75%	95%
Proportion of infected plants	**2** out of 10,000 plants	**13** out of 10,000 plants	**30** out of 10,000 plants	**58** out of 10,000 plants	**107** out of 10,000 plants
Summary of the information used for the evaluation	**Possibility that the pest could become associated with the commodity** *Entoleuca mammata* is present in the UK, although not widely distributed. Despite there is uncertainty on the host status of *A. campestre*, other *Acer* spp. are reported as hosts of the pathogen. Mechanical wounds including pruning wounds are expected to be present and may represent infection courts. The hosts can be present either inside or in the surroundings of the nurseries. Altogether, this suggests that the association with the commodity may be possible. **Measures taken against the pest and their efficacy** General measures taken by the nurseries are effective against the pathogen. These measures include (a) the use of certified plant material; (b) inspections, surveillance, monitoring, sampling and laboratory testing; (c) the removal of infected plant material and (d) application of pest control products. **Interception records** In the EUROPHYT/TRACES-NT database there are no records of notification of *Acer* plants for planting neither from the UK nor from other countries due to the presence of *E. mammata* between the years 1995 and December 2022 (EUROPHYT/TRACES-NT, online).				

	Shortcomings of current measures/procedures None observed. **Main uncertainties** – The level of susceptibility of *Acer* spp. to the pathogen. – Whether symptoms on *Acer* spp. are recognisable and may be promptly detected. – The presence/abundance of the pathogen in the area where the nurseries is located. – Effect of fungicide treatments against the pathogen.

For more details, see relevant pest data sheet on *Entoleuca mammata* (Section A.4 in Appendix A).

5.2.5. Overview of the evaluation of *Eulecanium excrescens* (Hemiptera; Coccidae)

Overview of the evaluation of *Eulecanium excrescens* for bundles of whips and seedlings					
Rating of the likelihood of pest freedom	Pest free with some exceptional cases (based on the Median).				
Percentile of the distribution	5%	25%	Median	75%	95%
Proportion of pest-free bundles	**9,897** out of 10,000 bundles	**9,943** out of 10,000 bundles	**9,972** out of 10,000 bundles	**9,989** out of 10,000 bundles	**9,997.3** out of 10,000 bundles
Percentile of the distribution	5%	25%	Median	75%	95%
Proportion of infested bundles	**2.7** out of 10,000 bundles	**11** out of 10,000 bundles	**28** out of 10,000 bundles	**57** out of 10,000 bundles	**103** out of 10,000 bundles
Summary of the information used for the evaluation	**Possibility that the pest could become associated with the commodity** The pest is present in the UK, and specifically in the location where nurseries are sited. First instar (crawlers) can be easily spread with the wind from the surroundings of the nurseries. The pest is extremely polyphagous. There are host species in the surroundings of the nurseries. An initial infestation of the pest could go undetected or confused with nymphs of other species during inspections. **Measures taken against the pest and their efficacy** General measures taken by the nurseries are effective against the pest. These measures include (a) inspections, surveillance, monitoring, sampling and laboratory testing; (b) hygiene measures; (c) application of pest control products and (d) removal of infested plant material. **Interception records** In the EUROPHYT/TRACES-NT database there are no records of notification of *Acer* plants for planting neither from the UK nor from other countries due to the presence of *E. excrescens* between the years 1995 and December 2022 (EUROPHYT/TRACES-NT, online). **Shortcomings of current measures/procedures** None. **Main uncertainties** – Pest abundance in the nursery and the surroundings. – The efficacy of surveillance and of the application of measures targeting the pest. – Host suitability of *Acer* spp. to the pest.				

Overview of the evaluation of *Eulecanium excrescens* for bare root plants/trees up to 7 years old					
Rating of the likelihood of pest freedom	Pest free with some exceptional cases (based on the Median).				
Percentile of the distribution	5%	25%	Median	75%	95%
Proportion of pest-free plants	**9,922** out of 10,000 plants	**9,955** out of 10,000 plants	**9,975** out of 10,000 plants	**9,988** out of 10,000 plants	**9,996** out of 10,000 plants
Percentile of the distribution	5%	25%	Median	75%	95%
Proportion of infested plants	**4** out of 10,000 plants	**12** out of 10,000 plants	**25** out of 10,000 plants	**45** out of 10,000 plants	**78** out of 10,000 plants
Summary of the information used for the evaluation	**Possibility that the pest could become associated with the commodity** The pest is present in the UK, and specifically in the location where nurseries are sited. First instar (crawlers) can be easily spread with the wind from the surroundings of the nurseries. The pest is extremely polyphagous. There are host species in the surroundings of the nurseries. An initial infestation of the pest could go undetected or confused with nymphs of other species during inspections. **Measures taken against the pest and their efficacy** General measures taken by the nurseries are effective against the pest. These measures include (a) inspections, surveillance, monitoring, sampling and laboratory testing; (b) hygiene measures; (c) application of pest control products and (d) removal of infested plant material. **Interception records** In the EUROPHYT/TRACES-NT database there are no records of notification of *Acer* plants for planting neither from the UK nor from other countries due to the presence of *E. excrescens* between the years 1995 and December 2022 (EUROPHYT/TRACES-NT, online). **Shortcomings of current measures/procedures** None. **Main uncertainties** – Pest abundance in the nursery and the surroundings. – The efficacy of surveillance and of the application of measures targeting the pest. – Host suitability of *Acer* spp. to the pest.				

Overview of the evaluation of *Eulecanium excrescens* for plants in pots up to 15 years old					
Rating of the likelihood of pest freedom	Pest free with some exceptional cases (based on the Median).				
Percentile of the distribution	5%	25%	Median	75%	95%
Proportion of pest-free plants	**9,879** out of 10,000 plants	**9,933** out of 10,000 plants	**9,962** out of 10,000 plants	**9,982** out of 10,000 plants	**9,994** out of 10,000 plants
Percentile of the distribution	5%	25%	Median	75%	95%
Proportion of infested plants	**6** out of 10,000 plants	**18** out of 10,000 plants	**38** out of 10,000 plants	**67** out of 10,000 plants	**121** out of 10,000 plants
Summary of the information used for the evaluation	**Possibility that the pest could become associated with the commodity** The pest is present in the UK, and specifically in the location where nurseries are sited. First instar (crawlers) can be easily spread with the wind from the surroundings of the nurseries. The pest is extremely polyphagous. There are host species in the surroundings of the nurseries. An initial infestation of the pest could go undetected or confused with nymphs of other species during inspections.				

	Measures taken against the pest and their efficacy General measures taken by the nurseries are effective against the pest. These measures include (a) inspections, surveillance, monitoring, sampling and laboratory testing; (b) hygiene measures; (c) application of pest control products and (d) removal of infested plant material. **Interception records** In the EUROPHYT/TRACES-NT database there are no records of notification of *Acer* plants for planting neither from the UK nor from other countries due to the presence of *E. excrescens* between the years 1995 and December 2022 (EUROPHYT/TRACES-NT, online). **Shortcomings of current measures/procedures** None. **Main uncertainties** – Pest abundance in the nursery and the surroundings. – The efficacy of surveillance and of the application of measures targeting the pest. – Host suitability of *Acer* spp. to the pest.

For more details, see relevant pest data sheet on *Eulecanium excrescens* (Section A.5 in Appendix A).

5.2.6. Overview of the evaluation of *Meloidogyne fallax* and *M. mali* (Rhabditida; Meloidogynidae)

Overview of the evaluation of *Meloidogyne fallax and M. mali* for bundles of whips and seedlings					
Rating of the likelihood of pest freedom	Pest free with some exceptional cases (based on the Median).				
Percentile of the distribution	5%	25%	Median	75%	95%
Proportion of pest-free bundles	**9,901** out of 10,000 bundles	**9,940** out of 10,000 bundles	**9,960** out of 10,000 bundles	**9,975** out of 10,000 bundles	**9,989** out of 10,000 bundles
Percentile of the distribution	5%	25%	Median	75%	95%
Proportion of infected bundles	**11** out of 10,000 bundles	**25** out of 10,000 bundles	**40** out of 10,000 bundles	**60** out of 10,000 bundles	**99** out of 10,000 bundles
Summary of the information used for the evaluation	**Possibility that the pest could become associated with the commodity** *Meloidogyne fallax* and *M. mali* are present in the UK with restricted distribution. Suitable hosts are present both in the nurseries and in the surroundings. *Acer palmatum* is a host of *M. fallax*. *Acer palmatum* and *A. pseudoplatanus* are hosts of *M. mali*. Given that both nematodes are highly polyphagous it is likely that also other *Acer* species could be used as host plants. The pest can enter into the nurseries and spread within the nurseries with infected plant material and movement of soil attached to machinery and shoes. The plants could become infected during the growth in the soil in the fields. **Measures taken against the pest and their efficacy** General measures taken by the nurseries are effective against the nematodes. These measures include (a) the use of certified plant material; (b) the use of heat-treated growing media; (c) inspections, surveillance, monitoring, sampling and laboratory testing; and (d) hygiene measures. **Interception records** In the EUROPHYT/TRACES-NT database there are no records of notification of *Acer* plants for planting neither from the UK nor from other countries due to the presence of *M. fallax* between the years 1995 and December 2022 (EUROPHYT/TRACES-NT, online). In the EUROPHYT/TRACES-NT database there are no records of notification of *Acer* plants for planting neither from the UK nor from other countries due to the presence of *M. mali* between the years 1995 and December 2022 (EUROPHYT/TRACES-NT, online).				

	Shortcomings of current measures/procedures Low pressure water is used for washing roots before export. This washing may not be as effective as using high pressure water in removing the soil, thereby making symptoms less visible. **Main uncertainties** – Whether symptoms may be promptly detected. – Level of susceptibility of *Acer* spp. – Pest pressure of the nematodes in the nurseries and in the surrounding areas. – The level to which the low-pressure water can remove the soil.

Overview of the evaluation of *Meloidogyne fallax and M. mali* for bare root plants/trees up to 7 years old					
Rating of the likelihood of pest freedom	Extremely frequently pest free (based on the Median).				
Percentile of the distribution	5%	25%	Median	75%	95%
Proportion of pest-free plants	**9,792** out of 10,000 plants	**9,873** out of 10,000 plants	**9,927** out of 10,000 plants	**9,967** out of 10,000 plants	**9,994** out of 10,000 plants
Percentile of the distribution	5%	25%	Median	75%	95%
Proportion of infected plants	**6** out of 10,000 plants	**33** out of 10,000 plants	**73** out of 10,000 plants	**127** out of 10,000 plants	**208** out of 10,000 plants
Summary of the information used for the evaluation	**Possibility that the pest could become associated with the commodity** *Meloidogyne fallax* and *M. mali* are present in the UK with restricted distribution. Suitable hosts are present both in the nurseries and in the surroundings. *Acer palmatum* is a host of *M. fallax*. *Acer palmatum* and *A. pseudoplatanus* are hosts of *M. mali*. Given that both nematodes are highly polyphagous it is likely that also other *Acer* species could be used as host plants. The pest can enter into the nurseries and spread within the nurseries with infected plant material and movement of soil attached to machinery and shoes. The plants could become infected during the growth in the soil in the fields. **Measures taken against the pest and their efficacy** General measures taken by the nurseries are effective against the nematodes. These measures include (a) the use of certified plant material; (b) the use of heat-treated growing media; (c) inspections, surveillance, monitoring, sampling and laboratory testing; and (d) hygiene measures. **Interception records** In the EUROPHYT/TRACES-NT database there are no records of notification of *Acer* plants for planting neither from the UK nor from other countries due to the presence of *M. fallax* between the years 1995 and December 2022 (EUROPHYT/TRACES-NT, online). In the EUROPHYT/TRACES-NT database there are no records of notification of *Acer* plants for planting neither from the UK nor from other countries due to the presence of *M. mali* between the years 1995 and December 2022 (EUROPHYT/TRACES-NT, online). **Shortcomings of current measures/procedures** Low pressure water is used for washing roots before export. This washing may not be as effective as using high pressure water in removing the soil, thereby making symptoms less visible. **Main uncertainties** – Whether symptoms may be promptly detected. – Level of susceptibility of *Acer* spp. – Pest pressure of the nematodes in the nurseries and in the surrounding areas. – The level to which the low-pressure water can remove the soil of bare root plants. – Whether plants transplanted to the pots before export have undergone a cleaning of roots allowing the detection of symptoms.				

Overview of the evaluation of *Meloidogyne fallax and M. mali* for plants in pots up to 15 years old					
Rating of the likelihood of pest freedom	Extremely frequently pest free (based on the Median).				
Percentile of the distribution	5%	25%	Median	75%	95%
Proportion of pest-free plants	**9,793** out of 10,000 plants	**9,866** out of 10,000 plants	**9,914** out of 10,000 plants	**9,953** out of 10,000 plants	**9,986** out of 10,000 plants
Percentile of the distribution	5%	25%	Median	75%	95%
Proportion of infected plants	**14** out of 10,000 plants	**47** out of 10,000 plants	**86** out of 10,000 plants	**134** out of 10,000 plants	**207** out of 10,000 plants
Summary of the information used for the evaluation	**Possibility that the pest could become associated with the commodity** *Meloidogyne fallax* and *M. mali* are present in the UK with restricted distribution. Suitable hosts are present both in the nurseries and in the surroundings. *Acer palmatum* is a host of *M. fallax*. *Acer palmatum* and *A. pseudoplatanus* are hosts of *M. mali*. Given that both nematodes are highly polyphagous it is likely that also other *Acer* species could be used as host plants. The pest can enter into the nurseries and spread within the nurseries with infected plant material and movement of soil attached to machinery and shoes. The plants could become infected during the growth in the soil in the fields. **Measures taken against the pest and their efficacy** General measures taken by the nurseries are effective against the nematodes. These measures include (a) the use of certified plant material; (b) the use of heat-treated growing media; (c) inspections, surveillance, monitoring, sampling and laboratory testing; (d) hygiene measures; and (e) separation of the pots from soil. **Interception records** In the EUROPHYT/TRACES-NT database there are no records of notification of *Acer* plants for planting neither from the UK nor from other countries due to the presence of *M. fallax* between the years 1995 and December 2022 (EUROPHYT/TRACES-NT, online). In the EUROPHYT/TRACES-NT database there are no records of notification of *Acer* plants for planting neither from the UK nor from other countries due to the presence of *M. mali* between the years 1995 and December 2022 (EUROPHYT/TRACES-NT, online). **Shortcomings of current measures/procedures** None. **Main uncertainties** – Whether symptoms may be promptly detected. – Level of susceptibility of *Acer* spp. – Pest pressure of the nematodes in the nurseries and in the surrounding areas. – The level to which the low-pressure water can remove the soil of bare root plants. – Whether plants transplanted to the pots before export have undergone a cleaning of roots allowing the detection of symptoms.				

For more details, see relevant pest data sheet on *Meloidogyne fallax* (Section A.6 in Appendix A) and *M. mali* (Section A.7 in Appendix A).

5.2.7. Overview of the evaluation of *Phytophthora ramorum* (Peronosporales; Peronosporaceae)

Overview of the evaluation of *Phytophthora ramorum* for bundles of whips and seedlings					
Rating of the likelihood of pest freedom	Pest free with some exceptional cases (based on the Median).				
Percentile of the distribution	5%	25%	Median	75%	95%
Proportion of pest-free bundles	**9,872** out of 10,000 bundles	**9,922** out of 10,000 bundles	**9,957** out of 10,000 bundles	**9,981** out of 10,000 bundles	**9,995** out of 10,000 bundles
Percentile of the distribution	5%	25%	Median	75%	95%
Proportion of infected bundles	**5** out of 10,000 bundles	**19** out of 10,000 bundles	**43** out of 10,000 bundles	**78** out of 10,000 bundles	**128** out of 10,000 bundles
Summary of the information used for the evaluation	**Possibility that the pest could become associated with the commodity** *Phytophthora ramorum* is present in the UK with a restricted distribution. The pathogen has a wide host range including *A. pseudoplatanus* and other *Acer* species. The main hosts (e.g. *Rhododendron* spp., *Larix* spp. etc.) can be present either inside or in the surroundings of the nurseries. Aerial inoculum could be produced on these host plants and cause bark and leaf infections on the commodity. **Measures taken against the pest and their efficacy** *P. ramorum* is a quarantine pest in the UK and under official control. General measures taken by the nurseries are effective against the pathogen. These measures include (a) the use of certified plant material and growing media; (b) inspections, surveillance, monitoring, sampling and laboratory testing; and (c) application of pest control products. **Interception records** In the EUROPHYT/TRACES-NT database there are no records of notification of *Acer* plants for planting neither from the UK nor from other countries due to the presence of *P. ramorum* between the years 1995 and December 2022 (EUROPHYT/TRACES-NT, online). **Shortcomings of current measures/procedures** None observed. **Main uncertainties** – The level of susceptibility of *Acer* spp. to the pathogen. – Whether symptoms may be promptly detected. – The presence/abundance of the pathogen in the area where the nurseries is located. – Effect of fungicide treatments against the pathogen.				

Overview of the evaluation of *Phytophthora ramorum* for bare root plants/trees up to 7 years old					
Rating of the likelihood of pest freedom	Pest free with some exceptional cases (based on the Median).				
Percentile of the distribution	5%	25%	Median	75%	95%
Proportion of pest-free plants	**9,886** out of 10,000 plants	**9,936** out of 10,000 plants	**9,964** out of 10,000 plants	**9,983** out of 10,000 plants	**9,995** out of 10,000 plants
Percentile of the distribution	5%	25%	Median	75%	95%
Proportion of infected plants	**5** out of 10,000 plants	**17** out of 10,000 plants	**36** out of 10,000 plants	**64** out of 10,000 plants	**114** out of 10,000 plants

Summary of the information used for the evaluation	**Possibility that the pest could become associated with the commodity** *Phytophthora ramorum* is present in the UK with a restricted distribution. The pathogen has a wide host range including *A. pseudoplatanus* and other *Acer* species. The main hosts (e.g. *Rhododendron* spp., *Larix* spp. etc.) can be present either inside or in the surroundings of the nurseries. Aerial inoculum could be produced on these host plants and cause bark and leaf infections on the commodity. **Measures taken against the pest and their efficacy** *P. ramorum* is a quarantine pest in the UK and under official control. General measures taken by the nurseries are effective against the pathogen. These measures include (a) the use of certified plant material and growing media; (b) inspections, surveillance, monitoring, sampling and laboratory testing; and (c) application of pest control products. **Interception records** In the EUROPHYT/TRACES-NT database there are no records of notification of *Acer* plants for planting neither from the UK nor from other countries due to the presence of *P. ramorum* between the years 1995 and December 2022 (EUROPHYT/TRACES-NT, online). **Shortcomings of current measures/procedures** None observed. **Main uncertainties** – The level of susceptibility of *Acer* spp. to the pathogen. – Whether symptoms may be promptly detected – The practicability of inspections of older trees – The presence/abundance of the pathogen in the area where the nurseries is located. – Effect of fungicide treatments against the pathogen.

Overview of the evaluation of *Phytophthora ramorum* for plants in pots up to 15 years old					
Rating of the likelihood of pest freedom	Extremely frequently pest free (based on the Median).				
Percentile of the distribution	5%	25%	Median	75%	95%
Proportion of pest-free plants	**9,757** out of 10,000 plants	**9,860** out of 10,000 plants	**9,924** out of 10,000 plants	**9,968** out of 10,000 plants	**9,993** out of 10,000 plants
Percentile of the distribution	5%	25%	Median	75%	95%
Proportion of infected plants	**7** out of 10,000 plants	**32** out of 10,000 plants	**76** out of 10,000 plants	**140** out of 10,000 plants	**243** out of 10,000 plants
Summary of the information used for the evaluation	**Possibility that the pest could become associated with the commodity** *Phytophthora ramorum* is present in the UK with a restricted distribution. The pathogen has a wide host range including *A. pseudoplatanus* and other *Acer* species. The main hosts (e.g. *Rhododendron* spp., *Larix* spp. etc.) can be present either inside or in the surroundings of the nurseries. Aerial inoculum could be produced on these host plants and cause bark and leaf infections on the commodity. **Measures taken against the pest and their efficacy** *P. ramorum* is a quarantine pest in the UK and under official control. General measures taken by the nurseries are effective against the pathogen. These measures include (a) the use of certified plant material and growing media; (b) inspections, surveillance, monitoring, sampling and laboratory testing; and (c) application of pest control products. **Interception records** In the EUROPHYT/TRACES-NT database there are no records of notification of *Acer* plants for planting neither from the UK nor from other countries due to the presence of *P. ramorum* between the years 1995 and December 2022 (EUROPHYT/TRACES-NT, online).				

	Shortcomings of current measures/procedures None observed. **Main uncertainties** – The level of susceptibility of *Acer* spp. to the pathogen. – Whether symptoms may be promptly detected. – The practicability of inspections of older trees. – The presence/abundance of the pathogen in the area where the nurseries is located. – Effect of fungicide treatments against the pathogen.

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

5.2.8. Overview of the evaluation of *Scirtothrips dorsalis* (Thysanoptera; Thripidae)

Overview of the evaluation of *Scirtothrips dorsalis* for bundles of whips and seedlings					
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 bundles	**9,987** out of 10,000 bundles	**9,994** out of 10,000 bundles	**9,997** out of 10,000 bundles	**9,999** out of 10,000 bundles	**9,999.87** out of 10,000 bundles
Percentile of the distribution	5%	25%	Median	75%	95%
Proportion of infested bundles	**0.13** out of 10,000 bundles	**1** out of 10,000 bundles	**3** out of 10,000 bundles	**6** out of 10,000 bundles	**13** out of 10,000 bundles
Summary of the information used for the evaluation	**Possibility that the pest could become associated with the commodity** The presence of the pest is doubtful in the UK, although not declared as eradicated. The adults fly and can be spread by the wind from the greenhouse where it was detected to the surroundings of the nurseries. The pest is extremely polyphagous. There are host species in the surroundings of the nurseries. An initial infestation of the pest could go undetected because symptoms are generic. **Measures taken against the pest and their efficacy** General measures taken by the nurseries are effective against the pest. These measures include (a) inspections, surveillance, monitoring, sampling and laboratory testing; (b) hygiene measures; (c) application of pest control products and (d) removal of infested plant material. **Interception records** In the EUROPHYT/TRACES-NT database there are no records of notification of *Acer* plants for planting neither from the UK nor from other countries due to the presence of *S. dorsalis* between the years 1995 and December 2022 (EUROPHYT/TRACES-NT, online). **Shortcomings of current measures/procedures** Detection can be difficult and require expert identification. **Main uncertainties** – Pest presence in the nursery and the surroundings. – Host suitability of *Acer* spp. to the pest. – The precision of the surveillance measures.				

Overview of the evaluation of *Scirtothrips dorsalis* for bare root plants/trees up to 7 years old					
Rating of the likelihood of pest freedom	Almost always pest free (based on the Median).				
Percentile of the distribution	5%	25%	Median	75%	95%
Proportion of pest-free plants	**9,986** out of 10,000 plants	**9,993** out of 10,000 plants	**9,996** out of 10,000 plants	**9,998** out of 10,000 plants	**9,999.4** out of 10,000 plants
Percentile of the distribution	5%	25%	Median	75%	95%
Proportion of infested plants	**0.6** out of 10,000 plants	**2** out of 10,000 plants	**4** out of 10,000 plants	**7** out of 10,000 plants	**14** out of 10,000 plants
Summary of the information used for the evaluation	**Possibility that the pest could become associated with the commodity** The presence of the pest is doubtful in the UK, although not declared as eradicated. The adults fly and can be spread by the wind from the greenhouse where it was detected to the surroundings of the nurseries. The pest is extremely polyphagous. There are host species in the surroundings of the nurseries. An initial infestation of the pest could go undetected because symptoms are generic. **Measures taken against the pest and their efficacy** General measures taken by the nurseries are effective against the pest. These measures include (a) inspections, surveillance, monitoring, sampling and laboratory testing; (b) hygiene measures; (c) application of pest control products and (d) removal of infested plant material. **Interception records** In the EUROPHYT/TRACES-NT database there are no records of notification of *Acer* plants for planting neither from the UK nor from other countries due to the presence of *S. dorsalis* between the years 1995 and December 2022 (EUROPHYT/TRACES-NT, online). **Shortcomings of current measures/procedures** Detection can be difficult and require expert identification. **Main uncertainties** – Pest presence in the nursery and the surroundings. – Host suitability of *Acer* spp. to the pest. – The precision of the surveillance measures.				

Overview of the evaluation of *Scirtothrips dorsalis* for plants in pots up to 15 years old					
Rating of the likelihood of pest freedom	Almost always pest free (based on the Median).				
Percentile of the distribution	5%	25%	Median	75%	95%
Proportion of pest-free plants	**9,982** out of 10,000 plants	**9,991** out of 10,000 plants	**9,995** out of 10,000 plants	**9,997.9** out of 10,000 plants	**9,999.62** out of 10,000 plants
Percentile of the distribution	5%	25%	Median	75%	95%
Proportion of infested plants	**0.38** out of 10,000 plants	**2.1** out of 10,000 plants	**5** out of 10,000 plants	**9** out of 10,000 plants	**18** out of 10,000 plants

Summary of the information used for the evaluation	**Possibility that the pest could become associated with the commodity** The presence of the pest is doubtful in the UK, although not declared as eradicated. The adults fly and can be spread by the wind from the greenhouse where it was detected to the surroundings of the nurseries. The pest is extremely polyphagous. There are host species in the surroundings of the nurseries. An initial infestation of the pest could go undetected because symptoms are generic and because the species is difficult to detect when overwintering in the soil. **Measures taken against the pest and their efficacy** General measures taken by the nurseries are effective against the pest. These measures include (a) inspections, surveillance, monitoring, sampling and laboratory testing; (b) hygiene measures; (c) application of pest control products; (d) removal of infested plant material; (e) using clean substrate. **Interception records** In the EUROPHYT/TRACES-NT database there are no records of notification of *Acer* plants for planting neither from the UK nor from other countries due to the presence of *S. dorsalis* between the years 1995 and December 2022 (EUROPHYT/TRACES-NT, online). **Shortcomings of current measures/procedures** Detection can be difficult especially in the soil and require expert identification. **Main uncertainties** – Pest presence in the nursery and the surroundings. – Host suitability of *Acer* spp. to the pest. – The precision of the surveillance measures.

For more details, see relevant pest data sheet on *Scirtothrips dorsalis* (Section A.9 in Appendix A).

5.2.9. Overview of the evaluation of *Takahashia japonica* (Hemiptera; Coccidae)

Overview of the evaluation of *Takahashia japonica* for bundles of whips and seedlings					
Rating of the likelihood of pest freedom	Pest free with some exceptional cases (based on the Median).				
Percentile of the distribution	5%	25%	Median	75%	95%
Proportion of pest-free bundles	**9,903** out of 10,000 bundles	**9,947** out of 10,000 bundles	**9,972** out of 10,000 bundles	**9,988** out of 10,000 bundles	**9,997.6** out of 10,000 bundles
Percentile of the distribution	5%	25%	Median	75%	95%
Proportion of infested bundles	**2.4** out of 10,000 bundles	**12** out of 10,000 bundles	**28** out of 10,000 bundles	**53** out of 10,000 bundles	**97** out of 10,000 bundles
Summary of the information used for the evaluation	**Possibility that the pest could become associated with the commodity** The pest is present in the UK. First instar (crawlers) can be easily spread with the wind from the surroundings of the nurseries. The pest is extremely polyphagous. There are host species in the surroundings of the nurseries. An initial infestation of the pest could go undetected or confused with nymphs of other species during inspections. **Measures taken against the pest and their efficacy** General measures taken by the nurseries are effective against the pest. These measures include (a) inspections, surveillance, monitoring, sampling and laboratory testing; (b) hygiene measures; (c) application of pest control products and (d) removal of infested plant material. **Interception records** In the EUROPHYT/TRACES-NT database there are no records of notification of *Acer* plants for planting neither from the UK nor from other countries due to the presence of *T. japonica* between the years 1995 and December 2022 (EUROPHYT/TRACES-NT, online).				

	Shortcomings of current measures/procedures None. **Main uncertainties** – Pest abundance in the nursery and the surroundings. – The precision of surveillance and the application of pesticides used and other measures targeting the pest.

Overview of the evaluation of *Takahashia japonica* for bare root plants/trees up to 7 years old					
Rating of the likelihood of pest freedom	Pest free with some exceptional cases (based on the Median).				
Percentile of the distribution	5%	25%	Median	75%	95%
Proportion of pest-free plants	**9,916** out of 10,000 plants	**9,953** out of 10,000 plants	**9,978** out of 10,000 plants	**9,992** out of 10,000 plants	**9,998.6** out of 10,000 plants
Percentile of the distribution	5%	25%	Median	75%	95%
Proportion of infested plants	**1.4** out of 10,000 plants	**8** out of 10,000 plants	**22** out of 10,000 plants	**47** out of 10,000 plants	**84** out of 10,000 plants
Summary of the information used for the evaluation	**Possibility that the pest could become associated with the commodity** The pest is present in the UK. First instar (crawlers) can be easily spread with the wind from the surroundings of the nurseries. The pest is extremely polyphagous. There are host species in the surroundings of the nurseries. An initial infestation of the pest could go undetected or confused with nymphs of other species during inspections. **Measures taken against the pest and their efficacy** General measures taken by the nurseries are effective against the pest. These measures include (a) inspections, surveillance, monitoring, sampling and laboratory testing; (b) hygiene measures; (c) application of pest control products and (d) removal of infested plant material. **Interception records** In the EUROPHYT/TRACES-NT database there are no records of notification of *Acer* plants for planting neither from the UK nor from other countries due to the presence of *T. japonica* between the years 1995 and December 2022 (EUROPHYT/TRACES-NT, online). **Shortcomings of current measures/procedures** None. **Main uncertainties** – Pest abundance in the nursery and the surroundings. – The precision of surveillance and the application of pesticides used and other measures targeting the pest.				

Overview of the evaluation of *Takahashia japonica* for plants in pots up to 15 years old					
Rating of the likelihood of pest freedom	Pest free with some exceptional cases (based on the Median).				
Percentile of the distribution	5%	25%	Median	75%	95%
Proportion of pest-free plants	**9,890** out of 10,000 plants	**9,937** out of 10,000 plants	**9,967** out of 10,000 plants	**9,986** out of 10,000 plants	**9,997** out of 10,000 plants

Percentile of the distribution	5%	25%	Median	75%	95%
Proportion of infested plants	**3** out of 10,000 plants	**14** out of 10,000 plants	**33** out of 10,000 plants	**63** out of 10,000 plants	**110** out of 10,000 plants
Summary of the information used for the evaluation	**Possibility that the pest could become associated with the commodity** The pest is present in the UK. First instar (crawlers) can be easily spread with the wind from the surroundings of the nurseries. The pest is extremely polyphagous. There are host species in the surroundings of the nurseries. An initial infestation of the pest could go undetected or confused with nymphs of other species during inspections. **Measures taken against the pest and their efficacy** General measures taken by the nurseries are effective against the pest. These measures include (a) inspections, surveillance, monitoring, sampling and laboratory testing; (b) hygiene measures; (c) application of pest control products and (d) removal of infested plant material. **Interception records** In the EUROPHYT/TRACES-NT database there are no records of notification of *Acer* plants for planting neither from the UK nor from other countries due to the presence of *T. japonica* between the years 1995 and December 2022 (EUROPHYT/TRACES-NT, online). **Shortcomings of current measures/procedures** None. **Main uncertainties** – Pest abundance in the nursery and the surroundings. – The precision of surveillance and the application of pesticides used and other measures targeting the pest.				

For more details, see relevant pest data sheet on *Takahashia japonica* (Section A.10 in Appendix A).

5.2.10. Outcome of expert knowledge elicitation

Table 7 and Figures 3, 4 and 5 show the outcome of the EKE regarding pest freedom after the evaluation of the implemented risk mitigation measures for all the evaluated pests.

Figure 6 provides an explanation of the descending distribution function describing the likelihood of pest freedom after the evaluation of the implemented risk mitigation measures for bundles of *Acer campestre* whips designated for export to the EU for *Coniella castaneicola*.

Table 7: Assessment of the likelihood of pest freedom following evaluation of current risk mitigation measures against pests and pathogens on *Acer campestre* plants designated for export to the EU. In panel A, the median value for the assessed level of pest freedom for each pest is indicated by 'M', the 5% percentile is indicated by 'L', and the 95% percentile is indicated by 'U'. The percentiles together span the 90% uncertainty range regarding pest freedom. The pest freedom categories are defined in panel B of the table

Number	Group	Pest species	Sometimes pest free	More often than not pest free	Frequently pest free	Very frequently pest free	Extremely frequently pest free	Pest free with some exceptional cases	Pest free with few exceptional cases	Almost always pest free
1	Insects	*Bemisia tabaci*/whips						LM		U
2	Fungi	*Coniella castaneicola*/ whips				L		M	U	
3	Fungi	*Cryphonectria parasitica*/whips						LM		U
4	Fungi	*Entoleuca mammata*/ whips					L	M		U
5	Insects	*Eulecanium excrescens*/whips				L		M		U
6	Nematodes	*Meloidogyne fallax* and *M. mali*/whips					L	MU		
7	Oomycetes	*Phytophthora ramorum*/whips				L		M		U
8	Insects	*Scirtothrips dorsalis*/ whips						L		MU
9	Insects	*Takahashia japonica*/ whips					L	M		U
10	Insects	*Bemisia tabaci*/bare root plants						LM		U
11	Fungi	*Coniella castaneicola*/ bare root plants				L		M		U
12	Fungi	*Cryphonectria parasitica*/bare root plants						LM		U
13	Fungi	*Entoleuca mammata*/ bare root plants					L	M		U

Number	Group	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
14	Insects	*Eulecanium excrescens*/bare root plants					L	M		U
15	Nematodes	*Meloidogyne fallax* and *M. mali*/bare root plants				L	M		U	
16	Oomycetes	*Phytophthora ramorum*/bare root plants				L		M		U
17	Insects	*Scirtothrips dorsalis*/ bare root plants						L		MU
18	Insects	*Takahashia japonica*/ bare root plants					L	M		U
19	Insects	*Bemisia tabaci*/plants in pots					L	M		U
20	Fungi	*Coniella castaneicola*/ plants in pots				L	M	U		
21	Fungi	*Cryphonectria parasitica*/plants in pots					L	M		U
22	Fungi	*Entoleuca mammata*/ plants in pots				L		M		U
23	Insects	*Eulecanium excrescens*/plants in pots				L		M	U	
24	Nematodes	*Meloidogyne fallax* and *M. mali*/plants in pots				L	M	U		
25	Oomycetes	*Phytophthora ramorum*/plants in pots				L	M		U	

Number	Group	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
26	Insects	*Scirtothrips dorsalis*/ plant in pots						L		MU
27	Insects	*Takahashia japonica*/ plants in pots				L		M		U

PANEL A

	Pest freedom category	Pest fee plants out of 10,000
	Sometimes pest free	≤ 5,000
	More often than not pest free	5,000–≤ 9,000
	Frequently pest free	9,000–≤ 9,500
	Very frequently pest free	9,500–≤ 9,900
	Extremely frequently pest free	9,900–≤ 9,950
	Pest free with some exceptional cases	9,950–≤ 9990
	Pest free with few exceptional cases	9,990–≤ 9,995
	Almost always pest free	9,995–≤ 10,000

PANEL B

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

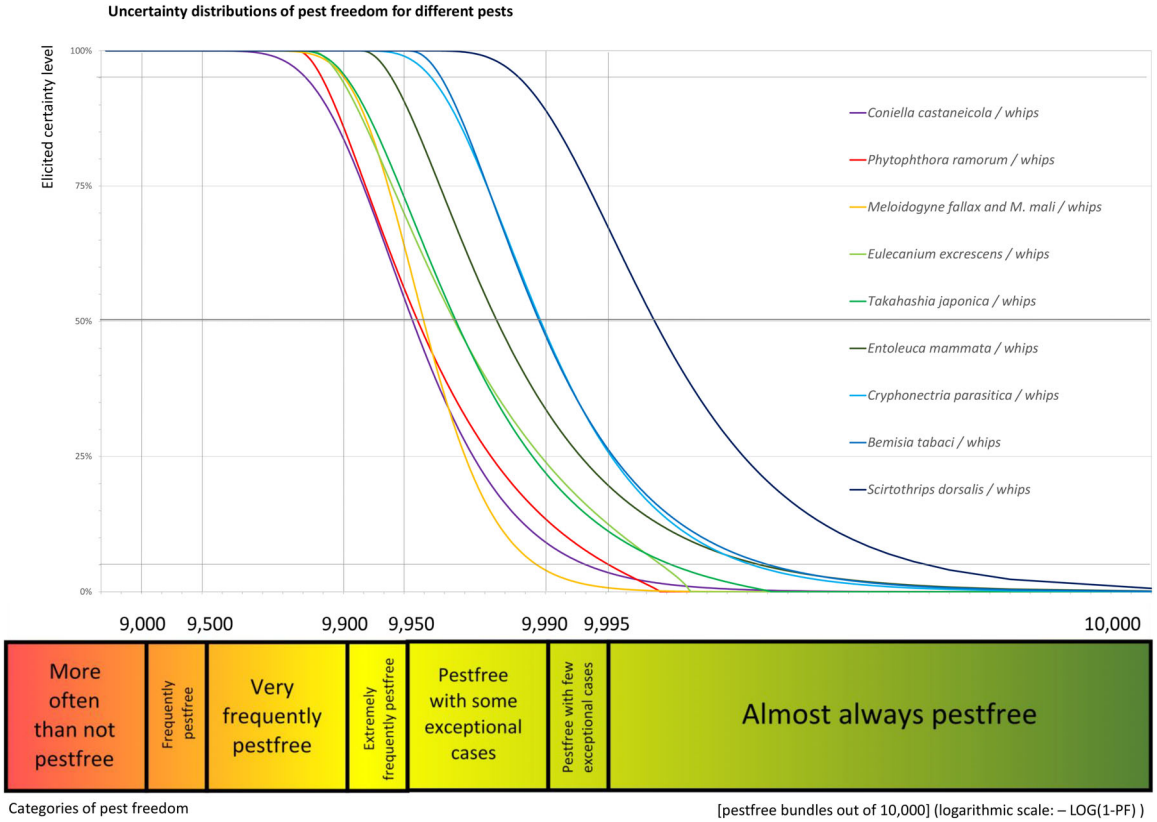

Figure 3: Elicited certainty (y-axis) of the number of pest-free *Acer campestre* whips and seedlings (x-axis; log-scaled) out of 10,000 bundles designated for export to the EU from the UK for all evaluated pests visualised as descending distribution function. Horizontal lines indicate the percentiles (starting from the bottom 5%, 25%, 50%, 75%, 95%)

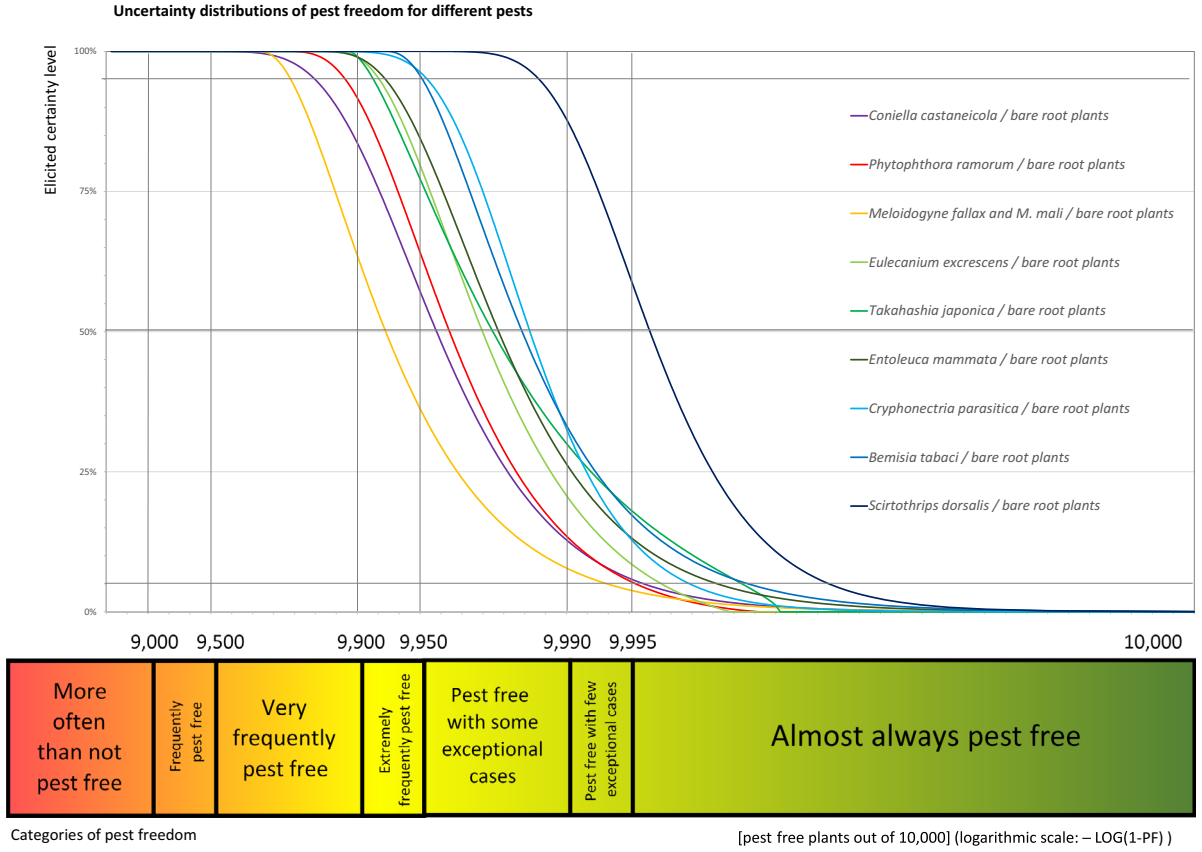

Figure 4: Elicited certainty (y-axis) of the number of pest-free *Acer campestre* bare root plants up to 7 years old (x-axis; log-scaled) out of 10,000 plants designated for export to the EU from the UK for all evaluated pests visualised as descending distribution function. Horizontal lines indicate the percentiles (starting from the bottom 5%, 25%, 50%, 75%, 95%)

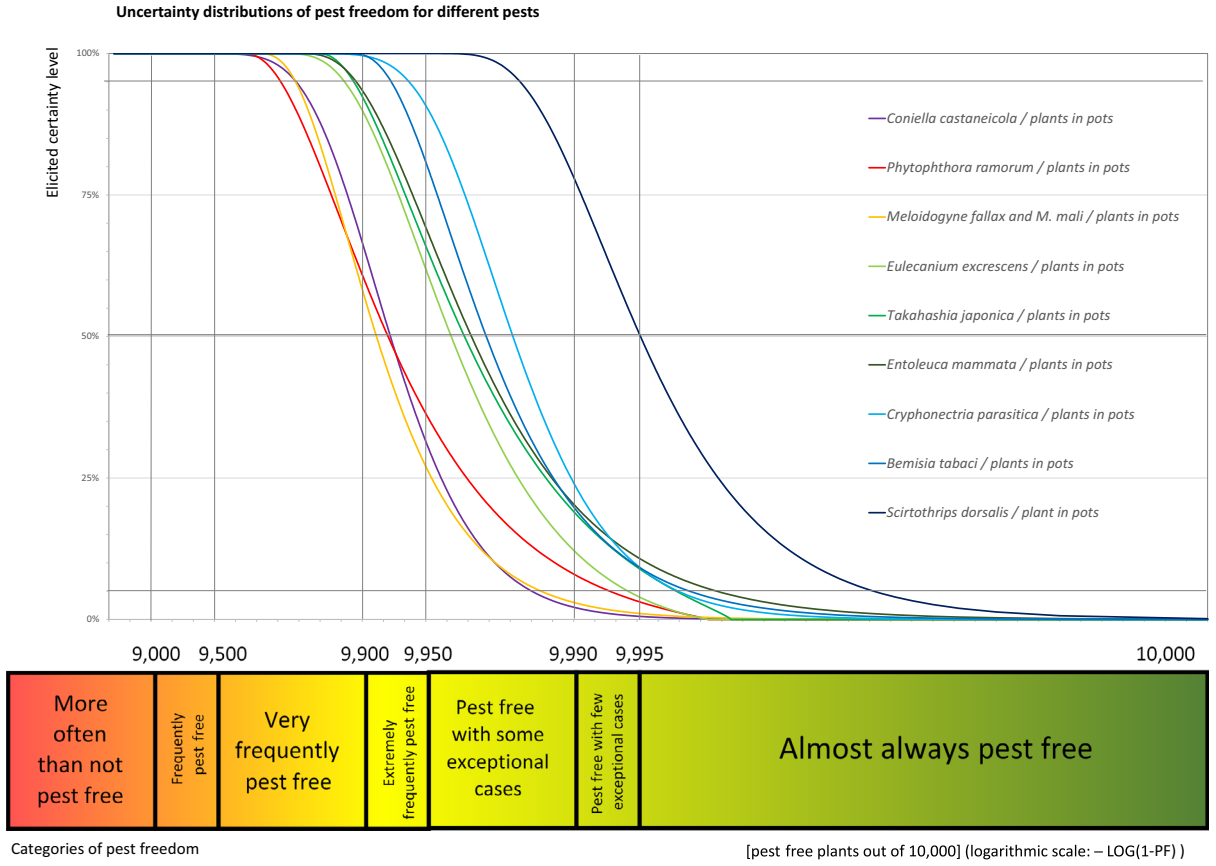

Figure 5: Elicited certainty (y-axis) of the number of pest-free *Acer campestre* plants in pots up to 15 years old (x-axis; log-scaled) out of 10,000 plants designated for export to the EU from the UK for all evaluated pests visualised as descending distribution function. Horizontal lines indicate the percentiles (starting from the bottom 5%, 25%, 50%, 75%, 95%)

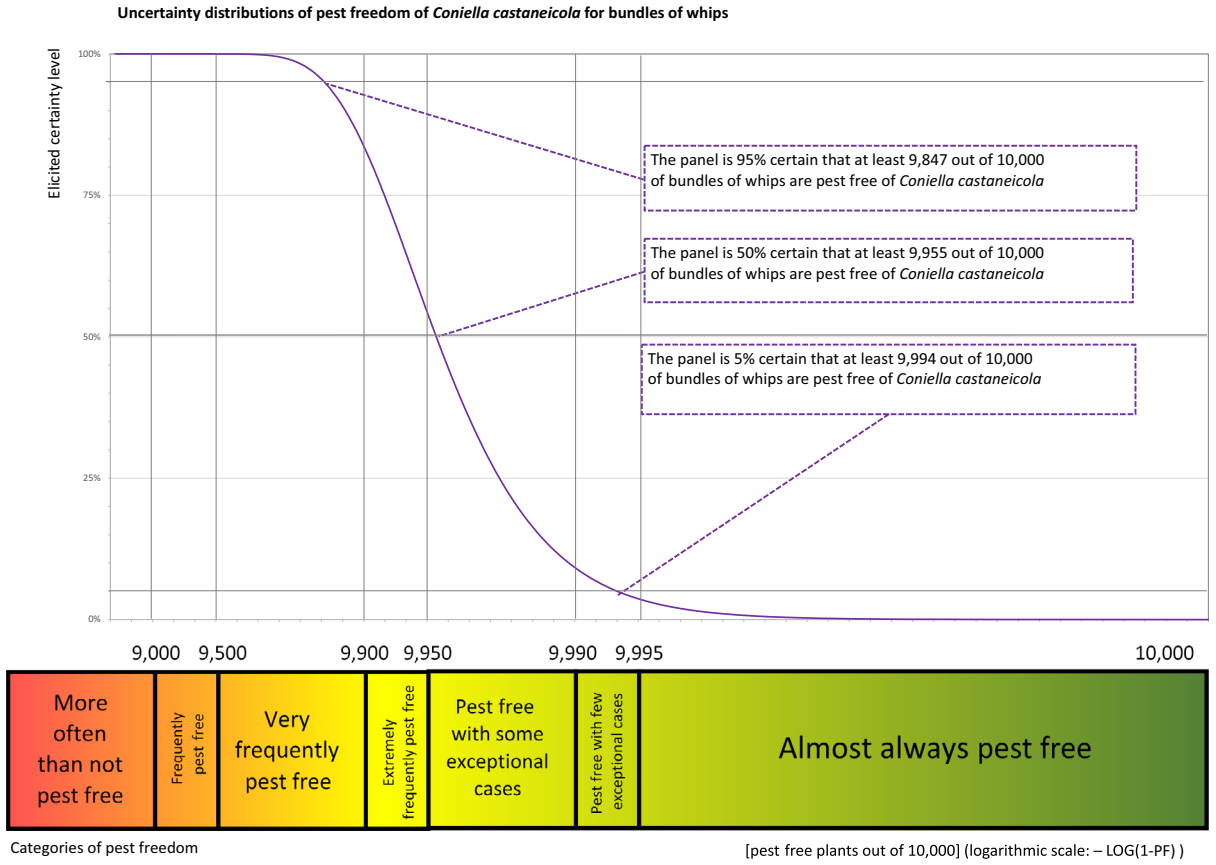

Figure 6: Explanation of the descending distribution function describing the likelihood of pest freedom after the evaluation of the implemented risk mitigation measures for plants designated for export to the EU based on based on the example of *Coniella castaneicola* on *Acer campestre* bundles of whips and seedlings

6. Conclusions

There are 10 pests identified to be present in the UK and considered to be potentially associated with the commodities imported from the UK and relevant for the EU.

These pests are *Bemisia tabaci*, *Coniella castaneicola*, *Cryphonectria parasitica*, *Entoleuca mammata*, *Eulecanium excrescens*, *Meloidogyne fallax*, *Meloidogyne mali*, *Phytophthora ramorum*, *Scirtothrips dorsalis* and *Takahashia japonica*. The likelihood of the pest freedom after the evaluation of the implemented risk mitigation measures for the commodities designated for export to the EU was estimated. In the assessment of risk, the age of the plants was considered, reasoning that older trees are more likely to be infested mainly due to longer exposure time and larger size (see Appendix A.8.7).

For *Bemisia tabaci*, the likelihood of pest freedom for bundles of whips and seedlings following evaluation of proposed risk mitigation measures was estimated as 'pest free with some exceptional cases' with the 90% uncertainty range spanning from 'pest free with some exceptional cases' to 'almost always pest free'. The EKE indicated, with 95% certainty, that between 9,967 and 10,000 bundles of whips and seedlings per 10,000 will be free from *B. tabaci*. The likelihood of pest freedom for bare root plants/trees up to 7 years old was estimated as 'pest free with some exceptional cases' with the 90% uncertainty range spanning from 'pest free with some exceptional cases' to 'almost always pest free'. The EKE indicated, with 95% certainty, that between 9,951 and 10,000 bare root plants/trees up to 7 years old per 10,000 will be free from *B. tabaci*. The likelihood of pest freedom for plants in pots up to 15 years old was estimated as 'pest free with some exceptional cases' with the 90% uncertainty range spanning from 'extremely frequently pest free' to 'almost always pest free'. The EKE indicated, with 95% certainty, that between 9,910 and 10,000 plants in pots up to 15 years old per 10,000 will be free from *B. tabaci*.

For *Coniella castaneicola*, the likelihood of pest freedom for bundles of whips and seedlings following evaluation of proposed risk mitigation measures was estimated as 'pest free with some exceptional cases' with the 90% uncertainty range spanning from 'very frequently pest free' to 'pest free with few exceptional cases'. The EKE indicated, with 95% certainty, that between 9,847 and 10,000 bundles of whips and seedlings per 10,000 will be free from *C. castaneicola*. The likelihood of pest freedom for bare root plants/trees up to 7 years old was estimated as 'pest free with some exceptional cases' with the 90% uncertainty range spanning from 'very frequently pest free' to 'almost always pest free'. The EKE indicated, with 95% certainty, that between 9,841 and 10,000 bare root plants/trees up to 7 years old per 10,000 will be free from *C. castaneicola*. The likelihood of pest freedom for plants in pots up to 15 years old was estimated as 'extremely frequently pest free' with the 90% uncertainty range spanning from 'very frequently pest free' to 'pest free with some exceptional cases'. The EKE indicated, with 95% certainty, that between 9,794 and 10,000 plants in pots up to 15 years old per 10,000 will be free from *C. castaneicola*.

For *Cryphonectria parasitica*, the likelihood of pest freedom for bundles of whips and seedlings following evaluation of proposed risk mitigation measures was estimated as 'pest free with some exceptional cases' with the 90% uncertainty range spanning from 'pest free with some exceptional cases' to 'almost always pest free'. The EKE indicated, with 95% certainty, that between 9,963 and 10,000 bundles of whips and seedlings per 10,000 will be free from *C. parasitica*. The likelihood of pest freedom for bare root plants/trees up to 7 years old was estimated as 'pest free with some exceptional cases' with the 90% uncertainty range spanning from 'pest free with some exceptional cases' to 'almost always pest free'. The EKE indicated, with 95% certainty, that between 9,954 and 10,000 bare root plants/trees up to 7 years old per 10,000 will be free from *C. parasitica*. The likelihood of pest freedom for plants in pots up to 15 years old was estimated as 'pest free with some exceptional cases' with the 90% uncertainty range spanning from 'extremely frequently pest free' to 'almost always pest free'. The EKE indicated, with 95% certainty, that between 9,940 and 10,000 plants in pots up to 15 years old per 10,000 will be free from *C. parasitica*.

For *Entoleuca mammata*, the likelihood of pest freedom for bundles of whips and seedlings following evaluation of proposed risk mitigation measures was estimated as 'pest free with some exceptional cases' with the 90% uncertainty range spanning from pest free with some exceptional cases' to 'almost always pest free'. The EKE indicated, with 95% certainty, that between 9,942 and 10,000 bundles of whips and seedlings per 10,000 will be free from *E. mammata*. The likelihood of pest freedom for bare root plants/trees up to 7 years old was estimated as 'pest free with some exceptional cases' with the 90% uncertainty range spanning from 'extremely frequently pest free' to 'almost always pest free'. The EKE indicated, with 95% certainty, that between 9,927 and 10,000 bare root plants/trees up to 7 years old per 10,000 will be free from *E. mammata*. The likelihood of pest

freedom for plants in pots up to 15 years old was estimated as 'pest free with some exceptional cases' with the 90% uncertainty range spanning from 'very frequently pest free' to 'almost always pest free'. The EKE indicated, with 95% certainty, that between 9,893 and 10,000 plants in pots up to 15 years old per 10,000 will be free from *E. mammata*.

For *Eulecanium excrescens*, the likelihood of pest freedom for bundles of whips and seedlings following evaluation of proposed risk mitigation measures was estimated as 'pest free with some exceptional cases' with the 90% uncertainty range spanning from 'very frequently pest free' to 'almost always pest free'. The EKE indicated, with 95% certainty, that between 9,897 and 10,000 bundles of whips and seedlings per 10,000 will be free from *E. excrescens*. The likelihood of pest freedom for bare root plants/ up to 7 years old was estimated as 'pest free with some exceptional cases' with the 90% uncertainty range spanning from 'extremely frequently pest free' to 'almost always pest free'. The EKE indicated, with 95% certainty, that between 9,922 and 10,000 bare root plants/trees up to 7 years old per 10,000 will be free from *E. excrescens*. The likelihood of pest freedom for plants in pots up to 15 years old was estimated as 'pest free with some exceptional cases' with the 90% uncertainty range spanning from 'very frequently pest free' to 'pest free with some exceptional cases'. The EKE indicated, with 95% certainty, that between 9,879 and 10,000 plants in pots up to 15 years old per 10,000 will be free from *E. excrescens*.

For *Meloidogyne fallax*, the likelihood of pest freedom for bundles of whips and seedlings following evaluation of proposed risk mitigation measures was estimated as 'pest free with some exceptional cases' with the 90% uncertainty range spanning from 'extremely frequently pest free' to 'pest free with few exceptional cases'. The EKE indicated, with 95% certainty, that between 9,901 and 10,000 bundles of whips and seedlings per 10,000 will be free from *M. fallax*. The likelihood of pest freedom for bare root plants/trees up to 7 years old was estimated as 'extremely frequently pest free' with the 90% uncertainty range spanning from 'very frequently pest free' to 'pest free with some exceptional cases'. The EKE indicated, with 95% certainty, that between 9,792 and 10,000 bare root plants/trees up to 7 years old per 10,000 will be free from *M. fallax*. The likelihood of pest freedom for plants in pots up to 15 years old was estimated as 'extremely frequently pest free' with the 90% uncertainty range spanning from 'very frequently pest free' to 'pest free with some exceptional cases'. The EKE indicated, with 95% certainty, that between 9,793 and 10,000 plants in pots up to 15 years old per 10,000 will be free from *M. fallax*.

For *Meloidogyne mali*, the likelihood of pest freedom for bundles of whips and seedlings following evaluation of proposed risk mitigation measures was estimated as 'pest free with some exceptional cases' with the 90% uncertainty range spanning from 'extremely pest free' to 'pest free with few exceptional cases'. The EKE indicated, with 95% certainty, that between 9,901 and 10,000 bundles of whips and seedlings per 10,000 will be free from *M. mali*. The likelihood of pest freedom for bare root plants/trees up to 7 years old was estimated as 'extremely frequently pest free' with the 90% uncertainty range spanning from 'very frequently pest free' to 'pest free with some exceptional cases'. The EKE indicated, with 95% certainty, that between 9,792 and 10,000 bare root plants/trees up to 7 years old per 10,000 will be free from *M. mali*. The likelihood of pest freedom for plants in pots up to 15 years old was estimated as 'extremely frequently pest free' with the 90% uncertainty range spanning from 'very frequently pest free' to 'pest free with some exceptional cases'. The EKE indicated, with 95% certainty, that between 9,793 and 10,000 plants in pots up to 15 years old per 10,000 will be free from *M. mali*.

For *Phytophthora ramorum*, the likelihood of pest freedom for bundles of whips and seedlings following evaluation of proposed risk mitigation measures was estimated as 'pest free with some exceptional cases' with the 90% uncertainty range spanning from 'very frequently pest free' to 'almost always pest free'. The EKE indicated, with 95% certainty, that between 9,872 and 10,000 bundles of whips and seedlings per 10,000 will be free from *P. ramorum*. The likelihood of pest freedom for bare root plants/trees up to 7 years old was estimated as 'pest free with some exceptional cases' with the 90% uncertainty range spanning from 'very frequently pest free' to 'almost always pest free'. The EKE indicated, with 95% certainty, that between 9,886 and 10,000 bare root plants/trees up to 7 years old per 10,000 will be free from *P. ramorum*. The likelihood of pest freedom for plants in pots up to 15 years old was estimated as 'extremely frequently pest free' with the 90% uncertainty range spanning from 'very frequently pest free' to 'pest free with some exceptional cases'. The EKE indicated, with 95% certainty, that between 9,757 and 10,000 plants in pots up to 15 years old per 10,000 will be free from *P. ramorum*.

For *Scirtothrips dorsalis*, the likelihood of pest freedom for bundles of whips and seedlings following evaluation of proposed risk mitigation measures was estimated as 'almost always pest free' with the

90% uncertainty range spanning from 'pest free with few exceptional cases' to 'almost always pest free'. The EKE indicated, with 95% certainty, that between 9,987 and 10,000 bundles of whips and seedlings per 10,000 will be free from *S. dorsalis*. The likelihood of pest freedom for bare root plants/trees up to 7 years old was estimated as 'almost always pest free' with the 90% uncertainty range spanning from 'pest free with some exceptional cases' to 'almost always pest free'. The EKE indicated, with 95% certainty, that between 9,986 and 10,000 bare root plants/trees up to 7 years old per 10,000 will be free from *S. dorsalis*. The likelihood of pest freedom for plants in pots up to 15 years old was estimated as 'almost always pest free' with the 90% uncertainty range spanning from 'pest free with some exceptional cases' to 'almost always pest free'. The EKE indicated, with 95% certainty, that between 9,982 and 10,000 plants in pots up to 15 years old per 10,000 will be free from *S. dorsalis*.

For *Takahashia japonica,* the likelihood of pest freedom for bundles of whips and seedlings following evaluation of proposed risk mitigation measures was estimated as 'pest free with some exceptional cases' with the 90% uncertainty range spanning from 'extremely frequently pest free' to 'almost always pest free'. The EKE indicated, with 95% certainty, that between 9,903 and 10,000 bundles of whips and seedlings per 10,000 will be free from *T. japonica*. The likelihood of pest freedom for bare root plants/trees up to 7 years old was estimated as 'pest free with some exceptional cases' with the 90% uncertainty range spanning from 'extremely frequently pest free' to 'almost always pest free'. The EKE indicated, with 95% certainty, that between 9,916 and 10,000 bare root plants/trees up to 7 years old per 10,000 will be free from *T. japonica*. The likelihood of pest freedom for plants in pots up to 15 years old was estimated as 'pest free with some exceptional cases' with the 90% uncertainty range spanning from 'very frequently pest free' to 'almost always pest free'. The EKE indicated, with 95% certainty, that between 9,890 and 10,000 plants in pots up to 15 years old per 10,000 will be free from *T. japonica*.

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Abbreviations

APHA	Animal and Plant Health Agency
CABI	Centre for Agriculture and Bioscience International
DEFRA	Department for Environment Food and Rural Affairs
EKE	expert knowledge elicitation
EPPO	European and Mediterranean Plant Protection Organization
FAO	Food and Agriculture Organization
ISPM	International Standards for Phytosanitary Measures
NPPO	National Plant Protection Organization
PHSI	Plant Health and Seeds Inspectorate
PLH	Plant Health
PRA	Pest Risk Assessment
RNQPs	Regulated Non-Quarantine Pests
SASA	Science and Advice for Scottish Agriculture

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).
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).

Appendix A – Data sheets of pests selected for further evaluation

A.1. *Bemisia tabaci* (European populations)

A.1.1. Organism information

Taxonomic information	Current valid scientific name: *Bemisia tabaci* 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. (European populations) Order: Hemiptera Family: Aleyrodidae Common name: cassava whitefly, cotton whitefly, silver-leaf whitefly, sweet-potato whitefly, tobacco whitefly Name used in the Dossier: –
Group	Insects
EPPO code	BEMITA
Regulated status	The pest is listed in Annex III as protected zone quarantine pest *Bemisia tabaci* Genn. (European populations) for Ireland and Sweden. *Bemisia tabaci* is included in the EPPO A2 list (EPPO, online_a). The species is a quarantine pest in Belarus, Moldova, Norway and New Zealand. It is on A1 list of Azerbaijan, Chile, Georgia, Kazakhstan, Ukraine and the UK. It is on A2 list of Bahrain, East Africa, Southern Africa, Russia, Türkiye and EAEU (= Eurasian Economic Union – Armenia, Belarus, Kazakhstan, Kyrgyzstan and Russia) (EPPO, online_b).
Pest status in the UK	*Bemisia tabaci* (European populations) is present in the UK, with few occurrences (CABI, online; EPPO, online_c) and it is continuously intercepted to the UK. The intercepted populations were identified as B biotype Middle East-Asia Minor 1 (=MEAM1) and Q biotype Mediterranean (=MED) (Cuthbertson, 2013). From 1998–2015 there were between 7 and 35 outbreaks per year of *B. tabaci* in the UK and all the findings were subject to eradication. The UK outbreaks of *B. tabaci* have been restricted to greenhouses and there are no records of the whitefly establishing outdoors during summer (Cuthbertson and Vänninen, 2015; Bradshaw et al., 2019). According to the Dossier Section 5.0 *B. tabaci* is present: not widely distributed and under official control, restricted to 4 outbreak sites in 2022/23 in contained environments (glasshouses). Many interceptions and outbreaks (356 in total in 2021), but all outbreaks subject to eradication measures. Not known outdoors (i.e. not under protection) and not thought to be able to establish outdoors.
Pest status in the EU	*Bemisia tabaci* (European populations) is widespread in the EU – Austria, Belgium, Bulgaria, Croatia, the Republic of Cyprus, Czechia, Finland, France, Germany, Greece, Hungary, Italy, Luxembourg, Malta, the Netherlands, Poland, Portugal, Romania, Slovenia and Spain (CABI, online; EPPO, online_c). It is absent from Denmark, Estonia, Ireland, Latvia, Lithuania, Slovakia and Sweden (CABI, online; EPPO, online_c). In the EU *B. tabaci* is mainly present in the greenhouses, with exception of Mediterranean coastal region (Cyprus, Greece, Malta, Italy, south of France, certain parts of Spain and Portugal), where the whitefly occurs also outdoors (EFSA PLH Panel, 2013).

Host status on *Acer*	*Acer palmatum* is reported host of *Bemisia tabaci* in China (Li et al., 2011; CABI, online). Other reported hosts are *A. buergerianum* (Li et al., 2011) and *A. macrophyllum* (Yassin and Bendixen, 1982). There is no information on whether *B. tabaci* can also attack *Acer campestre*.
PRA information	Available Pest Risk Assessments: – 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); – Scientific Opinion on the commodity risk assessment of *Persea americana* from Israel (EFSA PLH Panel, 2021); – Scientific report on the commodity risk assessment of specified species of *Lonicera* potted plants from Turkey (EFSA PLH Panel, 2022a); – Scientific Opinion on the commodity risk assessment of *Jasminum polyanthum* unrooted cuttings from Uganda (EFSA PLH Panel, 2022b); – Scientific Opinion on the commodity risk assessment of *Berberis thunbergii* potted plants from Turkey (EFSA PLH Panel, 2022c); – Scientific Opinion on the commodity risk assessment of *Ligustrum delavayanum* topiary plants grafted on *Ligustrum japonicum* from the UK (EFSA PLH Panel, 2022d); – UK Risk Register Details for *Bemisia tabaci* non-European populations (DEFRA, online_a); – UK Risk Register Details for *Bemisia tabaci* European populations (DEFRA, online_b).
Other relevant information for the assessment	
Biology	*Bemisia tabaci* is a cosmopolitan whitefly present on all continents except for Antarctica (CABI, online; EPPO, online_c). In the literature it is reported as either native to Africa, Asia, India, North America or South America (De Barro et al., 2011). However, based on mtCO1 (mitochondrial cytochrome oxidase 1) sequence its origin is most likely to be sub-Saharan Africa (De Barro, 2012). *Bemisia tabaci* is a complex of at least 40 cryptic species that are morphologically identical but distinguishable at molecular level (Khatun et al., 2018). The species differ from each other in host association, spread capacity, transmission of viruses and resistance to insecticides (De Barro et al., 2011). *Bemisia tabaci* develops through three life stages: egg, nymph (four instars) and adult (Walker et al., 2010). Nymphs of *Bemisia tabaci* mainly feed on phloem in minor veins of the underside leaf surface (Cohen et al., 1996). Adults feed on both phloem and xylem of leaves (Walker et al., 2010, citing others). Honeydew is produced by both nymphs and adults (Davidson et al., 1994). *Bemisia tabaci* is multivoltine with up to 15 generations per year (Ren et al., 2001). The life cycle from egg to adult requires from 2.5 weeks up to 2 months depending on the temperature (Norman et al., 1995) and the host plant (Coudriet et al., 1985). In the southern California desert on field-grown lettuce (from 27 October 1983 to 4 January 1984) *B. tabaci* completed at least one generation (Coudriet et al., 1985). In Israel the reproduction of *B. tabaci* was much reduced in winter months, but adults emerging in December survived and started ovipositing at the end of the cold season (Avidov, 1956). The most cold-tolerant stage are eggs (at temperatures of –2°, –6°, –10°C) and the least tolerant are large nymphs. Short periods of exposure in 0° to –6°C have little effect on mortality. As the temperature lowers to –10°C, the duration of time required to cause significant mortality shortens dramatically (Simmons and Elsey, 1995). Females can lay more than 300 eggs (Gerling et al., 1986), which can be found mainly on the underside of the leaves (CABI, online). Females develop from fertilised and males from unfertilised eggs (Gerling et al., 1986). Eggs are yellowish white and with age turn golden brown. Their size is about 0.19–0.20 mm long and 0.10–0.12 mm wide. First instar nymph (=crawler) is scale-like, elliptical, darker yellow in colour and about 0.26 mm long and 0.15 mm wide. Crawlers have legs and crawl actively on leaves before they settle down and moult through second (0.38 mm long and 0.24 mm wide), third (0.55 mm long and 0.35 mm wide) and fourth instar nymph (0.86 mm long and 0.63 mm wide) (Hill, 1969). Fourth instar

	nymph (=pupa) stops feeding and moults into an adult (Walker et al., 2010, citing others). Adult emerges through a 'T'-shaped rupture in the pupal case (El-Helaly et al., 1971). Adults are pale yellow and have two pairs of white wings dusted with a white waxy powder (Hill, 1969). Female is approximately 1 mm long. Males are smaller about 0.8 mm long (EFSA PLH Panel, 2013). Out of all life stages, only first instar nymph (=crawler) and adults are mobile. Movement of crawlers by walking is very limited, usually within the leaf where they hatched (Price and Taborsky, 1992) or to more suitable neighbouring leaves. The average distance was estimated within 10–70 mm (Summers et al., 1996). For these reasons they are not considered to be good colonisers. On a contrary, adults can fly reaching quite long distances in a search of a permanent host. According to a study done by Cohen et al. (1988) some of the marked individuals were trapped 7 km away from the initial place after 6 days. Long-distance passive dispersal by wind is also possible (Byrne, 1999). *Bemisia tabaci* is an important agricultural pest that is able to transmit more than 121 viruses (belonging to genera *Begomovirus*, *Crinivirus*, *Ipomovirus*, *Carlavirus* and *Torradovirus*) and cause significant damage to food crops such as tomatoes, cucurbits, beans and ornamental plants (EFSA PLH Panel, 2013). However, these viruses are not reported to infect *Acer* species. Possible pathways of entry for *B. tabaci* are plants for planting including cuttings and rooted ornamental plants; cut flowers and branches with foliage; fruits and vegetables; human-assisted spread; natural spread such as wind (EFSA PLH Panel, 2013).
Symptoms	**Main type of symptoms**	Main symptoms of *B. tabaci* on plants are chlorotic spotting, decrease of plant growth, deformation of fruits, deformation of leaves, intervein yellowing, leaf yellowing, leaf curling, leaf crumpling, leaf vein thickening, leaf enations, leaf cupping, leaf loss, necrotic lesions on stems, plant stunting, reduced flowering, reduced fruit development, silvering of leaves, stem twisting, vein yellowing, wilting, yellow blotching of leaves, yellow mosaic of leaves, presence of honeydew and sooty mould. These symptoms are plant responses to the feeding of the whitefly and to the presence of transmitted viruses (EPPO, 2004; EFSA PLH Panel, 2013; CABI, online).
	Presence of asymptomatic plants	Symptoms of *B. tabaci* being present on the plants are usually visible. However, *B. tabaci* is a vector of several viruses and their infection could be asymptomatic.
	Confusion with other pests	*Bemisia tabaci* can be easily confused with other whitefly species such as *B. afer*, *Trialeurodes lauri*, *T. packardi*, *T. ricini*, *T. vaporariorum* and *T. variabilis*. A microscopic slide is needed for morphological identification (EPPO, 2004). Different species of *B. tabaci* complex can be distinguished using molecular methods (De Barro et al., 2011).
Host plant range	*Bemisia tabaci* has a wide host range, including more than 1,000 different plant species (Abd-Rabou and Simmons, 2010). Some of the many hosts of *Bemisia tabaci* are *Abelmoschus esculentus, Amaranthus blitoides, Amaranthus retroflexus, Arachis hypogaea*, *Atriplex semibaccata*, *Bellis perennis, Borago officinalis*, *Brassica oleracea* var. *botrytis*, *B. oleracea* var. *gemmifera*, *B. oleracea* var. *italica*, *Bryonia dioica*, *Cajanus cajan*, *Capsella bursa-pastoris*, *Capsicum annuum*, *Citrus* spp., *Crataegus* spp., *Cucumis sativus*, *Cucurbita pepo*, *Erigeron canadensis*, *Euphorbia pulcherrima*, *Gerbera jamesonii*, *Glycine max*, *Gossypium* spp., *G. hirsutum*, *Hedera helix*, *Ipomoea batatas*, *Lactuca sativa*, *L. serriola*, *Lavandula coronopifolia*, *Ligustrum lucidum*, *L. quihoui*, *L. vicaryiis*, *Manihot esculenta*, *Melissa officinalis*, *Nicotiana tabacum*, *Ocimum basilicum*, *Origanum majorana*, *Oxalis pes-caprae*, *Phaseolus* spp., *Phaseolus vulgaris*, *Piper nigrum*, *Potentilla* spp., *Prunus* spp., *Rosa* spp., *Rubus fruticosus*, *Salvia officinalis*, *S. rosmarinus*, *Senecio vulgaris*, *Sinningia speciosa*, *Solanum lycopersicum*,	

	S. melongena, *S. nigrum*, *S. tuberosum, Sonchus oleraceus, Stellaria media, Tagetes erecta, Taraxacum officinale, Thymus serpyllum, Urtica urens, Vitis vinifera* and many more (Li et al., 2011; EFSA PLH Panel, 2013; CABI, online; EPPO, online_d). *Acer palmatum* and *A. buergerianumare* are reported hosts in China (Li et al., 2011; CABI, online). For a full host list refer to Li et al. (2011), EFSA PLH Panel (2013); CABI (online) and EPPO (online_d).
Reported evidence of impact	*Bemisia tabaci* (European populations) is EU protected zone quarantine pest.
Evidence that the commodity is a pathway	*Bemisia tabaci* is continuously intercepted in the EU on different commodities including plants for planting (EUROPHYT/TRACES-NT, online). Therefore, the commodity is a pathway for *B. tabaci*. Plants can carry leaves at the time of export which can host all life stages of the pest.
Surveillance information	*Bemisia tabaci* is regulated quarantine pest in the UK. As such, the policy for any outbreak is to eradicate the population. The UK makes many interceptions of *B. tabaci* and experiences a few outbreaks each year (356 interceptions and outbreaks in 2021), but all outbreaks are under protection and subject to eradication measures. This pest has never established outdoors in the UK (Dossier Section 3.0). As part of an annual survey at ornamental retail and production sites (frequency of visits determined by a decision matrix) *B. tabaci* is inspected for on common host plants. In addition, all tomato and pepper production sites subject to annual inspection (Dossier Sections 3.0 and 5.0).

A.1.2. Possibility of pest presence in the nursery

A.1.2.1. Possibility of entry from the surrounding environment

Bemisia tabaci (European populations) is present in the UK with few occurrences (location not specified) (CABI, online; EPPO, online_c) and is continuously intercepted in the UK. The UK outbreaks of *B. tabaci* have been restricted to glasshouses and there are no records of *B. tabaci* establishing outdoors during summer (Cuthbertson and Vänninen, 2015; Bradshaw et al., 2019). Bradshaw et al. (2019) indicate that theoretically *B. tabaci* (in summertime) could complete one generation across most of Scotland, and one to three generations over England and Wales. However, the temperatures experienced during the cold days and nights during summer may be low enough to cause chilling injury to *B. tabaci*, thereby inhibiting development and preventing establishment in the UK. It is unlikely, therefore, that this pest will establish outdoors in the UK under current climate conditions.

The possible entry of *B. tabaci* from surrounding environment to the nurseries may occur through adult dispersal and passively on wind currents (Cohen et al., 1988; Byrne, 1999; EFSA PLH Panel, 2013).

Bemisia tabaci is a polyphagous species that can infest number of different plants. Suitable hosts of *B. tabaci* like *Acer* spp., *Beta vulgaris*, *Camellia* spp., *Capsicum annuum*, *Crataegus* spp., *Daucus carota*, *Hedera* spp., *Ilex* spp., *Magnolia* spp., *Malus* spp., *Morus* spp., *Prunus* spp., *Rhododendron* spp., *Rosa* spp., *Salix* spp., *Solanum lycopersicum*, *Solanum tuberosum*, *Ulmus* spp., *Viburnum* spp. and *Wisteria* spp. are present within 2 km from the nurseries (Dossier Section 3.0).

Uncertainties:

- Exact locations where the whitefly is present.
- Possibility of spread beyond the infested greenhouses.
- Possibility of the whitefly to survive the UK summer in outdoor conditions.

Taking into consideration the above evidence and uncertainties, the Panel considers that it is possible for the pest to enter the nurseries from surrounding environment, even though it is only reported to be present in greenhouses. In the surrounding area, suitable hosts are present and the pest can spread by wind and adult flight.

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

The starting materials are either seeds, seedlings or scion woods/buds. Seeds are certified and coming from the UK. Seedlings are either from the UK, the EU (mostly the Netherlands) or New Zealand (Dossier Section 3.0). Seeds are not a pathway for the whitefly.

In addition to *Acer* plants, the nurseries also produce other plants (Dossier Section 6.0). Out of them, there are many suitable hosts for the whitefly (such as *Acacia* spp., *Ajuga* spp., *Allium* spp., *Arbutus* spp., *Artemisia* spp., *Aster* spp., *Aucuba* spp., *Berberis* spp., *Buxus* spp., etc.). However, there is no information on how and where the plants are produced. Therefore, if the plants are first produced in another nursery, the whitefly could possibly travel with them.

The nurseries are using virgin peat or peat-free compost (a mixture of coir, tree bark, wood fibre, etc.) as a growing media (Dossier Section 1.0), which is not a pathway for the whitefly.

Uncertainties:

- No information is available on the provenance of plants other than *Acer* used for plant production in the nurseries.

Taking into consideration the above evidence and uncertainties, the Panel considers that it is possible for the pest to enter the nurseries with new seedlings of *Acer* and new plants of other species used for plant production in the area. The entry of the pest with seeds and the growing media the Panel considers as not possible.

A.1.2.3. Possibility of spread within the nursery

Acer plants are either grown in containers (cells, pots, tubes, etc.) outdoors/ in the open air or in field. Cell grown trees may be grown in greenhouses, however most plants will be field grown or field grown in containers (Dossier Section 1.0). There are no mother plants present in the nurseries (Dossier Section 3.0).

The whitefly can attack other suitable plants (such as *Acacia* spp., *Ajuga* spp., *Allium* spp., etc.), non-cultivated herbaceous plants (*Bellis perennis*, *Potentilla* spp., *Taraxacum officinale*) present within the nurseries and hedges surrounding the nurseries (*Crataegus* spp., *Hedera* spp., *Ilex* spp. and *Prunus* spp.) (Dossier Sections 3.0 and 6.0).

The whitefly within the nurseries can spread by adult flight and wind. Spread within the nurseries through equipment and clothing is less relevant as the distance walked is very limited and of a short duration.

Uncertainties:

- Possibility of the whitefly to survive the UK summer in outdoor conditions.
- Possibility that greenhouses are heated which allows the pest to overwinter.

Taking into consideration the above evidence and uncertainties, the Panel considers that the spread of the pest within the nurseries is possible either by wind and active flight.

A.1.3. Information from interceptions

In the EUROPHYT/TRACES-NT database there are no records of notification of *Acer* plants for planting neither from the UK nor from other countries due to the presence of *Bemisia tabaci* between the years 1995 and December 2022 (EUROPHYT/TRACES-NT, online).

A.1.4. Evaluation of the risk mitigation measures

In the table below, all risk mitigation measures currently applied in the UK are listed and an indication of their effectiveness on *Bemisia tabaci* (European populations) is provided. The description of the risk mitigation measures currently applied in the UK is provided in the Table 6.

N	Risk mitigation measure	Effect on the pest	Evaluation and uncertainties
1	Registration of production sites	Yes	As the plant passport is very similar to the EU one, the plants shall be free from quarantine pests and RNQPs. Uncertainties: – None.
2	Physical separation	No	Not relevant. Physical separation is not a barrier for *B. tabaci* because the adults can fly.
3	Certified plant material	Yes	Only applicable to seedlings with leaves.
4	Growing media	No	Not relevant
5	Surveillance, monitoring and sampling	Yes	Although the plants are thoroughly checked during the production, later infestation by *B. tabaci* can go undetected. Uncertainties: – Capacity of detection of the pest on the older plants with many leaves.
6	Hygiene measures	Yes	Weeding can have some effect on the reduction of *Bemisia* populations. The other measures are not relevant. Uncertainties: – None.
7	Removal of infested plant material	Yes	Removal of infested plant material can have some effect on the reduction of *Bemisia* populations. Uncertainties: – None.
8	Irrigation water	No	Not relevant.
9	Application of pest control products	Yes	Chemical measures may have some effect on the pest. Uncertainties: – The active ingredients of chemical treatments and their level of efficacy against the pest.
10	Measures against soil pests	No	Not relevant.
11	Inspections and management of plants before export	Yes	Although the plants are thoroughly checked 2 weeks before the export, infestation by *B. tabaci* can go undetected. Uncertainties: – Capacity of detection of the pest on the older plants with many leaves.
12	Separation during transport to the destination	No	Not relevant. Plants are not individually separated during transportation. The pest can infest other plants.

A.1.5. Overall likelihood of pest freedom for bundles of whips and seedlings

A.1.5.1. Reasoning for a scenario which would lead to a reasonably low number of infested bundles of whips and seedlings

This scenario assumes a low pressure of the pest in the nurseries and the surrounding. In this scenario it is assumed that leaves are not present when the plants are exported. Pesticide treatments are effective.

A.1.5.2. Reasoning for a scenario which would lead to a reasonably high number of infested bundles of whips and seedlings

This scenario assumes a high pressure of the pest in the nurseries and the surrounding. Some leaves may be present and eggs laid underneath the leaves, crawlers can move and hide and may be

overlooked. Low density populations can also be overlooked. The pesticides used may not be effective against *B. tabaci*.

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

The uncertainties which were identified are equal in both directions and can lead equally to over- or underestimate the number of infested bundels.

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

The Panel assumes a medium uncertainty in the first quartile, and a medium uncertainty above the median because of restricted distribution of the pest. It is very unlikely to be present outdoors and maple is not a major host. It is a quarantine pest in the UK and therefore more likely to be detected and that measures are taken.

A.1.5.5. Elicitation outcomes of the assessment of the pest freedom for *Bemisia tabaci* (European populations) on bundles of whips and seedlings

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* (European populations) per 10,000 bundles

Percentile	1%	2.5%	5%	10%	17%	25%	33%	50%	67%	75%	83%	90%	95%	97.5%	99%
Elicited values	0					5		10		20					40
EKE	0.141	0.374	0.785	1.66	2.92	4.61	6.45	10.7	16.1	19.4	23.5	28.0	32.8	36.5	40.0

The EKE results is the BetaGeneral (0.94432, 2.5871, 0, 48.5) distribution fitted with @Risk version 7.6.

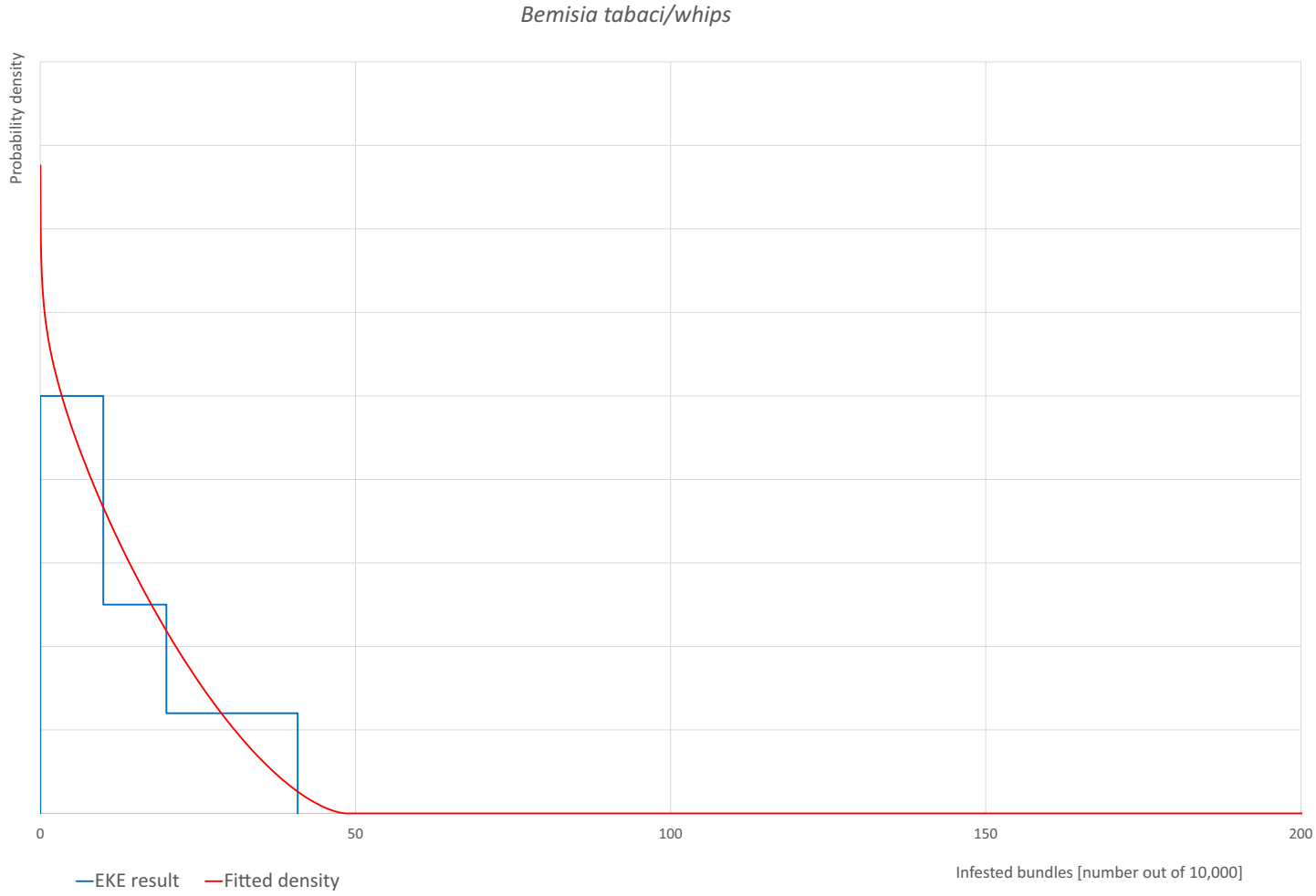
Based on the numbers of estimated infested bundles the pest freedom was calculated (i.e. = 10,000 – number of infested bundles per 10,000). The fitted values of the uncertainty distribution of the pest freedom are shown in Table A.2.

Table A.2: The uncertainty distribution of bundles free of *Bemisia tabaci* (European populations) per 10,000 bundles calculated by Table A.1

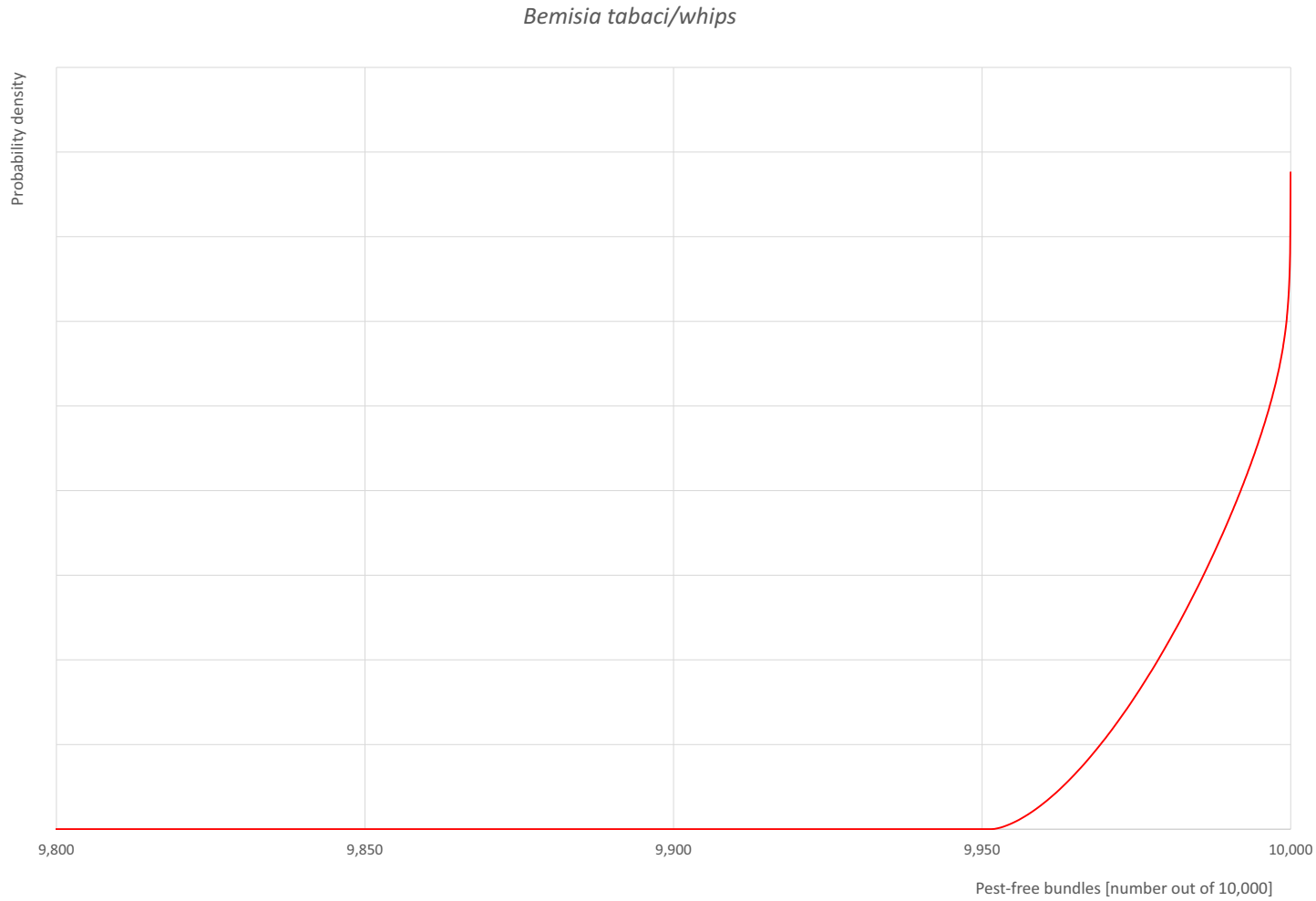
Percentile	1%	2.5%	5%	10%	17%	25%	33%	50%	67%	75%	83%	90%	95%	97.5%	99%
Values	9,960					9,980		9,990		9,995					10,000
EKE results	9,960	9,964	9,967	9,972	9,976	9,981	9,984	9,989	9,994	9,995	9,997	9,998	9,999.2	9,999.6	9,999.9

The EKE results are the fitted values.

(a)


Bemisia tabaci/whips
Probability density
0
50
100
150
200
Infested bundles [number out of 10,000]
EKE result
Fitted density

(b)


Bemisia tabaci/whips
Probability density
9,800
9,850
9,900
9,950
10,000
Pest-free bundles [number out of 10,000]

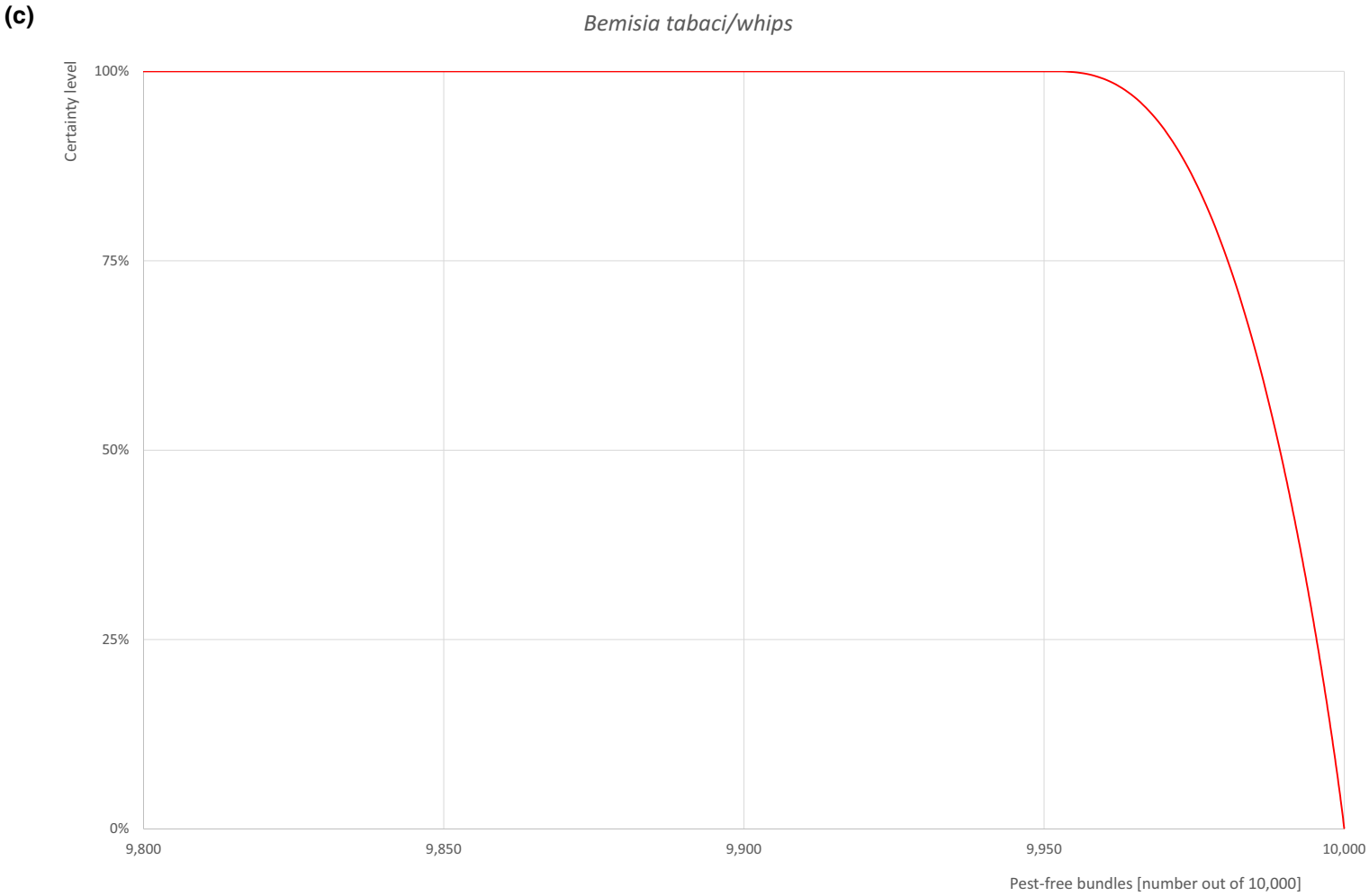


Figure A.1: (a) Elicited uncertainty of pest infestation per 10,000 bundles (histogram in blue – vertical blue line indicates the elicited percentile in the following order: 1%, 25%, 50%, 75%, 99%) and distributional fit (red line); (b) uncertainty of the proportion of pest-free bundles per 10,000 (i.e.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

A.1.6. Overall likelihood of pest freedom for bare root plants/trees up to 7 years old

A.1.6.1. Reasoning for a scenario which would lead to a reasonably low number of infested bare root plants/trees up to 7 years old

This scenario assumes a low pressure of the pest in the nurseries and the surrounding. In this scenario it is assumed that leaves are not present when the plants are exported. Pesticide treatments are effective.

A.1.6.2. Reasoning for a scenario which would lead to a reasonably high number of infested bare root plants/trees up to 7 years old

This scenario assumes a high pressure of the pest in the nurseries and the surrounding. Leaves may be present and eggs laid underneath the leaves, crawlers can move and hide and may be overlooked. Low density populations can also be overlooked. The pesticides used may not be effective against *B. tabaci*. Seven years old plants have more leaves compared to younger plants and hence more possibilities for the pest to hide and being overlooked.

A.1.6.3. Reasoning for a central scenario equally likely to over- or underestimate the number of infested bare root plants/trees up to 7 years old (Median)

The uncertainties which were identified are equal in both directions and can lead equally to over- or underestimate the number of infested plants.

A.1.6.4. Reasoning for the precision of the judgement describing the remaining uncertainties (1st and 3rd quartile/interquartile range)

The Panel assumes a medium uncertainty in the first quartile, and a medium uncertainty above the median because of restricted distribution of the pest. It is very unlikely to be present outdoors and maple is not a major host. It is a quarantine pest in the UK and therefore more likely to be detected and that measures are taken.

A.1.6.5. Elicitation outcomes of the assessment of the pest freedom for *Bemisia tabaci* (European populations) on bare root plants/trees up to 7 years old

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

Table A.3: Elicited and fitted values of the uncertainty distribution of pest infestation by *Bemisia tabaci* (European populations) 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					8		15		30					60
EKE	0.269	0.675	1.36	2.76	4.71	7.26	10.0	16.3	24.1	29.0	35.0	41.6	48.8	54.4	59.9

The EKE results is the BetaGeneral (1.0037, 2.8237, 0, 74.5) distribution fitted with @Risk version 7.6.

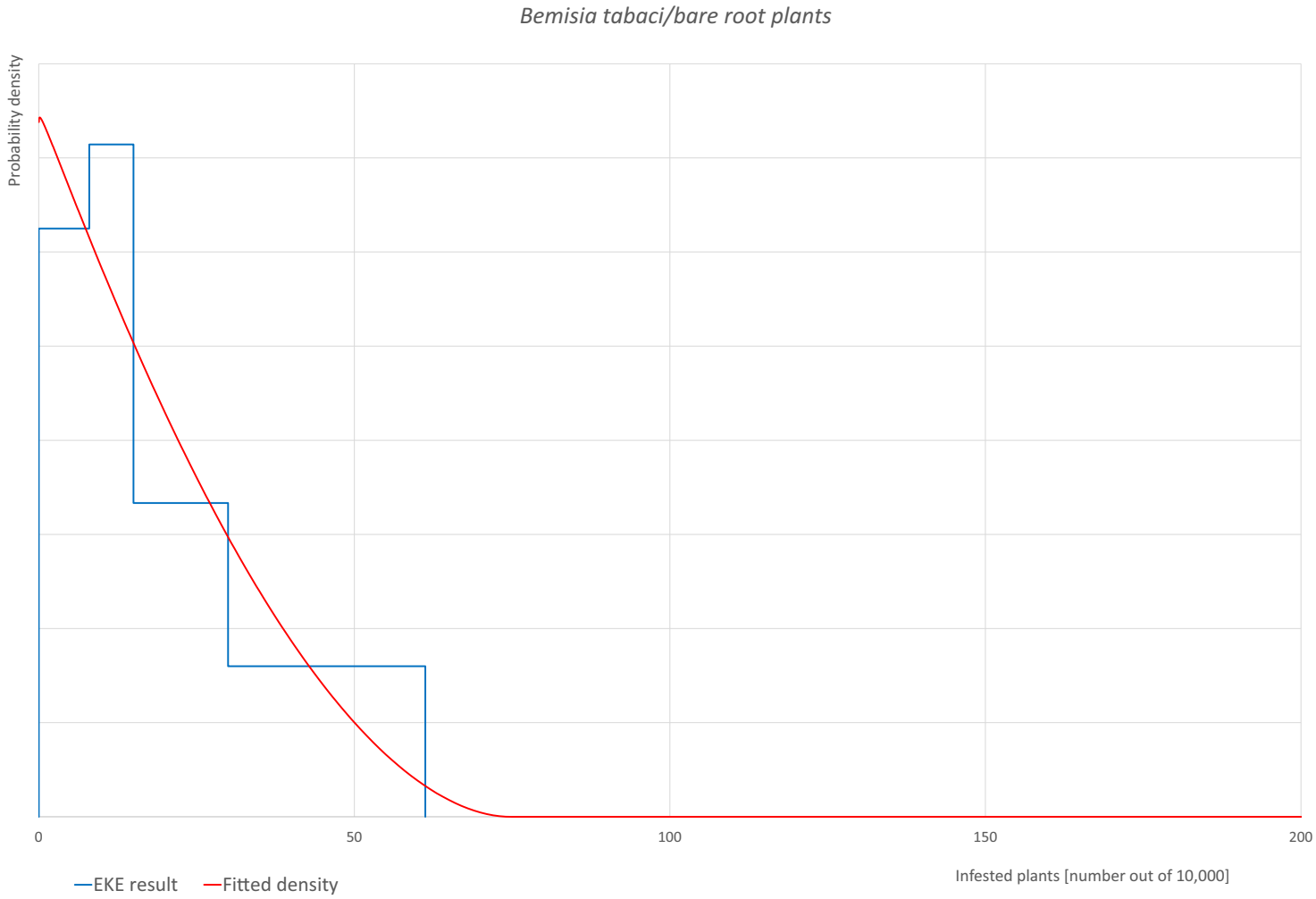
Based on the numbers of estimated infested plants the pest freedom was calculated (i.e. = 10,000 – number of infested plants per 10,000). The fitted values of the uncertainty distribution of the pest freedom are shown in Table A.4.

Table A.4: The uncertainty distribution of plants free of *Bemisia tabaci* (European populations) per 10,000 plants calculated by Table A.3

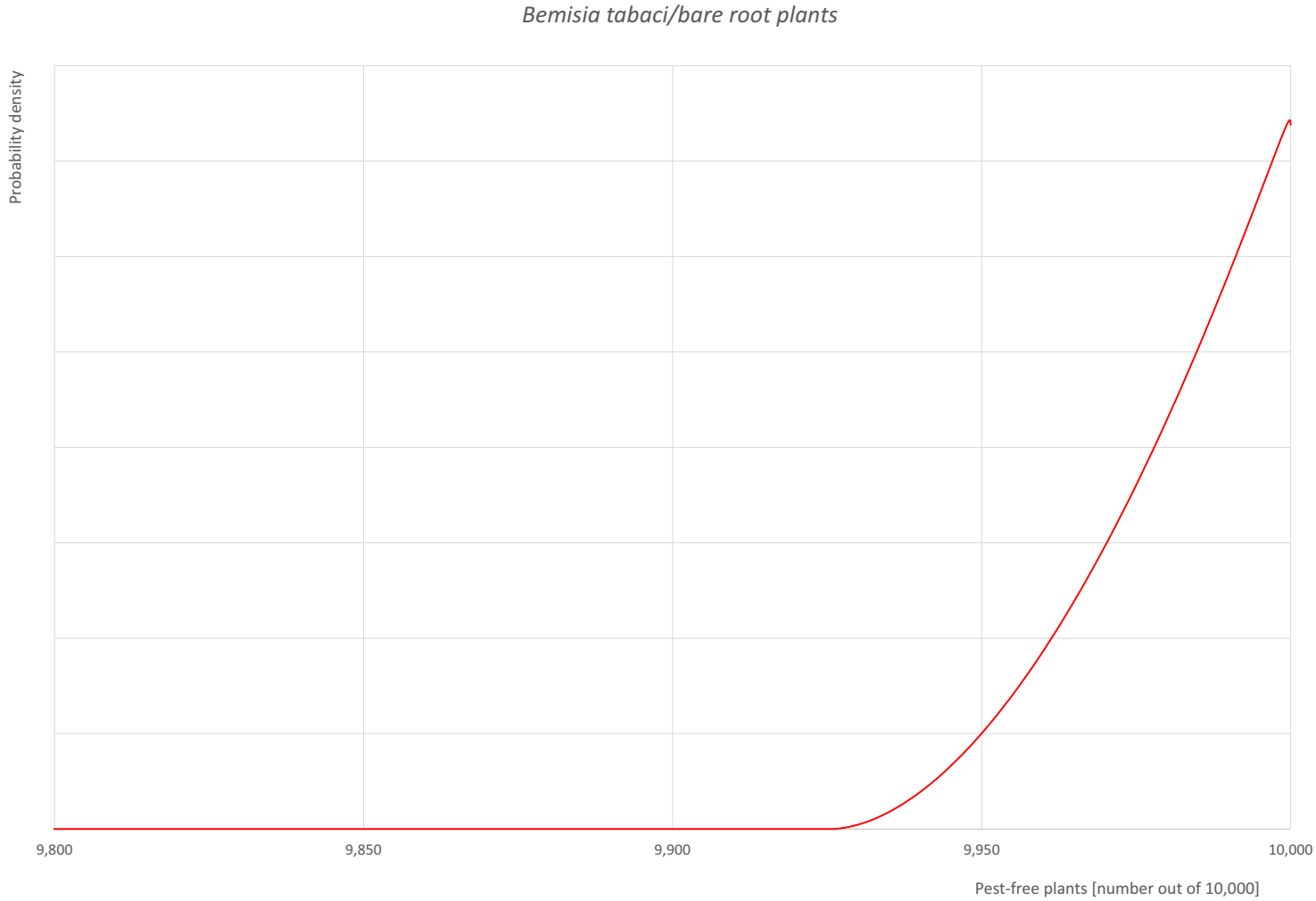
Percentile	1%	2.5%	5%	10%	17%	25%	33%	50%	67%	75%	83%	90%	95%	97.5%	99%
Values	9,940					9,970		9,985		9,992					10,000
EKE results	9,940	9,946	9,951	9,958	9,965	9,971	9,976	9,984	9,990	9,993	9,995	9,997	9,999	9,999.3	9,999.7

The EKE results are the fitted values.

(a)


Bemisia tabaci/bare root plants
Probability density
0
50
100
150
200
Infested plants [number out of 10,000]
EKE result
Fitted density

(b)


Bemisia tabaci/bare root plants
Probability density
9,800
9,850
9,900
9,950
10,000
Pest-free plants [number out of 10,000]

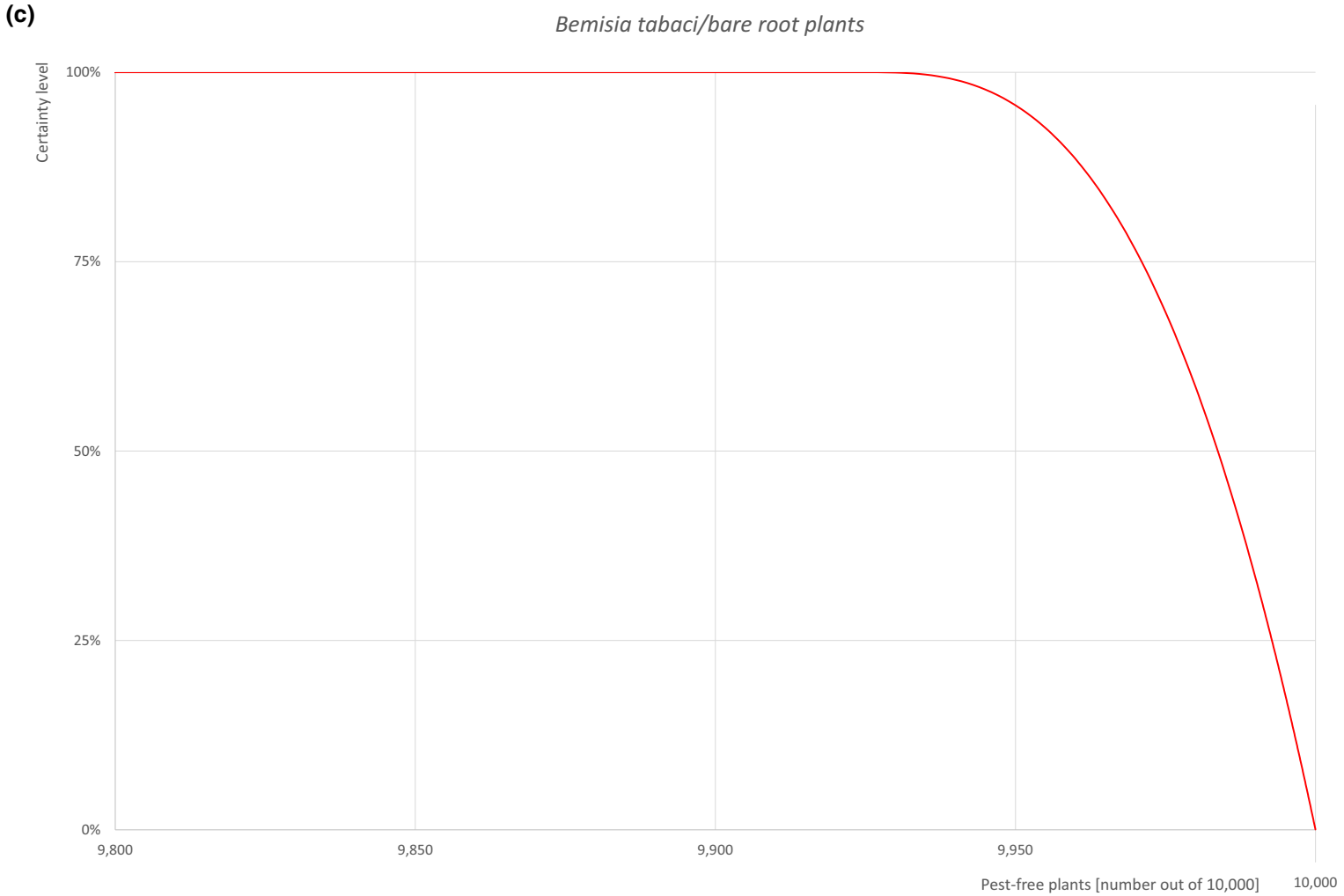


Figure A.2: (a) Elicited uncertainty of pest infestation per 10,000 plants (histogram in blue – vertical blue line indicates the elicited percentile in the following order: 1%, 25%, 50%, 75%, 99%) and distributional fit (red line); (b) uncertainty of the proportion of pest-free plants per 10,000 (i.e.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

A.1.7. Overall likelihood of pest freedom for plants in pots up to 15 years old

A.1.7.1. Reasoning for a scenario which would lead to a reasonably low number of infested plants in pots up to 15 years old

This scenario assumes a low pressure of the pest in the nurseries and the surrounding. Symptoms are developed and visible, chlorotic spotting well visible, honeydew and ants are present. Pesticide treatments are effective.

A.1.7.2. Reasoning for a scenario which would lead to a reasonably high number of infested plants in pots up to 15 years old

This scenario assumes a high pressure of the pest in the nurseries and the surrounding. It is assumed that leaves are on the plants. Eggs laid underneath the leaves, crawlers can move and hide and may be overlooked. Low density populations can also be overlooked. The pesticides used may not be effective against *B. tabaci*. 15 years old plants have too many leaves to ensure detection of the pest.

A.1.7.3. Reasoning for a central scenario equally likely to over- or underestimate the number of infested plants in pots up to 15 years old (Median)

The uncertainties which were identified are equal in both directions, and can lead equally to over- or underestimate the number of infested individual plants

A.1.7.4. Reasoning for the precision of the judgement describing the remaining uncertainties (1st and 3rd quartile/interquartile range)

The Panel assumes a medium uncertainty in the first quartile, and a medium uncertainty above the median because of restricted distribution of the pest. It is very unlikely to be present outdoors and maple is not a major host. It is a quarantine pest in the UK and therefore more likely to be detected and that measures are taken.

A.1.7.5. Elicitation outcomes of the assessment of the pest freedom for *Bemisia tabaci* (European populations) on plants in pots up to 15 years old

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

Table A.5: Elicited and fitted values of the uncertainty distribution of pest infestation by *Bemisia tabaci* (European populations) 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					13		25		45					90
EKE	0.687	1.53	2.83	5.28	8.48	12.5	16.7	25.9	37.2	44.2	52.9	62.4	73.0	81.5	90.2

The EKE results is the BetaGeneral (1.1536, 3.2941, 0, 117) distribution fitted with @Risk version 7.6.

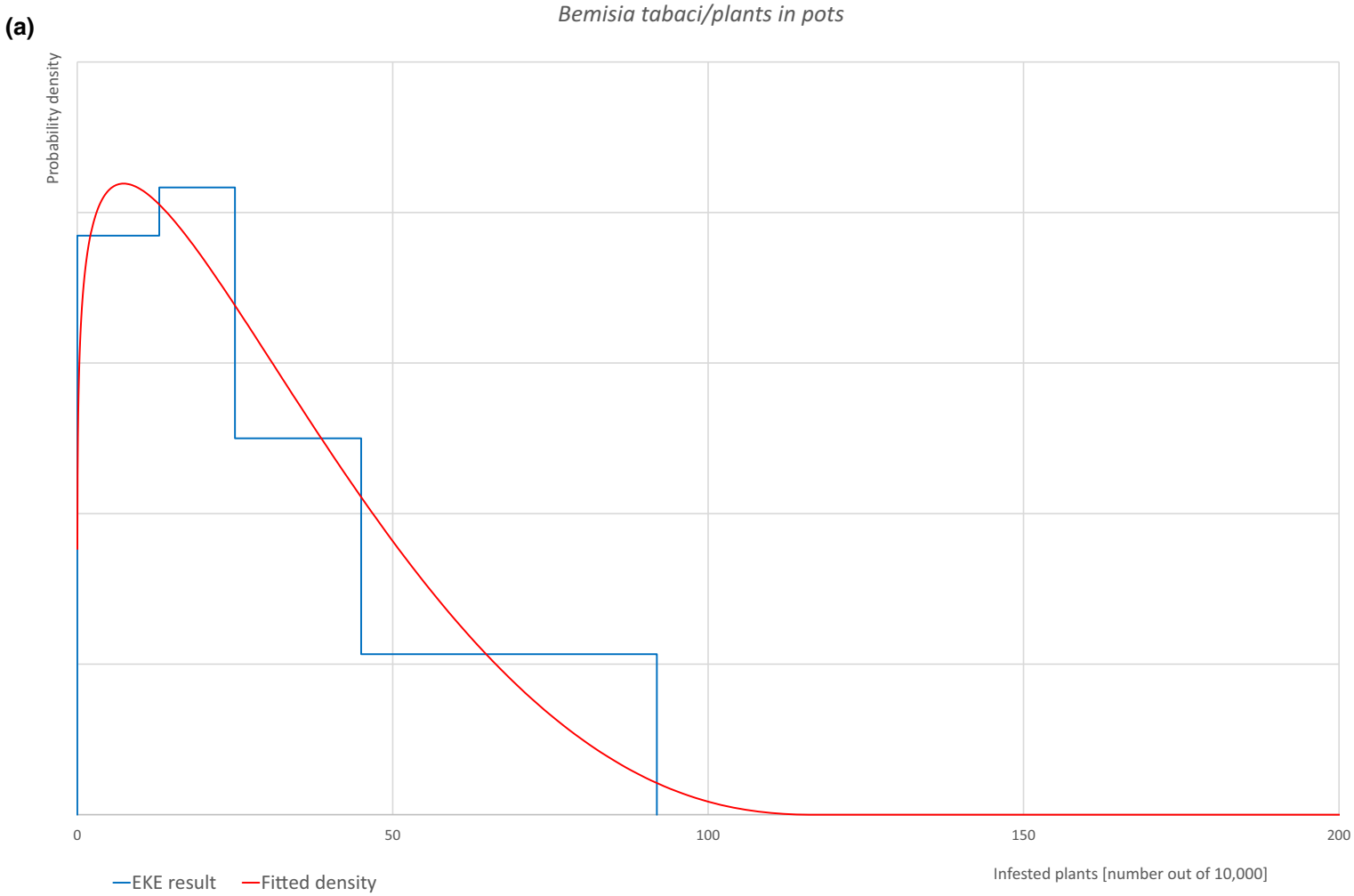
Based on the numbers of estimated infested plants the pest freedom was calculated (i.e. = 10,000 – number of infested plants per 10,000). The fitted values of the uncertainty distribution of the pest freedom are shown in Table A.6.

Table A.6: The uncertainty distribution of plants free of *Bemisia tabaci* (European populations) per 10,000 plants calculated by Table A.5

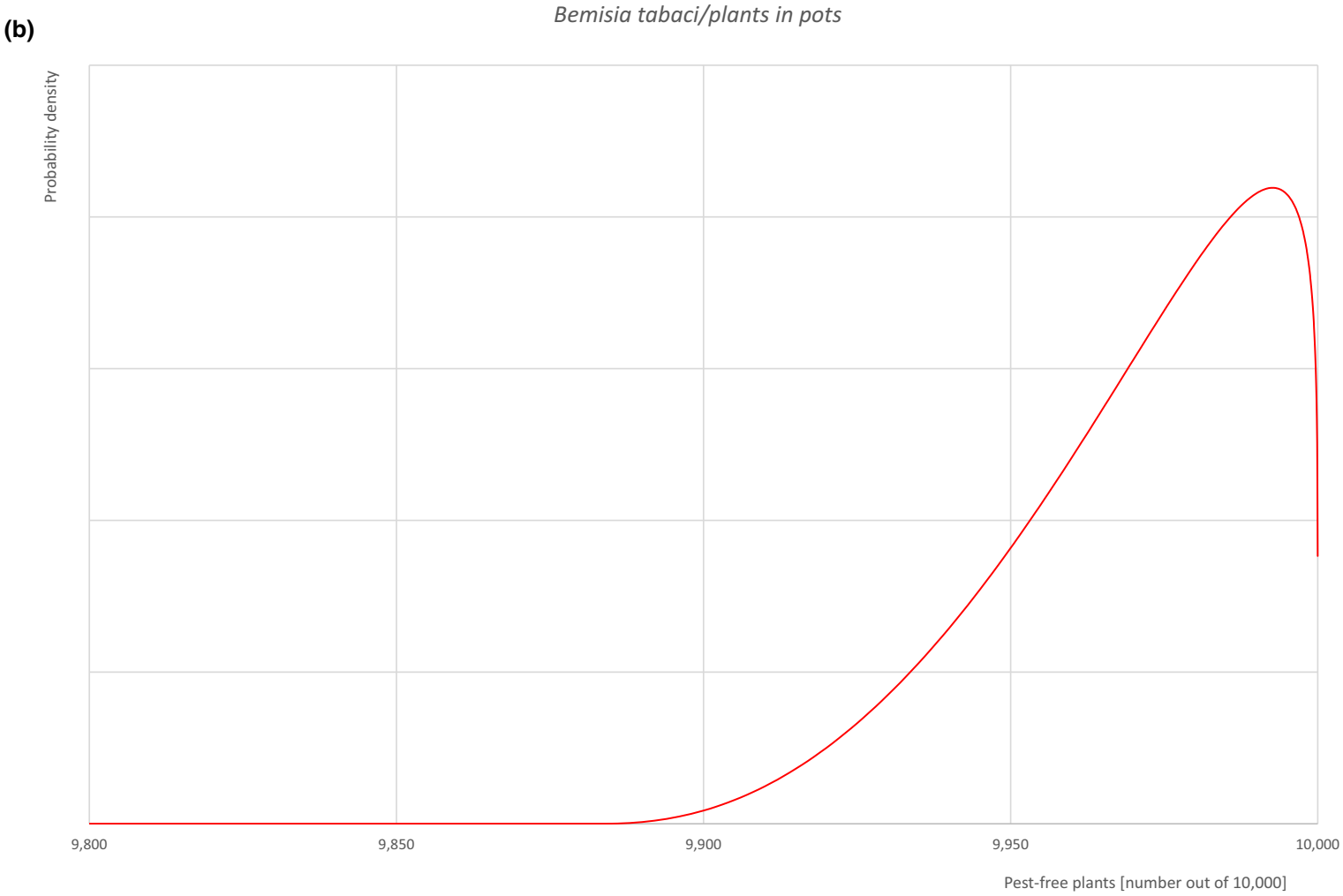
Percentile	1%	2.5%	5%	10%	17%	25%	33%	50%	67%	75%	83%	90%	95%	97.5%	99%
Values	9,910					9,955		9,975		9,987					10,000
EKE results	9,910	9,919	9,927	9,938	9,947	9,956	9,963	9,974	9,983	9,988	9,992	9,995	9,997	9,998	9,999

The EKE results are the fitted values.

(a)


Bemisia tabaci/plants in pots
Probability density
0
50
100
150
200
Infested plants [number out of 10,000]
EKE result
Fitted density

(b)


Bemisia tabaci/plants in pots
Probability density
9,800
9,850
9,900
9,950
10,000
Pest-free plants [number out of 10,000]

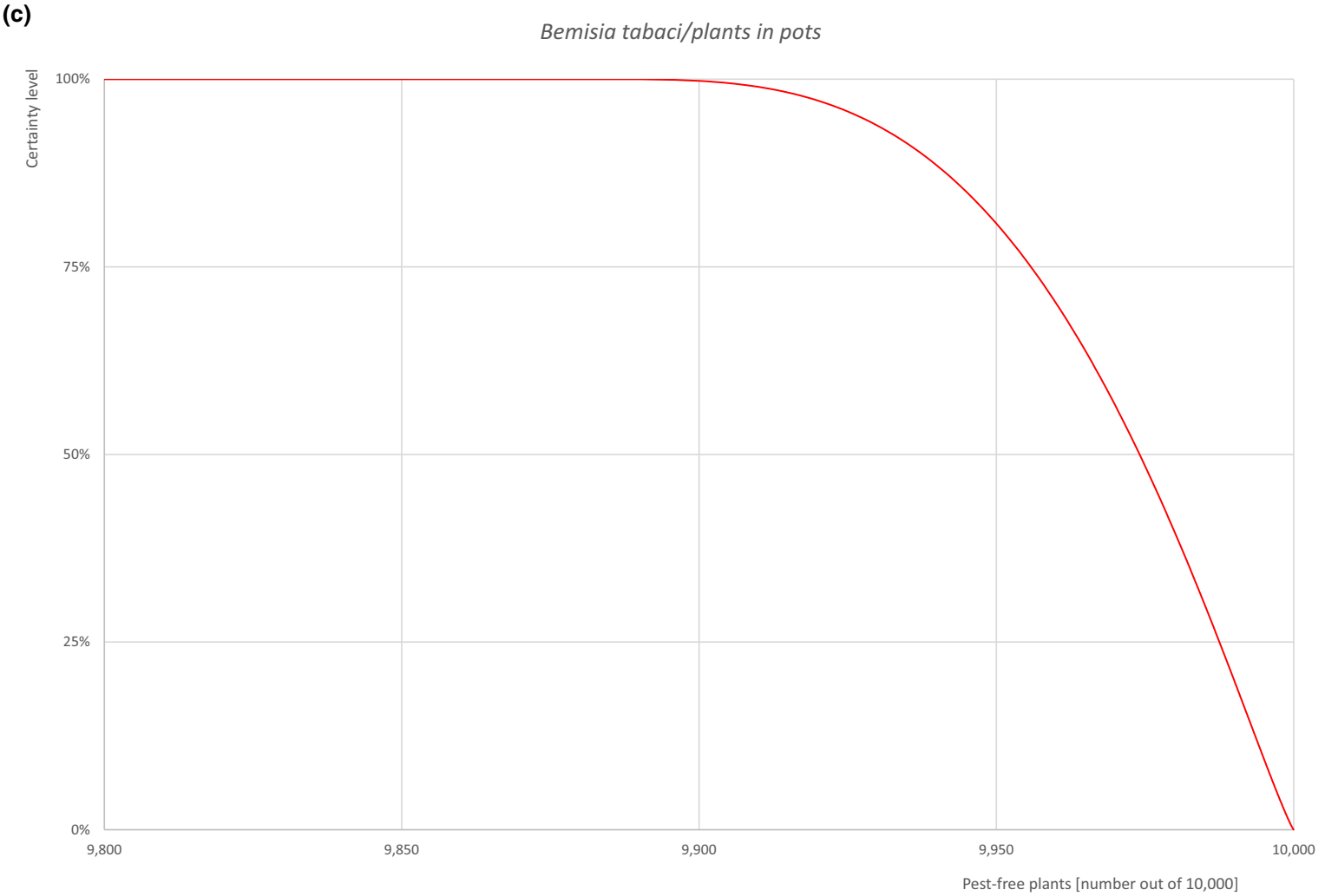


Figure A.3: (a) Elicited uncertainty of pest infestation per 10,000 plants (histogram in blue – vertical blue line indicates the elicited percentile in the following order: 1%, 25%, 50%, 75%, 99%) and distributional fit (red line); (b) uncertainty of the proportion of pest-free plants per 10,000 (i.e.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

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A.2. *Coniella castaneicola*

A.2.1. Organism information

Taxonomic information	Current valid scientific name: *Coniella castaneicola* Synonyms: *Anthasthoopa simba*, *Asteromella castaneicola, Coniella simba, Dothidella castaneicola, Embolidium eucalypti, Gloeosporium castaneicola, Phyllosticta castanicola, Pilidiella castaneicola* (according to Index Fungorum) Name used in the EU legislation: – Order: Diaportales Family: Schizoparmaceae Common name: white rot, Coniella leaf blight Name used in the Dossier: *Coniella castaneicola*
Group	Fungi
EPPO code	–
Regulated status	*Coniella castaneicola* is neither regulated in the EU, nor listed by EPPO. *Coniella castaneicola* is quarantine pathogen for New Zealand (MAF Biosecurity New Zealand, 2009), Western Australia (Australian Department of Agriculture, 2014) and Korea (Korea Government, 2013).
Pest status in the UK	*Coniella castaneicola* is present in the UK, where it is found in the London area (Elmbridge, Wandsworth) and in south England (New Forest) (NBN Atlas, online; Dossier Section 5.0). The pathogen was recorded from England in 1991 (South Hampshire), 1997 (Surrey), 2001 (Surrey) and from Scotland in 2006 (Dawyck Botanic Garden) (NBN atlas, online). In 2015 it was found on cupules of *Castanea sativa* from Studland, Dorset, England (Dorset nature, online).
Pest status in the EU	*Coniella castaneicola* is present in the EU in Germany (Kehr and Wulf, 1993) and Latvia, where it was found on few strawberry plantations in Kurzeme, in 2007 and 2008 (Laugale et al., 2009).
Host status on *Acer*	The only available record for *Acer* sp. being a host of *Coniella castaneicola* is from Canada (Farr and Rossman, online, citing Nag Raj, 1993). There is no information on whether *C. castaneicola* can also attack *Acer campestre*. However, given the polyphagous nature of *C. castaneicola* the Panel cannot exclude that *A. campestre* could be a hostplant for the pathogen.
PRA information	Available Pest Risk Assessment: – Import health standard commodity sub-class: fresh fruit/vegetables mango, *Mangifera indica* from Australia (MAF Biosecurity New Zealand, 2009); – Draft report for the non-regulated analysis of existing policy for table grapes from Japan (Australian Department of Agriculture, 2014).
Other relevant information for the assessment	
Biology	*Coniella castaneicola* is an ascomycete fungus causing rot of fruits and leaf spots on a number of hosts throughout the world, frequently found on living, decaying and dead leaves (Farr and Rossman, online). It is present in Africa (South Africa, Nigeria) (Van Niekerk et al., 2004; Australian department of Agriculture, 2014); Asia (China, Korea, India, Indonesia, Pakistan, Japan, Taiwan) (Farr and Rossman, online; Australian department of Agriculture, 2014; Wang and Lin, 2004); Australia (Australian department of Agriculture, 2014); North America and Caribbean (Canada, the US, Cuba) (Farr and Rossman, online); South America (Brazil) (Barreto et al., 2022).

		Coniella castaneicola is also present in Europe in Germany (Kehr and Wulf, 1993), Latvia (Laugale et al., 2009), Switzerland (Bissegger and Sieber, 1994), Russia (Melkumov, 2014) and the UK (GBIF, online; NBN Atlas, online). There is poor information on the biology and life cycle of *C. castaneicola*; however, its biology is considered very similar to that of *Pilidiella diplodiella*, so that the two species have been assessed together in Australia on grapevine (Australian Department of Agriculture, 2014). *Coniella castaneicola* is mostly known as a pathogen of grapevine, affecting peduncle, rachis, pedicel and berries; secondarily it is found on foliage of deciduous trees. Infections are frequently associated with hailstorms causing wounds on grapes and foliage. Heavy rain, sun scorch and wounding caused by insects can also facilitate infection to a lesser extent (Australian Department of Agriculture, 2014). The pathogen reproduces sexually and asexually, producing ascospores and conidia, respectively, both able to cause infection and dispersed by air or water. Conidia are also able to survive in the environment for long time. Infection rapidly develops at temperatures of 24–27°C, slowly at temperatures below 15°C and only slightly above 34°C. Incubation period varies from 3 to 8 days, depending on temperature, relative humidity, means of penetration and the tissue infected (Australian Department of Agriculture, 2014). Pycnidia and conidia of the pathogen overwinter on dead leaves and survive in the soil for long time (up to 15 years in case of *P. diplodiella*); conidia may germinate under favourable conditions and establish infection on suitable hosts. Conidia are dispersed over short distances by water splash from infected plant material as well as contaminated soil. On medium-long distances, both ascospores and conidia may be dispersed by air currents. The movement of infected material or nursery stock and contaminated soil may also contribute to spreading of the pathogen (Australian Department of Agriculture, 2014).
Symptoms	**Main type of symptoms**	Typical symptom on grapevine is white rot of peduncle, rachis, pedicel and berries. The infection begins as small, pale brown, elongated depressions, which may rapidly spread in favourable conditions, causing drying and falling of berries (Australian Department of Agriculture, 2014). According to Kaneko (1981), on *Castanea* and *Quercus* species in Japan the first symptom on leaves in summer is sparse small spots pale brown, becoming greyish white in colour. The spots increase in size and form irregular-shaped lesions causing marked leaf blight. Pycnidia are produced in the lesions on both leaf surfaces as minute black points. Usually, the disease seems not causing premature defoliation. No information about the symptoms on *Acer* leaves was found.
	Presence of asymptomatic plants	In Switzerland *C. castaneicola* was isolated from young healthy shoots of *Castanea sativa* (Bissegger and Sieber, 1994).
	Confusion with other pests	On grapevine, *Coniella castaneicola* and *Pilidiella diplodiella* cause very similar symptoms, hardly distinguishable. On deciduous trees, the symptoms of *C. castaneicola* may possibly be confused with those of foliage diseases caused by other ascomycete fungi, also depending on the host plant. Identification of the pathogen cannot be done on a symptomatic basis and requires microscopic examination of isolates in cultures or infected plant material with fruiting structures by specialists. A good description of sexual morph of the pathogen on *Castanea* is provided by Jiang et al. (2021).

Host plant range	*Coniella castaneicola* has a variety of hosts including *Acer* sp., *Carya* sp., *Castanea sativa, C. crenata, C. mollissima, C. dentata, Castanea* spp., *Castanopsis sempervirens, Eucalyptus grandis, Eucalyptus* spp., *Fragaria* spp., *Liquidambar styraciflua, Mangifera indica, Quercus alba, Q. rubra, Quercus* sp., *Rhus copallina, Rhus* spp., *Rosa rugosa-prostrata, Syzygium aromaticum, Vaccinium virgatum, Vitis cordifolia* and *V. vinifera* (Crous and Van der Linde, 1993; Farr and Rossman, online). Other host plants recognised in Europe are *Aesculus hippocastanum* (Melkumov, 2014) and *Quercus robur* (Kehr and Wulf, 1993).
Reported evidence of impact	*Coniella castaneicola* and *Pilidiella diplodiella* are mostly known as causing damage to grapevine berries, leading to crop losses and reduced marketability. In regions where hailstorms are frequent, white rot caused by *C. castaneicola* and *P. diplodiella* can lead to crop losses of 20–80% (Australian Department of Agriculture, 2014). *Coniella castaneicola* is also known to cause leaf and fruit diseases of strawberry in the US but no information on the economic significance was found (Australian Department of Agriculture, 2014). In Latvia the pathogen has only a little economic significance in strawberry plantations (Laugale et al., 2009). *Coniella castaneicola* is commonly found on leaves of *Eucalyptus* species, in plantations and nurseries in South Africa, Brazil and Australia, but is considered of minor importance as a pathogen causing leaf spot (Van Niekerk et al., 2004; Australian Department of Agriculture, 2014). In September 2020, *C. castaneicola* was observed on blueberries (*Vaccinium virgatum*) in Nanchang, China. The pathogen caused damage to the leaves (blight, curling, falling off), dieback and even shoot blight. Subsequently the pathogen lowered yield potential (floral buds' development was affected when the leaves fell off) (Lai et al., 2022).
Evidence that the commodity is a pathway	Although *C. castaneicola* has never been intercepted on plants for planting, the pathogen can move both via infected leaves on plants and contaminated soil in potted plants, therefore *Acer* plants for planting may be a pathway.
Surveillance information	*Coniella castaneicola* is not under official control in the UK (Dossier Section 5.0).

A.2.2. Possibility of pest presence in the nursery

A.2.2.1. Possibility of entry from the surrounding environment

Coniella castaneicola is present in the UK in the London area and southern England (South Hampshire, Surrey, Dorset) and Scotland (Dawyck Botanic Garden; NBN atlas, online; Dorset nature, online; Dossier Section 5.0).

The pathogen can naturally spread with ascospores and conidia dispersed by air currents also over long distance, as well as with conidia transported with rain and water splash on short distances.

Coniella castaneicola can infect *Acer* spp., *Castanea* spp. (mostly *C. sativa*), which are present within 2 km from the nurseries, together with other suitable hosts like *Quercus robur* and *Quercus* spp., *Aesculus* spp. and *Rosa* spp. (Dossier Section 3.0).

Uncertainties:

- The presence of the pathogen on host plants in the surrounding area.

Taking into consideration the above evidence and uncertainties, the Panel considers that it is possible for the pathogen to enter the nurseries from surrounding environment via conidia and ascospores transported by wind and air currents.

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

The starting materials are either seeds, seedlings or scion woods/buds. Seeds are certified and coming from the UK. Seedlings are either from the UK, the EU (mostly the Netherlands) or New Zealand (Dossier Section 3.0).

In addition to *Acer* plants, the nurseries also produce other plants (Dossier Section 6.0). Out of them, there are suitable hosts for the pathogen such as *Aesculus hippocastanum, Castanea* spp. and

Quercus spp. However, there is no information on how and where the plants are produced. Therefore, if the plants are first produced in another nursery, the pathogen could possibly travel with them.

The nurseries are using virgin peat or peat-free compost (a mixture of coir, tree bark, wood fibre, etc.) as a growing media (Dossier Section 1.0).

Pycnidia and conidia of *Coniella* and *Pilidiella* species can survive in the soil for long time (up to 15 years in case of *P. diplodiella*) (Australian Department of Agriculture, 2014), and therefore could potentially enter by this pathway. However, the growing media is certified and heat-treated by commercial suppliers during production to eliminate pests and diseases (Dossier Section 3.0).

Uncertainties:

- No information is available on the provenance of plants other than *Acer* used for plant production in the nurseries.

Taking into consideration the above evidence and uncertainties, the Panel considers that it is possible for the pathogen to enter the nurseries via new seedlings of *Acer* and plants of other species used for plant production in the area. The entry of the pathogen with seeds and the growing media the Panel considers as not possible.

A.2.2.3. Possibility of spread within the nursery

Acer plants are either grown in containers (cells, pots, tubes, etc.) outdoors, in the open air or in field. Cell grown trees may be grown in greenhouses, however most plants will be field grown or field grown in containers (Dossier Section 1.0). There are no mother plants present in the nurseries (Dossier Section 3.0).

The pathogen can infect other suitable plants, including *Aesculus* spp., *Acer* spp., *Quercus* spp. present within the nurseries (Dossier Sections 3.0 and 6.0).

Coniella castaneicola can naturally spread within the nurseries by rain, water splash, air currents and movement of soil. It can also be spread with tools/machinery/containers with contaminated soil and/or infected debris of host plants.

Uncertainties:

- None.

Taking into consideration the above evidence and uncertainties, the Panel considers that the spread of the pathogen within the nurseries is possible by air currents, rain and water splash, tools/ machinery/containers with contaminated soil and/or infected debris of host plants.

A.2.3. Information from interceptions

In the EUROPHYT/TRACES-NT database there are no records of notification of *Acer* plants for planting neither from the UK nor from other countries due to the presence of *Coniella castaneicola* between the years 1995 and December 2022 (EUROPHYT/TRACES-NT, online).

A.2.4. Evaluation of the risk mitigation measures

In the table below, all risk mitigation measures currently applied in the UK are listed and an indication of their effectiveness on *Coniella castaneicola* is provided. The description of the risk mitigation measures currently applied in the UK is provided in the Table 6.

N	Risk mitigation measure	Effect on the pest	Evaluation and uncertainties
1	Registration of production sites	Yes	Although the pathogen is not regulated, the risk mitigation measure could have some effects in reducing the likelihood of presence of the pathogen on the commodity. Uncertainties: – Whether disease symptoms on *Acer* are recognisable.
2	Physical separation	No	Not relevant.

N	Risk mitigation measure	Effect on the pest	Evaluation and uncertainties
3	Certified plant material	Yes	The risk mitigation measure could have some effects in reducing the likelihood of presence of the pathogen on the commodity. Uncertainties: – Whether disease symptoms on *Acer* are recognisable.
4	Growing media	Yes	As the pathogen can survive in the soil for long time, this measure, in particular using heat-treated growing media, could be effective in reducing the likelihood of introduction of the pathogen into the nurseries. Uncertainties: – None.
5	Surveillance, monitoring and sampling	Yes	Although the pathogen is not regulated, the risk mitigation measure could have some effects in reducing the likelihood of presence of the pathogen on the commodity. Uncertainties: – Whether disease symptoms on *Acer* are recognisable.
6	Hygiene measures	No	Not relevant. Uncertainties: – Whether the pathogen could infect through pruning wounds thereby making effective the disinfection of pruning tools.
7	Removal of infested plant material	Yes	This measure could have some effect. Uncertainties: – Whether disease symptoms on *Acer* are recognisable.
8	Irrigation water	Yes	Overhead irrigation could favour foliar infections and spread of the pathogen by water splash. Uncertainties: – None.
9	Application of pest control products	Yes	Some fungicides could reduce the likelihood of the infection by the pathogen. Uncertainties: – No specific information on the fungicides used. – The level of efficacy of fungicides in reducing infection of *C. castaneicola*.
10	Measures against soil pests	No	Not relevant.
11	Inspections and management of plants before export	Yes	Although the pathogen is not regulated, the risk mitigation measure could have some effects in reducing the likelihood of presence of the pathogen on the commodity. Uncertainties: – Whether disease symptoms on *Acer* are recognisable.
12	Separation during transport to the destination	No	Not relevant.

A.2.5. Overall likelihood of pest freedom for bundles of whips and seedlings

A.2.5.1. Reasoning for a scenario which would lead to a reasonably low number of infected bundles of whips and seedlings

The scenario assumes a low pressure of the pathogen in the nurseries and in the surroundings. Younger plants are exposed to the pathogen for only short period of time. The scenario assumes *Acer* spp. to be unsuitable/minor hosts for the pathogen. The scenario also assumes that symptoms of the disease are visible and promptly detected during inspections, and that infected leaves are removed from the ground thereby reducing the inoculum pressure.

A.2.5.2. Reasoning for a scenario which would lead to a reasonably high number of infected bundles of whips and seedlings

The scenario assumes a high pressure of the pathogen in the nurseries and in the surroundings as suitable hosts are present. Older plants are exposed to the pathogen for longer period of time. The scenario assumes *Acer* spp. to be hosts for the pathogen. The scenario also assumes that wounds (e.g. pruning wounds) representing infection courts may be present, that infected leaves are not completely removed from the ground, and that symptoms of the disease are not easily recognisable during inspections.

A.2.5.3. Reasoning for a central scenario equally likely to over- or underestimate the number of infected bundles of whips and seedlings (Median)

The scenario assumes a limited presence of the pathogen in the nurseries and the surroundings and that the plants are exposed to the pathogen for a sufficient period of time to cause infection. *Acer* spp. are considered minor hosts.

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

The limited information on occurrence of the pathogen in the UK including the nurseries and the surroundings results in high level of uncertainties for infection rates below the median. Otherwise, the pest pressure from the surroundings is expected to be low giving less uncertainties for rates above the median.

A.2.5.5. Elicitation outcomes of the assessment of the pest freedom for *Coniella castaneicola* on bundles of whips and seedlings

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

Table A.7: Elicited and fitted values of the uncertainty distribution of pest infection by *Coniella castaneicola* per 10,000 bundles

Percentile	1%	2.5%	5%	10%	17%	25%	33%	50%	67%	75%	83%	90%	95%	97.5%	99%
Elicited values	1					23		45		80					250
EKE	1.95	3.78	6.30	10.7	16.1	22.8	29.7	45.3	65.9	79.8	98.8	122	153	184	223

The EKE results is BetaGeneral (1.4281, 244.51, 0, 10,000) distribution fitted with @Risk version 7.6.

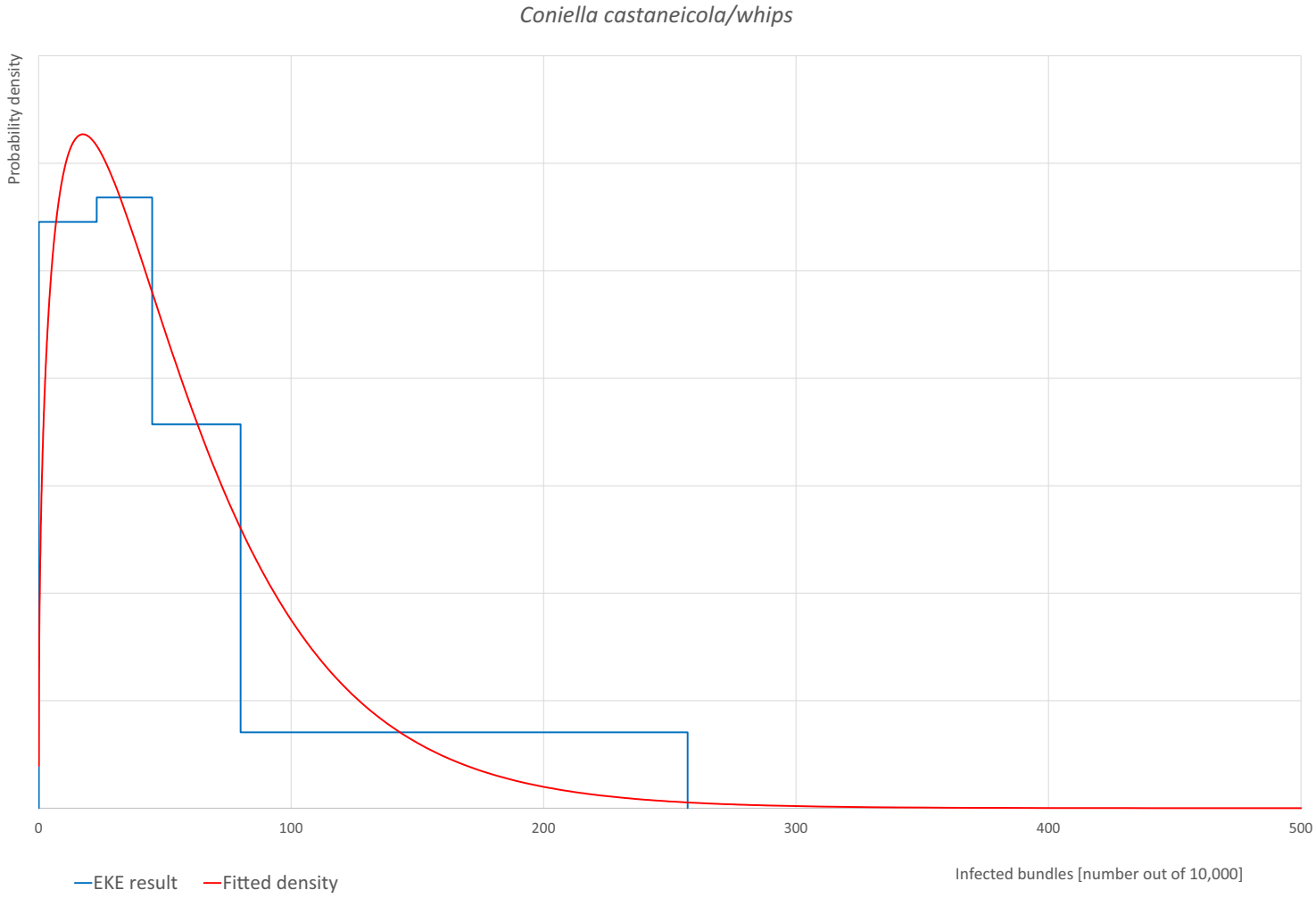
Based on the numbers of estimated infected bundles the pest freedom was calculated (i.e. = 10,000 – number of infected bundles per 10,000). The fitted values of the uncertainty distribution of the pest freedom are shown in Table A.8.

Table A.8: The uncertainty distribution of bundles free of *Coniella castaneicola* per 10,000 bundles calculated by Table A.7

Percentile	1%	2.5%	5%	10%	17%	25%	33%	50%	67%	75%	83%	90%	95%	97.5%	99%
Values	9,750					9,920		9,955		9,977					9,999
EKE results	9,777	9,816	9,847	9,878	9,901	9,920	9,934	9,955	9,970	9,977	9,984	9,989	9,994	9,996	9,998

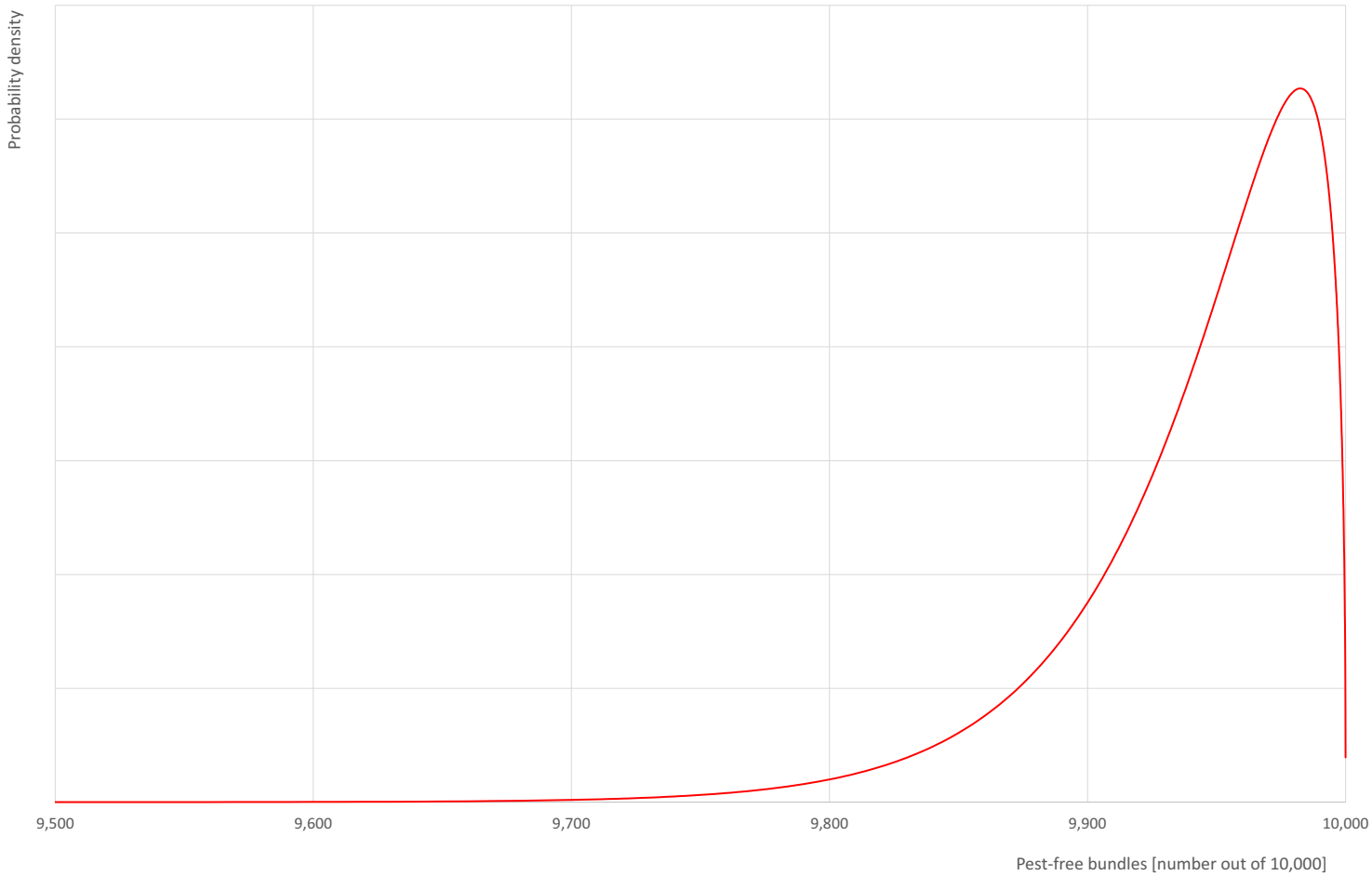
The EKE results are the fitted values.

(a)


Coniella castaneicola/whips
Probability density
0
100
200
300
400
500
Infected bundles [number out of 10,000]
EKE result
Fitted density

(b)

Coniella castaneicola/whips



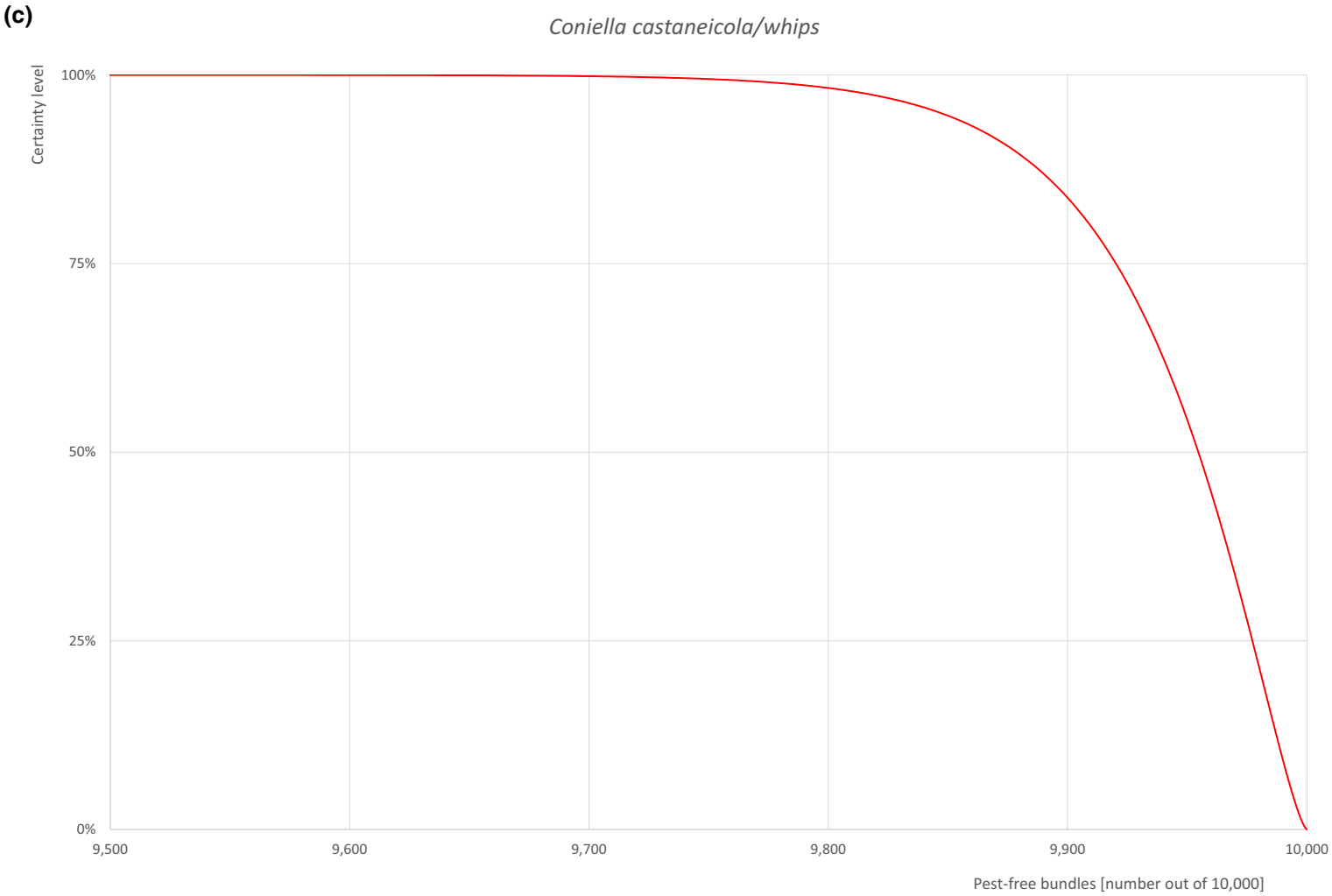


Figure A.4: (a) Elicited uncertainty of pest infection per 10,000 bundles (histogram in blue – vertical blue line indicates the elicited percentile in the following order: 1%, 25%, 50%, 75%, 99%) and distributional fit (red line); (b) uncertainty of the proportion of pest-free bundles per 10,000 (i.e.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

A.2.6. Overall likelihood of pest freedom for bare root plants/trees up to 7 years old

A.2.6.1. Reasoning for a scenario which would lead to a reasonably low number of infested bare root plants/trees up to 7 years old

The scenario assumes a low pressure of the pathogen in the nurseries and in the surroundings. Younger plants are exposed to the pathogen for only short period of time. The scenario assumes *Acer* spp. to be unsuitable/minor hosts for the pathogen. The scenario also assumes that symptoms of the disease are visible and promptly detected during inspections and that infected leaves are removed from the ground thereby reducing the inoculum pressure.

A.2.6.2. Reasoning for a scenario which would lead to a reasonably high number of infested bare root plants/trees up to 7 years old

The scenario assumes a high pressure of the pathogen in the nurseries and in the surroundings as suitable hosts are present. Older plants are exposed to the pathogen for longer period of time. The scenario assumes *Acer* spp. to be hosts for the pathogen. The scenario also assumes that wounds (e.g. pruning wounds) representing infection courts are frequent, that infected leaves are not completely removed from the ground and that symptoms of the disease are not easily recognisable during inspections.

A.2.6.3. Reasoning for a central scenario equally likely to over- or underestimate the number of infested bare root plants/trees up to 7 years old (Median)

The scenario assumes a limited presence of the pathogen in the nurseries and the surroundings and that the plants are exposed to the pathogen for a sufficient period of time to cause infection. *Acer* spp. are considered minor hosts.

A.2.6.4. Reasoning for the precision of the judgement describing the remaining uncertainties (1st and 3rd quartile/interquartile range)

The limited information on occurrence of the pathogen in the UK including the nurseries and the surroundings results in high level of uncertainties for infection rates below the median. Otherwise, the pest pressure from the surroundings is expected to be low giving less uncertainties for rates above the median.

A.2.6.5. Elicitation outcomes of the assessment of the pest freedom for *Coniella castaneicola* on bare root plants/trees up to 7 years old

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

Table A.9: Elicited and fitted values of the uncertainty distribution of pest infection by *Coniella castaneicola* per 10,000 plants

Percentile	1%	2.5%	5%	10%	17%	25%	33%	50%	67%	75%	83%	90%	95%	97.5%	99%
Elicited values	1					20		40		80					250
EKE	1.07	2.34	4.28	7.96	12.8	19.1	25.8	41.7	63.3	78.2	98.8	125	159	193	238

The EKE results is the BetaGeneral (1.1831, 208.25, 0, 10,000) distribution fitted with @Risk version 7.6.

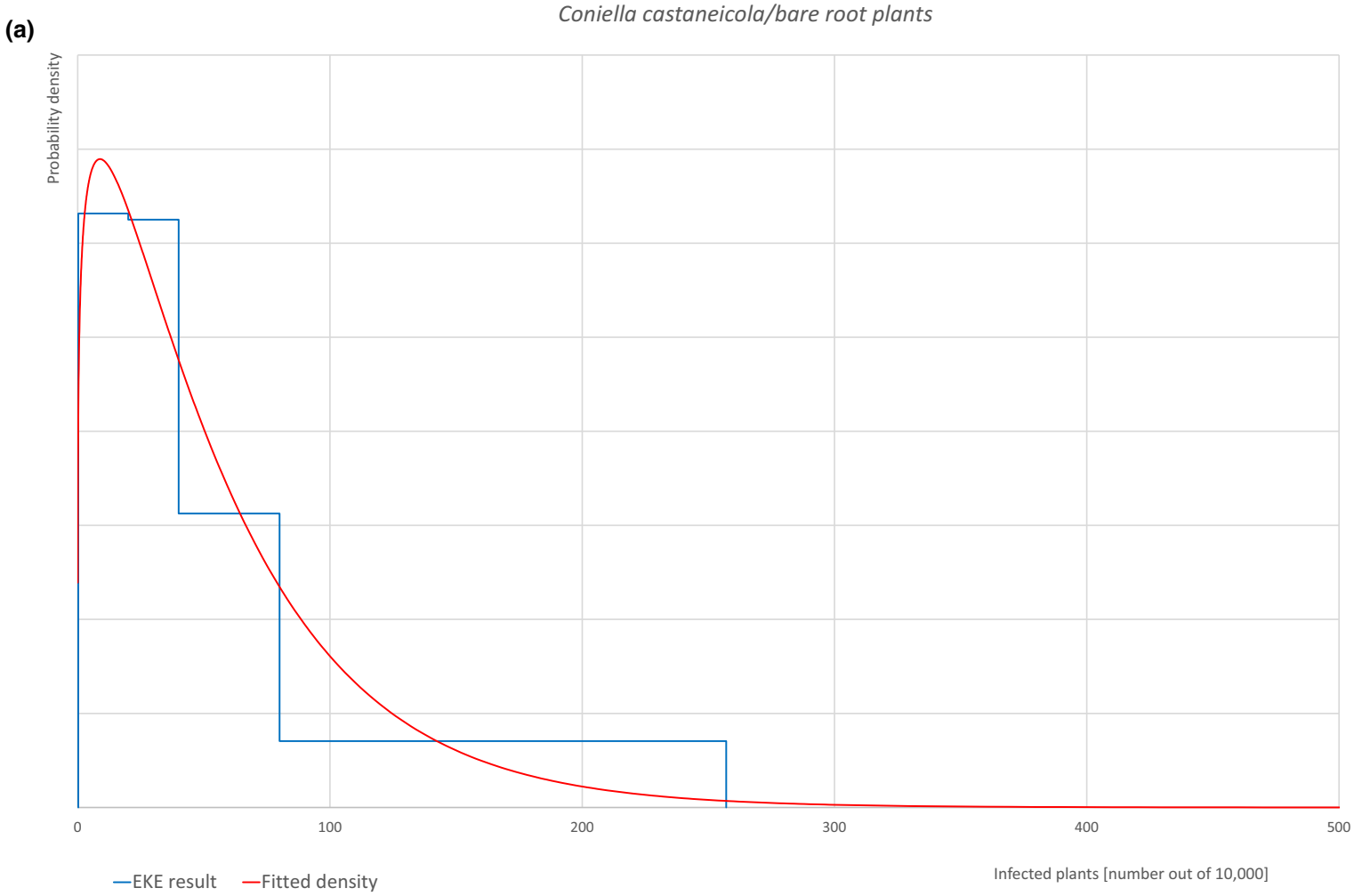
Based on the numbers of estimated infected plants the pest freedom was calculated (i.e. = 10,000 – number of infected plants per 10,000). The fitted values of the uncertainty distribution of the pest freedom are shown in Table A.10.

Table A.10: The uncertainty distribution of plants free of *Coniella castaneicola* per 10,000 plants calculated by Table A.9

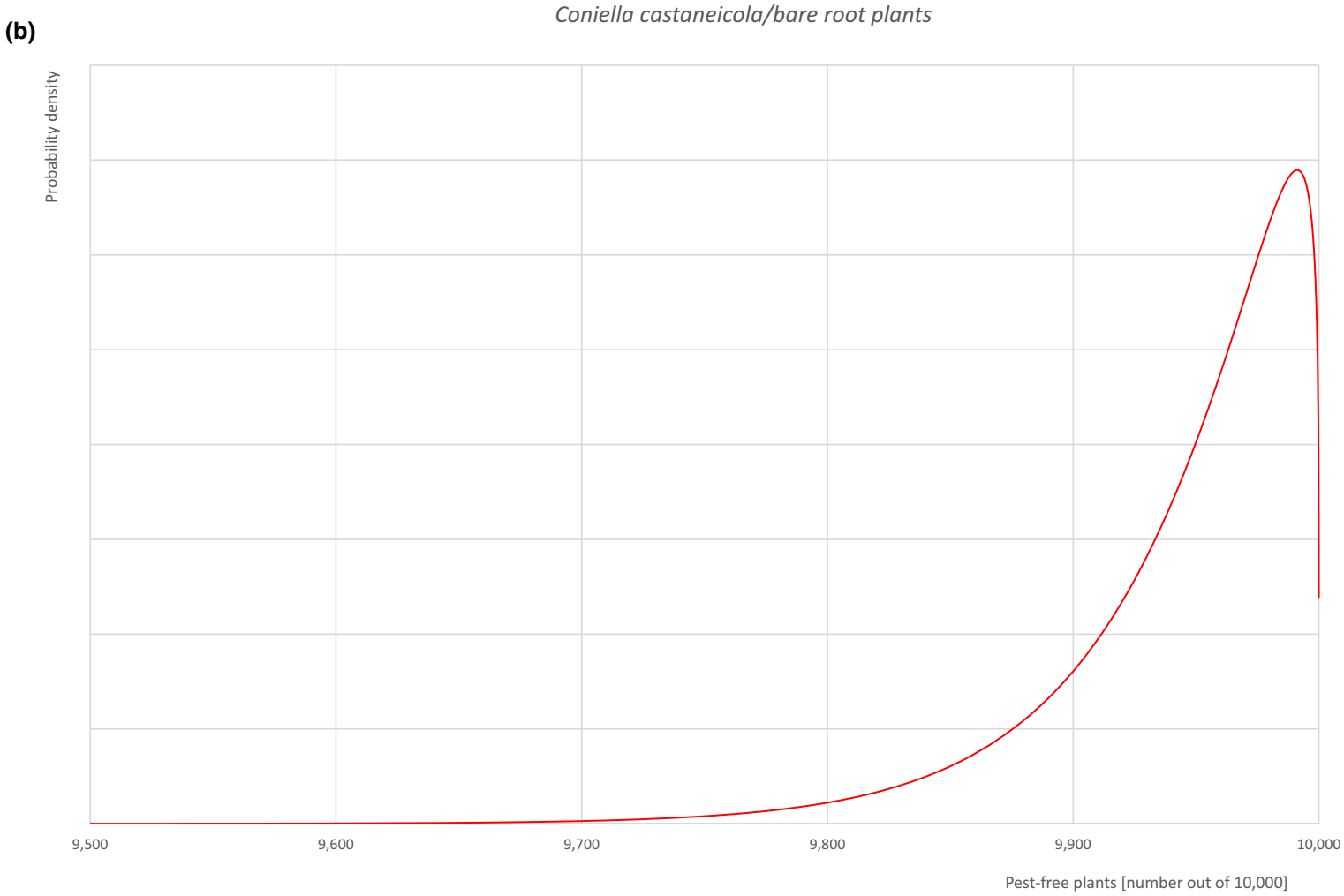
Percentile	1%	2.5%	5%	10%	17%	25%	33%	50%	67%	75%	83%	90%	95%	97.5%	99%
Values	9,750					9,920		9,960		9,980					9,999
EKE results	9,762	9,807	9,841	9,875	9,901	9,922	9,937	9,958	9,974	9,981	9,987	9,992	9,996	9,998	9,999

The EKE results are the fitted values.

(a)


Coniella castaneicola/bare root plants
Probability density
0
100
200
300
400
500
Infected plants [number out of 10,000]
EKE result
Fitted density

(b)


Coniella castaneicola/bare root plants
Probability density
9,500
9,600
9,700
9,800
9,900
10,000
Pest-free plants [number out of 10,000]

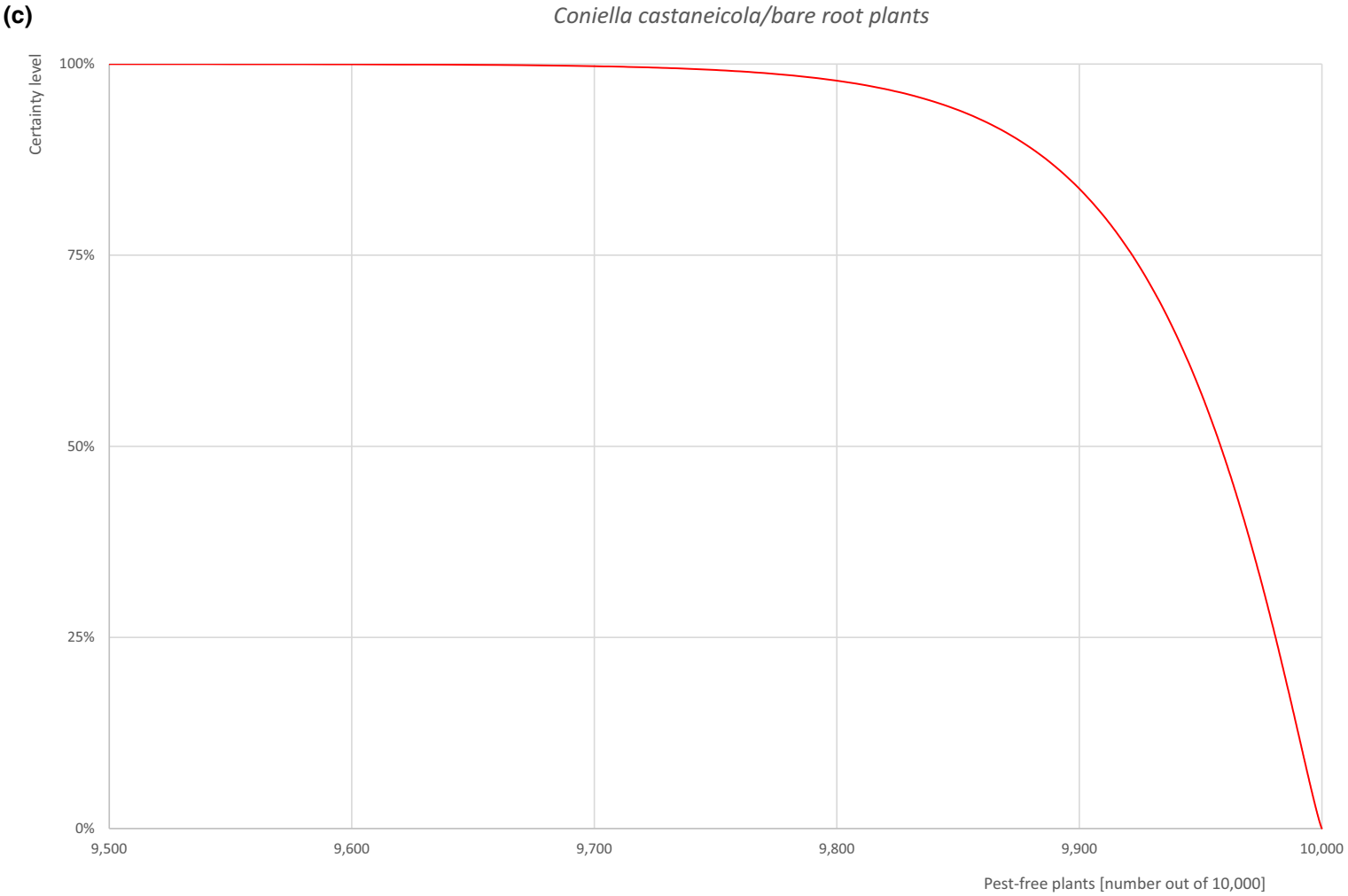


Figure A.5: (a) Elicited uncertainty of pest infection per 10,000 plants (histogram in blue – vertical blue line indicates the elicited percentile in the following order: 1%, 25%, 50%, 75%, 99%) and distributional fit (red line); (b) uncertainty of the proportion of pest-free plants per 10,000 (i.e.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

A.2.7. Overall likelihood of pest freedom for plants in pots up to 15 years old

A.2.7.1. Reasoning for a scenario which would lead to a reasonably low number of infected plants in pots up to 15 years old

The scenario assumes a low pressure of the pathogen in the nurseries and in the surroundings. Younger plants are exposed to the pathogen for only short period of time. The scenario assumes *Acer* spp. to be unsuitable/minor hosts for the pathogen. The scenario also assumes that symptoms of the disease are visible and promptly detected during inspections and that infected leaves are removed from the ground thereby reducing the inoculum pressure during production and preventing the pathogen to be exported in plant material dropped on to the substrate present in pots.

A.2.7.2. Reasoning for a scenario which would lead to a reasonably high number of infected plants in pots up to 15 years old

The scenario assumes a high pressure of the pathogen in the nurseries and in the surroundings as suitable hosts are present. Older plants are exposed to the pathogen for longer period of time. The scenario assumes *Acer* spp. to be hosts for the pathogen. The scenario also assumes that several consignments are traded during the vegetation period (with leaves), that wounds representing infection courts are frequent, that infected leaves are not completely removed from the ground and that symptoms of the disease are not easily recognisable during inspections.

A.2.7.3. Reasoning for a central scenario equally likely to over- or underestimate the number of infected plants in pots up to 15 years old (Median)

The scenario assumes a limited presence of the pathogen in the nurseries and the surroundings and that the plants are exposed to the pathogen for a sufficient period of time to cause infection. *Acer* spp. are considered minor hosts.

A.2.7.4. Reasoning for the precision of the judgement describing the remaining uncertainties (1st and 3rd quartile/interquartile range)

The limited information on occurrence of the pathogen in the UK including the nurseries and the surroundings results in high level of uncertainties for infection rates below the median. Otherwise, the pest pressure from the surroundings is expected to be low giving less uncertainties for rates above the median.

A.2.7.5. Elicitation outcomes of the assessment of the pest freedom for *Coniella castaneicola* on plants in pots up to 15 years old

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

Table A.11: Elicited and fitted values of the uncertainty distribution of pest infection by *Coniella castaneicola* per 10,000 plants

Percentile	1%	2.5%	5%	10%	17%	25%	33%	50%	67%	75%	83%	90%	95%	97.5%	99%
Elicited values	2					40		80		110					400
EKE	6.65	10.8	15.8	23.6	32.3	42.4	52.3	73.6	100	118	141	169	206	241	286

The EKE results is the BetaGeneral (2.0188, 229.1, 0, 10,000) distribution fitted with @Risk version 7.6.

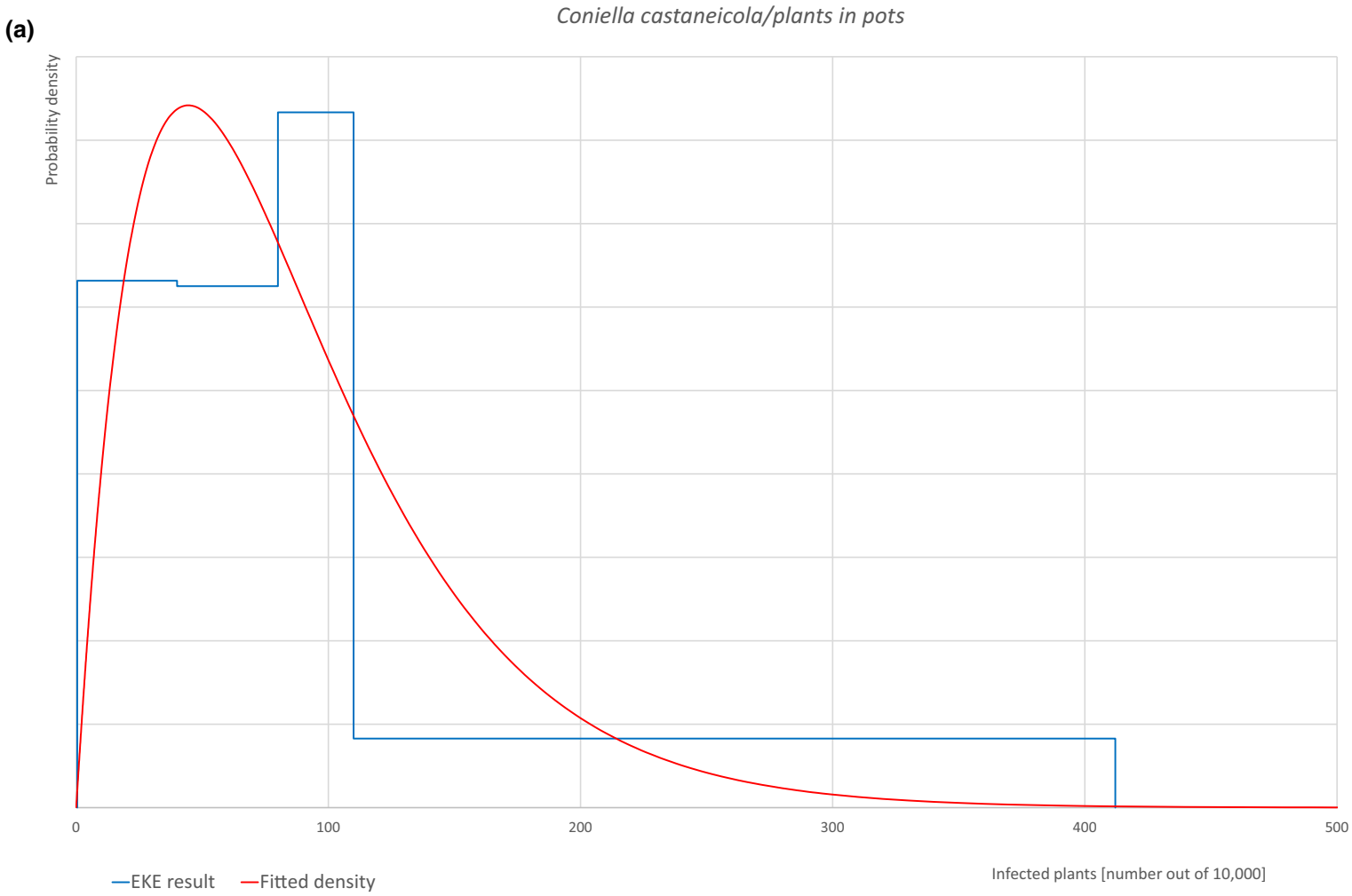
Based on the numbers of estimated infected plants the pest freedom was calculated (i.e. = 10,000 – number of infected plants per 10,000). The fitted values of the uncertainty distribution of the pest freedom are shown in Table A.12.

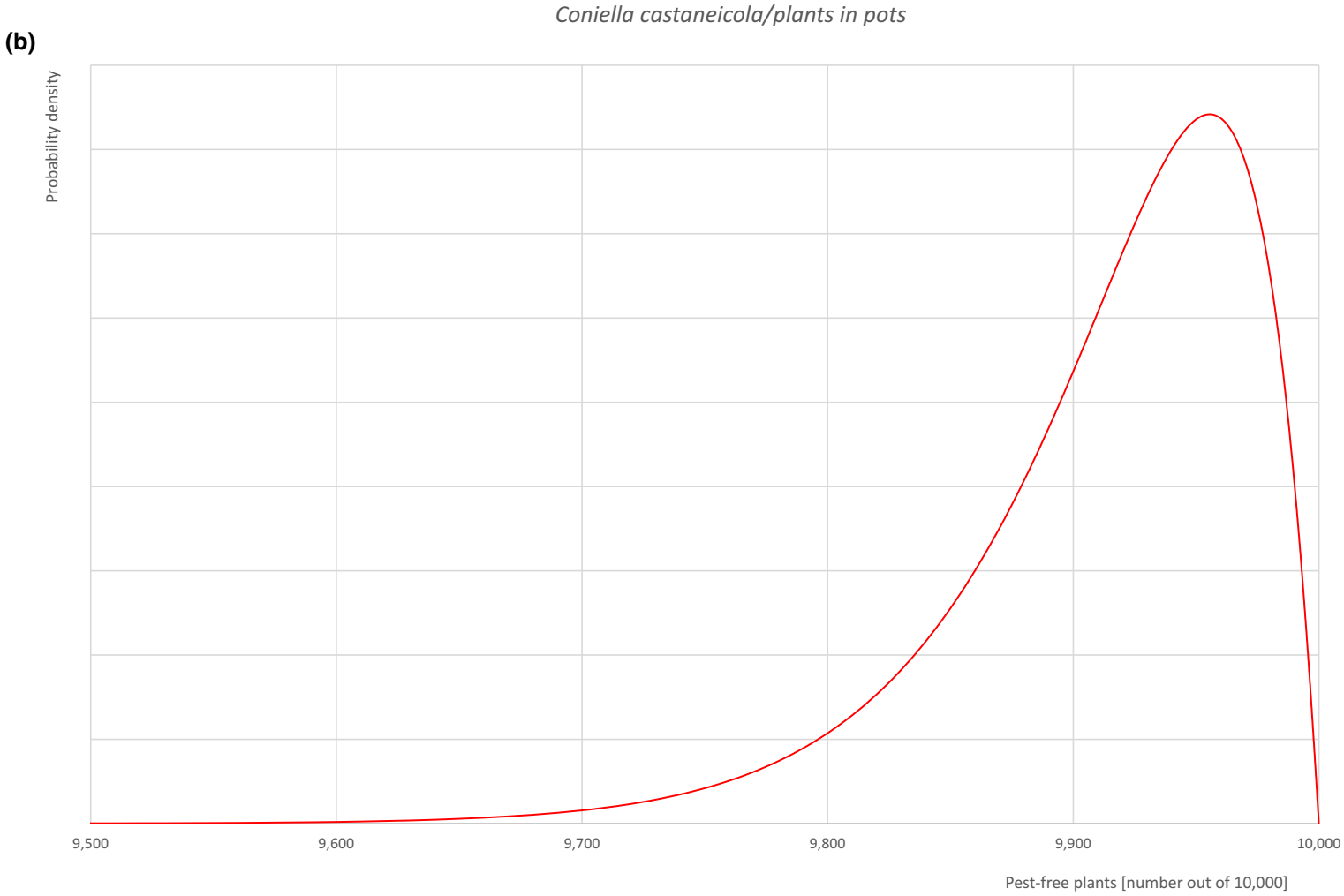
Table A.12: The uncertainty distribution of plants free of *Coniella castaneicola* per 10,000 plants calculated by Table A.11

Percentile	1%	2.5%	5%	10%	17%	25%	33%	50%	67%	75%	83%	90%	95%	97.5%	99%
Values	9,600					9,890		9,920		9,960					9,998
EKE results	9,714	9,759	9,794	9,831	9,859	9,882	9,900	9,926	9,948	9,958	9,968	9,976	9,984	9,989	9,993

The EKE results are the fitted values.

(a)


Coniella castaneicola/plants in pots
Probability density
0
100
200
300
400
500
Infected plants [number out of 10,000]
EKE result
Fitted density


(b)
Coniella castaneicola/plants in pots
Probability density
9,500
9,600
9,700
9,800
9,900
10,000
Pest-free plants [number out of 10,000]

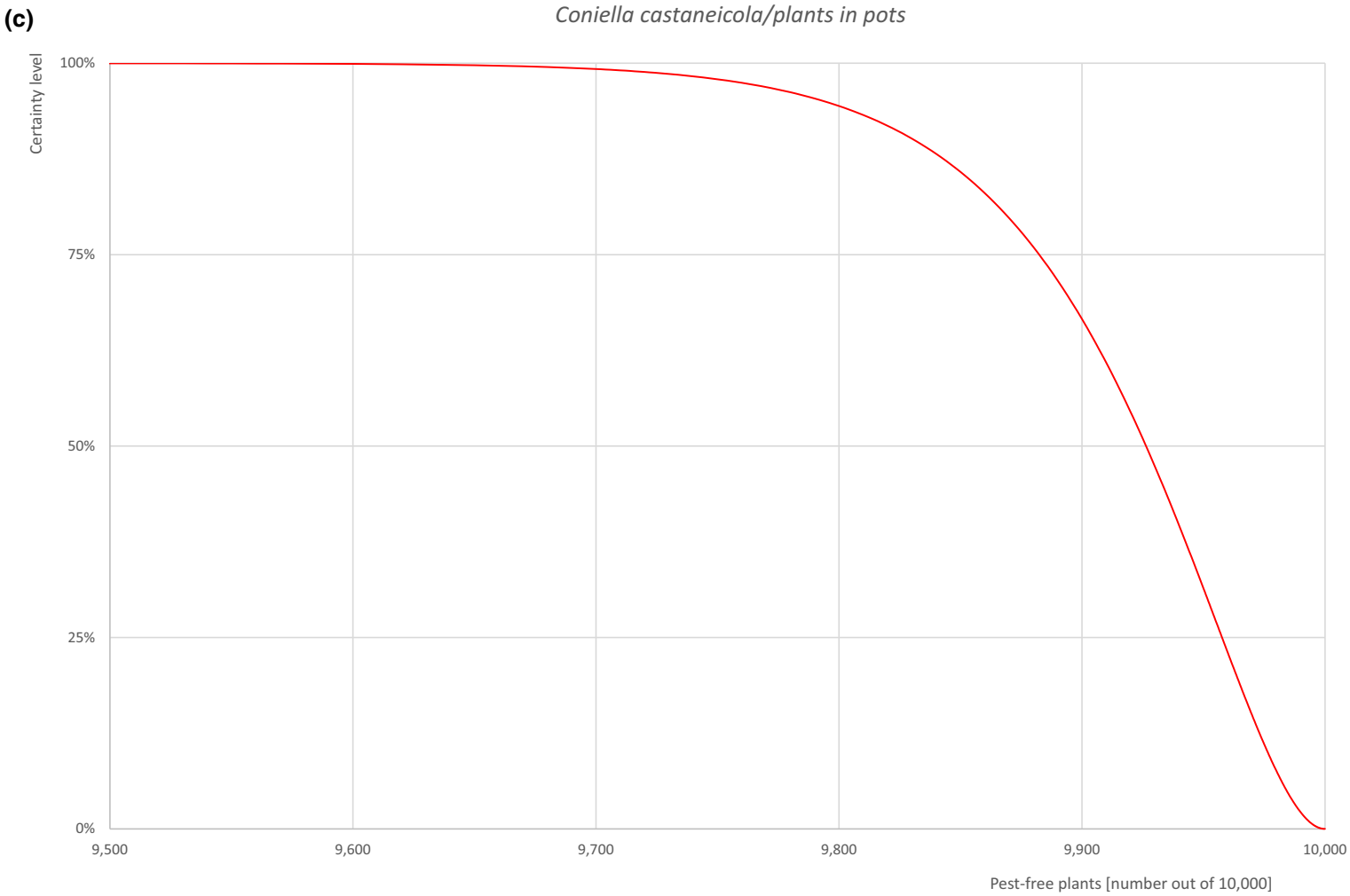


Figure A.6: (a) Elicited uncertainty of pest infection per 10,000 plants (histogram in blue – vertical blue line indicates the elicited percentile in the following order: 1%, 25%, 50%, 75%, 99%) and distributional fit (red line); (b) uncertainty of the proportion of pest-free plants per 10,000 (i.e.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

A.2.8. Reference list

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A.3. *Cryphonectria parasitica*

A.3.1. Organism information

Taxonomic information	Current valid scientific name: *Cryphonectria parasitica* Synonyms: *Diaporthe parasitica*, *Endothia gyrosa* var. *parasitica*, *Endothia parasitica, Valsonectria parasitica* (according to Index Fungorum) Name used in the EU legislation: *Cryphonectria parasitica* (Murrill) Barr [ENDOPA] Order: Diaporthales Family: Cryphonectriaceae Common name: chestnut blight, blight of chestnut, canker of chestnut, blight of oak Name used in the Dossier: *Cryphonectria parasitica*
Group	Fungi
EPPO code	ENDOPA
Regulated status	The pathogen is listed in Annex III and in Annex VI of Commission Implementing Regulation (EU) 2019/2072 as *Cryphonectria parasitica* (Murrill) Barr. [ENDOPA]. It is EU protected zone quarantine pests of Czechia, Ireland, Sweden and the UK (Northern Ireland) and also RNQP (Regulated non-quarantine pest) for plants for planting other than seeds of *Castanea*. *Cryphonectria parasitica* is a quarantine pest in Israel, Morocco, Norway and the US (EPPO, online_a). *Cryphonectria parasitica* is included in the EPPO A2 and in the A2 list of Jordan, Türkiye and COSAVE (Comite de Sanidad Vegetal del Cono Sur – Argentina, Brazil, Chile, Paraguay, Peru and Uruguay). It is also reported on A1 list of Argentina, Azerbaijan, Chile, the UK and IAPSC (Inter-African Phytosanitary Council) (EPPO, online_a).
Pest status in the UK	*Cryphonectria parasitica* is present in the UK (CABI, online; Farr and Rossman, online). The pathogen was apparently eradicated after the first findings in 2011, then newly recorded in 2016; it was suggested that *C. parasitica* has been introduced to the UK multiple times over at least two decades through international plant trade (Perez-Sierra et al., 2019). According to EPPO (online_b) the pathogen is present in the UK with restricted distribution. During surveys held in 2017/18 and 2019/20 *Cryphonectria parasitica* was detected in Berkshire, Buckinghamshire, Cornwall, Derbyshire, Devon, Dorset, London, West Sussex, Jersey and Guernsey (Perez-Sierra et al., 2019; Romon-Ochoa et al., 2022; EPPO, online_c; Forestry Commission, online). According to the Dossier Section 5.0 *Cryphonectria parasitica* is present, not widely distributed and under official control in Great Britain. It is present in central and southern England. In North Ireland the pathogen is not recorded.
Pest status in the EU	*Cryphonectria parasitica* is present in the EU. It is widespread in Croatia, Italy and Portugal. It has restricted distribution in Austria, Belgium, Bulgaria, France, Germany, Greece, Hungary, Romania, Slovakia, Slovenia and Spain. The pathogen is present with few occurrences in Czechia and the Netherlands. In Poland, the pathogen was eradicated (EPPO online_b). Different areas in the EU have different strains of *C. parasitica*, the ability of new strains to spread in areas already infested by other strains seems to be very limited (EFSA PLH Panel, 2016).
Host status on *Acer*	*Cryphonectria parasitica* may infect *Acer palmatum* (Spaulding, 1961; Farr and Rossman, online) and *Acer rubrum* (Anderson and Babcock, 1913; Shear et al., 1917). There is no information on whether *C. parasitica* can also attack *Acer campestre*. *Acer* spp. are reported as minor incidental hosts by Rigling and Prospero (2018).

PRA information	Available Pest Risk Assessment: – Technical justification for Australia's requirement for wood packaging material to be bark free (Biosecurity Australia, 2006); – Rapid pest risk analysis for *Cryphonectria parasitica* (Anderson et al., 2013); – Scientific Opinion on the pest categorisation of *Cryphonectria parasitica* (Murrill) Barr (EFSA PLH Panel, 2014); – Scientific opinion on the risk assessment and reduction options for *Cryphonectria parasitica* in the EU (EFSA PLH Panel, 2016); – Scientific Opinion on the commodity risk assessment of *Acer palmatum* plants grafted on *Acer davidii* from China (EFSA PLH Panel, 2022); – UK Risk Register Details for *Cryphonectria parasitica* (DEFRA, online).
Other relevant information for the assessment	
Biology	*Cryphonectria parasitica* is a pathogen in the family Cryphonectriaceae, native to East Asia (EPPO, online_b). It is present in Africa (Tunisia), Asia (China, India, Iran, Japan, North and South Korea, Taiwan), Europe, North America (Canada, the US) and Oceania (Australia) (EPPO, online_b). The biology section is based on the studies on chestnut, one of the major hosts. *Cryphonectria parasitica* is a bark pathogen that infects the tissue through wounds or growth cracks in the bark. The pathogen can also infect abandoned galls of the gall wasp *Dryocosmus kuriphilus* (Meyer et al., 2015). Hail wounds have been documented as important infection courts (Lione et al., 2020). The infection is caused by asexual and sexual spores. The infection develops in a lesion and a canker, which eventually kills the plant part distal to the infection. The pathogen can saprophytically colonise recently (one year) dead stems or branches (Hepting, 1974; Prospero et al., 2006). Then stromata develop. Stromata can contain sexual fruiting bodies (perithecia), asexual ones (pycnidia) or both. Pycnidia produce conidia that are released in tendrils in moist condition and splash dispersed by rain in a few metres range. Conidia can also be dispersed by birds, insects and windborne dust over long distances (Wendt et al., 1983; Russin et al., 1984). Once in the ground conidia can survive for a long time (Heald and Studhalter, 1914). Perithecia produce ascospores that can be dispersed by wind over hundreds of metres and are relatively short-lived. Ascospores are discharged from spring to autumn during warm rains (Heald and Gardner, 1914; Guérin et al., 2001). Sexual reproduction can be by both, outcrossing and self-fertilisation (Marra et al., 2004). In northern Italy, it has been reported that *C. parasitica* can release propagules all over the year, though with significant seasonal peaks in the spring and fall. Large propagule loads were significantly correlated with an increasing number of rainy days of the week (days providing 1-10 mm/day of water) (Lione et al., 2022). In newly established populations, asexual reproduction via conidia is often the predominant spreading mechanism (Rigling and Prospero, 2018). The canker growth can be as fast as 1 mm per day when the average daily temperature is 20°C, with a peak at 27°C and slowed down below 20°C (Bazzigher, 1981). The optimal germination temperature of conidia is 25–26°C, the ascospores' one is 21°C (Fulton, 1912). Humidity promotes spore release (Griffin, 1986), but drought stress can increase incidence and mortality of the pathogen (Roane et al., 1986; Waldboth and Oberhuber, 2009). The pathogen's ability to infect a new host is dependent on the age of the wound: on European chestnut *C. parasitica* cannot establish itself in wounds of 4 or more days (Bazzigher and Schmid, 1962). *Cryphonectria parasitica* can also show an endophytic behaviour, it has been found in symptomless stems 3 months after inoculation (Guérin and Robin, 2003) or developed its symptoms after 16 months of quarantine in Australia (Cunnington and Pascoe, 2003). On chestnut fruits, the fungus is associated with only the nutshell (Jaynes and Depalma, 1984).

		In newly colonised territories, the population usually consists of one or few genotypes, limiting sexual reproduction and long-range dispersal via ascospores. In most populations in Europe, random mating has been ruled out and, even then, ascospores are not likely to be the primary inoculum (Milgroom and Cortesi, 1999). The main mycovirus acting as biological control agent for *C. parasitica*, reducing its virulence, in Europe is *Cryphonectria* hypovirus 1 (CHV-1), one of the four known species of the genus Hypovirus (Turina and Rostagno, 2007). CHV-1 can spread via hyphal anastomosis from one individual to another or via conidia, but not via ascospores. Fungi-feeding mites can be important for the spread of CHV-1 (Bouneb et al., 2016). *Cryphonectria parasitica*, like many fungi has a vegetative incompatibility (vic) mechanism. This mechanism usually hinders the transmission of mycoviruses including CHV1. Up to date, there are 64 genetically defined vic genotypes (Short et al., 2015). According to EFSA PLH Panel (2016), the main pathways of entry for *C. parasitica* are plants for planting (including seedlings, scions, rootstocks, ornamental plants), wood with bark (including chips, wood for tannin production, hoops for barrels), fruit (nuts), soil and growing media (including isolated chestnut bark), natural spread of airborne inoculum, biological agents able to mechanically transfer the fungus (e.g. birds, mammals, insects, mites, etc.) and machinery (construction, terracing, etc.) and pruning/cutting tools. According to EUROPHYT (online), *Cryphonectria parasitica* was intercepted 14 times on wood and bark of *Castanea* sp. or *Castanea sativa*. Once it was intercepted on *Castanea sativa plants* intended for planting: not yet planted. *Cryphonectria parasitica* is singlehandedly responsible for the removal from the forest dominant plane of *Castanea dentata* in North America. Impact of the pathogen is strongly dependent on host availability, host susceptibility and virulence of the *Cryphonectria parasitica* strain. An in-depth analysis of the impact of introduction of new strains of the pathogen in EU countries where *C. parasitica* is already established and in countries where it is absent is available in the EFSA Pest Risk Assessment for *Cryphonectria parasitica* (EFSA PLH Panel, 2016).
Symptoms	**Main type of symptoms**	*Cryphonectria parasitica* only attacks the aboveground tree parts. Symptoms vary depending on the age of the host tree, its species, and the virulence of the particular pathogen strain (Heiniger and Rigling, 1994; Prospero and Rigling, 2013). Virulent strains on susceptible trees produce in few months cankers that can kill branches or twigs (Diller, 1965). On susceptible *Castanea* species, one of the first symptoms is branch wilting with wilted leaves hanging on the branches. Cankers typically appear as sunken, reddish-brown bark lesions. Below the cankers, trees can produce epicormic shoots. At the canker border and under the bark, the fungus develops pale brown mycelial fans. On more resistant tree species (Asian chestnut species, oaks), cankers typically have a swollen appearance and are superficial or callused. There is no information on the symptoms caused by *C. parasitica* on *Acer* plants.
	Presence of asymptomatic plants	*Cryphonectria parasitica* can show an endophytic behaviour, imported chestnut plants have developed symptoms after 16 months of quarantine (Cunnington and Pascoe, 2003).
	Confusion with other pests	*Cryphonectria parasitica* symptoms can be confused with other cankers in the first stages, but the presence of mycelial fans and appearance of the fruiting bodies makes the identification clear. Isolated on potato dextrose agar can identify also hypovirus-infected fungi, and molecular methods have been developed for identification (EFSA PLH Panel, 2014). Some confusion can occur with cancers caused by *Gnomonopsis castaneae* (Lione et al., 2019).

Host plant range	Main host of *Cryphonectria parasitica* are *Castanea dentata* and *C. sativa*. Other hosts in the *Castanea* genus are *C. crenata, C. henryi, C. mollissima, C. ozarkensis, C. pumila* and *C. seguinii*. Among oaks the known hosts are *Quercus alba, Q. coccinea, Q. frainetto, Q. ilex, Q. montana, Q. petraea, Q. prinus, Q. pubescens, Q. stellata, Q. suber, Q. velutina* and *Q. virginiana*. *Cryphonectria parasitica* was also reported on *Aesculus hippocastanum, Carya ovata, Carpinus betulus, Eucalyptus camaldulensis, E. haemastoma, E. microcorys, E. punctata, E. robusta, Rhus typhina* and *Fagus sylvatica* (EPPO, online_d; Farr and Rossman, online). The reports for *Fagus sylvatica* are only taken from artificial inoculation (Dennert et al., 2020). *Acer palmatum* is a known host for *C. parasitica* (EPPO, online_d; Farr and Rossman, online). *Cryphonectria parasitica* has also been reported on *Acer rubrum* in North America (Anderson and Babcock, 1913; Shear et al., 1917). Inoculation experiments indicated that bark of *Acer rubrum* is much less susceptible than the bark of *Quercus* sp. (Baird, 1991).
Reported evidence of impact	*Cryphonectria parasitica* is EU protected zone quarantine pest.
Evidence that the commodity is a pathway	Host plants for planting, excluding seeds, but including dormant plants, have been identified as pathways by EFSA PLH Panel (2014), and have been historically pathways even after quarantine (Cunnington and Pascoe, 2003).
Surveillance information	*Cryphonectria parasitica* is a regulated quarantine pest for Great Britain subject to eradication measures, unless in the wider environment where a containment policy may be taken dependent on the site. As part of an annual survey at ornamental retail and production sites (frequency of visits determined by a decision matrix) *Cryphonectria parasitica* is inspected for on common hosts plants (Dossier Section 3.0 and 5.0).

A.3.2. Possibility of pest presence in the nursery

A.3.2.1. Possibility of entry from the surrounding environment

Cryphonectria parasitica is present in the UK with restricted distribution mostly in central and southern England (Dossier Section 5.0; Forestry Commission, online).

The pathogen can naturally spread with ascospores dispersed by air currents over hundreds of metres, as well as with conidia transported with rain splash over short distances. However, conidia can also be dispersed by birds, insects and wind over long distances (Wendt et al., 1983; Russin et al., 1984).

Cryphonectria parasitica principally infects *Castanea* species mostly *C. sativa*, which is present within 2 km radius from the nurseries, together with other suitable hosts like *Quercus* spp. and other plants that the pathogen was reported on like *Aesculus hippocastanum* and *Fagus* spp. (Dossier Section 3.0).

Uncertainties:

- The susceptibility of *Acer* to the pathogen.
- The dispersal range of animals carrying *C. parasitica* inoculum (e.g. birds, insects and mites).
- The role of animals in *C. parasitica* dispersal.
- No information available on the distance of the nurseries to sources of pathogen in the surrounding environment.

Taking into consideration the above evidence and uncertainties, the Panel considers that it is possible for *Cryphonectria parasitica* to enter the nurseries from surrounding environment via conidia and ascospores transported by air currents, birds and insects.

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

The starting materials are either seeds, seedlings or scion woods/buds. Seeds are certified and coming from the UK. Seedlings are either from the UK, the EU (mostly the Netherlands) or New Zealand (Dossier Section 3.0).

In addition to *Acer*, the nurseries also produce other plants (Dossier Section 6.0). Out of them, there are suitable hosts for the pathogen such as *Castanea* spp. and *Quercus* spp. and other plants that the pathogen was reported on like *Aesculus hippocastanum*, *Carpinus betulus* and *Fagus sylvatica*. However, there is no information on how and where the plants are produced. Therefore, if the plants are first produced in another nursery, the pathogen could possibly travel with them.

The nurseries are using virgin peat or peat-free compost (a mixture of coir, tree bark, wood fibre, etc.) as a growing media (Dossier Section 1.0). Although soil and growing media are considered pathways of minor importance (EFSA, 2016), the conidia of *Cryphonectria parasitica* can survive in the soil for long time (Heald and Studhalter, 1914) and therefore could potentially enter by this way. However, the growing media is certified and heat-treated by commercial suppliers during production to eliminate pests and diseases (Dossier Section 3.0).

Uncertainties:

- The susceptibility of other plants in the nursery to the pathogen.
- No information is available on the provenance of plants other than *Acer* used for plant production in the nurseries.

Taking into consideration the above evidence and uncertainties, the Panel considers that it is possible for the pathogen to enter the nurseries via new seedlings of *Acer* and plants of other species used for plant production in the area. The entry of the pathogen with seeds and the growing media the Panel considers as not possible.

A.3.2.3. Possibility of spread within the nursery

Acer plants are either grown in containers (cells, pots, tubes, etc.) outdoors, in the open air or in field. Cell grown trees may be grown in greenhouses, however most plants will be field grown or field grown in containers (Dossier Section 1.0). There are no mother plants present in the nurseries (Dossier Section 3.0).

The pathogen can infect other plants, such as *Aesculus* spp., *Acer* spp., *Castanea* spp., *Fagus* spp., *Quercus* spp., etc. present within the nurseries (Dossier Sections 3.0 and 6.0).

If sporulating infections occur in the nurseries, *Cryphonectria parasitica* can naturally spread within the nurseries by rain/water splash, air currents, transported by insects, mites and birds. Human assisted spread could be mostly via contaminated equipment, but tools used in the nurseries are disinfected before being used on different plants (Dossier Section 3.0).

Uncertainties:

- The host suitability of *Acer* to *Cryphonectria parasitica*.

Taking into consideration the above evidence and uncertainties, the Panel considers that the spread of the pathogen within the nurseries is possible by rain/water splash, air currents and transport of insects, mites and birds.

A.3.3. Information from interceptions

In the EUROPHYT/TRACES-NT database there are no records of notification of *Acer* plants for planting neither from the UK nor from other countries due to the presence of *Cryphonectria parasitica* between the years 1995 and December 2022 (EUROPHYT/TRACES-NT, online).

A.3.4. Evaluation of the risk mitigation measures

In the table below, all risk mitigation measures currently applied in the UK are listed and an indication of their effectiveness on *Cryphonectria parasitica* is provided. The description of the risk mitigation measures currently applied in the UK is provided in the Table 6.

N	Risk mitigation measure	Effect on the pest	Evaluation and uncertainties
1	Registration of production sites	Yes	The risk mitigation measure is expected to be effective in reducing the likelihood of presence of the pathogen on the commodity. Uncertainties: – None.
2	Physical separation	No	Not relevant.
3	Certified plant material	Yes	The risk mitigation measure is expected to be effective in reducing the likelihood of presence of the pathogen on the commodity. Uncertainties: – None.
4	Growing media	No	Not relevant.
5	Surveillance, monitoring and sampling	Yes	This measure could have some effect. Uncertainties: – Whether symptoms caused by the pathogen on *Acer* are recognisable. – Whether *Acer* plants are subjected to annual surveys.
6	Hygiene measures	Yes	The desinfection of tools with appropriate product can prevent the spread of the pathogen within the nurseries. Uncertainties: – Specific product used for desinfection of tools.
7	Removal of infested plant material	Yes	This measure could have some effect. Uncertainties: – None.
8	Irrigation water	Yes	Overhead irrigation can increase the likelyhood of spread of the pathogen by water splash. Uncertainties: – None.
9	Application of pest control products	Yes	Althouth *C. parasitica* is generaly not a target of the pesticide treatments in the nurseries, some fungicides could reduce the likelihood of the infection by the pathogen. Uncertainties: – No specific information on the fungicides used. – The level of efficacy of fungicides in reducing infection of *C. parasitica*.
10	Measures against soil pests	No	Not relevant.
11	Inspections and management of plants before export	Yes	This measure could have some effect. Uncertainties: – Whether symptoms caused by the pathogen on *Acer* are recognisable.
12	Separation during transport to the destination	No	Not relevant.

A.3.5. Overall likelihood of pest freedom for bundles of whips and seedlings

A.3.5.1. Reasoning for a scenario which would lead to a reasonably low number of infected bundles of whips and seedlings

The scenario assumes a low pressure of the pathogen in the nurseries and in the surroundings. The plants are exposed to the pathogen for only short period of time. The scenario assumes *Acer* spp. to be unsuitable/minor hosts for the pathogen. The scenario also assumes that symptoms of the disease are visible and promptly detected during inspections.

A.3.5.2. Reasoning for a scenario which would lead to a reasonably high number of infected bundles of whips and seedlings

The scenario assumes a high pressure of the pathogen in the nurseries and in the surroundings as suitable hosts are present. The scenario assumes *Acer* spp. to be hosts for the pathogen. The scenario also assumes that symptoms of the disease are not easily recognisable during inspections.

A.3.5.3. Reasoning for a central scenario equally likely to over- or underestimate the number of infected bundles of whips and seedlings (Median)

The scenario assumes a limited presence of the pathogen in the nurseries and the surroundings. *Acer* spp. are considered minor hosts. The pathogen is a regulated quarantine pest in the UK and under official control.

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

The limited information on occurrence of the pathogen in the UK including the nurseries and the surroundings results in high level of uncertainties for infection rates below the median. Otherwise, the pest pressure from the surroundings is expected to be low giving less uncertainties for rates above the median.

A.3.5.5. Elicitation outcomes of the assessment of the pest freedom for *Cryphonectria parasitica* on bundles of whips and seedlings

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

Table A.13: Elicited and fitted values of the uncertainty distribution of pest infection by *Cryphonectria parasitica* per 10,000 bundles

Percentile	1%	2.5%	5%	10%	17%	25%	33%	50%	67%	75%	83%	90%	95%	97.5%	99%
Elicited values	0					5		10		20					50
EKE	0.209	0.494	0.952	1.86	3.10	4.72	6.46	10.5	15.9	19.47	24.2	29.8	36.6	42.8	50.0

The EKE results is the BetaGeneral (1.0764, 6.8505, 0, 100) distribution fitted with @Risk version 7.6.

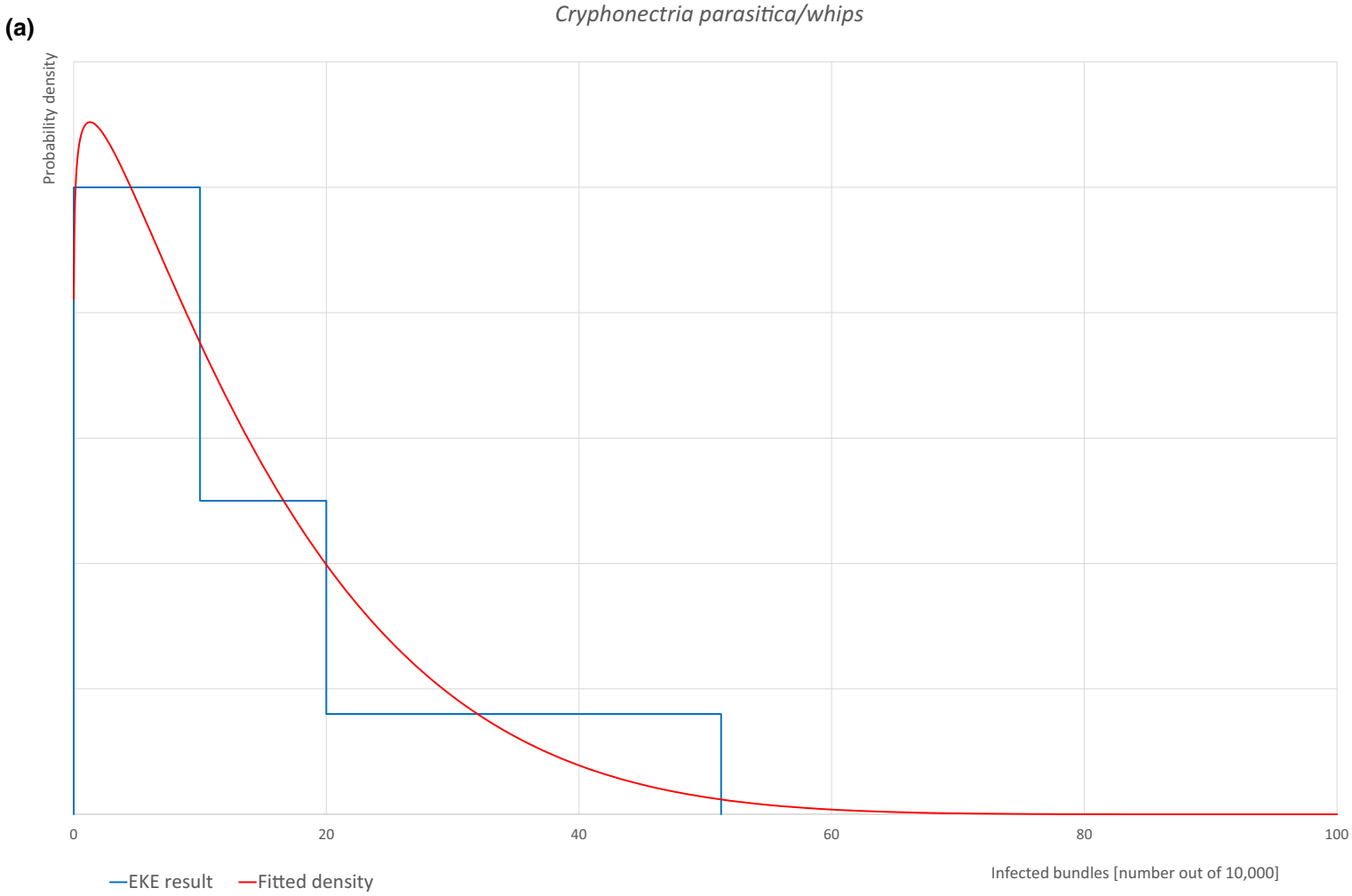
Based on the numbers of estimated infected bundles the pest freedom was calculated (i.e. = 10,000 – number of infected bundles per 10,000). The fitted values of the uncertainty distribution of the pest freedom are shown in Table A.14.

Table A.14: The uncertainty distribution of bundles free of *Cryphonectria parasitica* per 10,000 bundles calculated by Table A.13

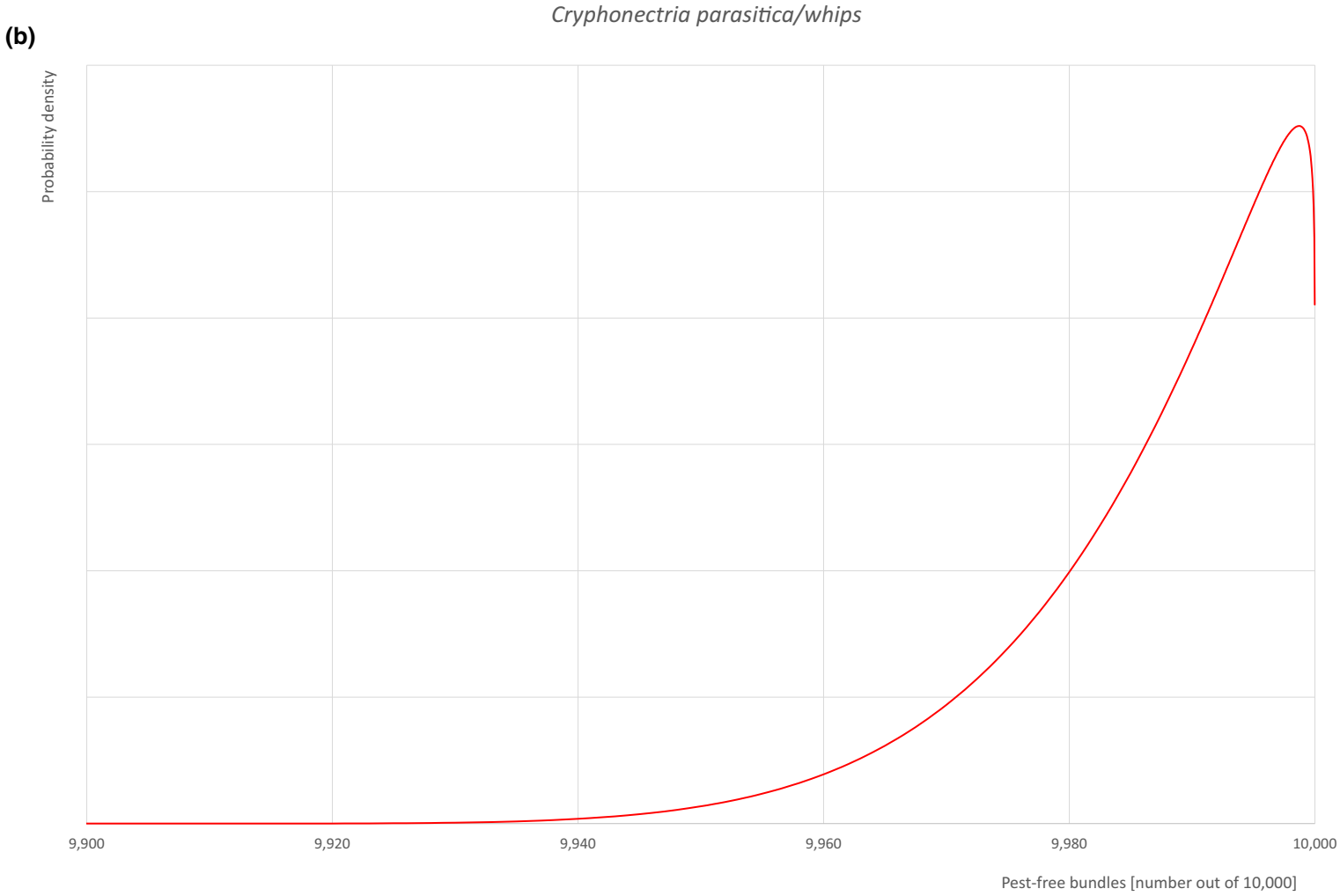
Percentile	1%	2.5%	5%	10%	17%	25%	33%	50%	67%	75%	83%	90%	95%	97.5%	99%
Values	9,950					9,980		9,990		9,995					10,000
EKE results	9,950	9,957	9,963	9,970	9,976	9,981	9,984	9,989	9,994	9,995	9,997	9,998	9,999	10,000	10,000

The EKE results are the fitted values.

(a)


Cryphonectria parasitica/whips
Probability density
0
20
40
60
80
100
Infected bundles [number out of 10,000]
EKE result
Fitted density

(b)


Cryphonectria parasitica/whips
Probability density
9,900
9,920
9,940
9,960
9,980
10,000
Pest-free bundles [number out of 10,000]

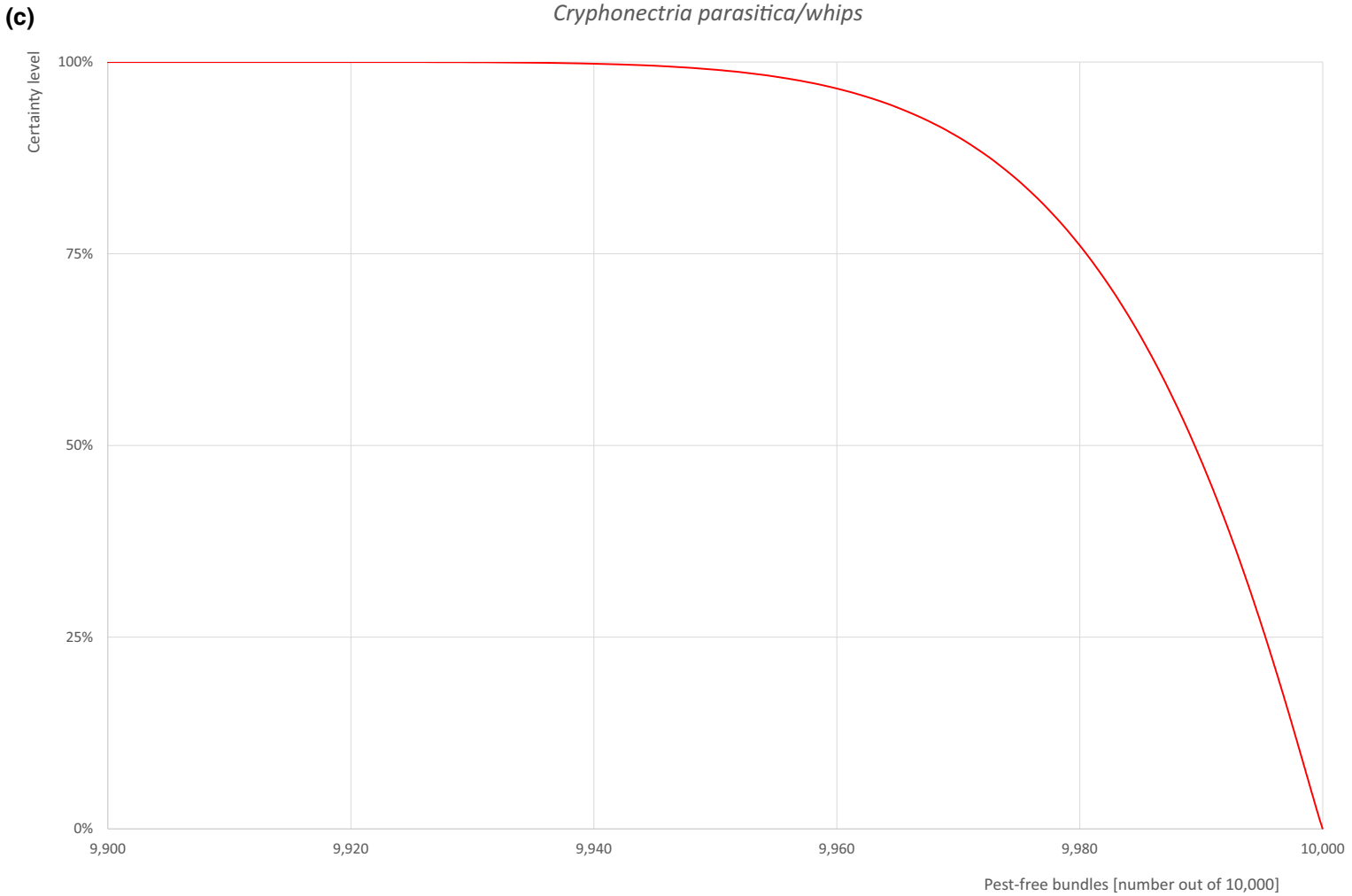


Figure A.7: (a) Elicited uncertainty of pest infection per 10,000 bundles (histogram in blue – vertical blue line indicates the elicited percentile in the following order: 1%, 25%, 50%, 75%, 99%) and distributional fit (red line); (b) uncertainty of the proportion of pest-free bundles per 10,000 (i.e.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

A.3.6. Overall likelihood of pest freedom for bare root plants/trees up to 7 years old

A.3.6.1. Reasoning for a scenario which would lead to a reasonably low number of infected bare root plants/trees up to 7 years old

The scenario assumes a low pressure of the pathogen in the nurseries and in the surroundings. Younger plants are exposed to the pathogen for only short period of time. The scenario assumes *Acer* spp. to be unsuitable/minor hosts for the pathogen. The scenario also assumes that symptoms of the disease are visible and promptly detected during inspections.

A.3.6.2. Reasoning for a scenario which would lead to a reasonably high number of infected bare root plants/trees up to 7 years old

The scenario assumes a high pressure of the pathogen in the nurseries and in the surroundings as suitable hosts are present. Older plants are exposed to the pathogen for longer period of time. The scenario assumes *Acer* spp. to be hosts for the pathogen. The scenario also assumes that symptoms of the disease are not easily recognisable during inspections.

A.3.6.3. Reasoning for a central scenario equally likely to over- or underestimate the number of infected bare root plants/up to 7 years old (Median)

The scenario assumes a limited presence of the pathogen in the nurseries and the surroundings and that the plants are exposed to the pathogen for a sufficient period of time to cause some infection. *Acer* spp. are considered minor hosts. The pathogen is a regulated quarantine pest in the UK and under official control.

A.3.6.4. Reasoning for the precision of the judgement describing the remaining uncertainties (1st and 3rd quartile/interquartile range)

The limited information on occurrence of the pathogen in the UK including the nurseries and the surroundings results in high level of uncertainties for infection rates below the median. Otherwise, the pest pressure from the surroundings is expected to be low giving less uncertainties for rates above the median.

A.3.6.5. Elicitation outcomes of the assessment of the pest freedom for *Cryphonectria parasitica* on bare root plants/trees up to 7 years old

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

Table A.15: Elicited and fitted values of the uncertainty distribution of pest infection by *Cryphonectria parasitica* 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					8		15		25					75
EKE	0.936	1.65	2.58	4.10	5.90	8.02	10.2	14.9	21.0	25.1	30.6	37.4	46.2	54.9	66.1

The EKE results is the BetaGeneral (1.6776, 908.36, 0, 10,000) distribution fitted with @Risk version 7.6.

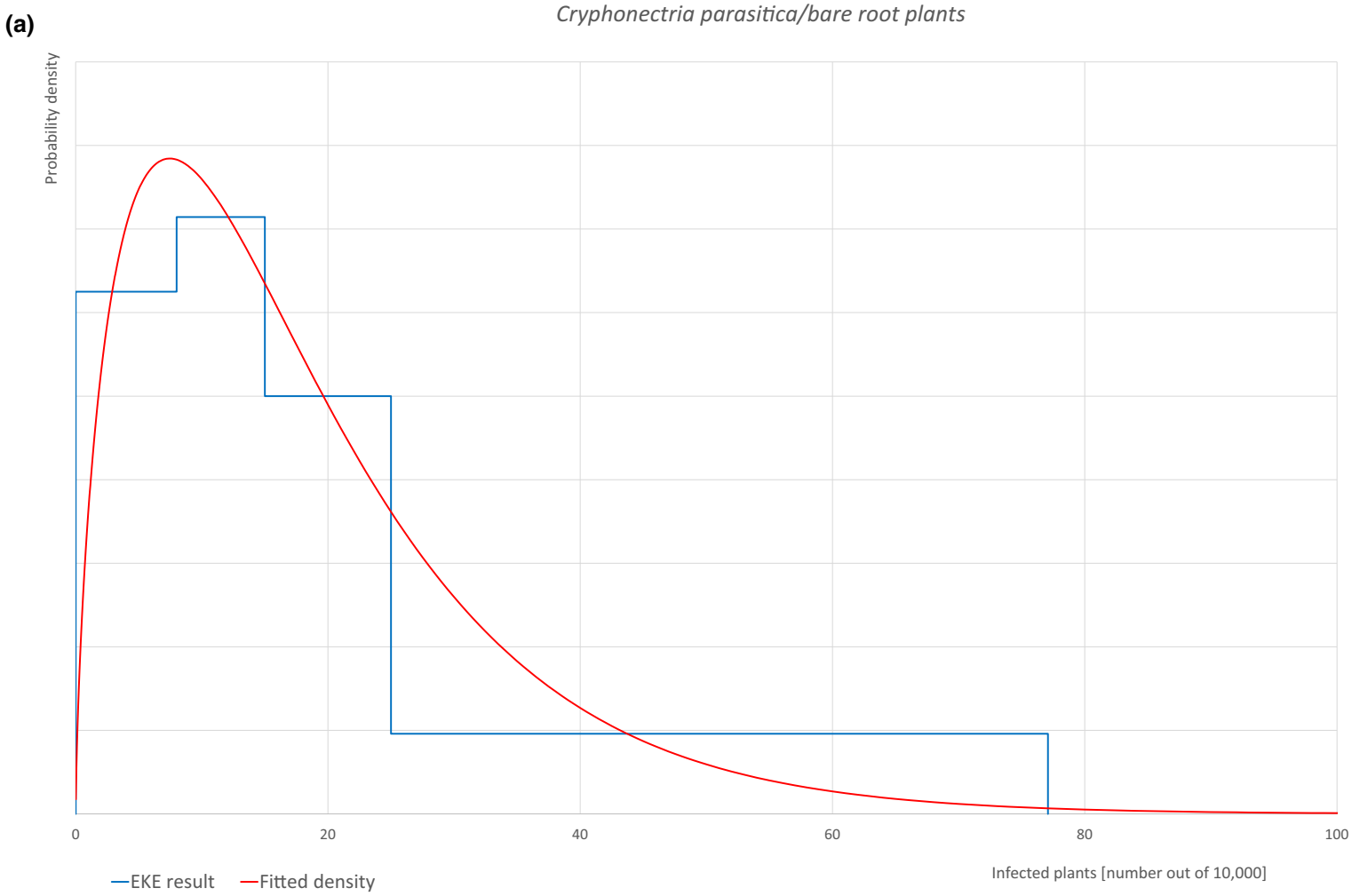
Based on the numbers of estimated infected plants the pest freedom was calculated (i.e. = 10,000 – number of infected plants per 10,000). The fitted values of the uncertainty distribution of the pest freedom are shown in Table A.16.

Table A.16: The uncertainty distribution of plants free of *Cryphonectria parasitica* per 10,000 plants calculated by Table A.15

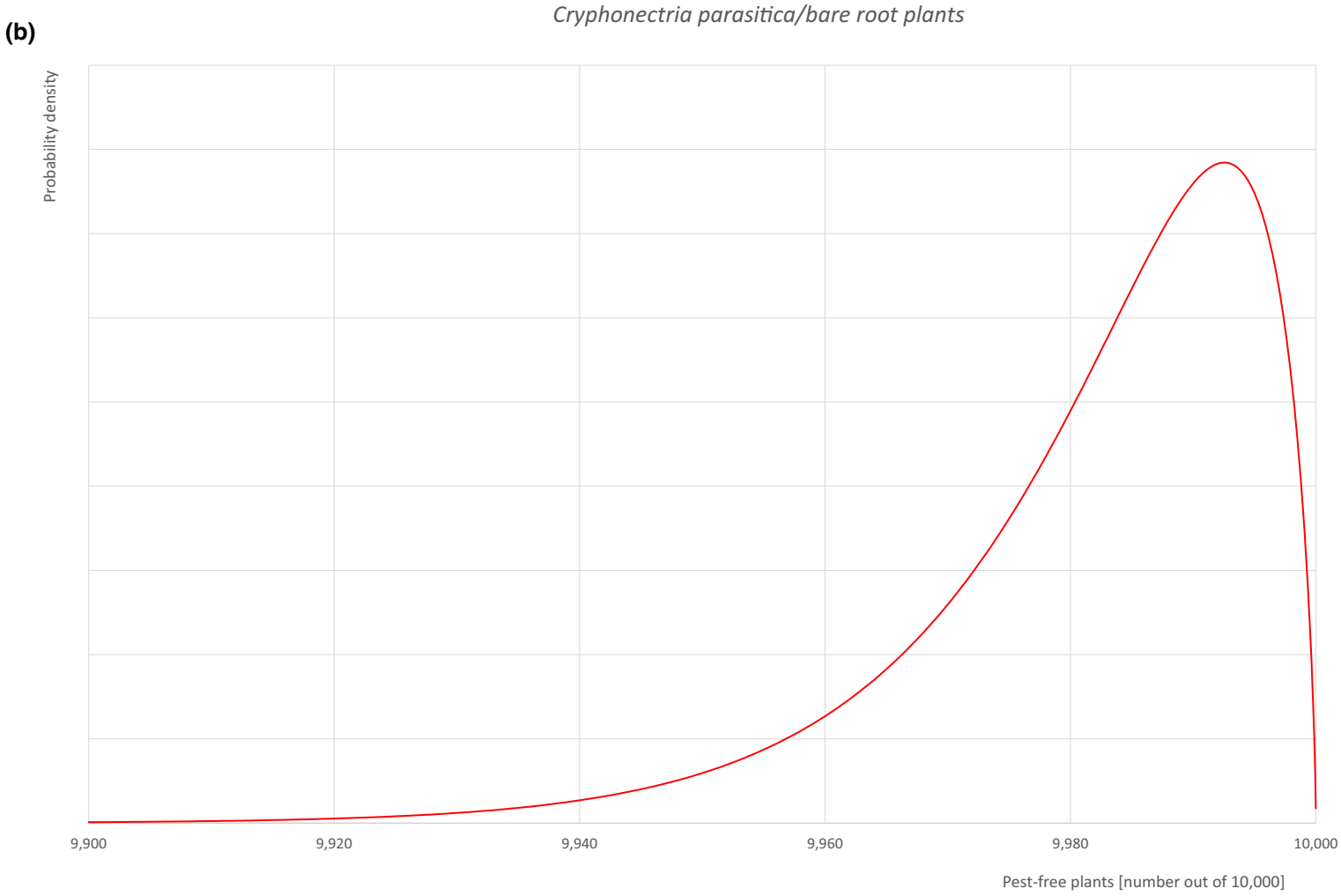
Percentile	1%	2.5%	5%	10%	17%	25%	33%	50%	67%	75%	83%	90%	95%	97.5%	99%
Values	9,925					9,975		9,985		9,992					10,000
EKE results	9,934	9,945	9,954	9,963	9,969	9,975	9,979	9,985	9,990	9,992	9,994	9,996	9,997	9,998	9,999

The EKE results are the fitted values.

(a)


Cryphonectria parasitica/bare root plants
Probability density
0
20
40
60
80
100
Infected plants [number out of 10,000]
EKE result
Fitted density

(b)


Cryphonectria parasitica/bare root plants
Probability density
9,900
9,920
9,940
9,960
9,980
10,000
Pest-free plants [number out of 10,000]

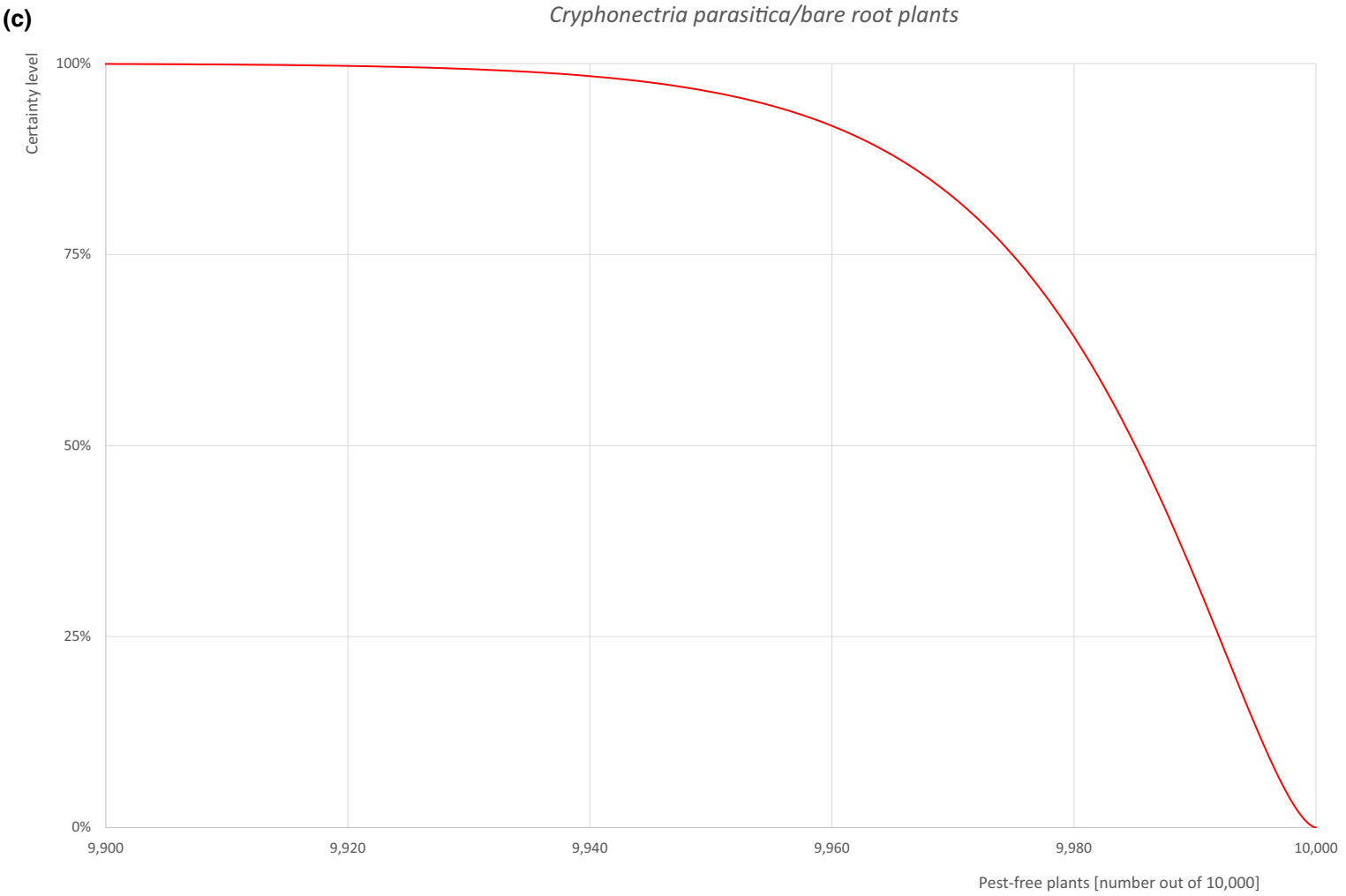


Figure A.8: (a) Elicited uncertainty of pest infection per 10,000 plants (histogram in blue – vertical blue line indicates the elicited percentile in the following order: 1%, 25%, 50%, 75%, 99%) and distributional fit (red line); (b) uncertainty of the proportion of pest-free plants per 10,000 (i.e.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

A.3.7. Overall likelihood of pest freedom for plants in pots up to 15 years old

A.3.7.1. Reasoning for a scenario which would lead to a reasonably low number of infected plants in pots up to 15 years old

The scenario assumes a low pressure of the pathogen in the nurseries and in the surroundings. Younger plants are exposed to the pathogen for only short period of time. The scenario assumes *Acer* spp. to be unsuitable/minor hosts for the pathogen. The scenario also assumes that symptoms of the disease are visible and promptly detected during inspections.

A.3.7.2. Reasoning for a scenario which would lead to a reasonably high number of infected plants in pots up to 15 years old

The scenario assumes a high pressure of the pathogen in the nurseries and in the surroundings as suitable hosts are present. Older plants are exposed to the pathogen for longer period of time. The scenario assumes *Acer* spp. to be hosts for the pathogen. The scenario also assumes that symptoms of the disease are not easily recognisable during inspections.

A.3.7.3. Reasoning for a central scenario equally likely to over- or underestimate the number of infected plants in pots up to 15 years old (Median)

The scenario assumes a limited presence of the pathogen in the nurseries and the surroundings and that the plants are exposed to the pathogen for a sufficient period of time to cause some infection. *Acer* spp. are considered minor hosts. The pathogen is a regulated quarantine pest in the UK and under official control.

A.3.7.4. Reasoning for the precision of the judgement describing the remaining uncertainties (1st and 3rd quartile/interquartile range)

The limited information on occurrence of the pathogen in the UK including the nurseries and the surroundings results in high level of uncertainties for infection rates below the median. Otherwise, the pest pressure from the surroundings is expected to be low giving less uncertainties for rates above the median.

A.3.7.5. Elicitation outcomes of the assessment of the pest freedom for *Cryphonectria parasitica* on plants in pots up to 15 years old

The following Tables show the elicited and fitted values for pest infection (Table A.17) and pest freedom (Table A.18).

Table A.17: Elicited and fitted values of the uncertainty distribution of pest infection by *Cryphonectria parasitica* per 10,000 plants

Percentile	1%	2.5%	5%	10%	17%	25%	33%	50%	67%	75%	83%	90%	95%	97.5%	99%
Elicited values	0					10		20		32					85
EKE	1.12	2.03	3.21	5.17	7.51	10.3	13.1	19.4	27.4	32.7	39.9	48.7	60.1	71.1	85.3

The EKE results is the BetaGeneral (1.6138, 65.896, 0, 1,000) distribution fitted with @Risk version 7.6.

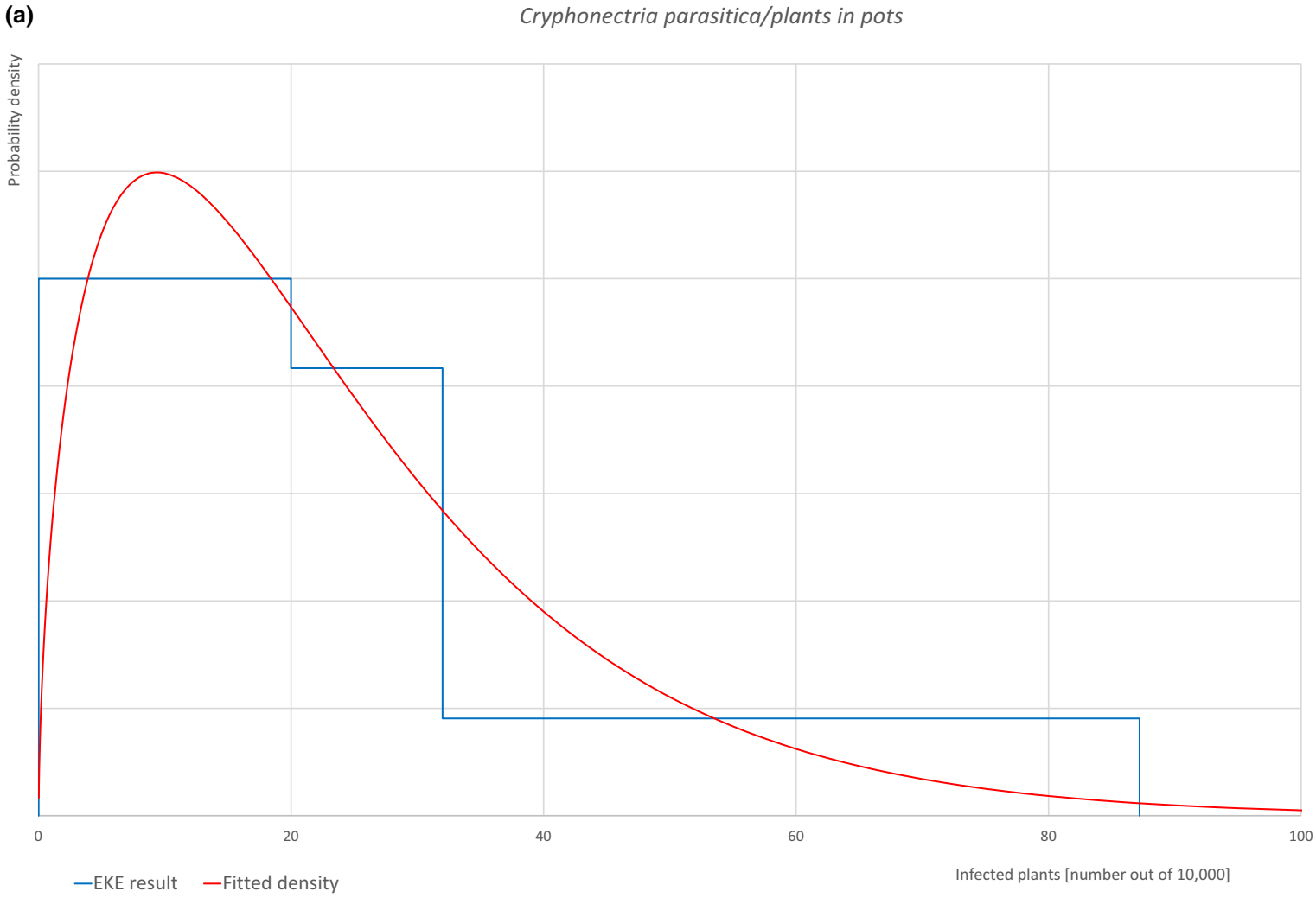
Based on the numbers of estimated infected plants the pest freedom was calculated (i.e. = 10,000 – number of infected plants per 10,000). The fitted values of the uncertainty distribution of the pest freedom are shown in Table A.18.

Table A.18: The uncertainty distribution of plants free of *Cryphonectria parasitica* per 10,000 plants calculated by Table A.17

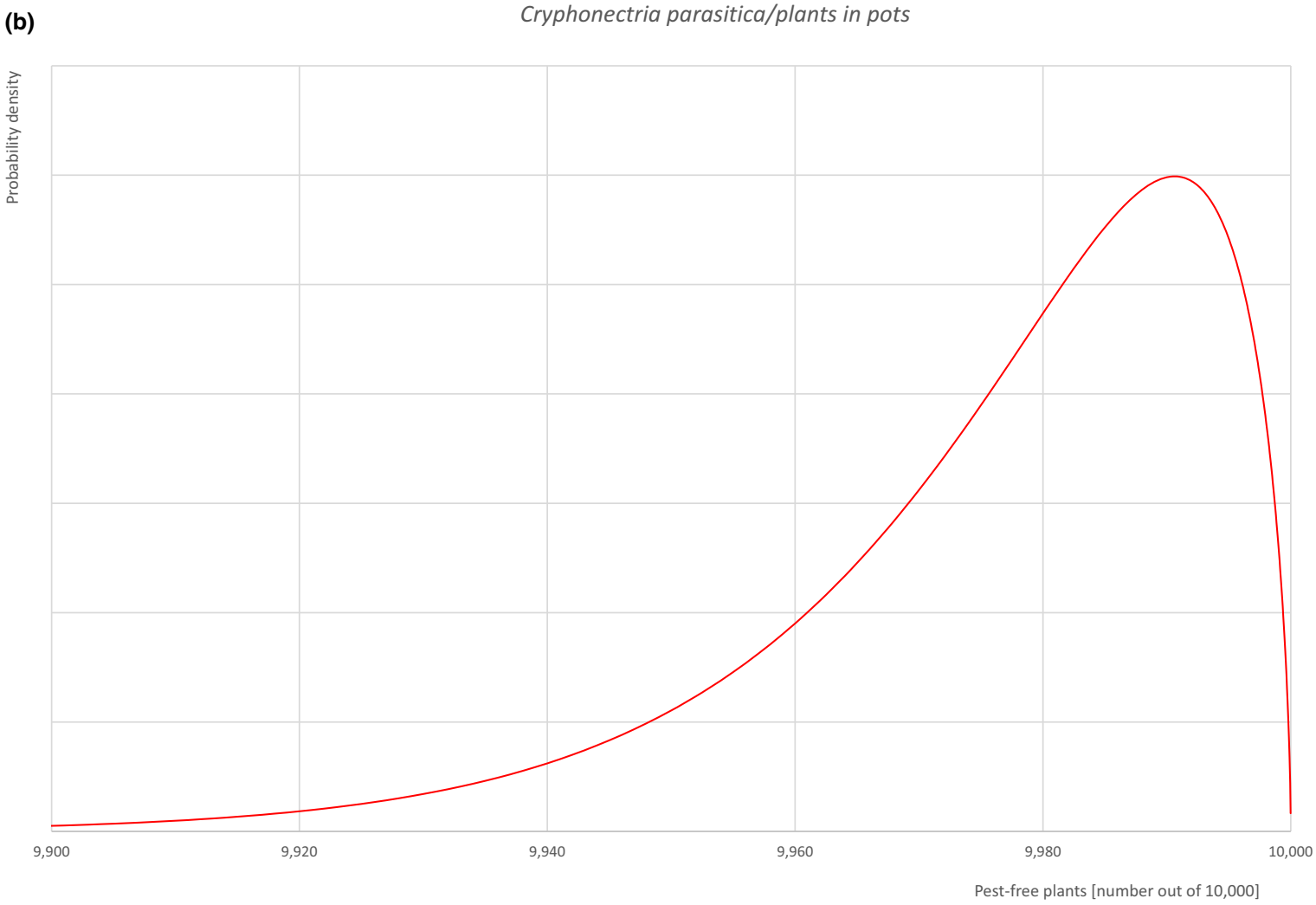
Percentile	1%	2.5%	5%	10%	17%	25%	33%	50%	67%	75%	83%	90%	95%	97.5%	99%
Values	9,915					9,968		9,980		9,990					10,000
EKE results	9,915	9,929	9,940	9,951	9,960	9,967	9,973	9,981	9,987	9,990	9,992	9,995	9,997	9,998	9,999

The EKE results are the fitted values.

(a)


Cryphonectria parasitica/plants in pots
Probability density
0
20
40
60
80
100
Infected plants [number out of 10,000]
EKE result
Fitted density

(b)


Cryphonectria parasitica/plants in pots
Probability density
9,900
9,920
9,940
9,960
9,980
10,000
Pest-free plants [number out of 10,000]

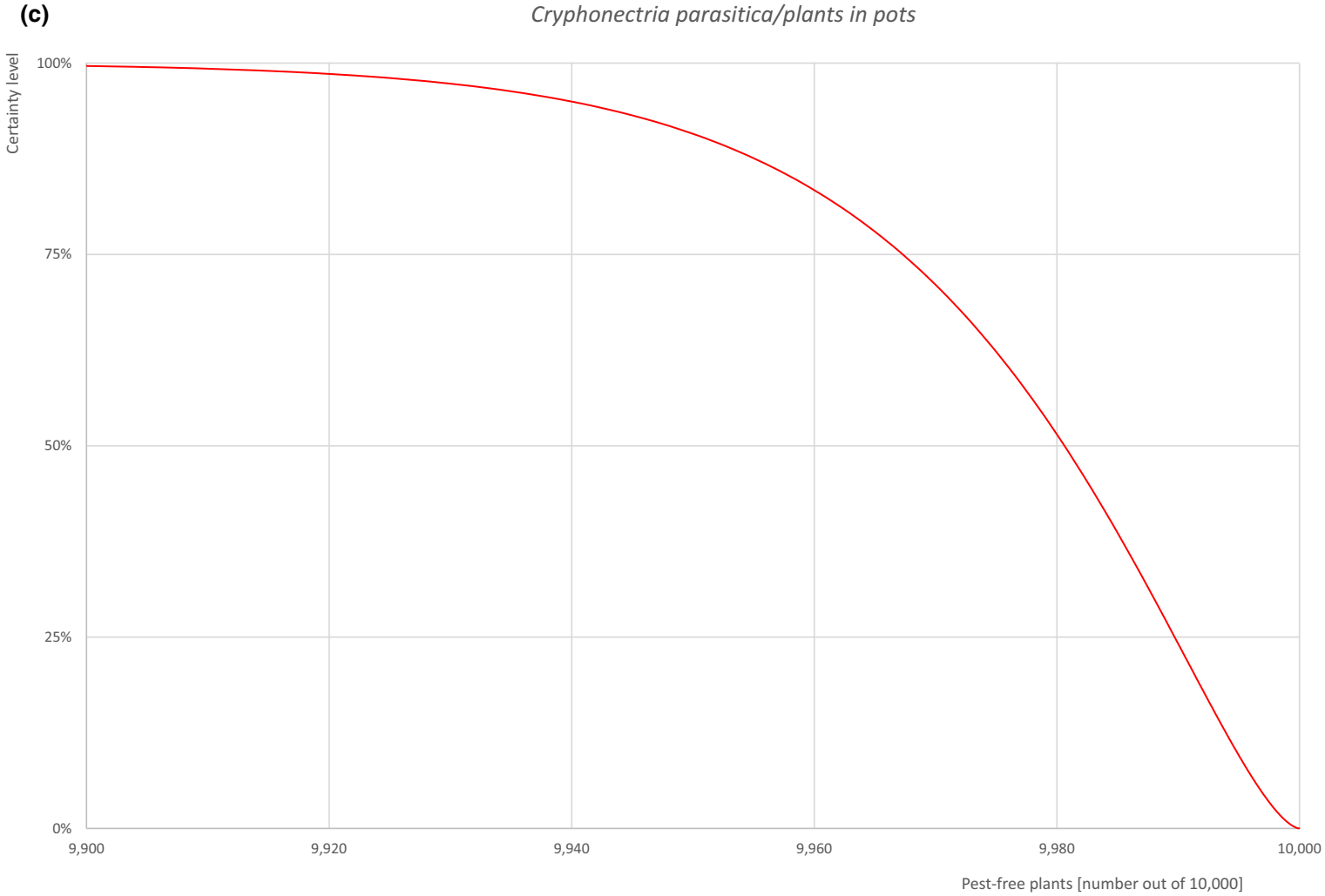


Figure A.9: (a) Elicited uncertainty of pest infection per 10,000 plants (histogram in blue – vertical blue line indicates the elicited percentile in the following order: 1%, 25%, 50%, 75%, 99%) and distributional fit (red line); (b) uncertainty of the proportion of pest-free plants per 10,000 (i.e. = 1 – pest infection proportion expressed as percentage); (c) descending uncertainty distribution function of pest infection per 10,000 plants

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Wendt R, 1983. Association of *Endothia parasitica* with mites isolated from cankers on American chestnut trees. Plant Disease, 67, 757. https://doi.org/10.1094/PD-67-757

A.4. *Entoleuca mammata*

A.4.1. Organism information

Taxonomic information	Current valid scientific name: *Entoleuca mammata* Synonyms: *Anthostoma blakei, Anthostoma morsei, Fuckelia morsei, Hypoxylon blakei, Hypoxylon holwayi, Hypoxylon mammatum, Hypoxylon morsei, Hypoxylon pauperatum, Hypoxylon pruinatum, Nemania mammata, Rosellinia pruinata, Sphaeria mammata, Sphaeria pruinata* (according to Index Fungorum) Name used in the EU legislation: *Entoleuca mammata* (Wahlenb.) Rogers and Ju Order: Xylariales Family: Xylariaceae Common name: hypoxylon canker of poplar, canker of aspen Name used in the Dossier: *Entoleuca mammata*, *Hypoxylon mammatum*
Group	Fungi
EPPO code	HYPOMA
Regulated status	*Entoleuca mammata* is listed in Annex III of Commission Implementing Regulation (EU) 2019/2072 as protected zone quarantine pest for Ireland. The pathogen is quarantine pest in China and Israel. It is on the A1 list of Türkiye (EPPO, online_a).
Pest status in the UK	*Entoleuca mammata* is present in the UK, with few occurrences in England, Wales, Channel Islands and Scotland (CABI, online; EPPO, online_b). According to Dossier Section 5.0 the pathogen is present: not widely distributed and not under official control.
Pest status in the EU	*Entoleuca mammata* is currently present in the EU in 19 MS: Austria, Belgium, Croatia, Czechia, Finland, France, Germany, Greece, Italy, Lithuania, the Netherlands, Slovakia, Slovenia, Sweden (EFSA PLH Panel, 2017); Denmark (GBIF, online); Estonia (Lutter et al., 2019) Latvia (Zeps et al., 2016); Poland and Spain (Farr and Rossman, online).
Host status on *Acer*	*Entoleuca mammata* was reported on *Acer ginnala, A. rubrum, A. saccharum, A. saccarophorum* and *Acer* sp. (Manion and Griffin, 1986; Farr and Rossman, online). There is no information on whether *E. mammata* can also infect *Acer campestre*.
PRA information	Pest Risk Assessments available: – Scientific Opinion on the pest categorisation of *Entoleuca mammata* (EFSA PLH Panel, 2017); – UK Risk Register Details for *Entoleuca mammata* (DEFRA, online); – Express Pest Risk Analysis: *Entoleuca mammata* (Klejdysz et al., online).
Other relevant information for the assessment	
Biology	*Entoleuca mammata* is an ascomycete fungus known as an important agent of canker disease in *Populus* species, mostly *Populus tremuloides* and *P. tremula*; other hardwood species like *Salix* spp. can also be infected (EFSA PLH Panel, 2017). The pathogen is native to North America and was introduced into Europe several centuries ago (Kasanen et al., 2004); it is now largely spread in the temperate zones of the northern hemisphere. *Entoleuca mammata* is present in Canada and in some northern states of the US (Alaska, Iowa, Michigan, Minnesota, Montana, New Hampshire, New York, Wisconsin). In Europe, in addition to the 19 mentioned EU MS (see above), it is reported in Andorra, Bosnia and Herzegovina, Montenegro, North Macedonia, Russia (Southern Russia and Western Siberia) Serbia, Switzerland, Ukraine and the UK (CABI, online; EPPO, online_b) and Norway (NBIC, online).

		The presence of *E. mammata* in Australia should be considered doubtful, as it is limited to a few specimens in herbarium without other records (EPPO, online_b). The ascospores of *E. mammata* can infect the living wood of the hosts penetrating in the periderm and invading tissues under healthy bark and through mechanical wounds, as well as through injuries caused by woodpeckers and insects, in particular the North American cerambycid beetles (mostly *Saperda inornata* and *Oberea* spp.) (Anderson et al., 1979a) and the cicada *Magicicada septendecim* (Ostry and Anderson, 1983) not occurring in Europe; water stress can increase host susceptibility (EFSA PLH Panel, 2017). *Entoleuca mammata* is mostly found on trees 15–40 years old, but all ages can be infected (EFSA PLH Panel, 2017; EPPO online_c). Infection usually starts from branches and twigs and then can spread to the main stem. The cankers expand very rapidly (7–8 cm per month) in summer and more slowly during winter; branches and stems can be girdled causing drying and breakage. The pathogen mostly develops in the range from 8 to 32°C, the optimum temperature is 28°C; toxins host-specific produced by the fungus are involved in pathogenesis (Stermer et al., 1984; EFSA PLH Panel, 2017; EPPO, online_c). *Entoleuca mammata* overwinters in host tissues as both mycelium and spores. 5 to 14 months after infection conidia are produced, but their role in the disease transmission is considered not relevant (EFSA PLH Panel, 2017). The pathogen spreads over long distances via windborne ascospores, which are produced only 2–3 years after infection; cankers on felled trees on the ground can continue to produce ascospores for 23 months. Ascospores are dispersed with a temperature above –4°C and wet weather; a minimum of 16°C is required for starting germination, which became rapid at 28–32°C (EFSA PLH Panel, 2017). Infected wood, mostly with bark, may be a pathway for passive spread of *E. mammata* in international trade; however, also young plants may carry ascospores or mycelium of the fungus, which can exist as a latent infection on living material inadvertently moved (EFSA PLH Panel, 2017; EPPO online_c).
Symptoms	**Main type of symptoms**	The symptoms are observed on *Populus* trees. Early symptoms of cankers on the bark appear as slightly sunken, yellowish-orange areas with an irregular border. Young cankers can be easily identified by removing the bark to expose the white mycelium in the cambial zone. The outer bark in older cankers is then lifted into blister-like patches and break away, exposing blackened areas prominently visible on green branches and trunks. Callus formation only occasionally develops because cankers spread very quickly (Anderson et al., 1979b; EPPO, online_c). Wilting of leaves may be observed when the trees are girdled, as well as sprouting of new shoots on stem and branches. Infected trees can be secondarily colonised by other fungi, accelerating the host decline (EPPO, online_c). There is no information on the symptoms caused to *Acer* plants.
	Presence of asymptomatic plants	The disease caused by *E. mammata* has a latent period and symptoms can appear only 2 years after the ascospore infection, therefore asymptomatic plants can be found (Ostry and Anderson, 2009).
	Confusion with other pests	Some *Hypoxylon* species present in Europe on deciduous trees (*H. confluens* and *H. udum*) show symptoms similar to those of *E. mammata* but can be easily distinguished in laboratory by the ascospore characteristics (EFSA PLH Panel, 2017).

Host plant range	In North America, *Entoleuca mammata* mainly infects quacking aspen (*Populus tremuloides*); minor damage is recorded on *P. grandidentata*, *P. balsamifera* and various *Populus* hybrids. Other secondary hosts in North America are *Acer, Alnus, Betula, Carpinus, Fagus, Picea, Pyrus, Salix, Sorbus* and *Ulmus* (Manion and Griffin, 1986). In Europe, the main host is *Populus tremula;* other hosts are *Populus alba, P. nigra, P. trichocarpa* and the hybrid *P. tremula* × *P. tremuloides* (Ostry, 2013).
Reported evidence of impact	*Entoleuca mammata* is an important pathogen of poplars in the US and Canada, causing economic losses of millions of dollars a year (Anderson et al., 1979b; Ostry, 2013; EFSA PLH Panel, 2017). In Europe *Entoleuca mammata* is known as a pest of low importance, although damage on *Populus tremula* has been reported in France (Pinon, 1976), Italy and Sweden (EFSA PLH Panel, 2017). Data on the incidence and impact of *E. mammata* on other woody species, *Acer* included, is not available and may be considered negligible.
Evidence that the commodity is a pathway	Plants for planting may carry ascospores and mycelium of *E. mammata* also as asymptomatic plants (EFSA PLH Panel; EPPO online_c) therefore the commodity is a pathway.
Surveillance information	*Entoleuca mammata* is not a regulated pest for Great Britain and it is not under official control and surveillance in the UK (Dossier Sections 3.0 and 5.0).

A.4.2. Possibility of pest presence in the nursery

A.4.2.1. Possibility of entry from the surrounding environment

Entoleuca mammata is present in the UK in England, Wales, Channel Islands and Scotland (EPPO, online_b; CABI, online; Dossier Section 5.0).

The pathogen can naturally spread with ascospores dispersed by air currents also over long distance.

Entoleuca mammata can infect *Acer* spp., *Alnus* spp., *Betula* spp., *Fagus* spp., *Picea* spp., *Populus* spp., *Salix* spp., *Sorbus* spp. and *Ulmus* spp. which are present within 2 km from the nurseries.

Uncertainties:

- The presence of the pathogen on host plants in the surrounding area.

Taking into consideration the above evidence and uncertainties, the Panel considers that it is possible for *Entoleuca mammata* to enter the nurseries from surrounding environment via ascospores transported by wind and air currents.

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

The starting materials are either seeds, seedlings or scion woods/buds. Seeds are certified and coming from the UK. Seedlings are either from the UK, the EU (mostly the Netherlands) or New Zealand (Dossier Section 3.0).

In addition to *Acer* plants, the nurseries also produce other plants (Dossier Section 6.0). Out of them, there are suitable hosts for the pathogen such as *Alnus* spp., *Betula* spp., *Carpinus* spp., *Fagus* spp., *Picea* spp., *Populus tremula, Populus* spp., *Pyrus* spp., *Salix* spp., *Sorbus* spp. and *Ulmus* spp. However, there is no information on how and where the plants are produced. Therefore, if the plants are first produced in another nursery, the pathogen could possibly travel with them.

The nurseries are using virgin peat or peat-free compost (a mixture of coir, tree bark, wood fibre, etc.) as a growing media (Dossier Section 1.0). The growing media is certified and heat-treated by commercial suppliers during production to eliminate pests and diseases (Dossier Section 3.0). There is no evidence that soil or growing media may be a pathway for *Entoleuca mammata*.

Uncertainties:

- No information is available on the provenance of plants other than *Acer* used for plant production in the nurseries.

Taking into consideration the above evidence and uncertainties, the Panel considers that it is possible for the pathogen to enter the nurseries via new seedlings of *Acer* and plants of other species used for plant production in the area. The entry of the pathogen with seeds and the growing media the Panel considers as not possible.

A.4.2.3. Possibility of spread within the nursery

Acer plants are either grown in containers (cells, pots, tubes, etc.) outdoors, in the open air or in field. Cell grown trees may be grown in greenhouses, however most plants will be field grown or field grown in containers (Dossier Section 1.0). There are no mother plants present in the nurseries (Dossier Section 3.0).

The pathogen can infect other suitable plants, such as *Acer* spp., *Alnus* spp., *Betula* spp. etc. present within the nurseries (Dossier Sections 3.0 and 6.0).

Once entered, ascospores of *Entoleuca mammata* could be produced on infected plants and naturally spread within the nurseries by air currents.

Uncertainties:

- Whether ascospores are produced on infected nursery plants.

Taking into consideration the above evidence and uncertainties, the Panel considers that the spread of the pathogen within the nurseries is possible by air currents.

A.4.3. Information from interceptions

In the EUROPHYT/TRACES-NT database there are no records of notification of *Acer* plants for planting neither from the UK nor from other countries due to the presence of *Entoleuca mammata* between the years 1995 and December 2022 (EUROPHYT/TRACES-NT, online).

A.4.4. Evaluation of the risk mitigation measures

In the table below, all risk mitigation measures currently applied in the UK are listed and an indication of their effectiveness on *Entoleuca mammata* is provided. The description of the risk mitigation measures currently applied in the UK is provided in the Table 6.

N	Risk mitigation measure	Effect on the pest	Evaluation and uncertainties
1	Registration of production sites	Yes	The risk mitigation measure is expected to be effective in reducing the likelihood of presence of the pathogen on the commodity. Uncertainties: – Whether symptoms on *Acer* are easily recognisable.
2	Physical separation	No	Not relevant.
3	Certified plant material	Yes	The risk mitigation measure is expected to be effective in reducing the likelihood of presence of the pathogen on the commodity. Uncertainties: – None.
4	Growing media	No	Not relevant.
5	Surveillance, monitoring and sampling	Yes	This measure could have some effect. Uncertainties: – Whether symptoms caused by the pathogen on *Acer* are recognisable. – Whether *Acer* plants are subjected to annual surveys.
6	Hygiene measures	No	Uncertainties: – Whether the pathogen could infect through pruning wounds thereby making effective the disinfection of pruning tools.

N	Risk mitigation measure	Effect on the pest	Evaluation and uncertainties
7	Removal of infested plant material	Yes	This measure could have some effect. Uncertainties: – None.
8	Irrigation water	No	Not relevnat.
9	Application of pest control products	Yes	Although *E. mammata* is generally not a target of the pesticide treatments in the nurseries, some fungicides could reduce the likelihood of the infection by the pathogen. Uncertainties: – No specific information on the fungicides used. – The level of efficacy of fungicides in reducing infection of *E. mammata*.
10	Measures against soil pests	No	Not relevant.
11	Inspections and management of plants before export	Yes	This measure could have some effect. Uncertainties: – Whether symptoms caused by the pathogen on *Acer* are recognisable.
12	Separation during transport to the destination	No	Not relevant.

A.4.5. Overall likelihood of pest freedom for bundles of whips and seedlings

A.4.5.1. Reasoning for a scenario which would lead to a reasonably low number of infected bundles of whips and seedlings

The scenario assumes a low pressure of the pathogen in the nurseries and in the surroundings. Younger plants are exposed to the pathogen for only short period of time. The scenario assumes *Acer* spp. to be unsuitable/minor hosts for the pathogen. The scenario also assumes that symptoms of the disease are visible and promptly detected during inspections.

A.4.5.2. Reasoning for a scenario which would lead to a reasonably high number of infected bundles of whips and seedlings

The scenario assumes a high pressure of the pathogen in the nurseries and in the surroundings as suitable hosts are present. Older plants are exposed to the pathogen for longer period of time. The scenario assumes *Acer* spp. to be hosts for the pathogen. The scenario also assumes that symptoms of the disease are not easily recognisable during inspections.

A.4.5.3. Reasoning for a central scenario equally likely to over- or underestimate the number of infected bundles of whips and seedlings (Median)

The scenario assumes a limited presence of the pathogen in the nurseries and the surroundings and that the plants are exposed to the pathogen for a sufficient period of time to cause infection through mechanical wounds. *Acer* spp. are considered minor hosts.

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

The limited information on occurrence of the pathogen in the UK including the nurseries and the surroundings results in high level of uncertainties for infestation rates below the median. Otherwise, the pest pressure from the surroundings is expected to be low giving less uncertainties for rates above the median.

A.4.5.5. Elicitation outcomes of the assessment of the pest freedom for *Entoleuca mammata* on bundles of whips and seedlings

The following Tables show the elicited and fitted values for pest infection (Table A.19) and pest freedom (Table A.20).

Table A.19: Elicited and fitted values of the uncertainty distribution of pest infection by *Entoleuca mammata* per 10,000 bundles

Percentile	1%	2.5%	5%	10%	17%	25%	33%	50%	67%	75%	83%	90%	95%	97.5%	99%
Elicited values	0					8		15		35					70
EKE	0.117	0.365	0.865	2.06	3.96	6.68	9.79	17.3	27.1	33.3	41.0	49.1	57.7	64.1	70.1

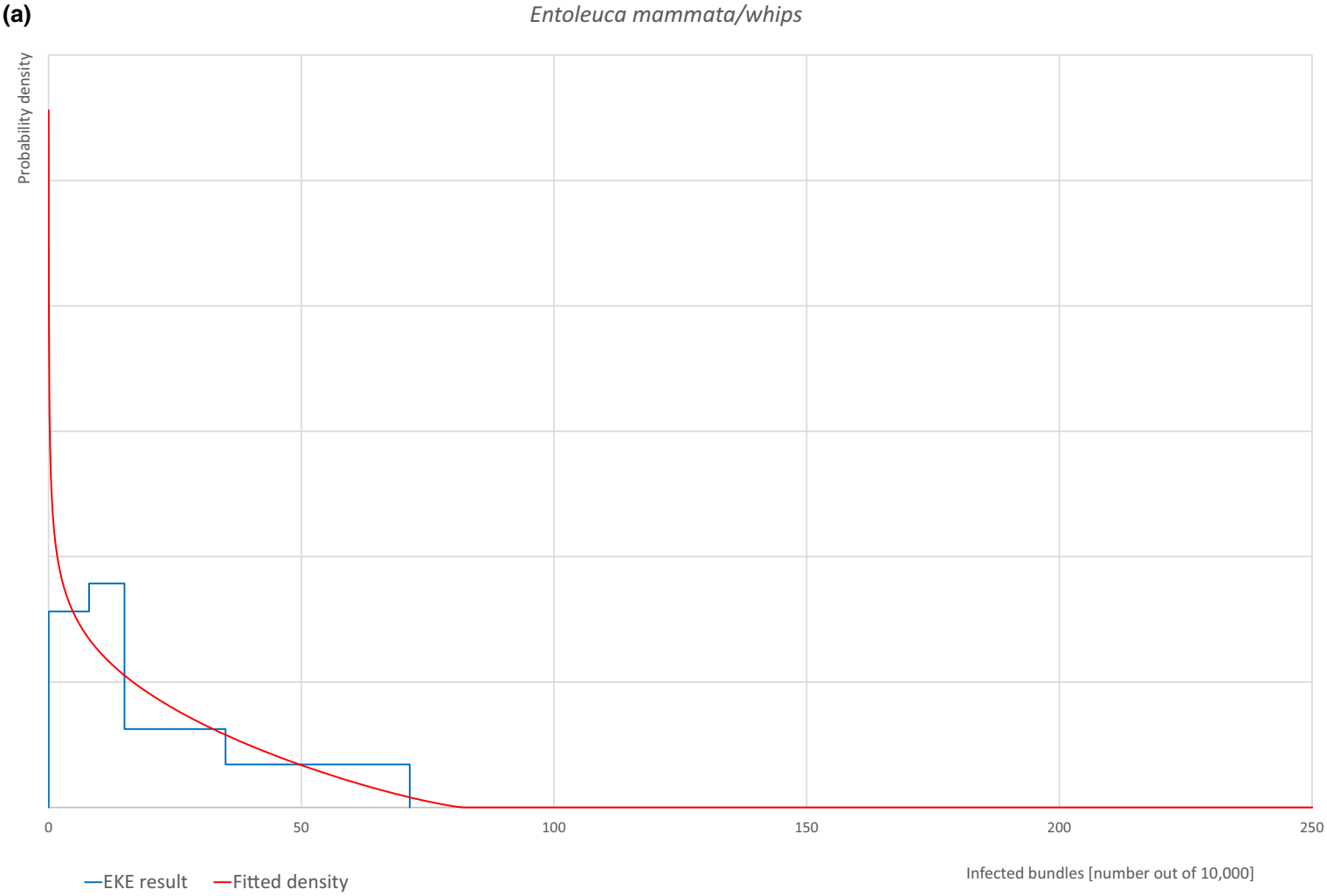
The EKE results is the BetaGeneral (0.80639, 2.2251, 0, 82) distribution fitted with @Risk version 7.6.

Based on the numbers of estimated infected bundles the pest freedom was calculated (i.e. = 10,000 – number of infected bundles per 10,000). The fitted values of the uncertainty distribution of the pest freedom are shown in Table A.20.

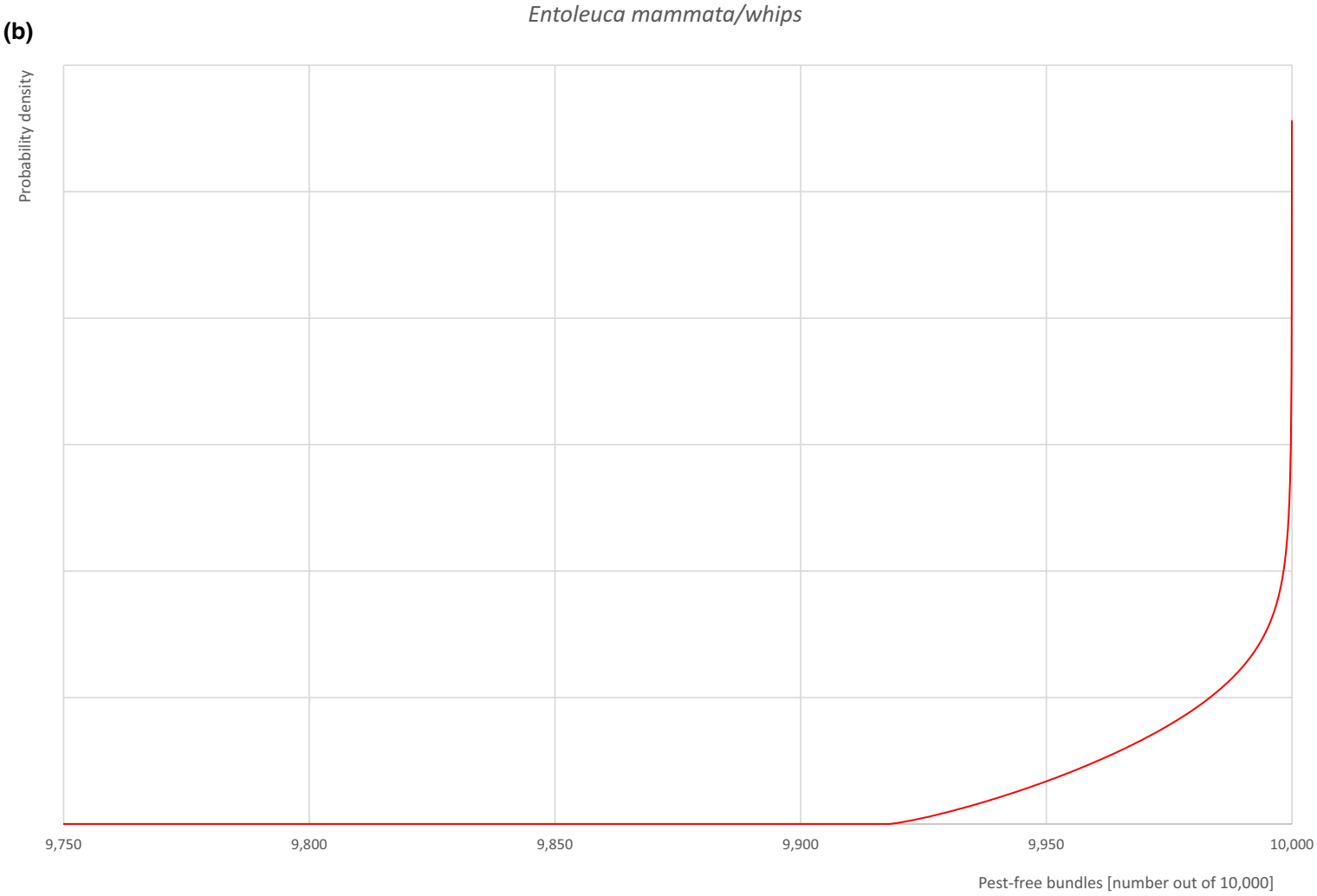
Table A.20: The uncertainty distribution of bundles free of *Entoleuca mammata* per 10,000 bundles calculated by Table A.19

Percentile	1%	2.5%	5%	10%	17%	25%	33%	50%	67%	75%	83%	90%	95%	97.5%	99%
Values	9,930					9,965		9,985		9,992					10,000
EKE results	9,930	9,936	9,942	9,951	9,959	9,967	9,973	9,983	9,990	9,993	9,996	9,998	9,999.1	9,999.6	9,999.9

The EKE results are the fitted values.


(a)
Entoleuca mammata/whips
Probability density
0
50
100
150
200
250
Infected bundles [number out of 10,000]
EKE result
Fitted density

(b)


Entoleuca mammata/whips
Probability density
9,750
9,800
9,850
9,900
9,950
10,000
Pest-free bundles [number out of 10,000]

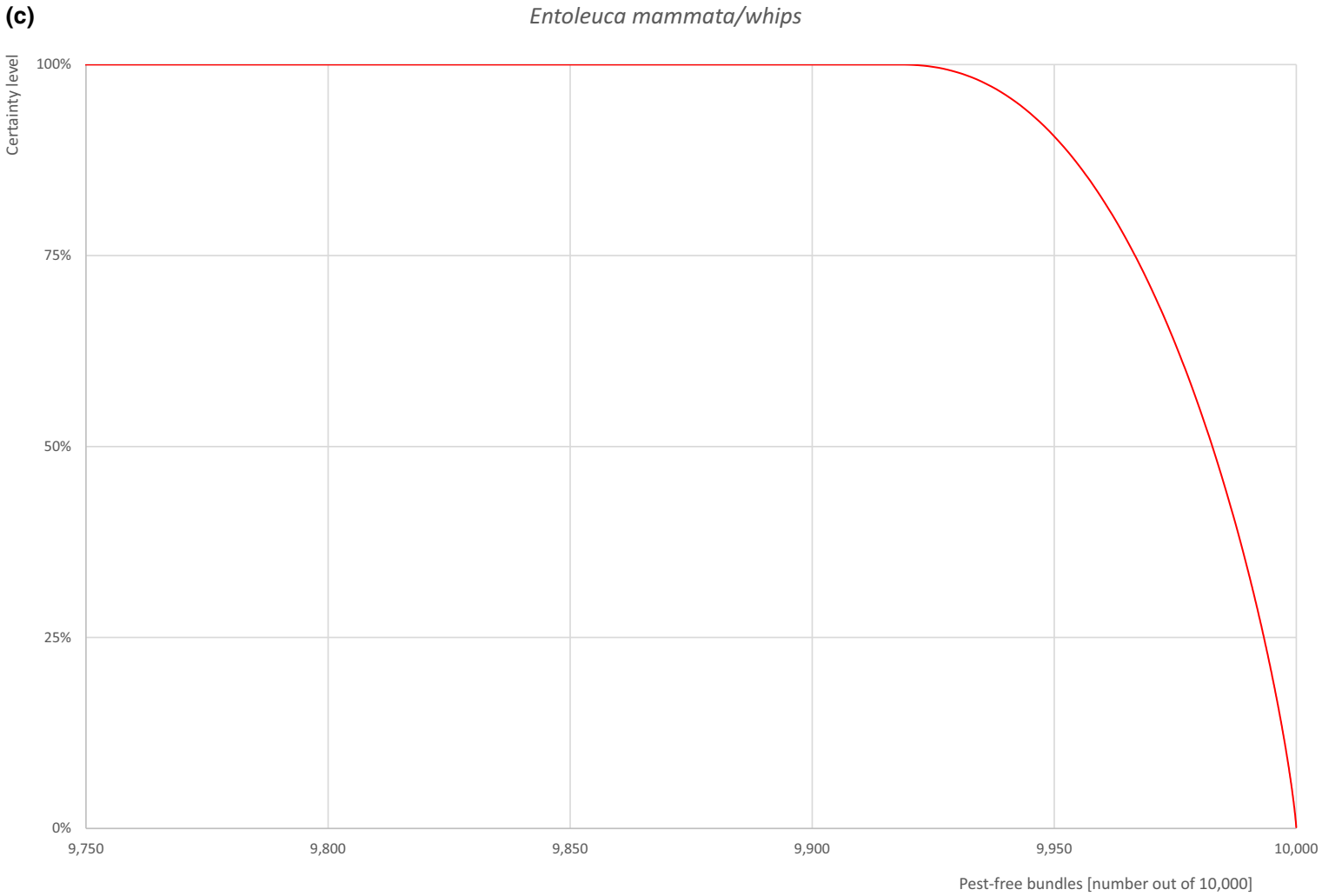


Figure A.10: (a) Elicited uncertainty of pest infection per 10,000 bundles (histogram in blue – vertical blue line indicates the elicited percentile in the following order: 1%, 25%, 50%, 75%, 99%) and distributional fit (red line); (b) uncertainty of the proportion of pest-free bundles per 10,000 (i.e.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

A.4.6. Overall likelihood of pest freedom for bare root plants/trees up to 7 years old

A.4.6.1. Reasoning for a scenario which would lead to a reasonably low number of infected bare root plants/trees up to 7 years old

The scenario assumes a low pressure of the pathogen in the nurseries and in the surroundings. Younger plants are exposed to the pathogen for only short period of time. The scenario assumes *Acer* spp. to be unsuitable/minor hosts for the pathogen. The scenario also assumes that symptoms of the disease are visible and promptly detected during inspections.

A.4.6.2. Reasoning for a scenario which would lead to a reasonably high number of infected bare root plants/trees up to 7 years old

The scenario assumes a high pressure of the pathogen in the nurseries and in the surroundings as suitable hosts are present. Older plants are exposed to the pathogen for longer period of time. The scenario assumes *Acer* spp. to be hosts for the pathogen. The scenario also assumes that symptoms of the disease are not easily recognisable during inspections.

A.4.6.3. Reasoning for a central scenario equally likely to over- or underestimate the number of infected bare root plants/trees up to 7 years old (Median)

The scenario assumes a limited presence of the pathogen in the nurseries and the surroundings and that the plants are exposed to the pathogen for a sufficient period of time to cause infection through mechanical wounds. *Acer* spp. are considered minor hosts.

A.4.6.4. Reasoning for the precision of the judgement describing the remaining uncertainties (1st and 3rd quartile/interquartile range)

The limited information on occurrence of the pathogen in the UK including the nurseries and the surroundings results in high level of uncertainties for infection rates below the median. Otherwise, the pest pressure from the surroundings is expected to be low giving less uncertainties for rates above the median.

A.4.6.5. Elicitation outcomes of the assessment of the pest freedom for *Entoleuca mammata* on bare root plants/trees up to 7 years old

The following Tables show the elicited and fitted values for pest infection (Table A.21) and pest freedom (Table A.22).

Table A.21: Elicited and fitted values of the uncertainty distribution of pest infection by *Entoleuca mammata* per 10,000 plants

Percentile	1%	2.5%	5%	10%	17%	25%	33%	50%	67%	75%	83%	90%	95%	97.5%	99%
Elicited values	0					10		20		40					100
EKE	0.418	0.987	1.90	3.72	6.20	9.44	12.9	21.1	31.8	38.9	48.4	59.5	73.3	85.6	100

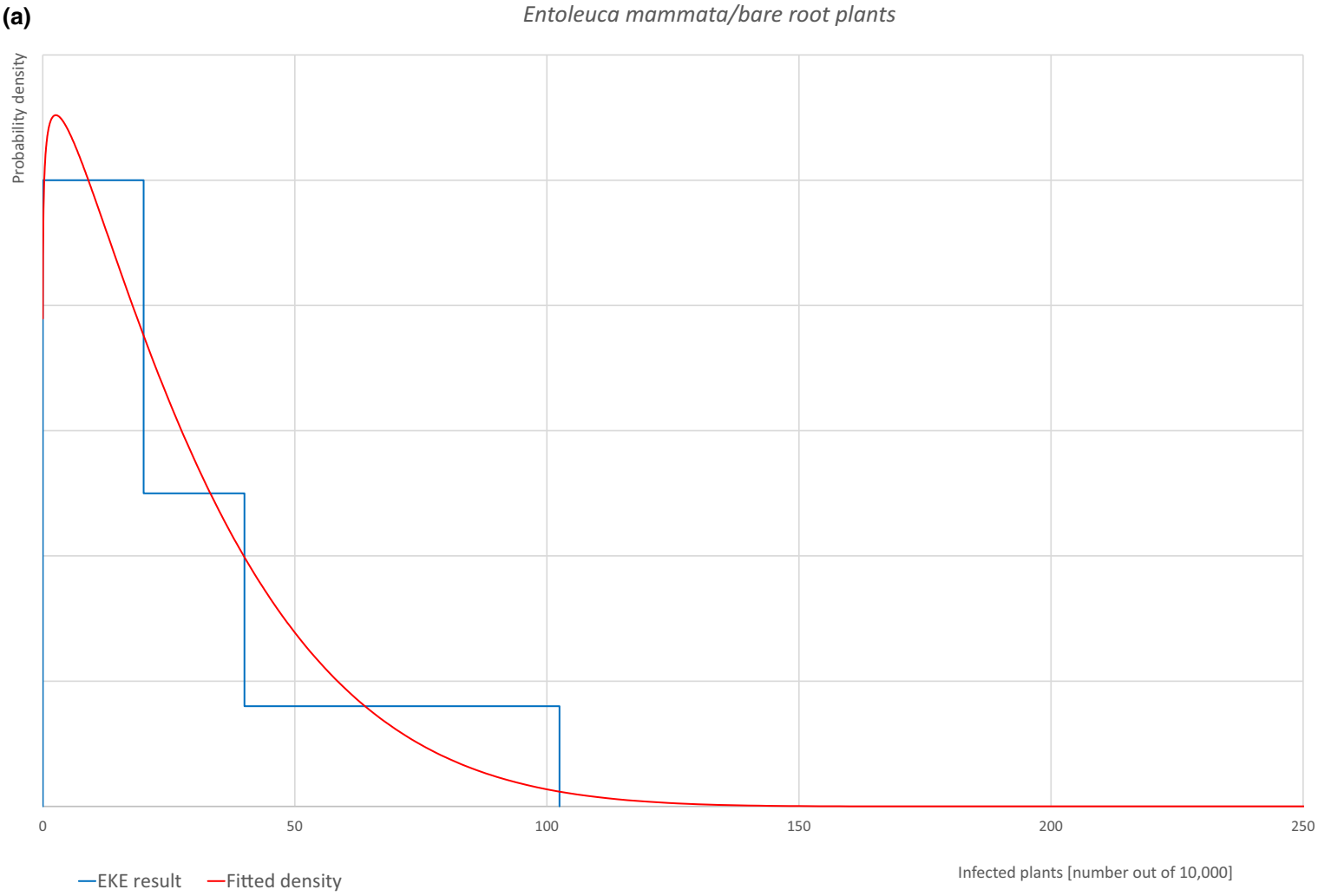
The EKE results is the BetaGeneral (1.0764, 6.8505, 0, 200) distribution fitted with @Risk version 7.6.

Based on the numbers of estimated infected plants the pest freedom was calculated (i.e. = 10,000 – number of infected plants per 10,000). The fitted values of the uncertainty distribution of the pest freedom are shown in Table A.22.

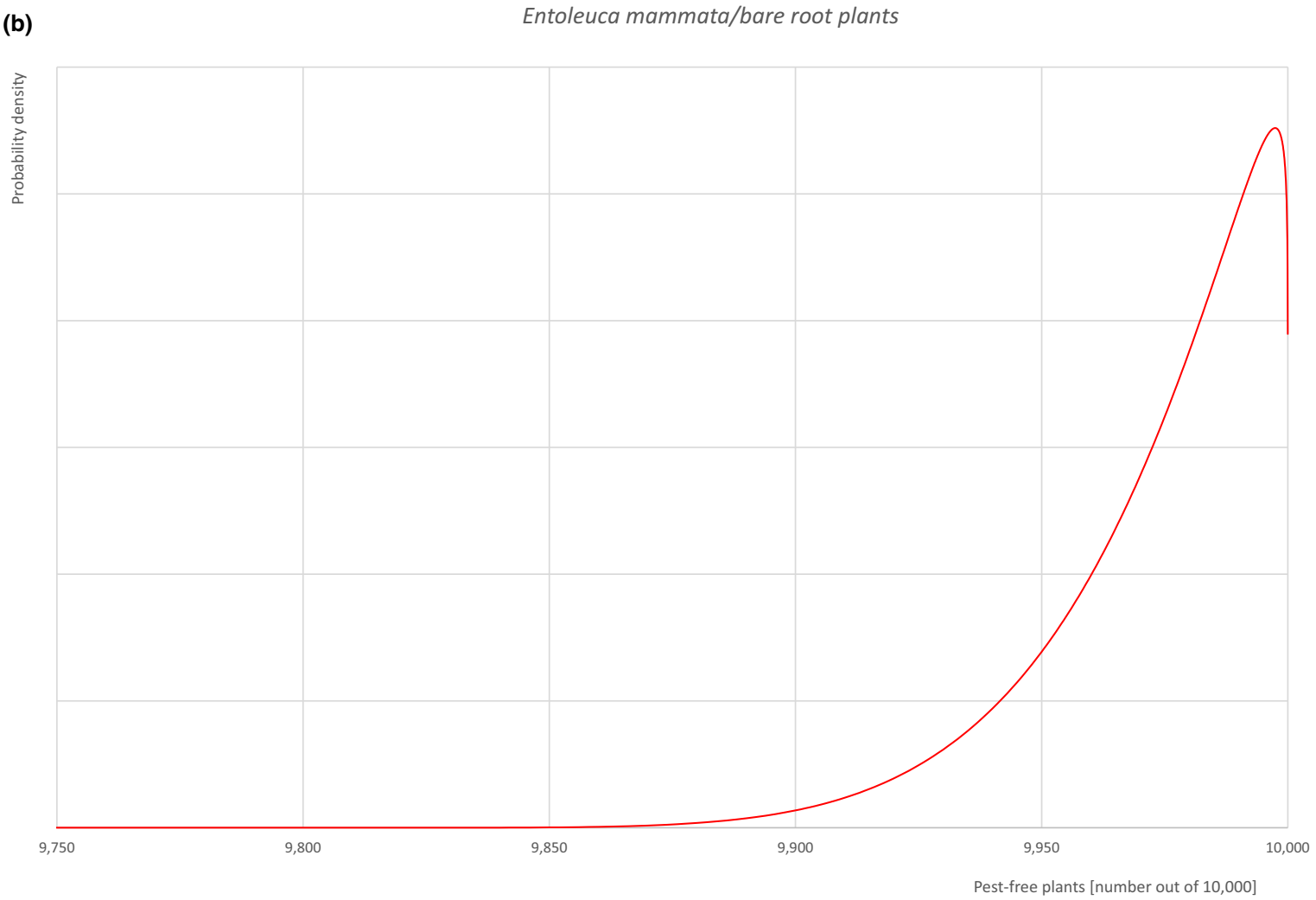
Table A.22: The uncertainty distribution of plants free of *Entoleuca mammata* per 10,000 plants calculated by Table A.21

Percentile	1%	2.5%	5%	10%	17%	25%	33%	50%	67%	75%	83%	90%	95%	97.5%	99%
Values	9,900					9,960		9,980		9,990					10,000
EKE results	9,900	9,914	9,927	9,940	9,952	9,961	9,968	9,979	9,987	9,991	9,994	9,996	9,998	9,999.0	9,999.6

The EKE results are the fitted values.


(a)
Entoleuca mammata/bare root plants
Probability density
0
50
100
150
200
250
EKE result
Fitted density
Infected plants [number out of 10,000]

(b)


Entoleuca mammata/bare root plants
Probability density
9,750
9,800
9,850
9,900
9,950
10,000
Pest-free plants [number out of 10,000]

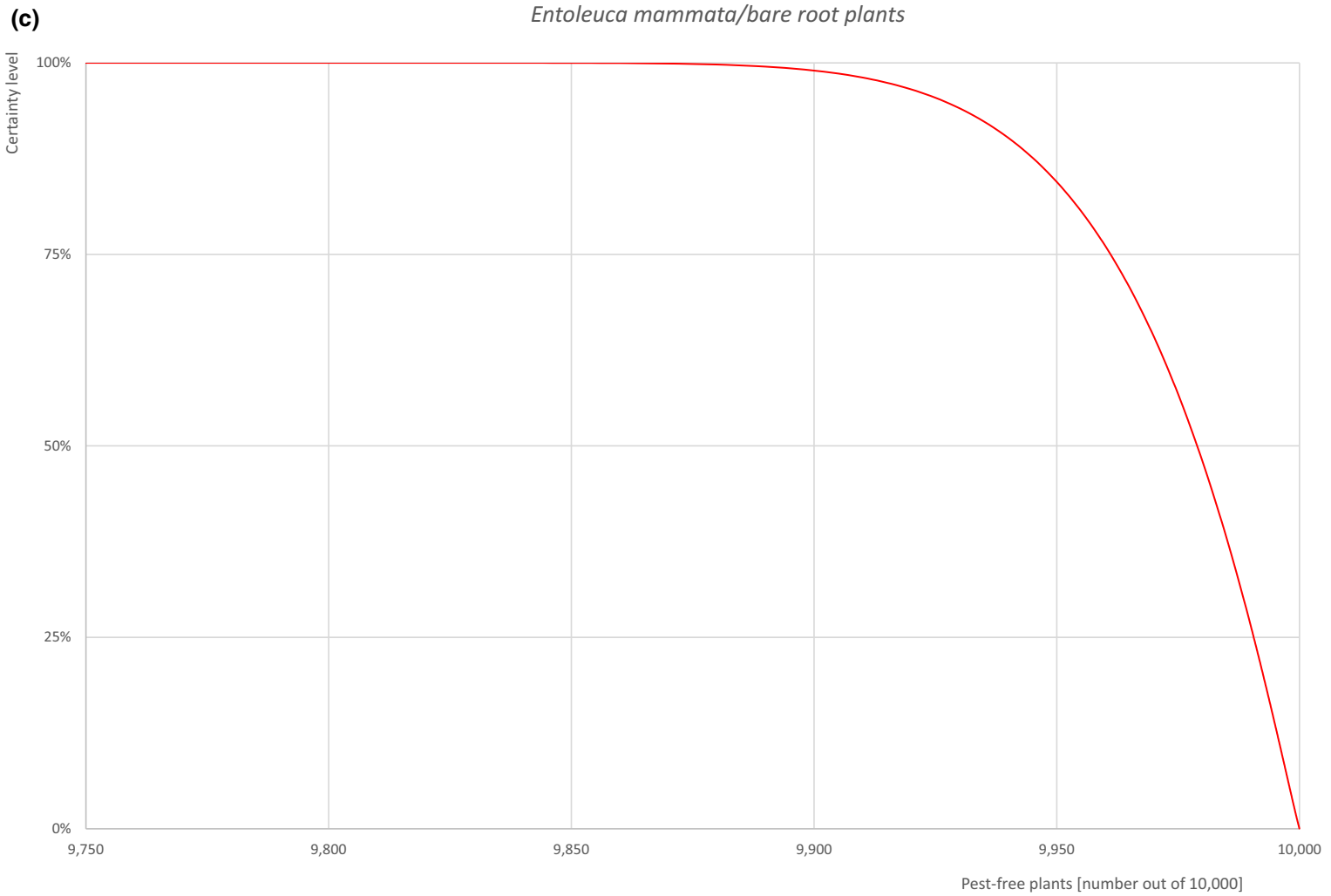


Figure A.11: (a) Elicited uncertainty of pest infection per 10,000 plants (histogram in blue – vertical blue line indicates the elicited percentile in the following order: 1%, 25%, 50%, 75%, 99%) and distributional fit (red line); (b) uncertainty of the proportion of pest-free plants per 10,000 (i.e. = 1 – pest infection proportion expressed as percentage); (c) descending uncertainty distribution function of pest infection per 10,000 plants

A.4.7. Overall likelihood of pest freedom for plants in pots up to 15 years old

A.4.7.1. Reasoning for a scenario which would lead to a reasonably low number of infected plants in pots up to 15 years old

The scenario assumes a low pressure of the pathogen in the nurseries and in the surroundings. Younger plants are exposed to the pathogen for only short period of time. The scenario assumes *Acer* spp. to be unsuitable/minor hosts for the pathogen. The scenario also assumes that symptoms of the disease are visible and promptly detected during inspections.

A.4.7.2. Reasoning for a scenario which would lead to a reasonably high number of infected plants in pots up to 15 years old

The scenario assumes a high pressure of the pathogen in the nurseries and in the surroundings as suitable hosts are present. Older plants are exposed to the pathogen for longer period of time. The scenario assumes *Acer* spp. to be hosts for the pathogen. The scenario also assumes that symptoms of the disease are not easily recognisable during inspections.

A.4.7.3. Reasoning for a central scenario equally likely to over- or underestimate the number of infected plants in pots up to 15 years old (Median)

The scenario assumes a limited presence of the pathogen in the nurseries and the surroundings and that the plants are exposed to the pathogen for a sufficient period of time to cause infection through mechanical wounds. *Acer* spp. are considered minor hosts.

A.4.7.4. Reasoning for the precision of the judgement describing the remaining uncertainties (1st and 3rd quartile/interquartile range)

The limited information on occurrence of the pathogen in the UK including the nurseries and the surroundings results in high level of uncertainties for infection rates below the median. Otherwise, the pest pressure from the surroundings is expected to be low giving less uncertainties for rates above the median.

A.4.7.5. Elicitation outcomes of the assessment of the pest freedom for *Entoleuca mammata* on plants in pots up to 15 years old

The following Tables show the elicited and fitted values for pest infection (Table A.23) and pest freedom (Table A.24).

Table A.23: Elicited and fitted values of the uncertainty distribution of pest infection by *Entoleuca mammata* 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					14		28		60					140
EKE	0.373	0.996	2.10	4.49	7.97	12.7	17.9	30.5	47.0	57.8	71.9	88.0	107	123	140

The EKE results is the BetaGeneral (0.93724, 4.0674, 0, 210) distribution fitted with @Risk version 7.6.

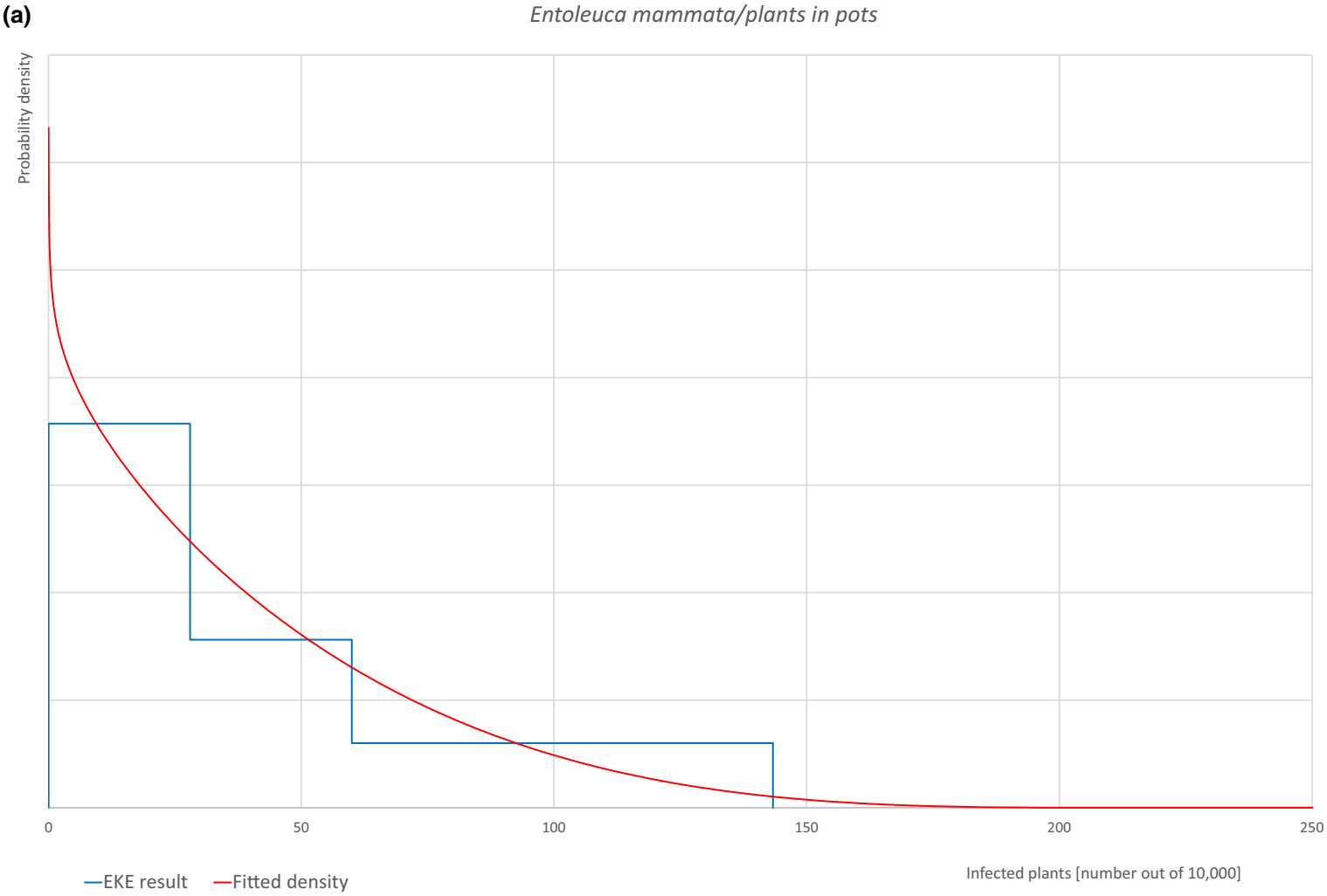
Based on the numbers of estimated infected plants the pest freedom was calculated (i.e. = 10,000 – number of infected plants per 10,000). The fitted values of the uncertainty distribution of the pest freedom are shown in Table A.24.

Table A.24: The uncertainty distribution of plants free of *Entoleuca mammata* per 10,000 plants calculated by Table A.23

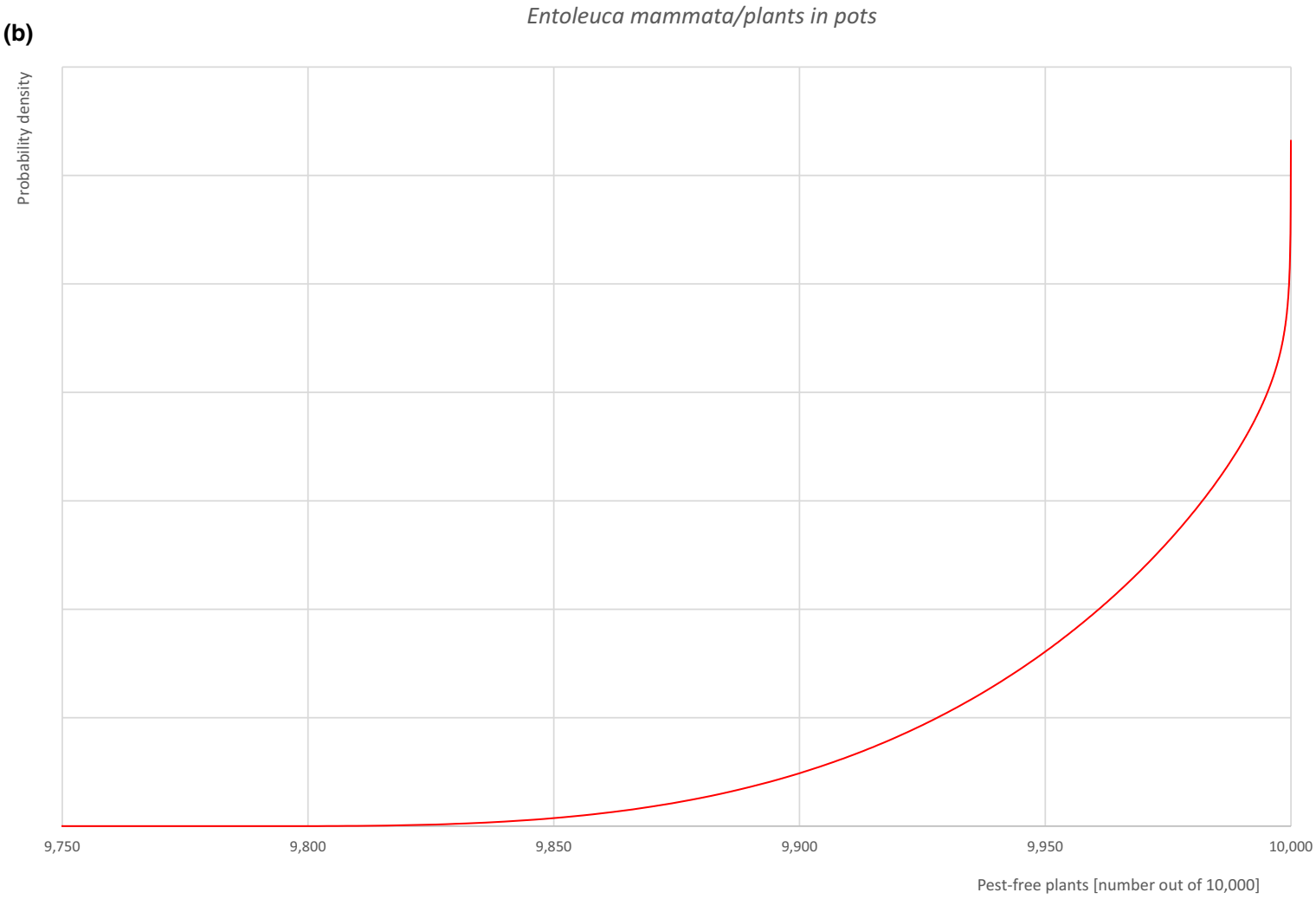
Percentile	1%	2.5%	5%	10%	17%	25%	33%	50%	67%	75%	83%	90%	95%	97.5%	99%
Values	9,860					9,940		9,972		9,986					10,000
EKE results	9,860	9,877	9,893	9,912	9,928	9,942	9,953	9,970	9,982	9,987	9,992	9,996	9,998	9,999.0	9,999.6

The EKE results are the fitted values.

(a)


Entoleuca mammata/plants in pots
Probability density
0
50
100
150
200
250
EKE result
Fitted density
Infected plants [number out of 10,000]

(b)


Entoleuca mammata/plants in pots
Probability density
9,750
9,800
9,850
9,900
9,950
10,000
Pest-free plants [number out of 10,000]

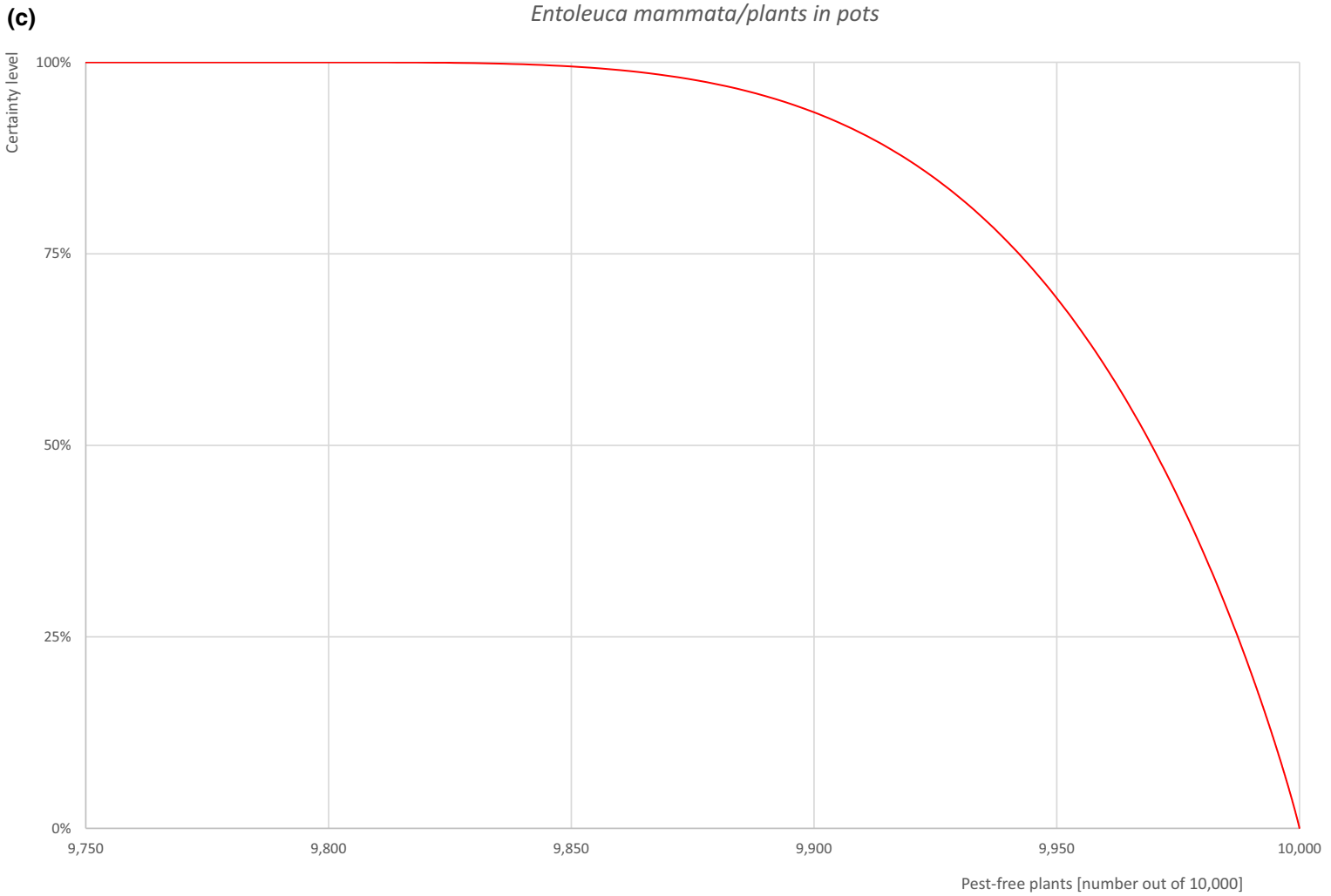


Figure A.12: (a) Elicited uncertainty of pest infection per 10,000 plants (histogram in blue – vertical blue line indicates the elicited percentile in the following order: 1%, 25%, 50%, 75%, 99%) and distributional fit (red line); (b) uncertainty of the proportion of pest-free plants per 10,000 (i.e. = 1 – pest infection proportion expressed as percentage); (c) descending uncertainty distribution function of pest infection per 10,000 plants.

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A.5. *Eulecanium excrescens*

A.5.1. Organism information

Taxonomic information	Current valid scientific name: *Eulecanium excrescens* Synonyms: *Lecanium excrescens* Name used in the EU legislation: – Order: Hemiptera Family: Coccidae Common name: excrescent scale, wisteria scale Name used in the Dossier: *Eulecanium excrescens*
Group	Insects
EPPO code	–
Regulated status	The pest is neither regulated in the EU nor listed by EPPO. *Eulecanium excrescens* is listed in the UK Plant Health Risk Register but archived in 2020 as considered to pose a low risk to the UK (DEFRA, online).
Pest status in the UK	*Eulecanium excrescens* is present in the UK as introduced species since at least 2000 (MacLeod and Matthews, 2005; Dossier Section 5.0) with restricted distribution to the Greater London Area (e.g. Bishops Strotford, Hornchurch, London, Maidenhead, Roystone, Wickford) where it is considered an 'established exotic pest' (MacLeod and Matthews, 2005). Outside this area, *E. excrescens* has been reported in a few localities of the neighbouring county of Hertfordshire (Salisbury et al., 2010) and more recently (2021) in Gloucester (GBIF, online). According to the Dossier Section 5.0 the pest is present in the UK: not widely distributed and not under official control.
Pest status in the EU	*Eulecanium excrescens* is absent from the EU (García Morales et al., online).
Host status on *Acer*	*Acer pseudoplatanus* is a host for *E. excrescens* (Malumphy, 2005). There is no information on whether *Acer campestre* may be hosts for *E. excrescens*.
PRA information	Pest Risk Assessments available: – CSL Pest Risk Analysis for *Eulecanium excrescens* (MacLeod and Matthews, 2005) – Scientific opinion on the commodity risk assessment of *Malus domestica* plants from United Kingdom (EFSA PLH Panel, 2023); – UK Risk Register Details for *Eulecanium excrescens* (DEFRA, online).
Other relevant information for the assessment	
Biology	*Eulecanium excrescens* is a polyphagous soft scale native to Asia (China) and introduced in the US, where it is present in California, Connecticut, New York, Oregon and Pennsylvania (MacLeod and Matthews, 2005; Malumphy, 2005); in Europe it is present only in the UK (Malumphy, 2005; GBIF, online). It is absent from Africa, Central and South America and Oceania (García Morales et al., online). There is no specific information about the number of life stages of *E. excrescens*. However, soft scales have three development stages: eggs, nymphs (two or three instars) and adult (Camacho and Chong, 2015). The nymphs of *E. excrescens* are orange or pale brown with rectangular whitish encrustations on their surface; the first instar nymphs are mobile (crawlers) and disperse actively by crawling away from their mothers or passively by wind or phoresis. Both nymphs and adults of soft scales (except adult males when present) feed on twigs and leaves sucking phloem and often producing large amount of honeydew (Camacho and Chong, 2015). In the UK, *E. excrescens* is a parthenogenetic species and has one generation per year; the nymphs overwinter and reach maturity in April. The large globular adult females (10-13 mm) are dark brown, covered by grey powdery wax. They lay eggs in May, each female lays about 2,000 eggs. The crawlers emerge in May-June and settle to the underside of leaves; in autumn, before the leaf fall, they move from the leaves to the woody parts to overwinter (Malumphy, 2005).

	Eulecanium excrescens can spread naturally by crawling of first instar nymphs on very short distances, and passively via air currents and wind of the same development stage. No specific information on the natural dispersal of *E. excrescens* is available, which is considered 'likely slow' (MacLeod and Matthews, 2005). However, it is known that some soft scale crawlers may be dispersed by wind to 55 m to > 4 km (Camacho and Chong, 2015). Passive transport of nymphs on medium-long distance is also possible by phoresis mostly with birds and ants, and human assisted spread may occur via infested plants.	
Symptoms	**Main type of symptoms**	Only a non-specific leaf loss and slow dieback may be sometimes observed as a symptom on plants strongly attacked by *E. excrescens*, as a result of large amount of sap removed by the scale. The main evidence of the pest attack is the presence of colonies of adults and nymphs producing honeydew on the stem and branches. Adults of *E. excrescens* are large size (10-13 mm in length/ diameter), and this make the pest easy to detect, since no other soft scale species raises that size in the UK.
	Presence of asymptomatic plants	There is no information on the presence of asymptomatic plants, although initial infestations caused by a few insects may go unnoticed.
	Confusion with other pests	In the UK other six species of *Eulecanium* are found (Malumphy, 2005) but none raises the size of adult females of *E. excrescens*, therefore no confusion with other species is possible at that stage. The nymphs may be confused with those of other *Eulecanium*, as well as with other soft scale species and need to be examined in laboratory for identification with the support of diagnostic keys.
Host plant range	*Eulecanium excrescens* feeds on a wide host plant range including *Acer pseudoplatanus*, *Juglans regia*, *Malus* spp., *Prunus dulcis, P. armeniaca, P. persica, Prunus* spp., *Pyrus communis, Ulmus* spp. and *Zelkova serrata*. In the UK the scale also attacks some vine species as *Ceanothus* sp., *Podranea ricasoliana, Parthenocyssus quinquefolia, P. tricuspidata* and mostly *Wisteria* spp. The latter appears to be the preferred host genus as it is in the US (Malumphy, 2005; Salisbury et al., 2010).	
Reported evidence of impact	*Eulecanium excrescens* is a sap sucker able to damage host plants by removing large quantities of sap, so causing weakening, leaf loss and dieback; large amount of honeydew is also produced, reducing photosynthesis and disfiguring ornamental plants in parks and gardens (MacLeod and Matthews, 2005). In China, *E. excrescens* is regarded as a pest damaging fruit orchards of *Malus, Prunus* and *Pyrus* (MacLeod and Matthews, 2005). In the US, the scale is included in the list of pests harmful to hazelnut (*Corylus avellana*) production in Oregon (Murray and Jepson, 2018); not regarded as a pest of economic importance in California (MacLeod and Matthews, 2005). Impact on ornamental *Wisteria* may be relevant in case of heavy infestation, as these vines are often cultivated in gardens and for covering walls and buildings in the UK. No information on damage on *Acer* was found.	
Evidence that the commodity is a pathway	The pest occurs on bark. Although the source of infestations in the UK is unknown (MacLeod and Matthews, 2005) and no interception is recorded (EUROPHYT/ TRACES, online), plants for planting (except seeds bulbs and tubers) are pathways for *E. excrescens* according to DEFRA (online). The commodities including dormant plants are pathways for the pest.	
Surveillance information	*Eulecanium excrescens* is not under official control and surveillance in the UK, as does not meet criteria of quarantine pest for Great Britain (Dossier Section 5.0).	

A.5.2. Possibility of pest presence in the nursery

A.5.2.1. Possibility of entry from the surrounding environment

Eulecanium excrescens is present in the UK, with restricted distribution to the Great London area and some findings in Hertfordshire and Gloucester (MacLeod and Matthews, 2005; Salisbury et al., 2010; GBIF, online; Dossier Section 5.0).

Eulecanium excrescens has limited ability of active spreading, but the first instar nymphs of the pest (crawlers) may be naturally dispersed by phoresis and wind over distances of some kilometres.

Eulecanium excrescens can feed on *Acer pseudoplatanus*, *Juglans regia, Prunus* spp., *Ulmus* spp. and *Wisteria* spp. which are present within 2 km from the nurseries (Dossier Section 3.0).

Uncertainties:

- The presence of the pest on host plants in the surrounding area.

Taking into consideration the above evidence and uncertainties, the Panel considers that it is possible for the pest to enter the nurseries from surrounding environment via first instar nymphs (crawlers) transported by wind and birds.

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

The starting materials are either seeds, seedlings or scion woods/buds. Seeds are certified and coming from the UK. Seedlings are either from the UK, the EU (mostly the Netherlands) or New Zealand (Dossier Section 3.0).

In addition to *Acer* plants, the nurseries also produce other plants (Dossier Section 6.0). Out of them, there are suitable hosts for the pathogen such as *Juglans regia, Malus* spp., *Prunus, Pyrus, Ulmus* and *Wisteria sinensis*. However, there is no information on how and where the plants are produced. Therefore, if the plants are first produced in another nursery, the pest could possibly travel with them.

The nurseries are using virgin peat or peat-free compost (a mixture of coir, tree bark, wood fibre, etc.) as a growing media (Dossier Section 1.0). The growing media is certified and heat-treated by commercial suppliers during production to eliminate pests and diseases (Dossier Section 3.0). There is no evidence that soil or growing media may be a pathway for *E. excrescens*.

Uncertainties:

- No information is available on the provenance of plants other than *Acer* used for plant production in the nurseries.

Taking into consideration the above evidence and uncertainties, the Panel considers that it is possible for the pest to enter the nurseries via new seedlings of *Acer* and plants of other species used for plant production in the area. The entry of the pest with seeds and the growing media the Panel considers as not possible.

A.5.2.3. Possibility of spread within the nursery

Acer plants are either grown in containers (cells, pots, tubes, etc.) outdoors, in the open air or in field. Cell grown trees may be grown in greenhouses, however most plants will be field grown or field grown in containers (Dossier Section 1.0). There are no mother plants present in the nurseries (Dossier Section 3.0).

The pest can attack other suitable plants, such as *Juglans regia, Malus, Prunus, Pyrus, Ulmus* and *Wisteria* present within the nurseries (Dossier Sections 3.0 and 6.0).

Once entered, the pest can naturally spread within the nurseries both by crawling of the nymphs plant to plant, and by air currents and phoresis with birds and ants; nymphs could also move with equipment/clothes of the nursery staff.

Uncertainties:

- None.

Taking into consideration the above evidence and uncertainties, the Panel considers that the spread of the pest within the nurseries is possible by crawling, air currents and phoresis.

A.5.3. Information from interceptions

In the EUROPHYT/TRACES-NT database there are no records of notification of *Acer* plants for planting neither from the UK nor from other countries due to the presence of *Eulecanium excrescens* between the years 1995 and December 2022 (EUROPHYT/TRACES-NT, online).

A.5.4. Evaluation of the risk mitigation measures

In the table below, all risk mitigation measures currently applied in the UK are listed and an indication of their effectiveness on *Eulecanium excrescens* is provided. The description of the risk mitigation measures currently applied in the UK is provided in the Table 6.

N	Risk mitigation measure	Effect on the pest	Evaluation and uncertainties
1	Registration of production sites	Yes	Although *E. excrescens* is not a quarantine pest, it has been listed the UK Plant Health Risk Register until 2020 and it is easy to spot. The risk mitigation measure could have some effects in reducing the likelihood of presence of the pest on the commodity. Uncertainties: – None.
2	Physical separation	No	Not relevant. Physical separation is not a barrier for *E. excrescens* because crawlers can be easily spread by wind and air currents.
3	Certified plant material	Yes	The risk mitigation measure could have some effects in reducing the likelihood of presence of the pest on the commodity. Uncertainties: – None.
4	Growing media	No	Not relevant. *Eulecanium excrescens* is not present in soil.
5	Surveillance, monitoring and sampling	Yes	Incoming plant material is thoroughly checked, *E. excrescens* is easy to spot. The risk mitigation measure could have some effects in reducing the likelihood of presence of the pest on the commodity. Uncertainties: – None.
6	Hygiene measures	Yes	Nymphs could move with equipment/clothes of the nursery staff. The described measures could have very little effect in reducing the likelihood of presence of the pest on the commodity. *Eulecanium excrescens* is not present on weeds. Uncertainties: – None.
7	Removal of infested plant material	Yes	Removal of generically damaged plants could reduce the probability of carrying *E. excrescens*. Uncertainties: – None.
8	Irrigation water	No	Not relevant.
9	Application of pest control products	Yes	Chemical control measures adopted when the pest is found may have a substantial effect of pest suppression. Uncertainties: – The active substances of chemical treatments and their efficacy against the pest.

N	Risk mitigation measure	Effect on the pest	Evaluation and uncertainties
10	Measures against soil pests	No	Not relevant.
11	Inspections and management of plants before export	Yes	Inspection should detect *E. excrescens* as signs are clear (honeydew). Uncertainties: – Capacity of detecting symptoms at low pest density.
12	Separation during transport to the destination	No	Not relevant. *Acer* plants are not individually separated during transportation.

A.5.5. Overall likelihood of pest freedom for bundles of whips and seedlings

A.5.5.1. Reasoning for a scenario which would lead to a reasonably low number of infested bundles of whips and seedlings

This scenario assumes a low pressure of the pest in the nurseries and the surrounding. In this scenario it is also assumed that plants are very small and therefore symptoms and signs are easy to spot, as small plants can be more accurate inspected. Honeydew is present and adult females are settled and big, so they are easy to be spotted during inspections, and measures against the pest can be taken.

A.5.5.2. Reasoning for a scenario which would lead to a reasonably high number of infested bundles of whips and seedlings

This scenario assumes a high pressure of the pest in the nurseries and the surrounding. It also assumes that the pest is spreading. No measures are being taken by the UK against this pest. Leaves can mask the presence of the pest on the twigs. Crawlers can move and hide and may be overlooked. The scenario assumes that low density populations can be overlooked during inspections, and that mode of action of the pesticides used may not be effective against *E. excrescens*. Finally, the scenario assumes that pest is coming from the surroundings and a bundle effect is expected to increase the number of infestations.

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

The Panel assumes a high efficacy of the surveillance and inspections conducted in the nursery due to the small size of the plants and the big size of adult females. The Panel also assumes that symptoms as honeydew are easily visible and, therefore, measures against the pest can be taken. These considerations lead Panel to indicate low value of the median.

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

The Panel assumes a high uncertainty in the first quartile and a medium uncertainty above the median because symptoms because of the ease of detection of signs and symptoms of the pest, and because clustering of infestation is unknown or unclear.

A.5.5.5. Elicitation outcomes of the assessment of the pest freedom for *Eulecanium excrescens* on bundles of whips and seedlings

The following Tables show the elicited and fitted values for pest infestation (Table A.25) and pest freedom (Table A.26).

Table A.25: Elicited and fitted values of the uncertainty distribution of pest infestation by *Eulecanium excrescens* per 10,000 bundles

Percentile	1%	2.5%	5%	10%	17%	25%	33%	50%	67%	75%	83%	90%	95%	97.5%	99%
Elicited values	2					12		25		60					125
EKE	2.00	2.19	2.67	4.04	6.54	10.5	15.4	28.2	45.8	57.3	71.7	87.1	103	115	126

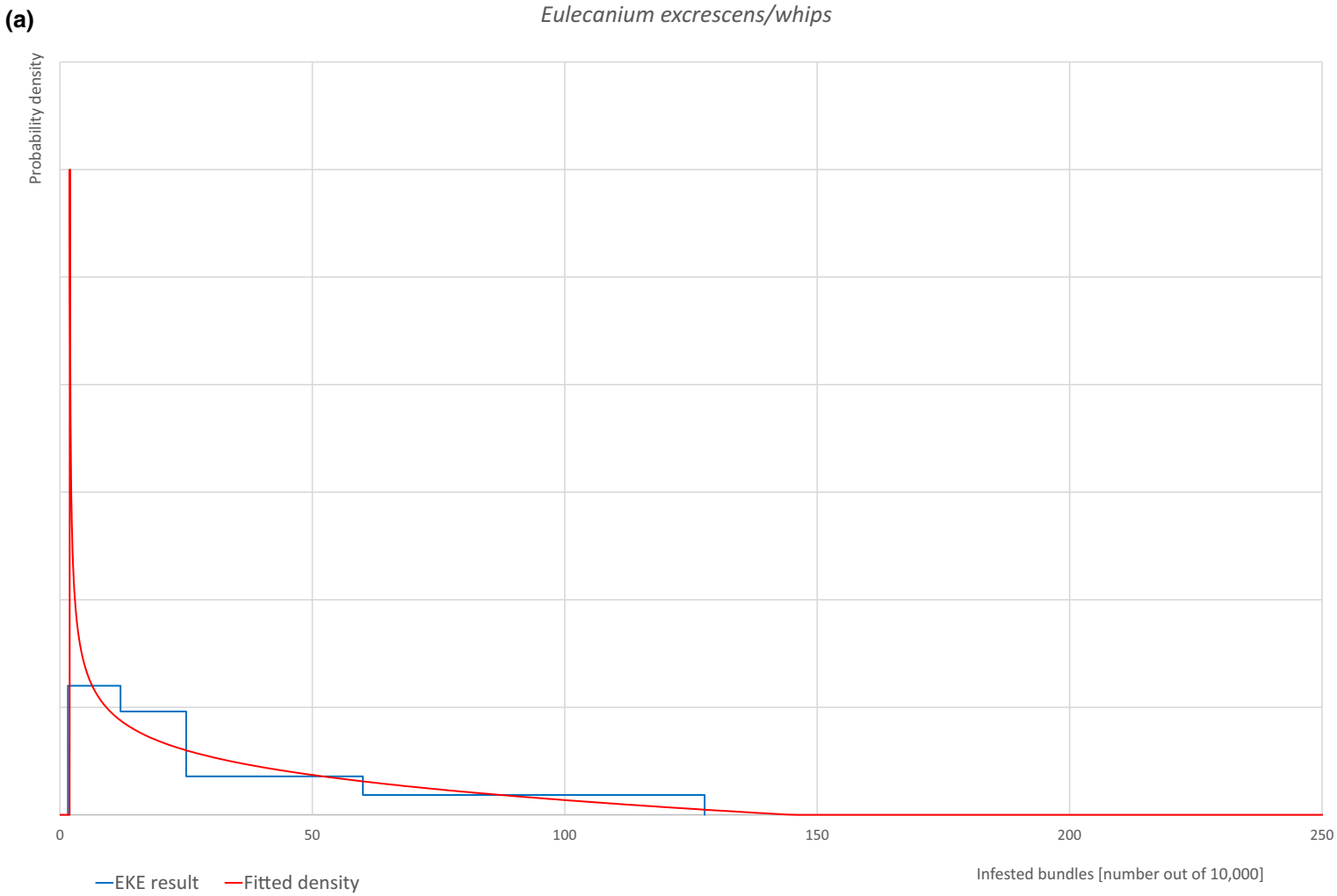
The EKE results is the BetaGeneral (0.66731, 2.0139, 1.93, 145) distribution fitted with @Risk version 7.6.

Based on the numbers of estimated infested bundles the pest freedom was calculated (i.e. = 10,000 – number of infested bundles per 10,000). The fitted values of the uncertainty distribution of the pest freedom are shown in Table A.26.

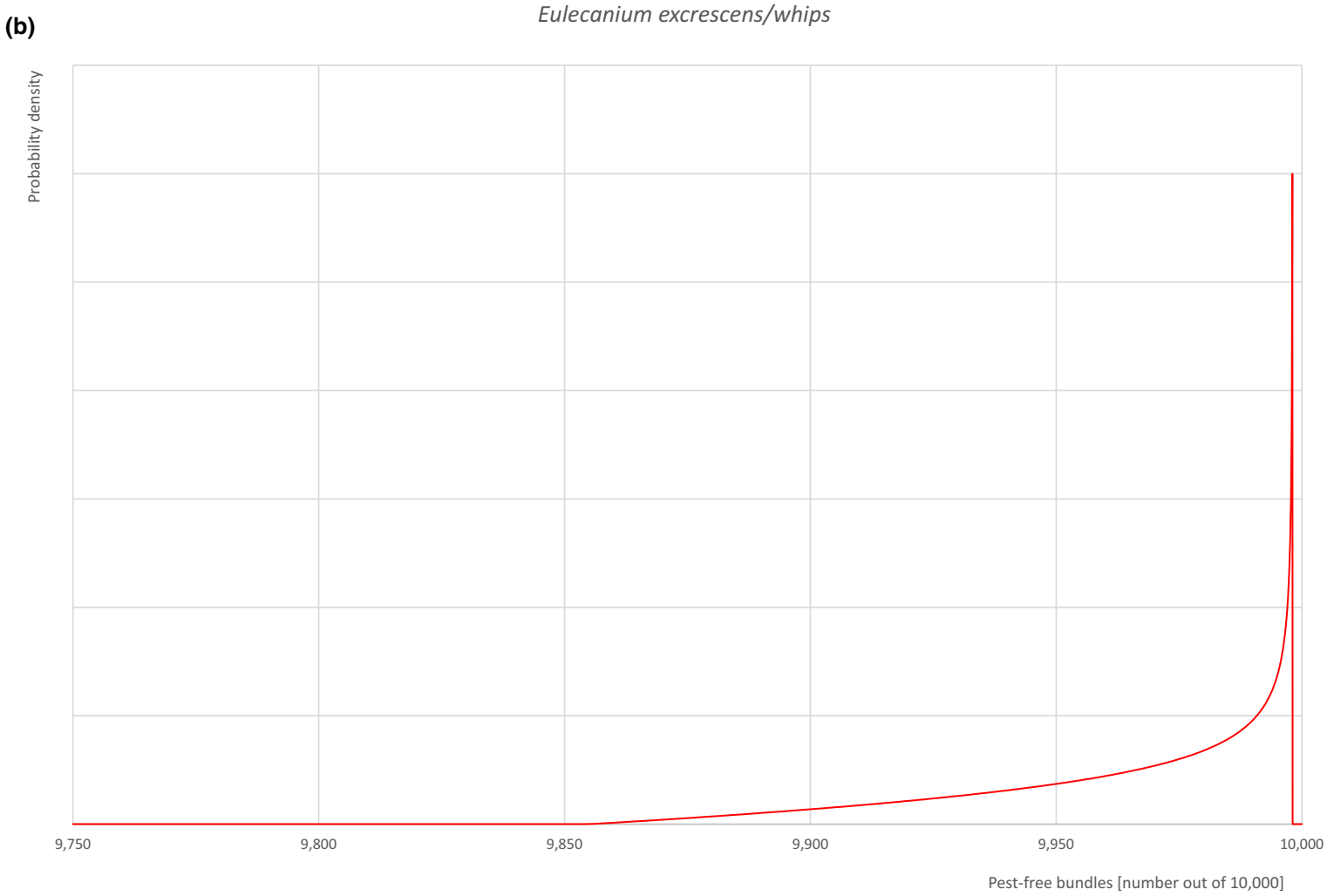
Table A.26: The uncertainty distribution of bundles free of *Eulecanium excrescens* per 10,000 bundles calculated by Table A.25

Percentile	1%	2.5%	5%	10%	17%	25%	33%	50%	67%	75%	83%	90%	95%	97.5%	99%
Values	9,875					9,940		9,975		9,988					9,998
EKE results	9,874	9,885	9,897	9,913	9,928	9,943	9,954	9,972	9,985	9,989	9,993	9,996	9,997.3	9,997.8	9,998.0

The EKE results are the fitted values.


(a)
Eulecanium excrescens/whips
Probability density
0
50
100
150
200
250
Infested bundles [number out of 10,000]
EKE result
Fitted density

(b)


Eulecanium excrescens/whips
Probability density
9,750
9,800
9,850
9,900
9,950
10,000
Pest-free bundles [number out of 10,000]

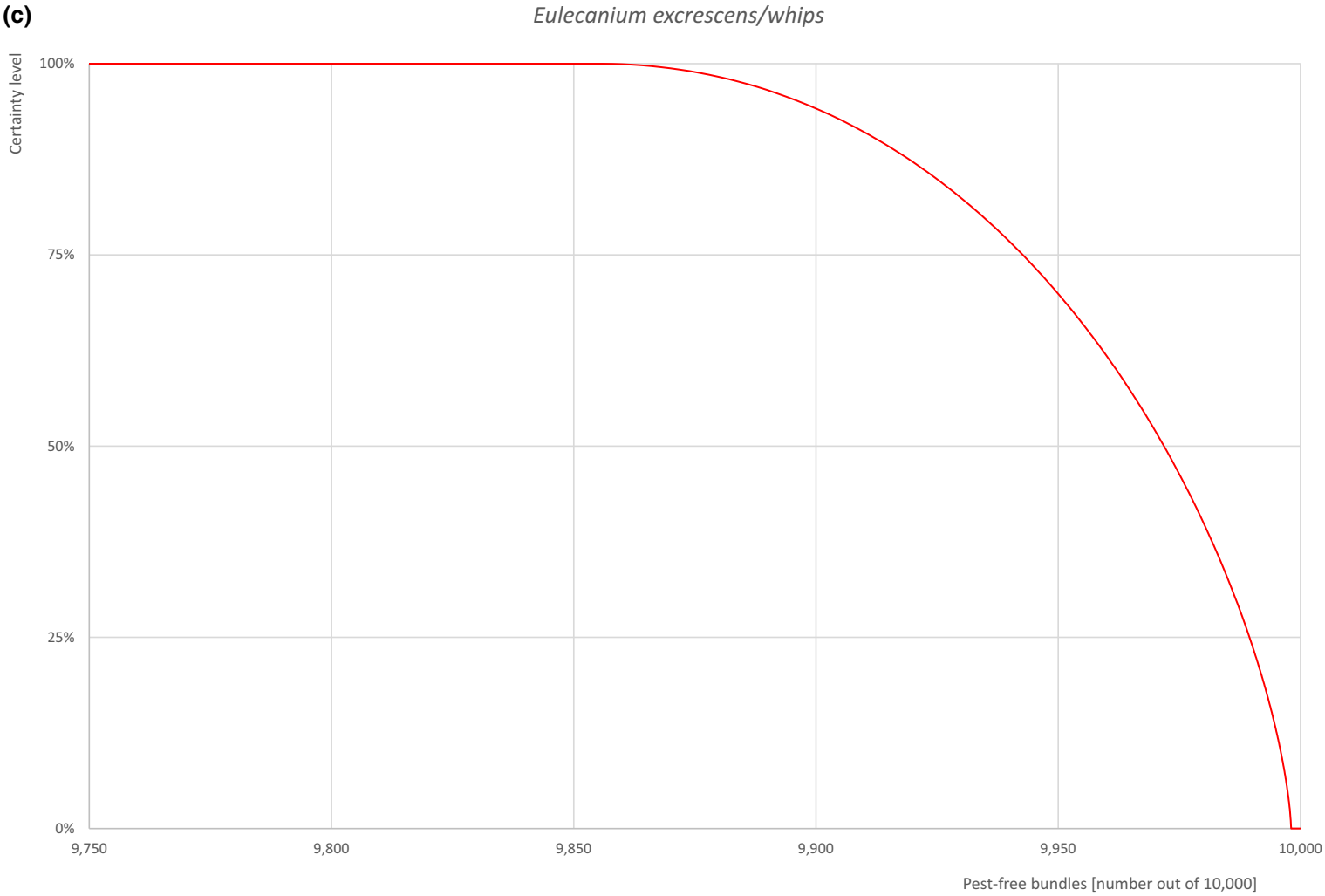


Figure A.13: (a) Elicited uncertainty of pest infestation per 10,000 bundles (histogram in blue – vertical blue line indicates the elicited percentile in the following order: 1%, 25%, 50%, 75%, 99%) and distributional fit (red line); (b) uncertainty of the proportion of pest-free bundles per 10,000 (i.e. = 1 – pest infestation proportion expressed as percentage); (c) descending uncertainty distribution function of pest infestation per 10,000 bundles

A.5.6. Overall likelihood of pest freedom for bare root plants/trees up to 7 years old

A.5.6.1. Reasoning for a scenario which would lead to a reasonably low number of infested bare root plants/trees up to 7 years old

This scenario assumes a low pressure of the pest in the nurseries and the surrounding. In this scenario it is also assumed that symptoms are easy to spot as honeydew is present and adult females are settled and big. Therefore, signs and symptoms are easy to be spotted during inspections, and measures against the pest can be taken.

A.5.6.2. Reasoning for a scenario which would lead to a reasonably high number of infested bare root plants/trees up to 7 years old

This scenario assumes a high pressure of the pest in the nurseries and the surrounding. It also assumes that the pest is spreading and that no measures are being taken by the UK against this pest. The scenario assumes that low density populations can be overlooked during inspections, that leaves can mask the presence of the pest on the twigs, and that mode of action of the pesticides used may not be effective against *E. excrescens*.

A.5.6.3. Reasoning for a central scenario equally likely to over- or underestimate the number of infested bare root plants/trees up to 7 years old (Median)

The Panel assumes a high efficacy of the surveillance and inspections conducted in the nursery due to big size of adult females. The Panel also assumes that symptoms as honeydew are easily visible and, therefore, measures against the pest can be taken. These considerations lead Panel to indicate low value of the median.

A.5.6.4. Reasoning for the precision of the judgement describing the remaining uncertainties (1st and 3rd quartile/interquartile range)

The Panel assumes a high uncertainty in the first quartile, and a medium uncertainty above the median, because of the ease of detection of signs and symptoms of the pest, and because of the effectiveness of measures conducted to control the pest in the nursery.

A.5.6.5. Elicitation outcomes of the assessment of the pest freedom for *Eulecanium excrescens* on bare root plants/trees up to 7 years old

The following Tables show the elicited and fitted values for pest infestation (Table A.27) and pest freedom (Table A.28).

Table A.27: Elicited and fitted values of the uncertainty distribution of pest infestation by *Eulecanium excrescens* per 10,000 plants

Percentile	1%	2.5%	5%	10%	17%	25%	33%	50%	67%	75%	83%	90%	95%	97.5%	99%
Elicited values	2					12		25		45					100
EKE	2.01	2.57	3.52	5.48	8.24	11.9	15.9	25.2	37.1	44.8	54.7	65.7	78.5	89.0	100

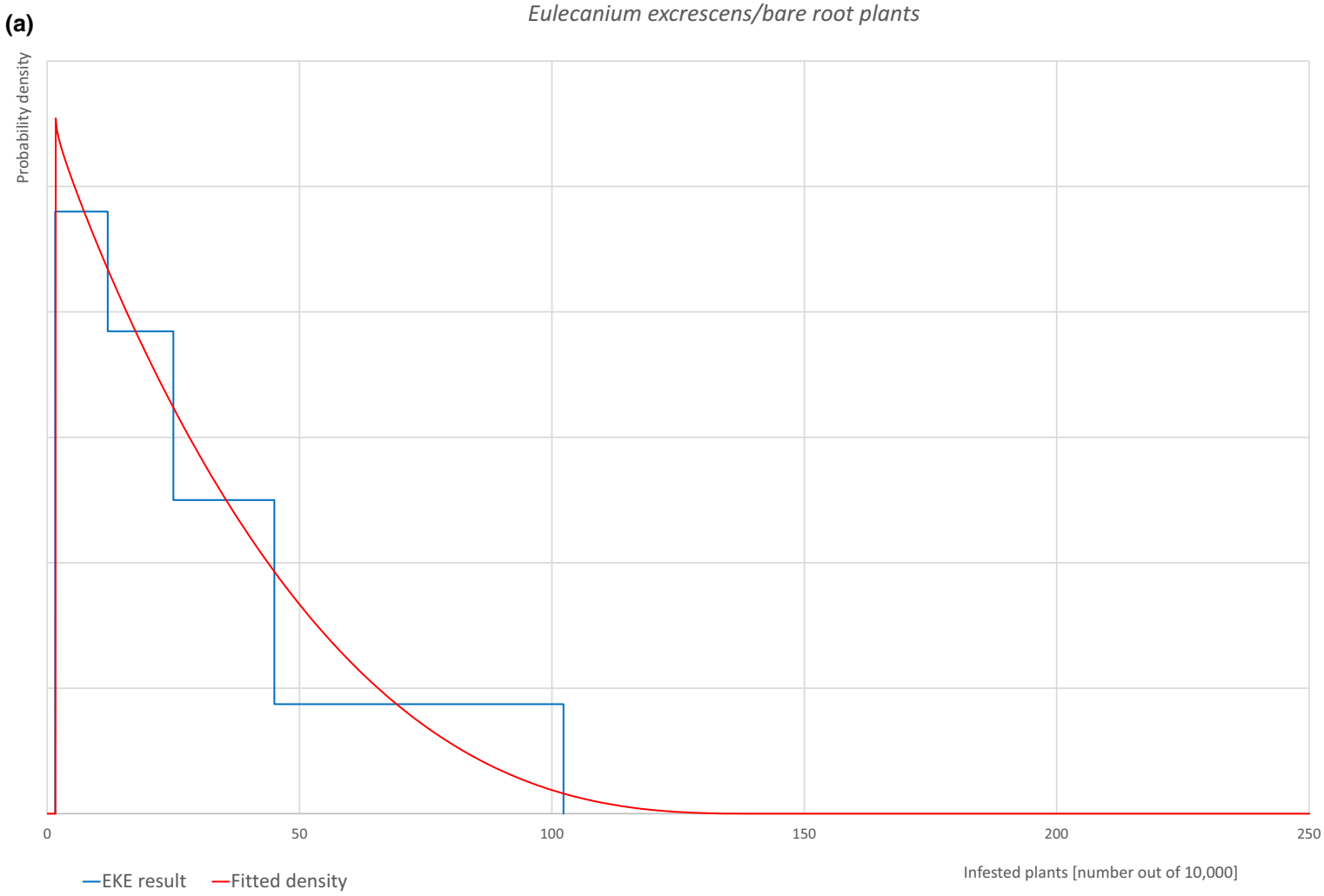
The EKE results is the BetaGeneral (0.99307, 3.6847, 1.65, 140) distribution fitted with @Risk version 7.6.

Based on the numbers of estimated infested plants the pest freedom was calculated (i.e. = 10,000 – number of infested plants per 10,000). The fitted values of the uncertainty distribution of the pest freedom are shown in Table A.28.

Table A.28: The uncertainty distribution of plants free of *Eulecanium excrescens* per 10,000 plants calculated by Table A.27

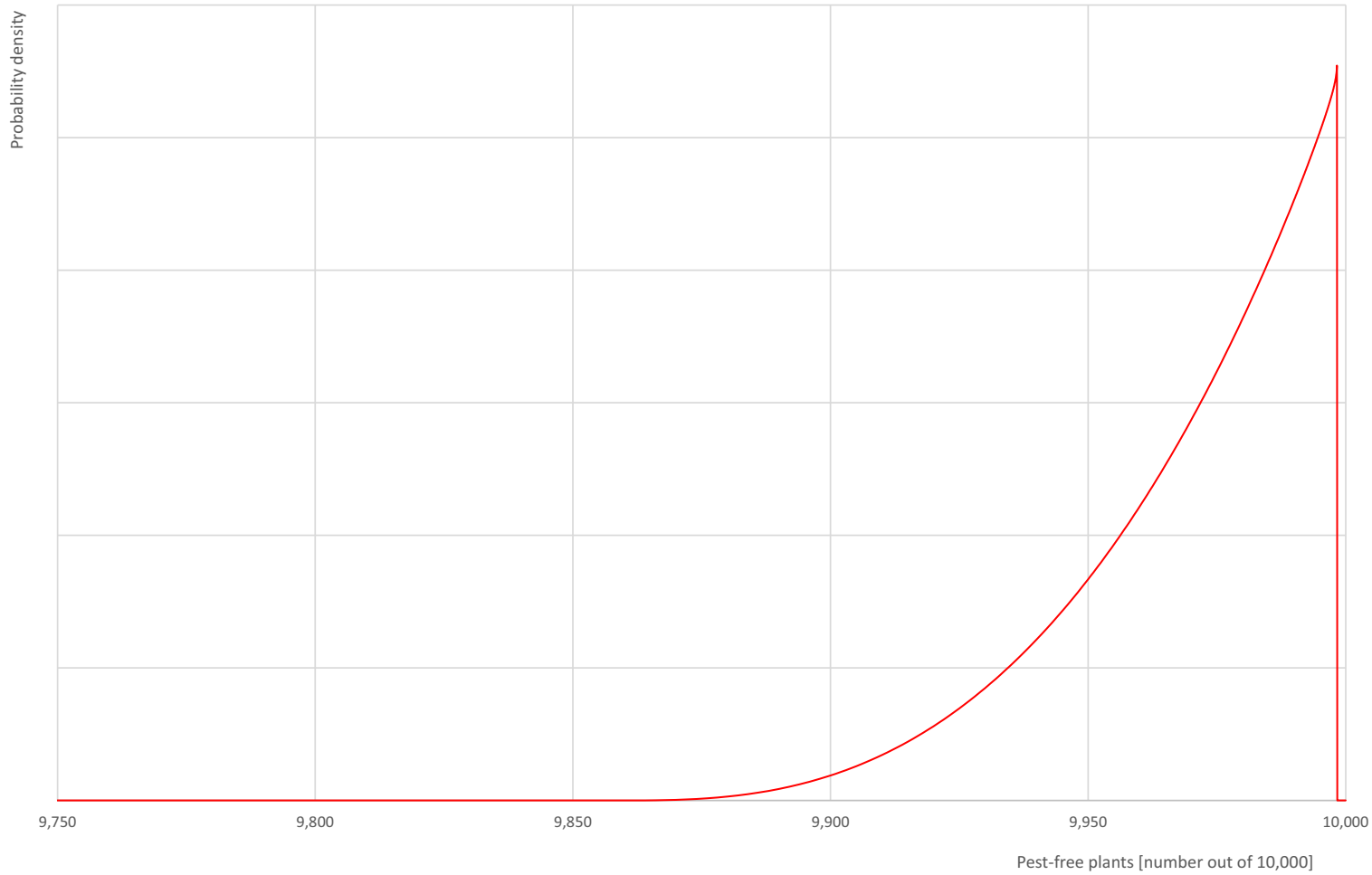
Percentile	1%	2.5%	5%	10%	17%	25%	33%	50%	67%	75%	83%	90%	95%	97.5%	99%
Values	9,900					9,955		9,975		9,988					9,998
EKE results	9,900	9,911	9,922	9,934	9,945	9,955	9,963	9,975	9,984	9,988	9,992	9,995	9,996	9,997	9,998

The EKE results are the fitted values.


(a)
Eulecanium excrescens/bare root plants
Probability density
0
50
100
150
200
250
Infested plants [number out of 10,000]
EKE result
Fitted density

(b)

Eulecanium excrescens/bare root plants



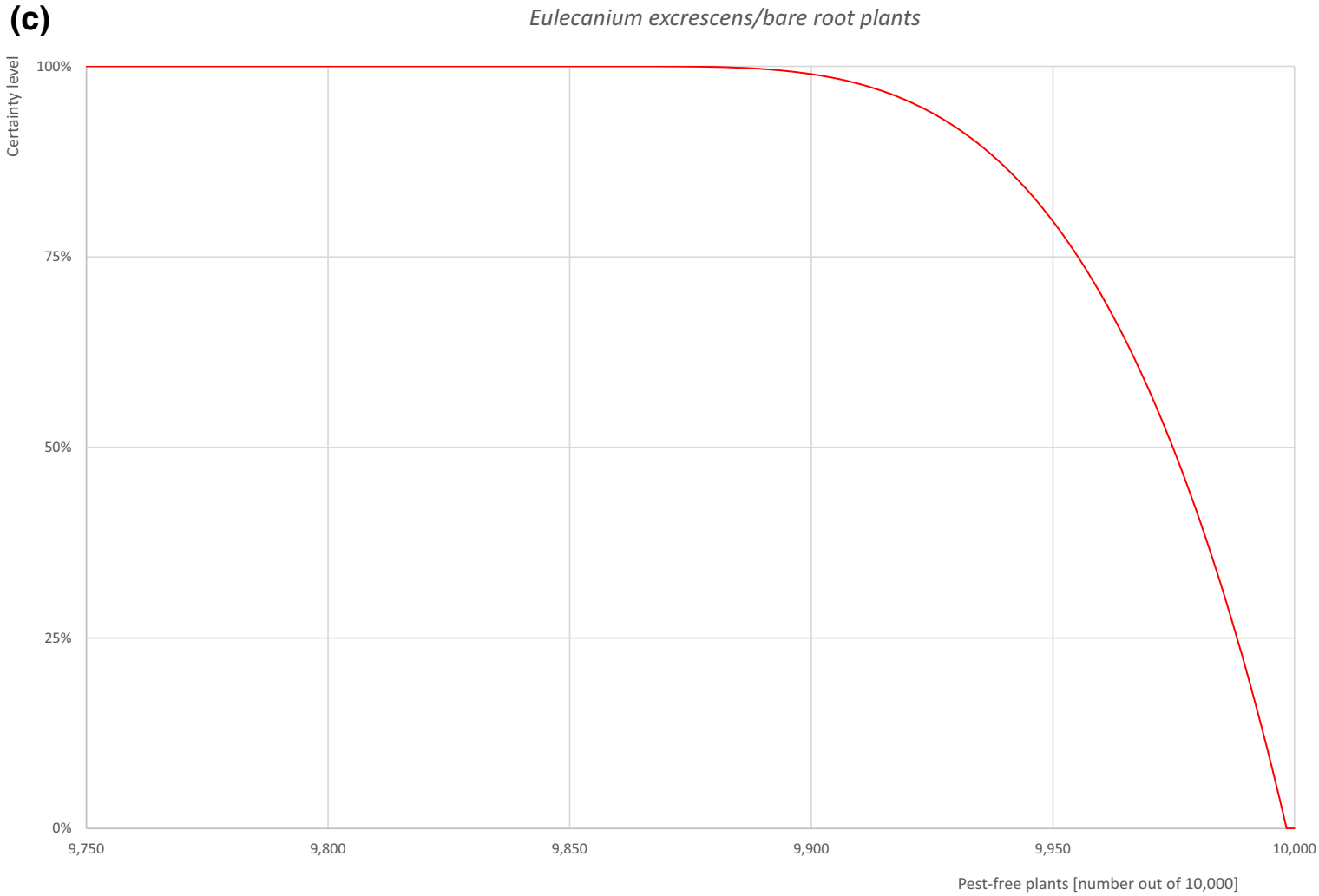


Figure A.14: (a) Elicited uncertainty of pest infestation per 10,000 plants (histogram in blue – vertical blue line indicates the elicited percentile in the following order: 1%, 25%, 50%, 75%, 99%) and distributional fit (red line); (b) uncertainty of the proportion of pest-free plants per 10,000 (i.e. = 1 – pest infestation proportion expressed as percentage); (c) descending uncertainty distribution function of pest infestation per 10,000 plants

A.5.7. Overall likelihood of pest freedom for plants in pots up to 15 years old

A.5.7.1. Reasoning for a scenario which would lead to a reasonably low number of infested plants in pots up to 15 years old

This scenario assumes a low pressure of the pest in the nurseries and the surrounding. In this scenario it is also assumed that symptoms and signs are easy to be spotted, as honeydew is present and adult females are settled and big. Therefore, inspections can be effective and measures against the pest can be taken consequently. Finally, the scenario assumes that seldomly commodity is exported with leaves, period when active crawlers and recent infestations could lead to undetected infestations.

A.5.7.2. Reasoning for a scenario which would lead to a reasonably high number of infested plants in pots up to 15 years old

This scenario assumes a high pressure of the pest in the nurseries and the surrounding. It also assumes that the pest is spreading and that no measures are being taken by the UK against this specific pest. The scenario assumes that low density populations can be overlooked during inspections, that leaves can mask the presence of the pest on the twigs, and that mode of action of the pesticides used may not be effective against *E. excrescens*. The scenario assumes that the commodity can be exported any time of the year and with leaves, so period when crawlers are active and recent infestations could lead to undetected infestations. Finally, the scenario assumes that the pest can be hidden and not detected in the bigger trees with large canopy, compared to the previous commodities.

A.5.7.3. Reasoning for a central scenario equally likely to over- or underestimate the number of infested plants in pots up to 15 years old (Median)

The Panel assumes a high efficacy of the surveillance and inspections conducted in the nursery due to big size of adult females. The Panel also assumes that symptoms as honeydew are easily visible and, therefore, measures against the pest can be taken. These considerations lead Panel to indicate low value of the median.

A.5.7.4. Reasoning for the precision of the judgement describing the remaining uncertainties (1st and 3rd quartile/interquartile range)

The Panel assumes a high uncertainty in the first quartile, and a medium uncertainty above the median, because of the ease of detection of signs and symptoms of the pest, and because of the effectiveness of measures conducted to control the pest in the nursery.

A.5.7.5. Elicitation outcomes of the assessment of the pest freedom for *Eulecanium* excrescens on plants in pots up to 15 years old

The following Tables show the elicited and fitted values for pest infestation (Table A.29) and pest freedom (Table A.30).

Table A.29: Elicited and fitted values of the uncertainty distribution of pest infestation by *Eulecanium excrescens* per 10,000 plants

Percentile	1%	2.5%	5%	10%	17%	25%	33%	50%	67%	75%	83%	90%	95%	97.5%	99%
Elicited values	3					20		35		70					160
EKE	3.00	3.97	5.52	8.61	12.8	18.3	24.2	38.0	55.8	67.4	82.6	100	121	140	161

The EKE results is the BetaGeneral (1.0692, 5.2856, 2.3, 270) distribution fitted with @Risk version 7.6.

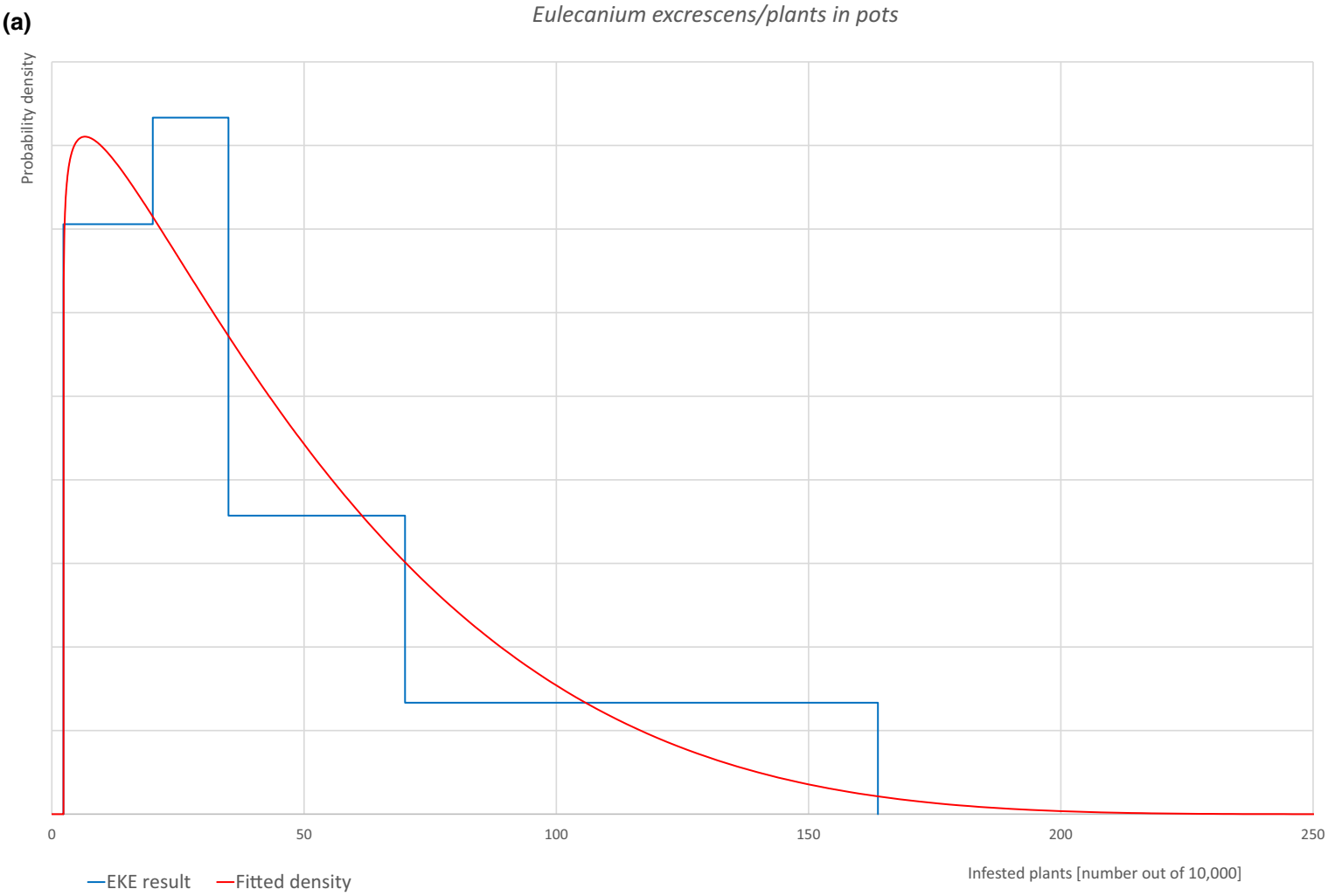
Based on the numbers of estimated infested plants the pest freedom was calculated (i.e. = 10,000 – number of infested plants per 10,000). The fitted values of the uncertainty distribution of the pest freedom are shown in Table A.30.

Table A.30: The uncertainty distribution of plants free of *Eulecanium excrescens* per 10,000 plants calculated by Table A.29

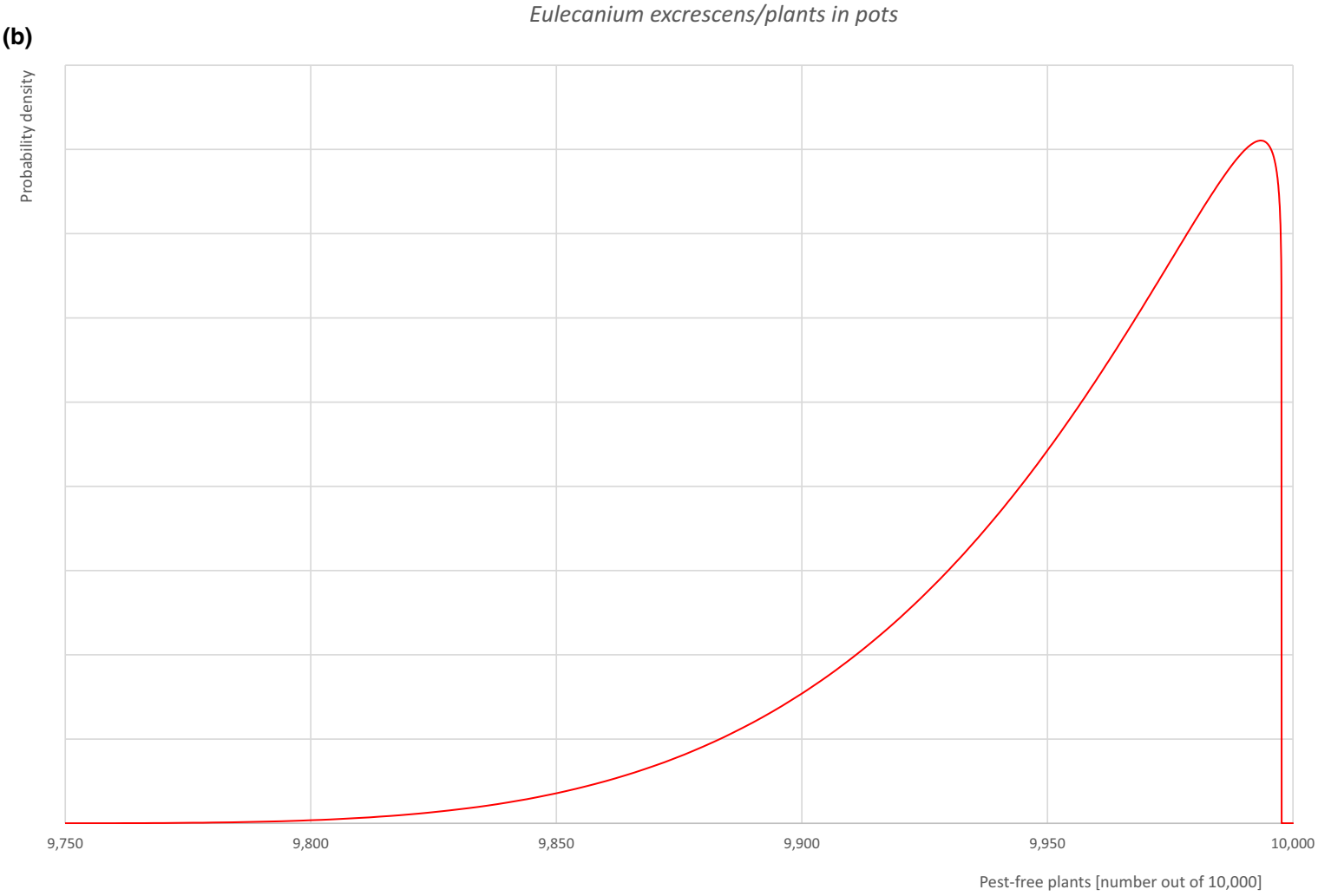
Percentile	1%	2.5%	5%	10%	17%	25%	33%	50%	67%	75%	83%	90%	95%	97.5%	99%
Values	9,840					9,930		9,965		9,980					9,997
EKE results	9,839	9,860	9,879	9,900	9,917	9,933	9,944	9,962	9,976	9,982	9,987	9,991	9,994	9,996	9,997

The EKE results are the fitted values.

(a)


Eulecanium excrescens/plants in pots
Probability density
0
50
100
150
200
250
Infested plants [number out of 10,000]
EKE result
Fitted density

(b)


Eulecanium excrescens/plants in pots
Probability density
9,750
9,800
9,850
9,900
9,950
10,000
Pest-free plants [number out of 10,000]

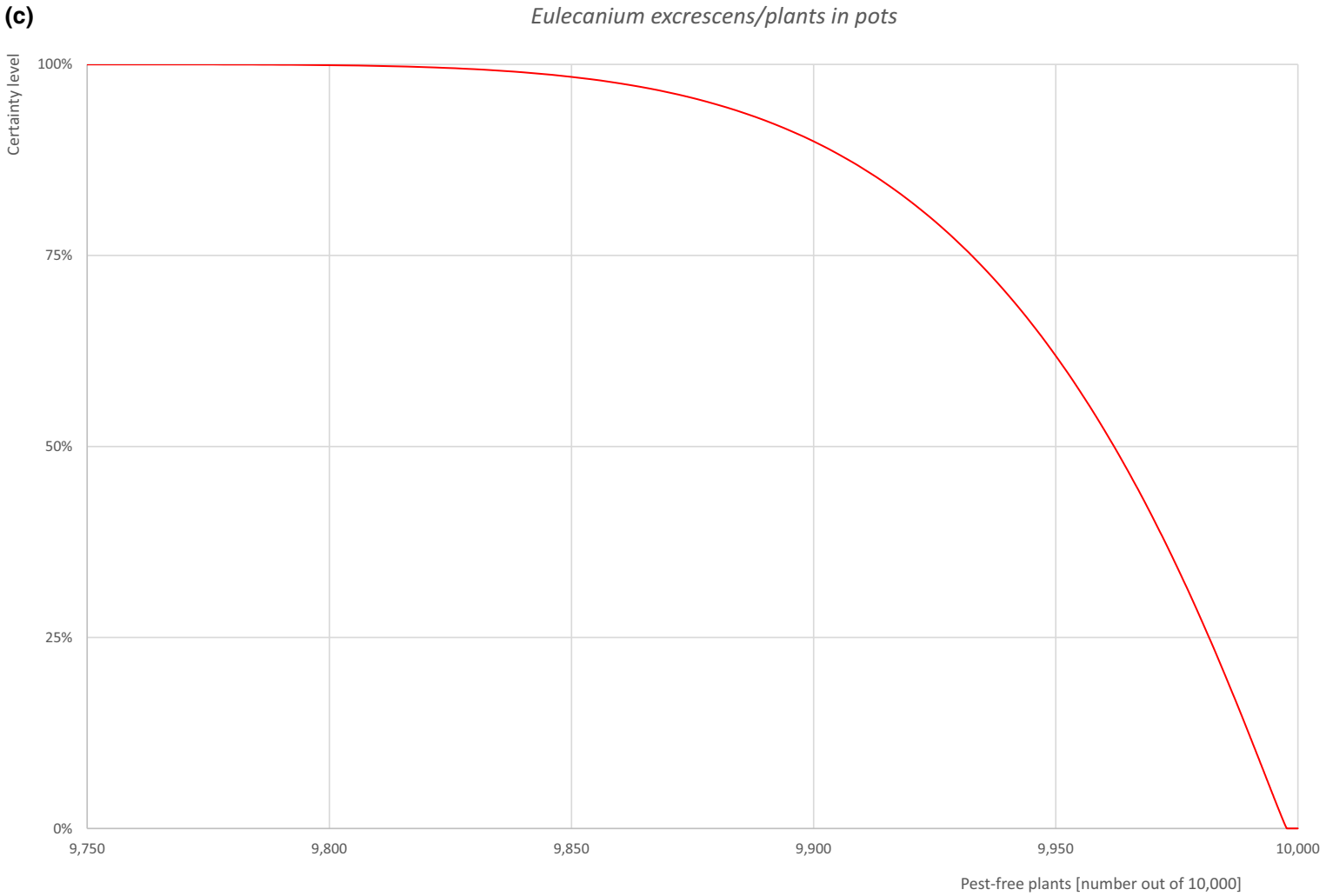


Figure A.15: (a) Elicited uncertainty of pest infestation per 10,000 plants (histogram in blue – vertical blue line indicates the elicited percentile in the following order: 1%, 25%, 50%, 75%, 99%) and distributional fit (red line); (b) uncertainty of the proportion of pest-free plants per 10,000 (i.e. = 1 – pest infestation proportion expressed as percentage); (c) descending uncertainty distribution function of pest infestation per 10,000 plants

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A.6. *Meloidogyne fallax*

A.6.1. Organism information

Taxonomic information	Current valid scientific name: *Meloidogyne fallax* Synonyms: *Meloidogyne chitwoodi* (Baexem) B-type Name used in the EU legislation: *Meloidogyne fallax* Karssen [MELGFA] Order: Rhabditida Family: Meloidogynidae Common name: false Columbia root-knot nematode, root gall nematode Name used in the Dossier: *Meloidogyne fallax*
Group	Nematodes
EPPO code	MELGMA
Regulated status	The pest is listed in Annex II of Regulation (EU) 2019/2072 as *Meloidogyne fallax* Karssen [MELGFA]. The pest is included in the EPPO A2 list (EPPO, online_a). *Meloidogyne fallax* is quarantine in Morocco, Moldova and Norway. It is on A1 list of Argentina, Bahrain, Brazil, Egypt, Georgia, Kazakhstan, Russia, Ukraine and EAEU (=Eurasian Economic Union – Armenia, Belarus, Kazakhstan, Kyrgyzstan and Russia). It is on A2 list of COSAVE (=Comite de Sanidad Vegetal del Cono Sur – Argentina, Brazil, Chile, Paraguay, Peru and Uruguay) (EPPO, online_b). *M. fallax* is also quarantine pest in the US (Kantor et al., 2022).

	In the UK *M. fallax* is regulated non-quarantine pest in Great Britain on potato only, as this is considered to be the main host at risk (EPPO, online_b; DEFRA, online), and it is regulated quarantine pest in Northern Ireland (DEFRA, online; Dossier Section 5.0).
Pest status in the UK	*Meloidogyne fallax* is present in the UK (CABI, online; EPPO, online_c) with a restricted distribution in England and Wales and no findings associated to trees (Dossier Sections 2.0, 3.0 and 5.0). *M. fallax* was also detected in Northern Ireland in 2011 (EPPO, 2015); however, its presence there is currently not confirmed (Dossier Section 5.0).
Pest status in the EU	*Meloidogyne fallax* is present in Belgium, France, the Netherlands and Sweden; in the latter country it is under eradication (DEFRA, online; EPPO, online_c,d). It is transient and under eradication in Germany (CABI, online; EPPO, online_c). *M. fallax* was present in Ireland in the past century (1965) (Topalović et al., 2017), but it has not been reported since.
Host status on *Acer*	*Acer palmatum* is reported as a host plant for *Meloidogyne fallax* in field experiments (den Nijs et al., 2004). No information on *Acer campestre* as a natural host of *M. fallax* was found. However, given the polyphagous nature of *M. fallax* the Panel cannot exclude that *A. campestre* could be a hostplant for the nematode.
PRA information	Available Pest Risk Assessments: – Pest risk assessment for the European Community plant health: a comparative approach with case studies. Cases: *Meloidogyne chitwoodi* and *M. fallax* (MacLeod et al., 2012); – Scientific Opinion on the commodity risk assessment of *Acer* spp. plants from New Zealand (EFSA PLH Panel, 2020); – UK Risk Register Details for *Meloidogyne fallax* (DEFRA, online).
Other relevant information for the assessment	
Biology	*Meloidogyne fallax* is a highly polyphagous root-gall nematode firstly described from the Netherlands and mostly distributed in temperate regions of the world. It is present in Africa (South Africa), Asia (Indonesia), Europe (Belgium, France, Germany, the Netherlands, Switzerland, Sweden, UK), Oceania (Australia, New Zealand), South America (Chile) (CABI, online; EPPO, online_c). According to MacLeod et al. (2012) *M. fallax* may be more widespread because it is frequently confused with similar species as *M. hapla* and *M. chitwoodi*, and not causing clear external symptoms on host plants. *Meloidogyne fallax* has three development stages: eggs, juveniles (four stages) and adults. The nematode mainly reproduces parthenogenetically, and sexual reproduction can possibly occur under adverse conditions; like other *Meloidogyne* species, *M. fallax* has 1-3 generations per year depending on temperature and host availability (MacLeod et al., 2012; EFSA, 2019). Females lay up to 800-1,000 eggs in gelatinous masses on the root surface, in galls and tubers. Hatching can occur at temperatures below 10°C, so that *M. fallax* is considered cryophilic (MacLeod et al., 2012; EFSA PLH Panel, 2020). The second-stage juveniles move in the soil and penetrate host roots, start feeding on cortical tissues inducing the formation of root galls; they become sedentary and develop to successive stages by quick moults. The nematode can stay infective in the soil for long time, being also able to survive for more than 300 days at temperatures of 5 and 10°C and 140 days at higher temperatures (15-25°C). Survival and infectivity may be also related to high soil humidity (100% survival with 98% RH) although in moderate dry soil conditions *M. fallax* may survive for more than 9 weeks (MacLeod et al., 2012). As other nematode species living in the soil, *Meloidogyne fallax* has only little spread capacity, the juvenile stages moving 1-2 m maximum per year depending on type of soil, water availability and other parameters (EFSA, 2019). Water could also disperse the nematode (mainly eggs and juveniles) at short distances. The human-assisted spread on medium-long distance is very frequent and effective by passive transport. Possible pathways are mainly plants for planting with infected roots; tubers and bulbs; soil and growing media; contaminated tools, machinery, shoes and packaging material (EFSA, 2019).

Symptoms	**Main type of symptoms**	*Meloidogyne fallax* is a root-knot nematode. Heavily infested plants show stunting and yellowing on above ground parts and galling on roots (Moens et al., 2009; MacLeod et al., 2012; EFSA, 2019). Symptoms of root-knot nematodes on hardwood trees may show as slow growth, sparse foliage, chlorotic leaves and crown dieback (Riffle, 1963). Symptoms on roots vary with species but should be visible as galls in advanced infections. On potato tubers, *M. fallax* cause numerous small pimple-like areas on the surface (EPPO, 2019). No specific information about symptoms on *Acer* sp. was found.
	Presence of asymptomatic plants	At the early stages of infection, plants may not show any apparent symptoms on the above ground parts and do not show galls on the roots. In some cases, plants are wilted and lack vigour. The main impact of the pest is on root growth, and on the quality and growth of the plant (Moens et al., 2009; MacLeod et al., 2012; EFSA, 2019).
	Confusion with other pests	*Meloidogyne fallax* is morphologically very similar to *M. chitwoodi* and may also be easily confused with other species as *M. hapla* and *M. minor*, often found in the same habitat. *M. fallax* cannot be identified on the basis of sole galls, since other soil nematode cause similar damage and some insects and bacteria can induce comparable galls on roots as well (EFSA, 2019). The nematode can be identified by laboratory tests on morphometric characters, electrophoresis or sequencing/DNA barcoding are needed (EPPO, 2016).
Host plant range	*Meloidogyne fallax* is a polyphagous nematode with a wide host range, including several major horticultural and agricultural crops and a few species of trees, shrubs and herbaceous plants. Main horticultural/agricultural hosts are: *Apium graveolens, Allium porrum, Asparagus officinalis, Avena strigosa, Beta vulgaris, Cicorium endivia, Cynara scolymus, Daucus carota, Foeniculum vulgare, Fragaria ananassa, Hordeum vulgare, Lactuca sativa, Lycopersicum esculentum, Medicago sativa, Phaseolus vulgaris, Secale cereale, Solanum nigrum, S. tuberosum, Solanum spp., Triticum aestivum* and *Zea mays* (MacLeod et al., 2012; CABI, online; EPPO, online_e). Woody hosts of *M. fallax* are *Acer palmatum, Betula pendula, Cornus sanguinea, Laburnum anagyroides, Lonicera xylosteum* (MacLeod et al., 2012; Ferris, online). For a more exhaustive list of hosts see de Nijs et al. (2004); MacLeod et al. (2012); CABI (online); EPPO (online_e) and Ferris (online).	
Reported evidence of impact	*Meloidogyne fallax* is EU quarantine pest. *Meloidogyne fallax* is known as species of economic concern on some horticultural crops as potato and carrot, mostly in the Netherlands, but no information is available on yield losses. The main damage observed is the reduction of merchantability in potato tubers (MacLeod et al., 2012). Similarly, no significant damage was observed on strawberries (van der Sommen et al., 2005). Few reports demonstrate the impact of *M. fallax* on yield or quality of plant products. The nematode species has been reported to be of economic importance on potato and carrot in the Netherlands, but no data were given on yield losses in practice (MacLeod et al., 2012). Damage caused by *M. fallax* in sports turf were reported in North-western England in 2015 (EPPO, 2015; DEFRA, 2017). No specific data about damage on *Acer* sp. was found.	

Evidence that the commodity is a pathway	*Meloidogyne* nematodes, although rarely identified at species level, are frequently intercepted on plants for planting, including bonsais of *Acer palmatum* (EUROPHYT/ TRACES, online); therefore the commodity is a possible pathway of entry for *M. fallax*.
Surveillance information	According to the Dossier Section 3.0 and 5.0, *Meloidogyne fallax* is not under official surveillance in the UK, as does not meet criteria of quarantine pest for Great Britain.

A.6.2. Possibility of pest presence in the nursery

A.6.2.1. Possibility of entry from the surrounding environment

Meloidogyne fallax is present in the UK territory with restricted distribution in England and Wales in agricultural lands and sports turf (Dossier Section 3.0 and 5.0).

The nematode has very limited capacity of movement in the soil (1–2 m) and can only spread by passive transport human assisted with plants for planting with infected roots, infected soil and growing media and possibly via contaminated tools and machinery. No other possibility of entry in the nurseries is known.

Meloidogyne fallax can infect *Allium porrum, Beta vulgaris, Betula, Daucus carota, Hordeum vulgare, Solanum lycopersicum* and *S. tuberosum* which are present within 2 km from the nurseries (Dossier Section 3.0).

Uncertainties:

- Pest presence and pressure in the surrounding.

Taking into consideration the above evidence and uncertainties, the Panel considers that it is possible for *Meloidogyne fallax* to enter the nurseries from surrounding environment. In the surrounding area, suitable hosts are present and the nematode could enter by human assisted spread.

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

The starting materials are either seeds, seedlings or scion woods/buds. Seeds are certified and coming from the UK. Seedlings are either from the UK, the EU (mostly the Netherlands) or New Zealand (Dossier Section 3.0). Seeds are not a pathway for the nematode.

In addition to *Acer*, the nurseries also produce other plants (Dossier Section 6.0). Out of them, there are some suitable hosts for the nematode (such as *Betula pendula, Cornus sanguinea, Laburnum anagyroides* and *Lonicera xylosteum*). However, there is no information on how and where the plants are produced. Besides, *M. fallax* may also spread on soil adhering to the roots of non-host plants (MacLeod et al., 2012). Therefore, if the plants are first produced in another nursery, the nematode could possibly travel with them.

The nurseries are using virgin peat or peat-free compost (a mixture of coir, tree bark, wood fibre, etc.) as a growing media (Dossier Section 1.0). *Meloidogyne fallax* is able to survive in the soil for long time and therefore could potentially enter with infested soil/growing media. However, the growing media is certified and heat-treated by commercial suppliers during production to eliminate pests and diseases (Dossier Section 3.0).

Uncertainties:

- No information is available on the provenance of plants other than *Acer* used for plant production in the nurseries.

Taking into consideration the above evidence and uncertainties, the Panel considers that it is possible for the nematode to enter the nurseries via infected roots of new seedlings of *Acer* and plants of other species used for plant production in the area. The entry of the nematode with seeds and the growing media the Panel considers as not possible.

A.6.2.3. Possibility of spread within the nursery

Acer plants are either grown in containers (cells, pots, tubes, etc.) outdoors in the open air or in field. Cell grown trees may be grown in greenhouses, however most plants will be field grown or field grown in containers (Dossier Section 1.0). There are no mother plants present in the nurseries (Dossier Section 3.0).

The nematode can infect other suitable plants such as *Betula pendula, Cornus sanguinea, Laburnum anagyroides* and *Lonicera xylosteum*, present within the nurseries (Dossier Sections 3.0 and 6.0).

Meloidogyne fallax can spread within the nurseries by movement of soil, water, infested plant material and infected tools, contaminated shoes and machinery. Tools used in the nurseries are disinfected after operation on a stock and before being used on a different plant species (Dossier Section 3.0); however, no information is available on the measures to reduce the risk of contamination of machinery, shoes or other material (i.e. package, bags, etc.).

Uncertainties:

- Possibility that the pest can spread via contaminated soil adhering to shoes, machinery or other material.

Taking into consideration the above evidence and uncertainties, the Panel considers that the spread of the nematode within the nurseries is possible either by movement of infested soil (also via machinery, shoes and other material) water and plant material.

A.6.3. Information from interceptions

In the EUROPHYT/TRACES-NT database there are no records of notification of *Acer* plants for planting neither from the UK nor from other countries due to the presence of *Meloidogyne fallax* between the years 1995 and December 2022 (EUROPHYT/TRACES-NT, online).

A.6.4. Evaluation of the risk mitigation measures

In the table below, all risk mitigation measures currently applied in the UK are listed and an indication of their effectiveness on *Meloidogyne fallax* is provided. The description of the risk mitigation measures currently applied in the UK is provided in the Table 6.

N	Risk mitigation measure	Effect on the pest	Evaluation and uncertainties
1	Registration of production sites	Yes	As the plant passport is very similar to the EU one, the plants shall be free from quarantine pests and RNQPs. Uncertainties: – None.
2	Physical separation	No	Not relevant.
3	Certified plant material	Yes	Seedlings could be a pathway for the nematode. Uncertainties: – None
4	Growing media	Yes	Heat treatment and protection of the treated growing media is effective against the nematode. Uncertainties: – None.
5	Surveillance, monitoring and sampling	Yes	This assessment can have some effect against the nematode. Uncertainties: – The capability of detecting infections by the pest, especially in the case of early infections.
6	Hygiene measures	Yes	This assessment can have some effect against the nematode. Uncertainties: – The degree to which roots of weeds are examined for the pest.

N	Risk mitigation measure	Effect on the pest	Evaluation and uncertainties
7	Removal of infested plant material	Yes	This assessment can have some effect against the nematode. Uncertainties: – The degree to which roots of weeds are examined for the pest.
8	Irrigation water	Yes	Uncertainties: – None.
9	Application of pest control products	No	Not relevant. No nematicides are used in the nurseries.
10	Measures against soil pests	Yes	Separation of the pots from soil is effective against the nematode. Uncertainties: – None.
11	Inspections and management of plants before export	Yes	This assessment can have some effect against the nematode. Uncertainties: – The capability of detecting infections by the pest, especially in the case of early infections.
12	Separation during transport to the destination	No	Not relevant. The nematode cannot spread between the roots of the plants when transported to the EU.

A.6.5. Overall likelihood of pest freedom for bundles of whips and seedlings

A.6.5.1. Reasoning for a scenario which would lead to a reasonably low number of infected bundles of whips and seedlings

The scenario assumes a low pressure of the pest in the nurseries and in the surroundings. The plants are exposed to the nematode for only short period of time. The scenario also assumes that root galls are visible while inspecting plants before export and that the second juvenile stage are washed away during the root washing.

A.6.5.2. Reasoning for a scenario which would lead to a reasonably high number of infected bundles of whips and seedlings

The scenario assumes a high pressure of the pest in the nurseries and in the surroundings as many potential hosts are present. The scenario also assumes that root galls are not easily recognisable while inspecting plants before export and that the low-pressure washing is not effective in removing the second juvenile stage before export.

A.6.5.3. Reasoning for a central scenario equally likely to over- or underestimate the number of infected bundles of whips and seedlings (Median)

The scenario assumes a limited presence of the pest in the nurseries and the surroundings and that the plants are exposed to the nematode for only short period of time. The movement of soil from the surrounding into the nurseries is not expected to be significant.

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

The limited information on occurrence of the pests in the UK including the nurseries and the surroundings results in high level of uncertainties for infestation rates below the median. Otherwise, the pest pressure from the surroundings is expected to be low giving less uncertainties for rates above the median.

A.6.5.5. Elicitation outcomes of the assessment of the pest freedom for *Meloidogyne mali* and *M. fallax* on bundles of whips and seedlings

The following Tables show the elicited and fitted values for pest infection (Table A.31) and pest freedom (Table A.32).

Table A.31: Elicited and fitted values of the uncertainty distribution of pest infection by *Meloidogyne mali* and *M. fallax* per 10,000 bundles

Percentile	1%	2.5%	5%	10%	17%	25%	33%	50%	67%	75%	83%	90%	95%	97.5%	99%
Elicited values	3					25		40		60					150
EKE	5.507	8.116	11.04	15.31	19.91	24.97	29.82	39.98	52.2	60.1	70.5	83.0	99.1	114.4	133.9

The EKE results is the BetaGeneral (2.6372, 576.47, 0, 10,000) distribution fitted with @Risk version 7.6.

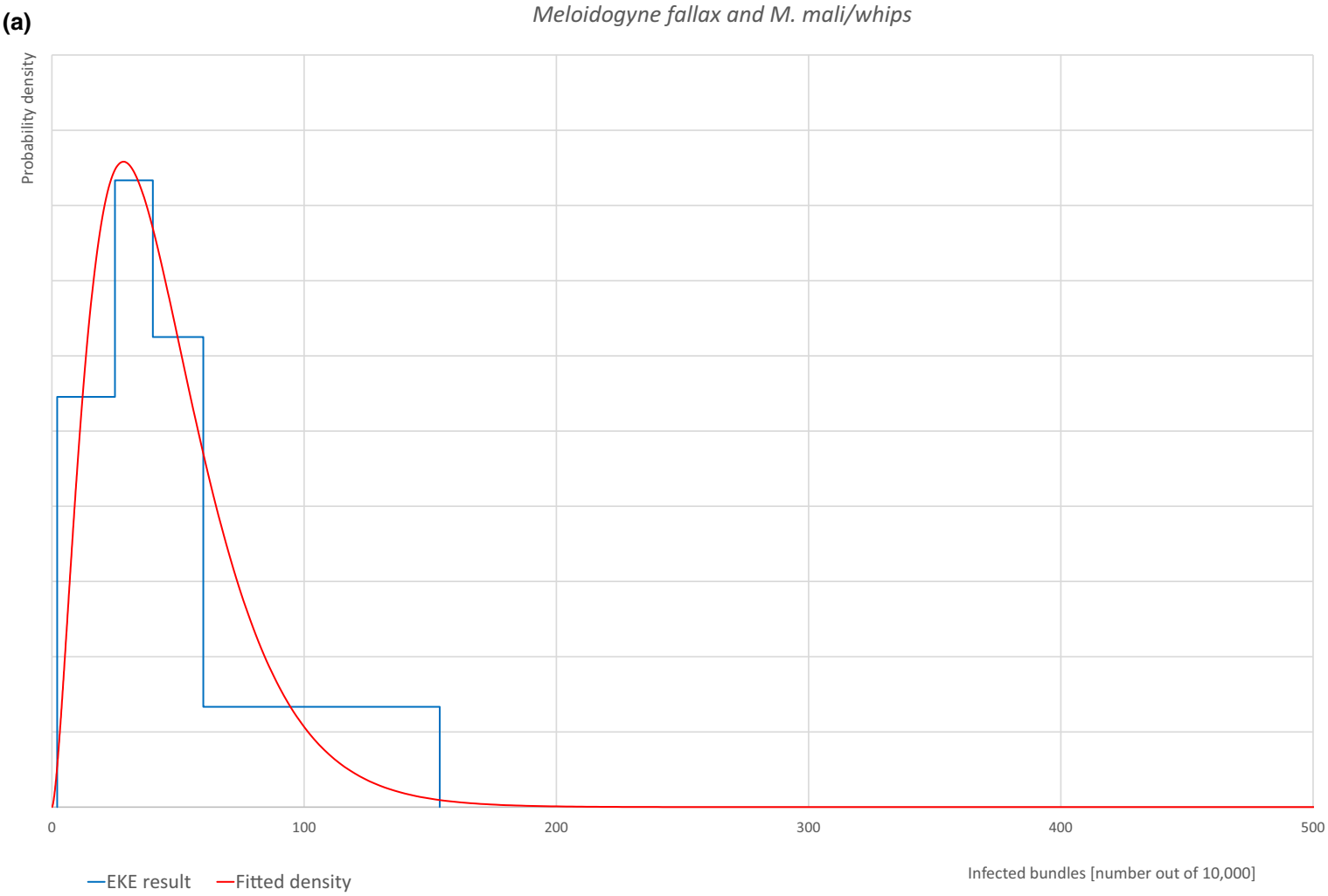
Based on the numbers of estimated infected bundles the pest freedom was calculated (i.e. = 10,000 – number of infected bundles per 10,000). The fitted values of the uncertainty distribution of the pest freedom are shown in Table A.32.

Table A.32: The uncertainty distribution of bundles free of *Meloidogyne mali* and *M. fallax* per 10,000 bundles calculated by Table A.31

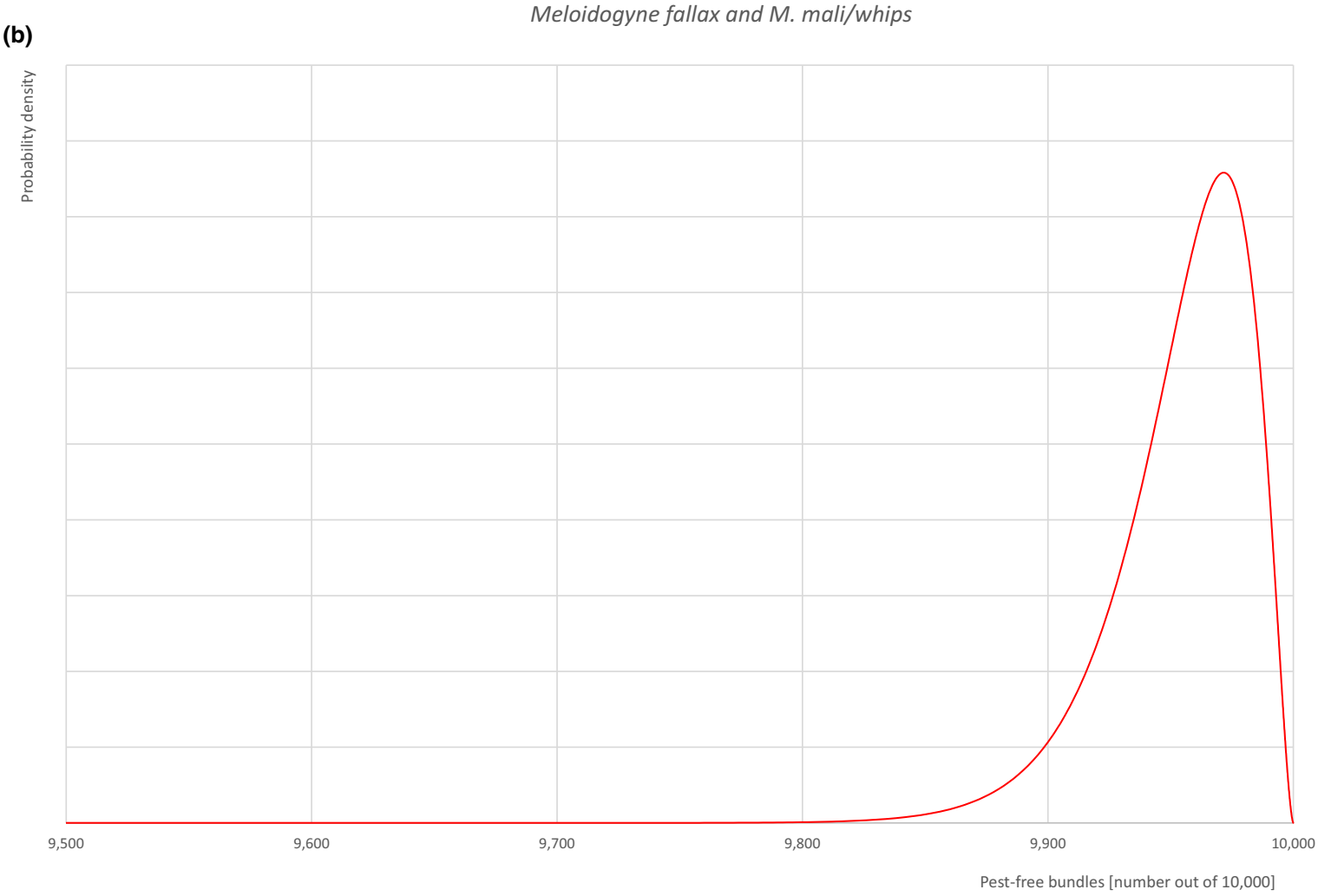
Percentile	1%	2.5%	5%	10%	17%	25%	33%	50%	67%	75%	83%	90%	95%	97.5%	99%
Values	9,850					9,940		9,960		9,975					9,997
EKE results	9,866	9,886	9,901	9,917	9,929	9,940	9,948	9,960	9,970	9,975	9,980	9,985	9,989	9,992	9,994

The EKE results are the fitted values.

(a)


Meloidogyne fallax and M. mali/whips
Probability density
0
100
200
300
400
500
EKE result
Fitted density
Infected bundles [number out of 10,000]

(b)


Meloidogyne fallax and M. mali/whips
Probability density
9,500
9,600
9,700
9,800
9,900
10,000
Pest-free bundles [number out of 10,000]

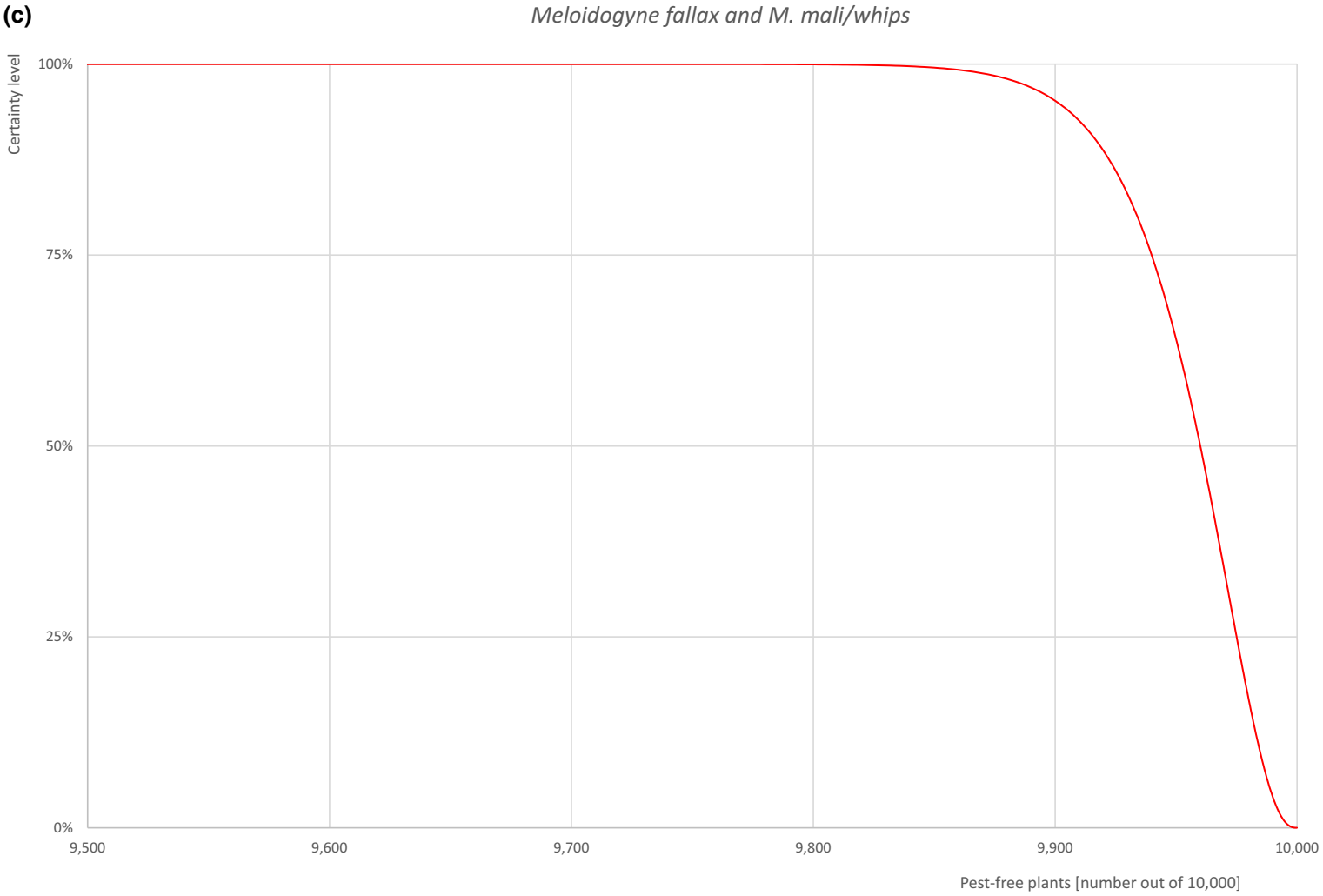


Figure A.16: (a) Elicited uncertainty of pest infection per 10,000 bundles (histogram in blue – vertical blue line indicates the elicited percentile in the following order: 1%, 25%, 50%, 75%, 99%) and distributional fit (red line); (b) uncertainty of the proportion of pest-free bundles per 10,000 (i.e. = 1 – pest infection proportion expressed as percentage); (c) descending uncertainty distribution function of pest infection per 10,000 bundles

A.6.6. Overall likelihood of pest freedom for bare root plants/trees up to 7 years old

A.6.6.1. Reasoning for a scenario which would lead to a reasonably low number of infected bare root plants/trees up to 7 years old

The scenario assumes a low pressure of the pest in the nurseries and in the surroundings. Younger plants are exposed to the nematode for only short period of time. The scenario also assumes that root galls are visible while inspecting plants before export and that the second juvenile stage are washed away during the root washing of bare root plants.

A.6.6.2. Reasoning for a scenario which would lead to a reasonably high number of infected bare root plants/trees up to 7 years old

The scenario assumes a high pressure of the pest in the nurseries and in the surroundings as many potential hosts are present. Older plants are exposed to the nematode for longer period of time. The scenario also assumes that root galls are not easily recognisable while inspecting plants before export and that the low-pressure washing is not effective in removing the second juvenile stage before export.

A.6.6.3. Reasoning for a central scenario equally likely to over- or underestimate the number of infected bare root plants/trees up to 7 years old (Median)

The scenario assumes a limited presence of the pest in the nurseries and the surroundings and that the plants are exposed to the nematode for a sufficient period of time for infection to occur. The movement of soil from the surrounding into the nurseries is not expected to be significant.

A.6.6.4. Reasoning for the precision of the judgement describing the remaining uncertainties (1st and 3rd quartile/interquartile range)

The limited information on occurrence of the pests in the UK including the nurseries and the surroundings results in high level of uncertainties for infestation rates below the median. Otherwise, the pest pressure from the surroundings is expected to be low giving less uncertainties for rates above the median.

A.6.6.5. Elicitation outcomes of the assessment of the pest freedom for *Meloidogyne mali* and *M. fallax* on bare root plants/ trees up to 7 years old

The following Tables show the elicited and fitted values for pest infection (Table A.33) and pest freedom (Table A.34).

Table A.33: Elicited and fitted values of the uncertainty distribution of pest infection by *Meloidogyne mali* and *M. fallax* per 10,000 plants

Percentile	1%	2.5%	5%	10%	17%	25%	33%	50%	67%	75%	83%	90%	95%	97.5%	99%
Elicited values	1					35		70		130					250
EKE	1.31	3.22	6.41	12.8	21.7	33.2	45.5	73.1	107	127	153	179	208	229	250

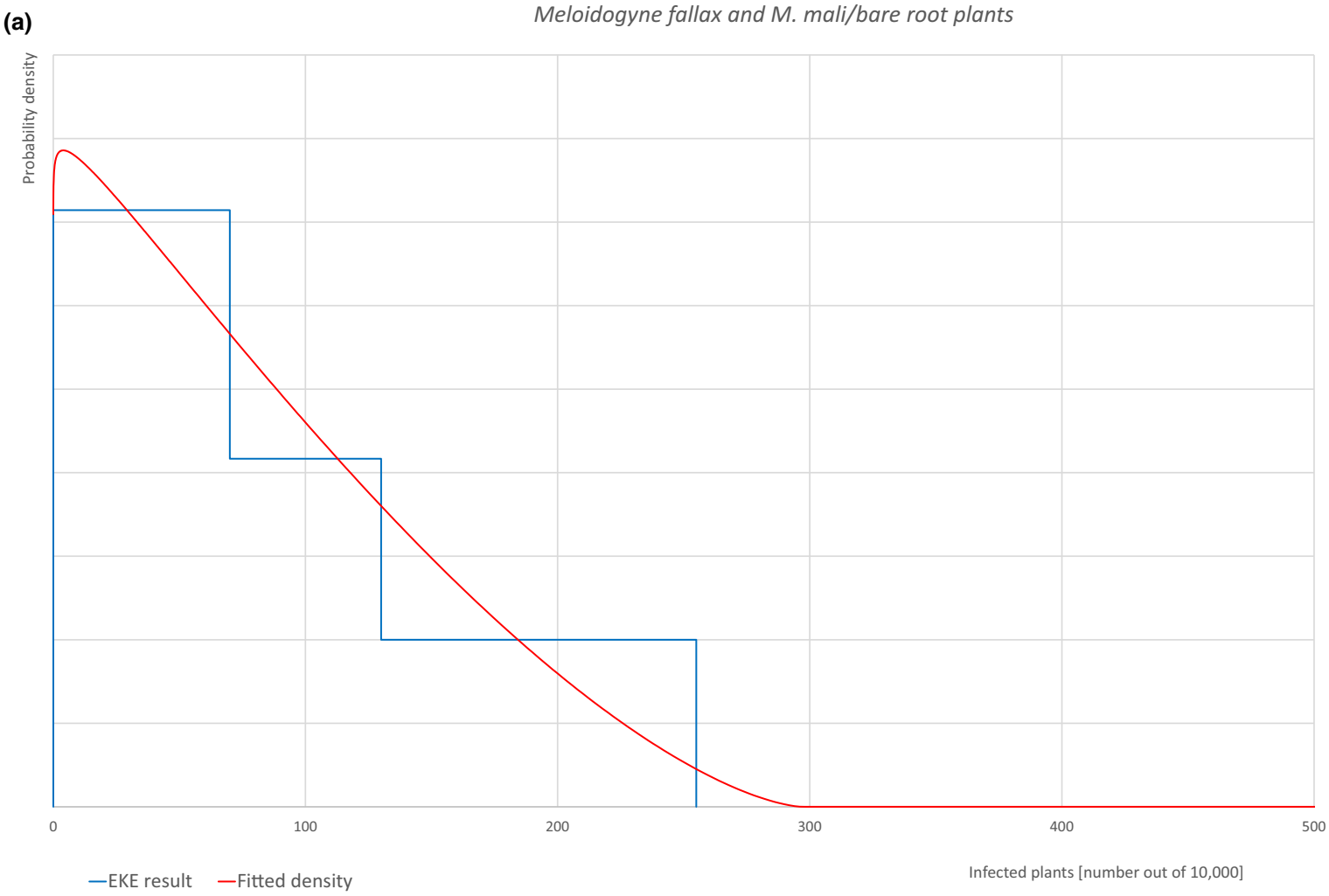
The EKE results is the BetaGeneral (1.0205, 2.5146, 0, 297) distribution fitted with @Risk version 7.6.

Based on the numbers of estimated infected plants the pest freedom was calculated (i.e. = 10,000 – number of infected plants per 10,000). The fitted values of the uncertainty distribution of the pest freedom are shown in Table A.34.

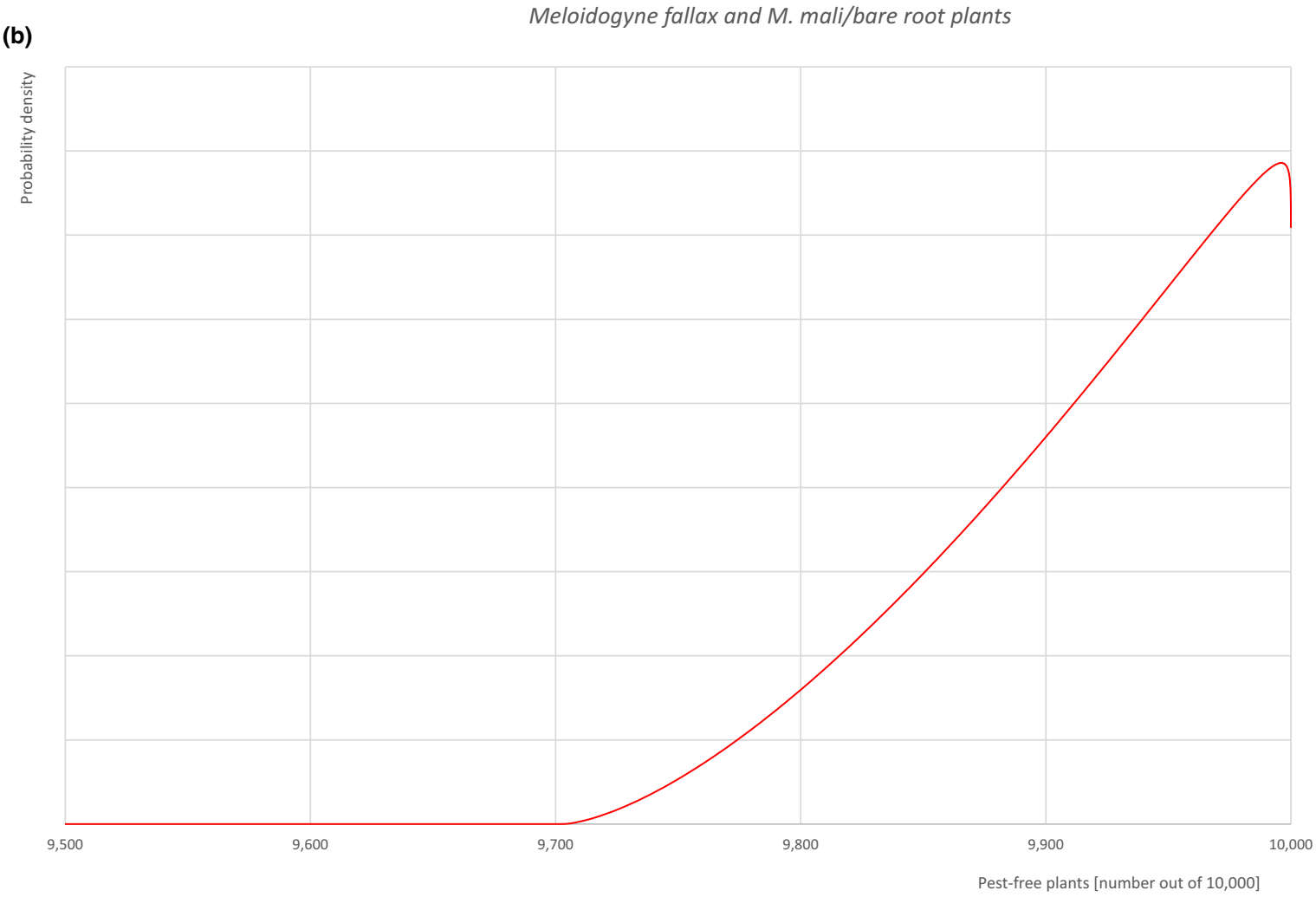
Table A.34: The uncertainty distribution of plants free of *Meloidogyne mali* and *M. fallax* per 10,000 plants calculated by Table A.33

Percentile	1%	2.5%	5%	10%	17%	25%	33%	50%	67%	75%	83%	90%	95%	97.5%	99%
Values	9,750					9,870		9,930		9,965					9,999
EKE results	9,750	9,771	9,792	9,821	9,847	9,873	9,893	9,927	9,955	9,967	9,978	9,987	9,994	9,997	9,999

The EKE results are the fitted values.


(a)
Meloidogyne fallax and M. mali/bare root plants
Probability density
0
100
200
300
400
500
EKE result
Fitted density
Infected plants [number out of 10,000]

(b)


Meloidogyne fallax and M. mali/bare root plants
Probability density
9,500
9,600
9,700
9,800
9,900
10,000
Pest-free plants [number out of 10,000]

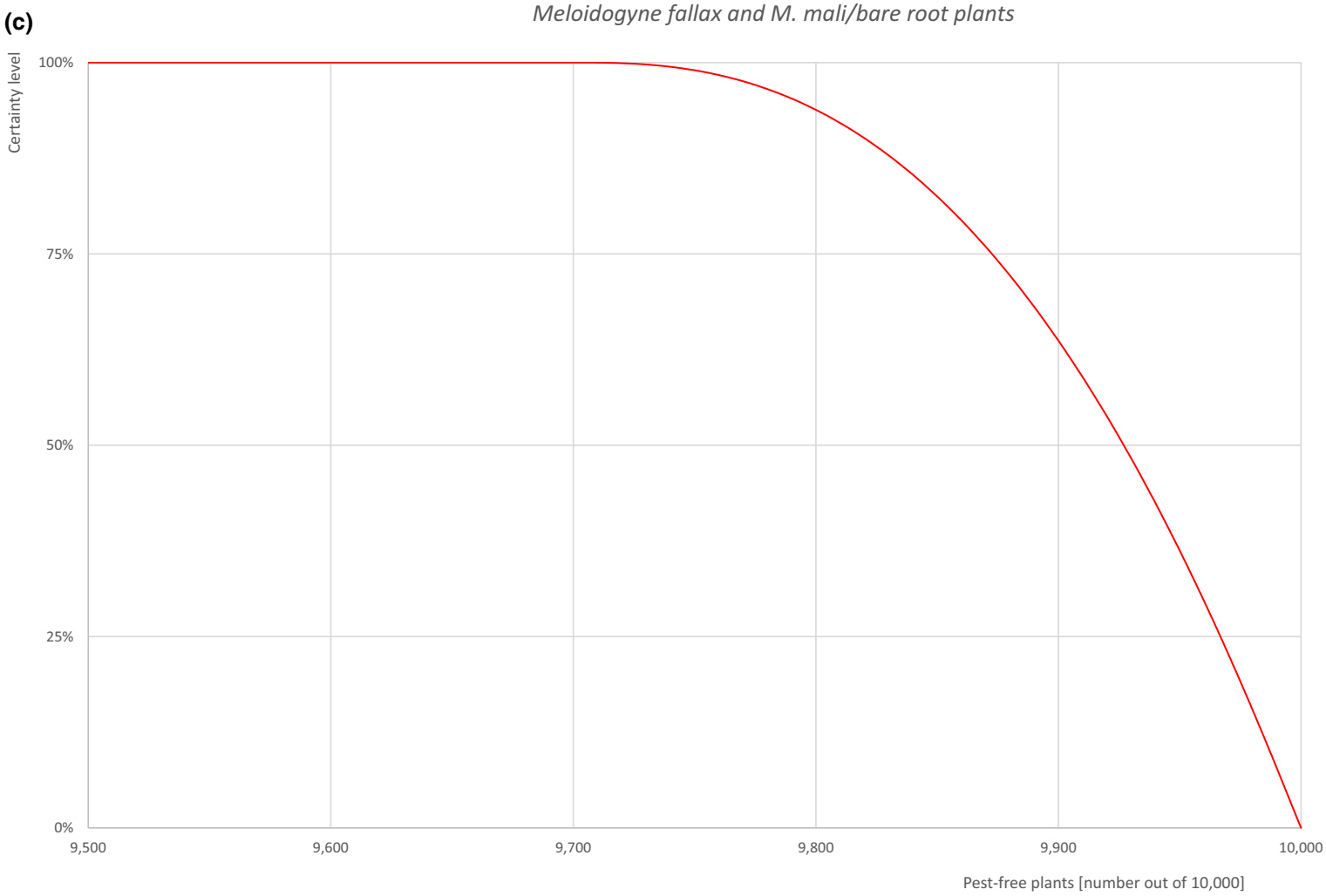


Figure A.17: (a) Elicited uncertainty of pest infection per 10,000 plants (histogram in blue – vertical blue line indicates the elicited percentile in the following order: 1%, 25%, 50%, 75%, 99%) and distributional fit (red line); (b) uncertainty of the proportion of pest-free plants per 10,000 (i.e. = 1 – pest infection proportion expressed as percentage); (c) descending uncertainty distribution function of pest infection per 10,000 plants

A.6.7. Overall likelihood of pest freedom for plants in pots up to 15 years old

A.6.7.1. Reasoning for a scenario which would lead to a reasonably low number of infected plants in pots up to 15 years old

The scenario assumes a low pressure of the pest in the nurseries and in the surroundings. Younger plants are exposed to the nematode for only short period of time. The scenario also assumes that root galls are visible while inspecting plants before export and that the root systems of plants have undergone washing and inspection before being transplanted in pots.

A.6.7.2. Reasoning for a scenario which would lead to a reasonably high number of infected plants in pots up to 15 years old

The scenario assumes a high pressure of the pest in the nurseries and in the surroundings as many potential hosts are present. Older plants are exposed to the nematode for longer period of time. The scenario also assumes that root galls are not easily recognisable while inspecting plants before export and that the root systems of plants did not undergone washing and inspection before being transplanted in pots.

A.6.7.3. Reasoning for a central scenario equally likely to over- or underestimate the number of infected plants in pots up to 15 years old (Median)

The scenario assumes a limited presence of the pest in the nurseries and the surroundings and that the plants are exposed to the nematode for a sufficient period of time for infection to occur. The movement of soil from the surrounding into the nurseries is not expected to be significant.

A.6.7.4. Reasoning for the precision of the judgement describing the remaining uncertainties (1st and 3rd quartile/interquartile range)

The limited information on occurrence of the pests in the UK including the nurseries and the surroundings results in high level of uncertainties for infestation rates below the median. Otherwise, the pest pressure from the surroundings is expected to be low giving less uncertainties for rates above the median.

A.6.7.5. Elicitation outcomes of the assessment of the pest freedom for *Meloidogyne mali* and *M. fallax* on plants in pots up to 15 years old

The following Tables show the elicited and fitted values for pest infection (Table A.35) and pest freedom (Table A.36).

Table A35: Elicited and fitted values of the uncertainty distribution of pest infection by *Meloidogyne mali* and *M. fallax* per 10,000 plants

Percentile	1%	2.5%	5%	10%	17%	25%	33%	50%	67%	75%	83%	90%	95%	97.5%	99%
Elicited values	1					45		90		130					250
EKE	4.68	8.79	14.3	23.5	34.3	47.0	59.5	85.7	116	134	157	181	207	228	250

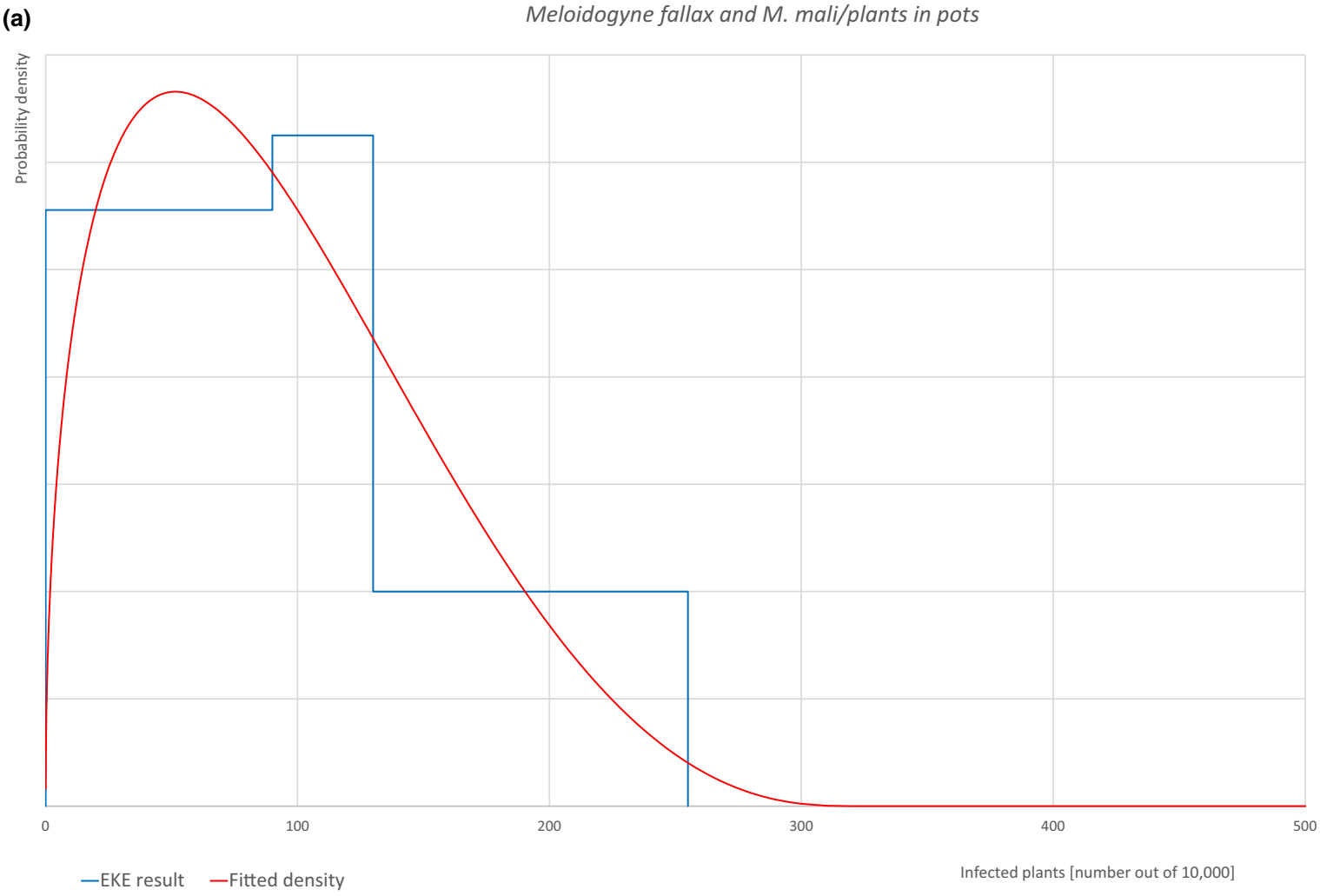
The EKE results is the BetaGeneral (1.4846, 3.5229, 0, 320) distribution fitted with @Risk version 7.6.

Based on the numbers of estimated infected plants the pest freedom was calculated (i.e. = 10,000 – number of infected plants per 10,000). The fitted values of the uncertainty distribution of the pest freedom are shown in Table A.36.

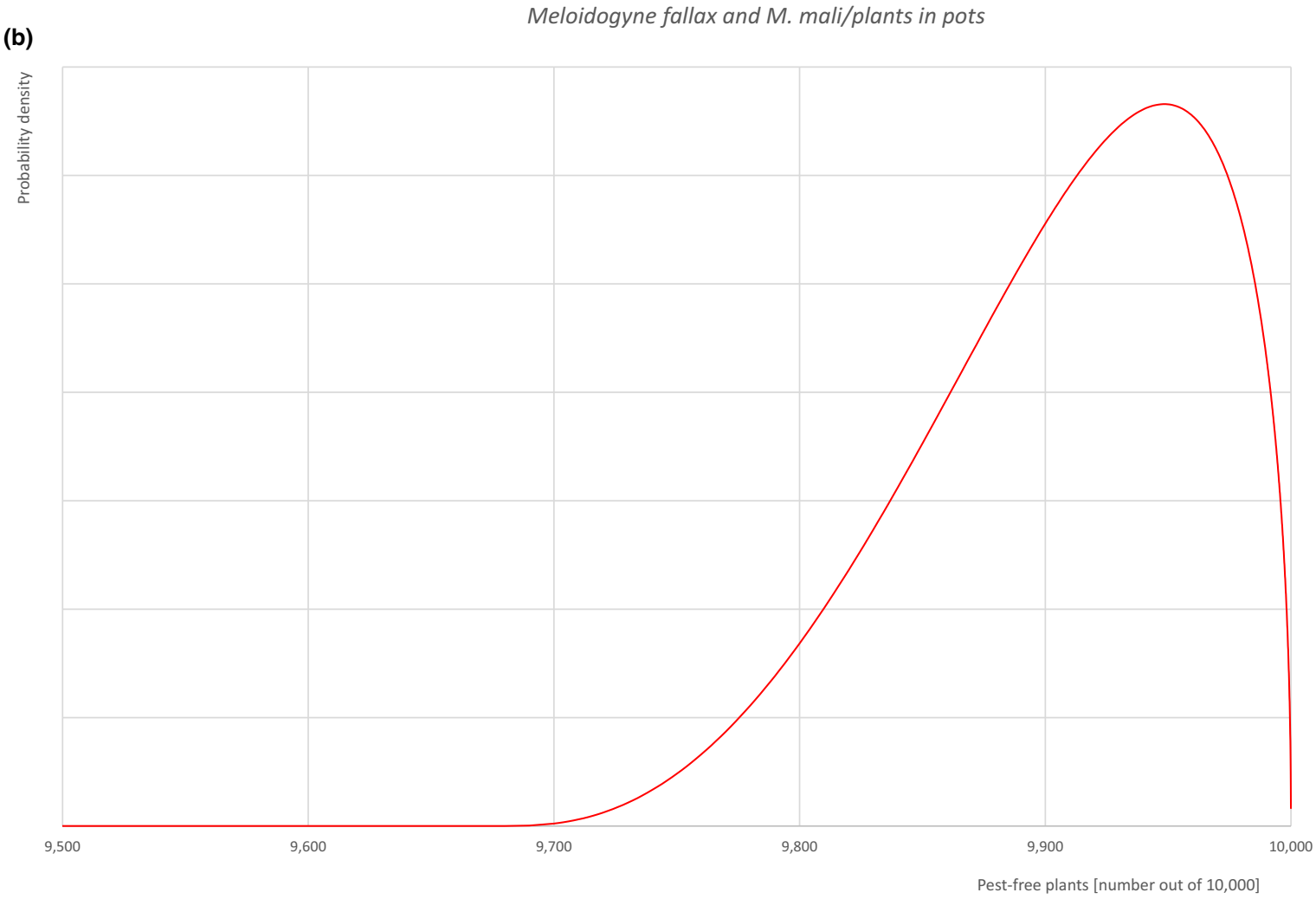
Table A36: The uncertainty distribution of plants free of *Meloidogyne mali* and *M. fallax* per 10,000 plants calculated by Table A.35

Percentile	1%	2.5%	5%	10%	17%	25%	33%	50%	67%	75%	83%	90%	95%	97.5%	99%
Values	9,750					9,870		9,910		9,955					9,999
EKE results	9,750	9,772	9,793	9,819	9,843	9,866	9,884	9,914	9,940	9,953	9,966	9,977	9,986	9,991	9,995

The EKE results are the fitted values.


(a)
Meloidogyne fallax and M. mali/plants in pots
Probability density
0
100
200
300
400
500
Infected plants [number out of 10,000]
EKE result
Fitted density

(b)


Meloidogyne fallax and M. mali/plants in pots
Probability density
9,500
9,600
9,700
9,800
9,900
10,000
Pest-free plants [number out of 10,000]

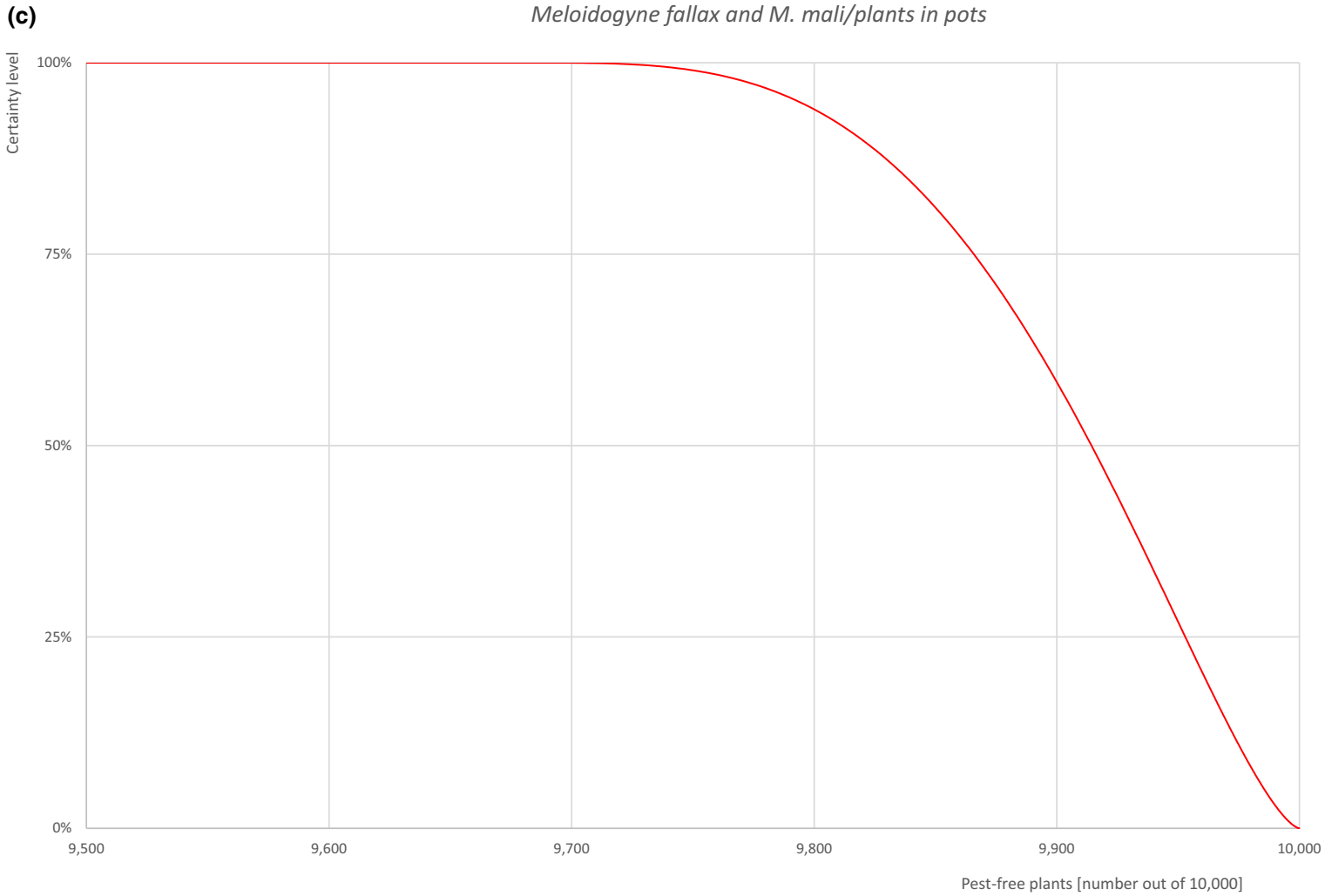


Figure A.18: (a) Elicited uncertainty of pest infection per 10,000 plants (histogram in blue – vertical blue line indicates the elicited percentile in the following order: 1%, 25%, 50%, 75%, 99%) and distributional fit (red line); (b) uncertainty of the proportion of pest-free plants per 10,000 (i.e. = 1 – pest infection proportion expressed as percentage); (c) descending uncertainty distribution function of pest infection per 10,000 plants

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A.7. *Meloidogyne mali*

A.7.1. Organism information

Taxonomic information	Current valid scientific name: *Meloidogyne mali* Synonyms: *Meloidogyne ulmi* Name used in the EU legislation: – Order: Rhabditia Family: Meloidogynidae Common name: apple root-knot nematode Name used in the Dossier: *Meloidogyne mali*
Group	Nematodes
EPPO code	MELGMA
Regulated status	*Meloidogyne mali* is included in the EPPO A2 list (EPPO, online_a) and was recently recommended for regulation as quarantine pest (EPPO, online_b). *Meloidogyne mali* is quarantine pest in the US and Morocco (EPPO, online_a) and listed as a 'pest of quarantine interest' in the Dominican Republic (EPPO, 2017); it is also regulated in Colombia, the Republic of Korea, Malaysia and Uruguay (EPPO, 2017). All *Meloidogyne* species are quarantine pests for Türkiye (EPPO, 2017).
Pest status in the UK	*Meloidogyne mali* is present in the UK in Southern England - two sites in Farnham and Surrey (Dossier Section 3.0) where it was found on elm trees in 2018, as consequence of introduction in the past of infected elms from the Netherlands (Prior et al., 2019). According to the Dossier Section 5.0 the nematode is present in the UK: not widely distributed and not under official control.
Pest status in the EU	*Meloidogyne mali* is currently present in the EU in Austria (de Jong et al., online); it is also present in Belgium (Suwanngam and Wesemael, 2019), Italy (Palmisano and Ambrogioni, 2000) and the Netherlands (Ahmed et al., 2013), in all cases with few occurrences or restricted distribution (EPPO, online_c). *M. mali* was detected in France (Ile de France) in 2016, but it was eradicated in 2021 (EPPO, online_c). According to Ahmed et al. (2013) and EPPO (2017) *M. mali* may have a wider distribution in Europe, since elm plants growing in plots infested by the nematode in the Netherlands have been sent to other countries (Belgium, Denmark, France, Germany, Ireland, Italy, Spain, Slovakia, Romania, the UK) to carry out resistance tests against the Dutch Elm Disease (DED). These programmes started from the 80's of the last century (Prior et al., 2019).
Host status on *Acer*	*Acer palmatum, A. pseudoplatanus*, *A. x freemanii* and *Acer saccharinum*, are host plants for *Meloidogyne mali* (EPPO, 2017; Kang et al., 2021). There is no information on whether *Acer campestre* may be hosts for *M. mali*. However, given the polyphagous nature of *M. mali* the Panel cannot exclude that *A. campestre* could be a hostplant for the nematode.
PRA information	Available Pest Risk Assessments: – Risks to plant health posed by EU import of soil or growing media (EFSA PLH Panel, 2015); – A quickscan pest risk analysis for the *Meloidogyne mali* (Pylypenko, 2016); – Pest Risk Analysis for *Meloidogyne mali*, apple root-knot nematode (EPPO, 2017);

	– Scientific Opinion on the commodity risk assessment of *Malus domestica* plants from United Kingdom (EFSA PLH Panel, 2023); – UK Risk Register Details for *Meloidogyne mali* (DEFRA, online).

Other relevant information for the assessment

Biology	*Meloidogyne mali* is a root-knot nematode inducing root galls on host plants; it is native to Asia (Japan), introduced decades ago to Europe and more recently also to the US (EPPO, 2017; Eisenback et al., 2017) and to the Republic of Korea (Kang et al., 2021). When found in Europe in 2000, the nematode was initially described as a new species, *Meloidogyne ulmi* (Palmisano and Ambrogioni, 2000) and elms remained long-time the only known host plants. The synonymy with the well-known species *M. mali* was found later, after comparison in the Netherlands with living material from Japan (Ahmed et al., 2013). *Meloidogyne mali* develops through three stages: eggs, juveniles (four stages) and adults, all living in the root galls. Adult males, 2nd stage juveniles and eggs can live also free in the soil (EPPO, 2017). Information on *M. mali* biology mainly come from *Malus* sp. in Japan where the nematode and has one generation per year and the life cycle lasts 18–22 weeks. However, it is known that *Meloidogyne* species can frequently have more generations per year depending on the temperature and the feeding on perennial plants. Only few specific information on the life cycle of *M. mali* is available. Unlike similar species as *M. chitwoodi* and *M. fallax* which are parthenogenetic, *Meloidogyne mali* reproduces sexually. Like all *Meloidogyne* root-knot nematodes it deposits eggs in gelatinous sacs on the surface of galls or within them (EPPO, 2017; EFSA, 2019); in Japan the minimum hatching temperature range of *M. mali* eggs is 10–15°C (optimal 20–33°C) (EPPO, 2017). As usual in *Meloidogyne* species, the infective second-stage juveniles move in the soil and attack the roots penetrating behind the root cap. They start to feed on cortical tissues inducing the formation of giant cells that cause swelling and finally root galls. After moulting, adults develop from the last juvenile stage; females remain into the roots where they lay eggs in a gelatinous matrix, while males leave the galls (EFSA, 2019). It is not clear in what extent the nematode can survive frost conditions during winter. *Meloidogyne mali* can probably overwinter in the roots of plants growing outdoors, possibly as young females, given that egg-laying females have been observed in early March (EPPO, 2017). In the US the nematode seems able to survive at minimum winter temperature of –6°C (Pylypenko, 2016). Although *Meloidogyne* species are known not forming cysts to resist to the absence of host plants for long-time, *M. mali* can survive for at least 2 years in root fragments in the soil after removal of infected trees; it is not known, however, if the nematode can also have a diapause period (EPPO, 2017). All *Meloidogyne* are strictly associated with the roots of plants and are known to be sedentary species, moving in the soil 1–2 m maximum per year, and spread through the roots depending on their size, type of soil, water availability and other parameters (EFSA, 2019). As other species of root-knot nematodes, the spread on medium-long distance of *Meloidogyne mali* is by passive transport, and possible pathways are mainly plants for planting with infected roots, soil and growing media and also contaminated tools and machinery (EPPO, 2017).	
Symptoms	**Main type of symptoms**	Plants infected by *Meloidogyne mali* show root-knot galls on roots. The galls can be of different size also depending on the hosts and are always visible to the naked eye (0.5–2 cm in diameter) (EPPO, 2018). When a severe root infection occurs, as consequence of the developing of large number of galls the root system can be damaged, reducing uptake of water and minerals and causing symptoms on above-ground part of plants. Common symptoms are little growth of primary shoots and increase of secondary shoots, leaf fall and general reduction of growth. No specific information about symptoms on *Acer* was found.

	Presence of asymptomatic plants	Plants infected by *Meloidogyne mali* can remain asymptomatic. Damage on above-ground part of plants goes often unnoticed in early infection stage or when underground attack on roots is light. 30-year-old elms gravely infected in the root system were uprooted by wind without any symptom on the crown or foliage (EPPO, 2017).
	Confusion with other pests	Plants infected by *Meloidogyne mali* appear similar to plants infected by other nematode species or root pathogens living in the soil. The identification of the nematode is not possible on the basis of sole galls. *M. mali* juveniles and adults are morphologically similar to other *Meloidogyne* nematodes. For identification to species level, laboratory tests on morphometric characters, electrophoresis or sequencing/ DNA barcoding are needed (EPPO, 2018).
Host plant range	*Meloidogyne mali* is a polyphagous nematode feeding on roots of several species of trees, shrubs and herbaceous plants. Some important woody hosts of *M. mali* are *Acer x freemani, A. palmatum. A. pseudoplatanus, Castanea crenata, Euonymus kiautschovicus, E. fortunei, Fagus sylvatica, Lagerstroemia indica, Malus pumila, Morus alba, Prunus serrulata, Quercus robur, Sorbus aucuparia, Taxus baccata, Ulmus glabra, U. parvifolia, Vitis vinifera, Zelkova serrata* (EPPO, 2017; DEFRA, online; Ferris, online). Common herbaceous hosts are: *Dryopteris filix-mas, D. carthusiana, Geranium robertianum, Geum coccineum, Impatiens parviflora, Rosa* sp., *Rubus fruticosus, Taraxacum officinale, Trifolium repens* and *Urtica dioica* (EPPO, 2017; DEFRA, online). For a complete list of hosts see EPPO (2017) and DEFRA (online).	
Reported evidence of impact	Only poor information on economic impact caused by *Meloidogyne mali* is available. In Japan, damage on *Malus* and *Morus* (15–43% growth reduction) was reported only following inoculation experiments. In Italy slowly declining elms were observed (Palmisano and Ambrogioni, 2000). In the UK, *M. mali* was only found in elms killed by DED (Prior et al., 2019). Roots damaged by *M. mali* may be also attacked by secondary pathogen agents. On elm trees in the Netherlands the infection by *M. mali* caused detriment of stability with uprooting by wind in urban areas (EPPO, 2017). No specific data about damage on *Acer* was found.	
Evidence that the commodity is a pathway	*Meloidogyne mali* can travel with plants for planting; therefore, they are possible pathways of entry for the nematode. The pest has been intercepted in China in 2013 and 2020 on *Acer palmatum* and in 2015 on *Lagerstroemia indica*, in both cases on plants imported from Japan (EPPO, 2017; GenBank, online). In the period 1995–December 2022, there have been several interceptions of *Meloidogyne species* in the EU from Japan, mostly on bonsais, including on hosts of *M. mali* as *Acer palmatum,* although in these hosts the nematode was never identified at species level.	
Surveillance information	According to the Dossier Section 5.0, *Meloidogyne mali* is not under official surveillance, as does not meet criteria of quarantine pest for Great Britain. A survey was conducted to determine the extent of *Meloidogyne mali* presence in Surrey; all of the samples outside the two sites where the nematode was found in 2018 were negative, indicating that it has not spread off the sites (Dossier Section 3.0). A containment approach is being implemented in the two sites. No movement of soil from the sites is allowed. No movement of host plants from the sites is allowed. Staff and contractors coming into contact with host plants or soil on sites must remove soil from footwear and equipment before leaving the sites. Only non-hosts should be planted at the sites (Dossier Section 3.0).	

A.7.2. Possibility of pest presence in the nursery

A.7.2.1. Possibility of entry from the surrounding environment

Meloidogyne mali is eradicated from the outbreak locations on *Ulmus* sp. in the two sites in Southern England (Farnham, Surrey) (Prior et al., 2019; Dossier Sections 3.0 and 5.0). The pest is not regulated in the UK. No presence of the nematode outside the two known sites is reported and a containment approach has been implemented (Dossier Section 3.0).

The nematode can only spread by passive transport with plants for planting with infected roots, infected soil and growing media, and possibly via contaminated tools and machinery. No other possibility of entry in the nurseries is known.

Meloidogyne mali can infect *Castanea* spp., *Fagus* spp., *Malus* spp., *Morus* spp., *Taxus baccata, Quercus robur, Prunus* spp., *Rosa* spp., *Solanum lycopersicum, Ulmus* spp. which are present within 2 km from the nurseries (Dossier Section 3.0).

Uncertainties:

- Pest presence and pressure in the surrounding.

Taking into consideration the above evidence and uncertainties, the Panel considers that it is possible for *Meloidogyne mali* to enter the nurseries from surrounding environment. In the surrounding area, suitable hosts are present and the nematode could enter by human assisted spread.

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

The starting materials are either seeds, seedlings or scion woods/buds. Seeds are certified and coming from the UK. Seedlings are either from the UK, the EU (mostly the Netherlands) or New Zealand (Dossier Section 3.0). Seeds are not a pathway for the nematode.

In addition to *Acer*, the nurseries also produce other plants (Dossier Section 6.0). Out of them, there are many suitable hosts for the nematode (such as *Castanea* spp., *Fagus* spp., *Malus* spp., *Prunus* spp., *Quercus* spp., *Rosa* spp., *Sorbus* spp., *Taxus baccata, Ulmus* spp.). However, there is no information on how and where the plants are produced. Therefore, if the plants are first produced in another nursery, the nematode could possibly travel with them.

The nurseries are using virgin peat or peat-free compost (a mixture of coir, tree bark, wood fibre, etc.) as a growing media (Dossier Section 1.0). *Meloidogyne mali* is able to survive both in the soil and in root fragments in the soil for 2 years (EPPO, 2007) and therefore could potentially enter with infested soil/growing media. However, the growing media is certified and heat-treated by commercial suppliers during production to eliminate pests and diseases (Dossier Section 3.0).

Uncertainties:

- No information is available on the provenance of plants other than *Acer* used for plant production in the nurseries.

Taking into consideration the above evidence and uncertainties, the Panel considers that it is possible for the nematode to enter the nurseries via infected roots of new seedlings of *Acer* and plants of other species used for plant production in the area. The entry of the nematode with seeds and the growing media the Panel considers as not possible.

A.7.2.3. Possibility of spread within the nursery

Acer plants are either grown in containers (cells, pots, tubes, etc.) outdoors in the open air or in field. Cell grown trees may be grown in greenhouses, however most plants will be field grown or field grown in containers (Dossier Section 1.0). There are no mother plants present in the nurseries (Dossier Section 3.0).

The nematode can infect other suitable plants (such as *Acer* spp., *Fagus* spp., *Quercus* spp., *Ulmus* spp. etc.) present within the nurseries (Dossier Sections 3.0 and 6.0).

Meloidogyne mali can spread within the nurseries by movement of soil, water, infested plant material and infected tools and machinery (EPPO, 2017). However, tools used in the nurseries are disinfected after operation on a stock and before being used on a different plant species (Dossier Section 3.0).

Uncertainties:

- None.

Taking into consideration the above evidence and uncertainties, the Panel considers that the spread of the nematode within the nurseries is possible either by movement of infested soil, water and plant material.

A.7.3. Information from interceptions

In the EUROPHYT/TRACES-NT database there are no records of notification of *Acer* plants for planting neither from the UK nor from other countries due to the presence of *Meloidogyne mali* between the years 1995 and December 2022 (EUROPHYT/TRACES-NT, online).

A.7.4. Evaluation of the risk mitigation measures

In the table below, all risk mitigation measures currently applied in the UK are listed and an indication of their effectiveness on *Meloidogyne mali* is provided. The description of the risk mitigation measures currently applied in the UK is provided in the Table 6.

N	Risk mitigation measure	Effect on the pest	Evaluation and uncertainties
1	Registration of production sites	Yes	As the plant passport is very similar to the EU one, the plants shall be free from quarantine pests and RNQPs. Uncertainties: – None.
2	Physical separation	No	Not relevant.
3	Certified plant material	Yes	Seedlings could be a pathway for the nematode. The certification could have an effect on preventing the nematode to enter into the nurseries. Uncertainties: – None.
4	Growing media	Yes	Heat treatment and protection of the treated growing media is effective against the nematode. Uncertainties: – None.
5	Surveillance, monitoring and sampling	Yes	This assessment can have some effect against the nematode. Uncertainties: – The capability of detecting infections by the pest, especially in the case of early infections.
6	Hygiene measures	Yes	This assessment can have some effect against the nematode. Uncertainties: – The degree to which roots of weeds are examined for the pest.
7	Removal of infested plant material	Yes	This assessment can have some effect against the nematode. Uncertainties: – The degree to which roots of weeds are examined for the pest.
8	Irrigation water	Yes	Uncertainties: – None.

N	Risk mitigation measure	Effect on the pest	Evaluation and uncertainties
9	Application of pest control products	No	Not relevant. No nematicides are used in the nurseries.
10	Measures against soil pests	Yes	Separation of the pots from soil is effective against the nematode. Uncertainties: – None.
11	Inspections and management of plants before export	Yes	This assessment can have some effect against the nematode. Uncertainties: – The capability of detecting infections by the pest, especially in the case of early infections.
12	Separation during transport to the destination	No	Not relevant. The nematode cannot spread between the roots of the plants when transported to the EU.

A.7.5. Overall likelihood of pest freedom for bundles of whips and seedlings

A.7.5.1. Reasoning for a scenario which would lead to a reasonably low number of infected bundles of whips and seedlings

The scenario assumes a low pressure of the pest in the nurseries and in the surroundings. The plants are exposed to the nematode for only short period of time. The scenario also assumes that root galls are visible while inspecting plants before export and that the second juvenile stage are washed away during the root washing.

A.7.5.2. Reasoning for a scenario which would lead to a reasonably high number of infected bundles of whips and seedlings

The scenario assumes a high pressure of the pest in the nurseries and in the surroundings as many potential hosts are present. The scenario also assumes that root galls are not easily recognisable while inspecting plants before export and that the low-pressure washing is not effective in removing the second juvenile stage before export.

A.7.5.3. Reasoning for a central scenario equally likely to over- or underestimate the number of infected bundles of whips and seedlings (Median)

The scenario assumes a limited presence of the pest in the nurseries and the surroundings and that the plants are exposed to the nematode for only short period of time. The movement of soil from the surrounding into the nurseries is not expected to be significant.

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

The limited information on occurrence of the pests in the UK including the nurseries and the surroundings results in high level of uncertainties for infestation rates below the median. Otherwise, the pest pressure from the surroundings is expected to be low giving less uncertainties for rates above the median.

A.7.5.5. Elicitation outcomes of the assessment of the pest freedom for *Meloidogyne mali* and *M. fallax* on bundles of whips and seedlings

The following Tables show the elicited and fitted values for pest infection (Table A.37) and pest freedom (Table A.38).

Table A.37: Elicited and fitted values of the uncertainty distribution of pest infectionby *Meloidogyne mali* and *M. fallax* per 10,000 bundles

Percentile	1%	2.5%	5%	10%	17%	25%	33%	50%	67%	75%	83%	90%	95%	97.5%	99%
Elicited values	3					25		40		60					150
EKE	5.507	8.116	11.04	15.31	19.91	24.97	29.82	39.98	52.2	60.1	70.5	83.0	99.1	114.4	133.9

The EKE results is the BetaGeneral (2.6372, 576.47, 0, 10,000) distribution fitted with @Risk version 7.6.

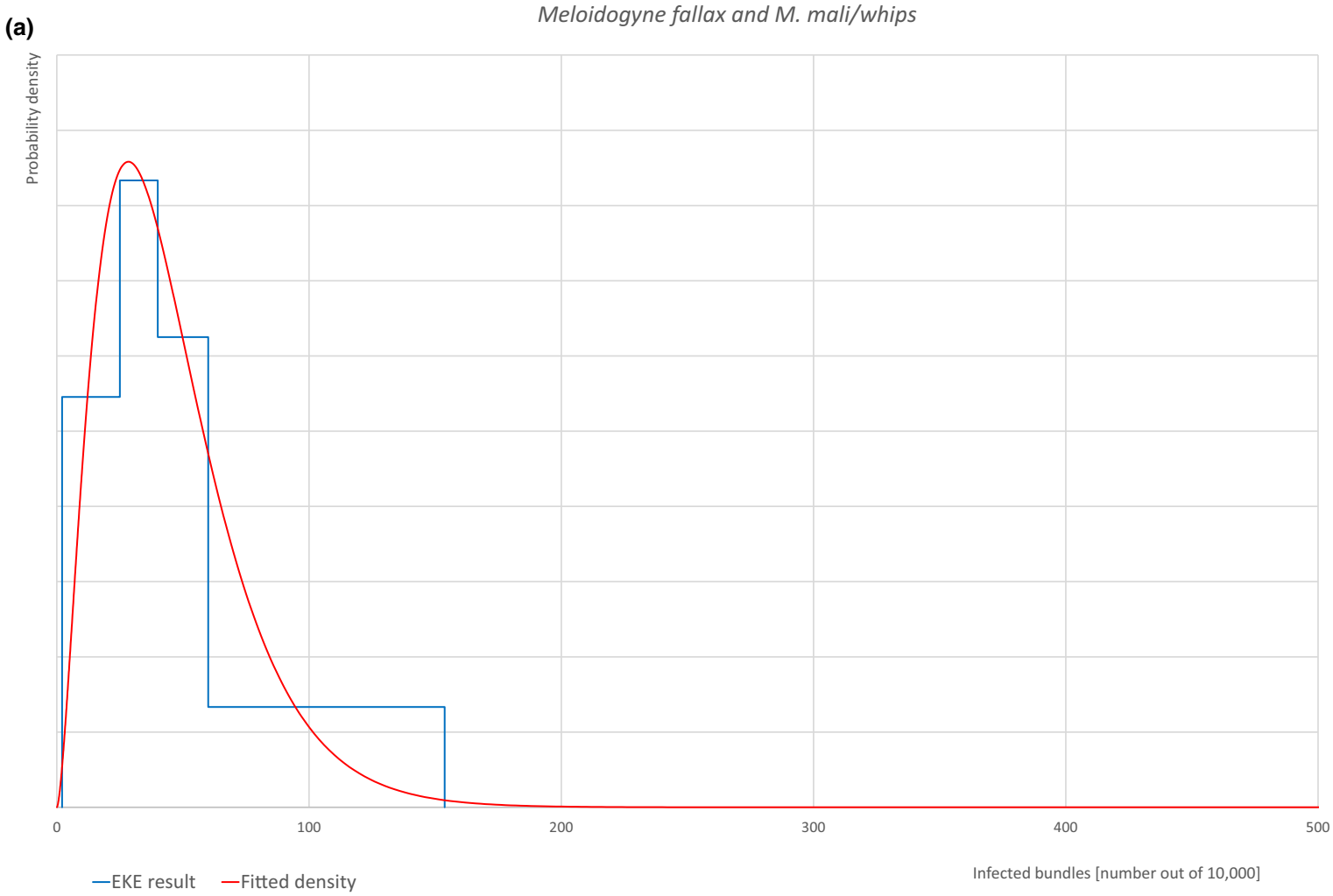
Based on the numbers of estimated infected bundles the pest freedom was calculated (i.e. = 10,000 – number of infected bundles per 10,000). The fitted values of the uncertainty distribution of the pest freedom are shown in Table A.38.

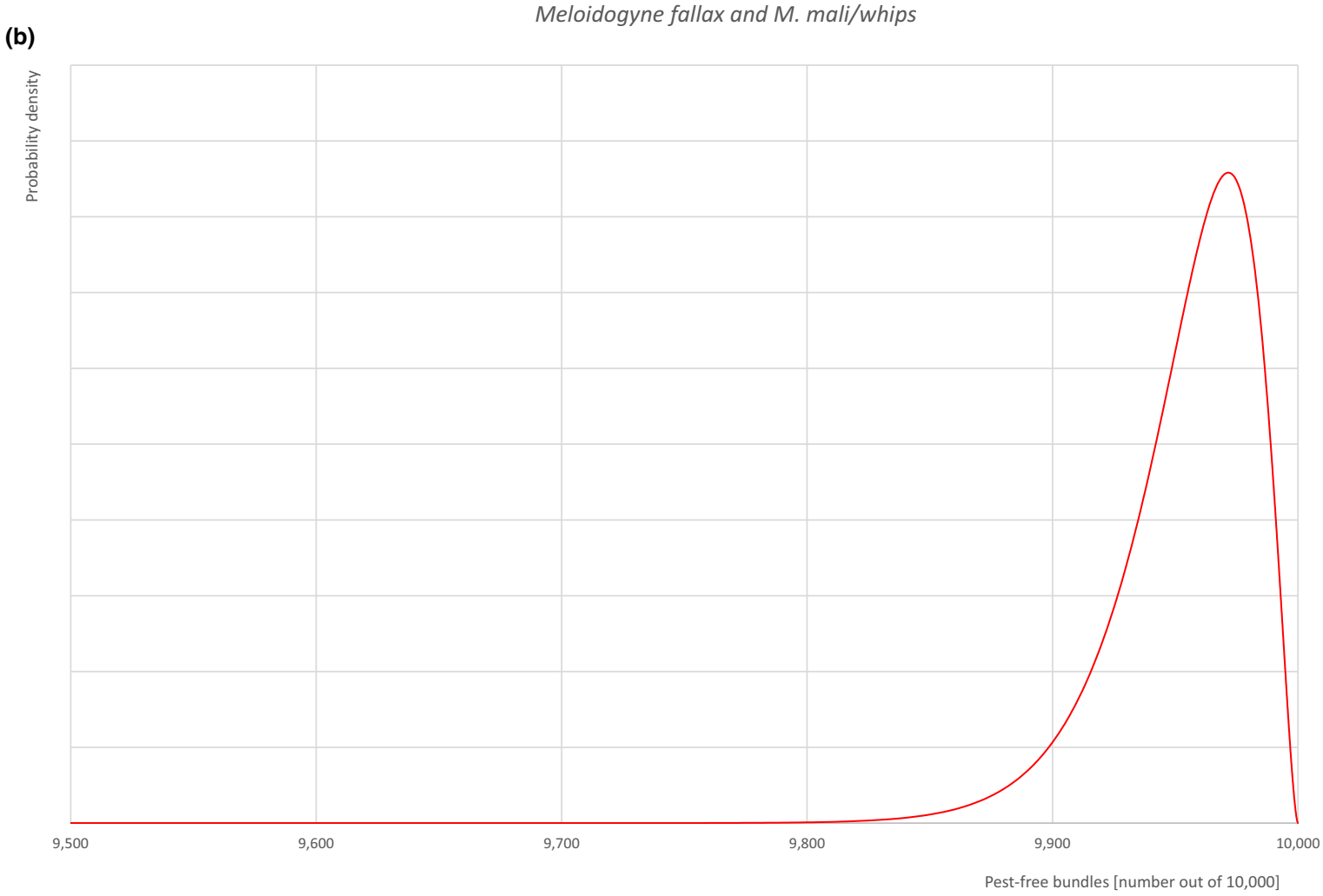
Table A.38: The uncertainty distribution of bundles free of *Meloidogyne mali* and *M. fallax* per 10,000 bundles calculated by Table A.37

Percentile	1%	2.5%	5%	10%	17%	25%	33%	50%	67%	75%	83%	90%	95%	97.5%	99%
Values	9,850					9,940		9,960		9,975					9,997
EKE results	9,866	9,886	9,901	9,917	9,929	9,940	9,948	9,960	9,970	9,975	9,980	9,985	9,989	9,992	9,994

The EKE results are the fitted values.

(a)


Meloidogyne fallax and M. mali/whips
Probability density
0
100
200
300
400
500
EKE result
Fitted density
Infected bundles [number out of 10,000]


(b)
Meloidogyne fallax and M. mali/whips
Probability density
9,500
9,600
9,700
9,800
9,900
10,000
Pest-free bundles [number out of 10,000]

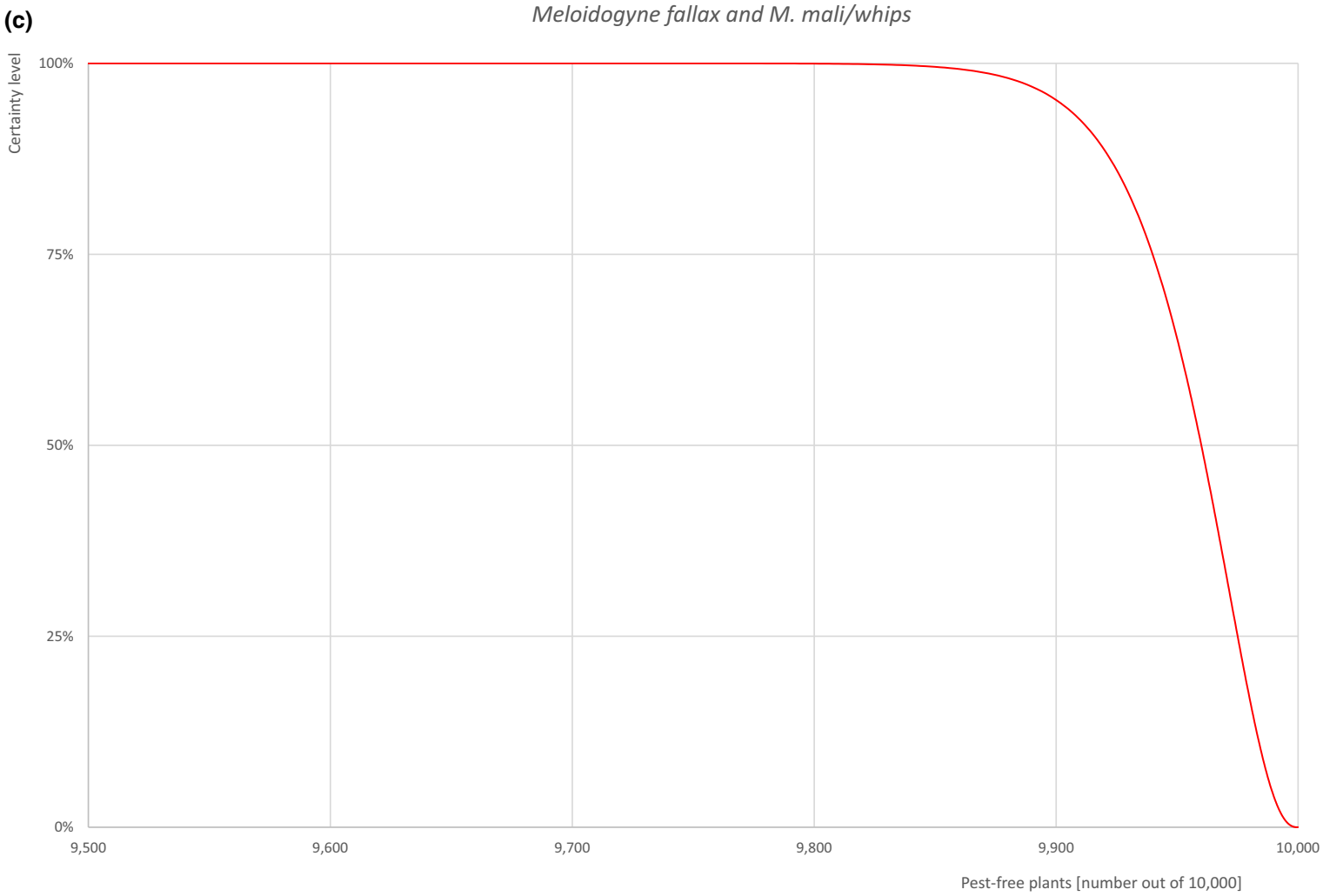


Figure A.19: (a) Elicited uncertainty of pest infection per 10,000 bundles (histogram in blue – vertical blue line indicates the elicited percentile in the following order: 1%, 25%, 50%, 75%, 99%) and distributional fit (red line); (b) uncertainty of the proportion of pest-free bundles per 10,000 (i.e. = 1 – pest infection proportion expressed as percentage); (c) descending uncertainty distribution function of pest infection per 10,000 bundles

A.7.6. Overall likelihood of pest freedom for bare root plants/trees up to 7 years old

A.7.6.1. Reasoning for a scenario which would lead to a reasonably low number of infected bare root plants/trees up to 7 years old

The scenario assumes a low pressure of the pest in the nurseries and in the surroundings. Younger plants are exposed to the nematode for only short period of time. The scenario also assumes that root galls are visible while inspecting plants before export and that the second juvenile stage are washed away during the root washing of bare root plants.

A.7.6.2. Reasoning for a scenario which would lead to a reasonably high number of infected bare root plants/trees up to 7 years old

The scenario assumes a high pressure of the pest in the nurseries and in the surroundings as many potential hosts are present. Older plants are exposed to the nematode for longer period of time. The scenario also assumes that root galls are not easily recognisable while inspecting plants before export and that the low-pressure washing is not effective in removing the second juvenile stage before export.

A.7.6.3. Reasoning for a central scenario equally likely to over- or underestimate the number of infected bare root plants/trees up to 7 years old (Median)

The scenario assumes a limited presence of the pest in the nurseries and the surroundings and that the plants are exposed to the nematode for a sufficient period of time for infection to occur. The movement of soil from the surrounding into the nurseries is not expected to be significant.

A.7.6.4. Reasoning for the precision of the judgement describing the remaining uncertainties (1st and 3rd quartile/interquartile range)

The limited information on occurrence of the pests in the UK including the nurseries and the surroundings results in high level of uncertainties for infestation rates below the median. Otherwise, the pest pressure from the surroundings is expected to be low giving less uncertainties for rates above the median.

A.7.6.5. Elicitation outcomes of the assessment of the pest freedom for *Meloidogyne mali* and *M. fallax* on bare root plants/ trees up to 7 years old

The following Tables show the elicited and fitted values for pest infection (Table A.39) and pest freedom (Table A.40).

Table A.39: Elicited and fitted values of the uncertainty distribution of pest infection by *Meloidogyne mali* and *M. fallax* per 10,000 plants

Percentile	1%	2.5%	5%	10%	17%	25%	33%	50%	67%	75%	83%	90%	95%	97.5%	99%
Elicited values	1					35		70		130					250
EKE	1.31	3.22	6.41	12.8	21.7	33.2	45.5	73.1	107	127	153	179	208	229	250

The EKE results is the BetaGeneral (1.0205, 2.5146, 0, 297) distribution fitted with @Risk version 7.6.

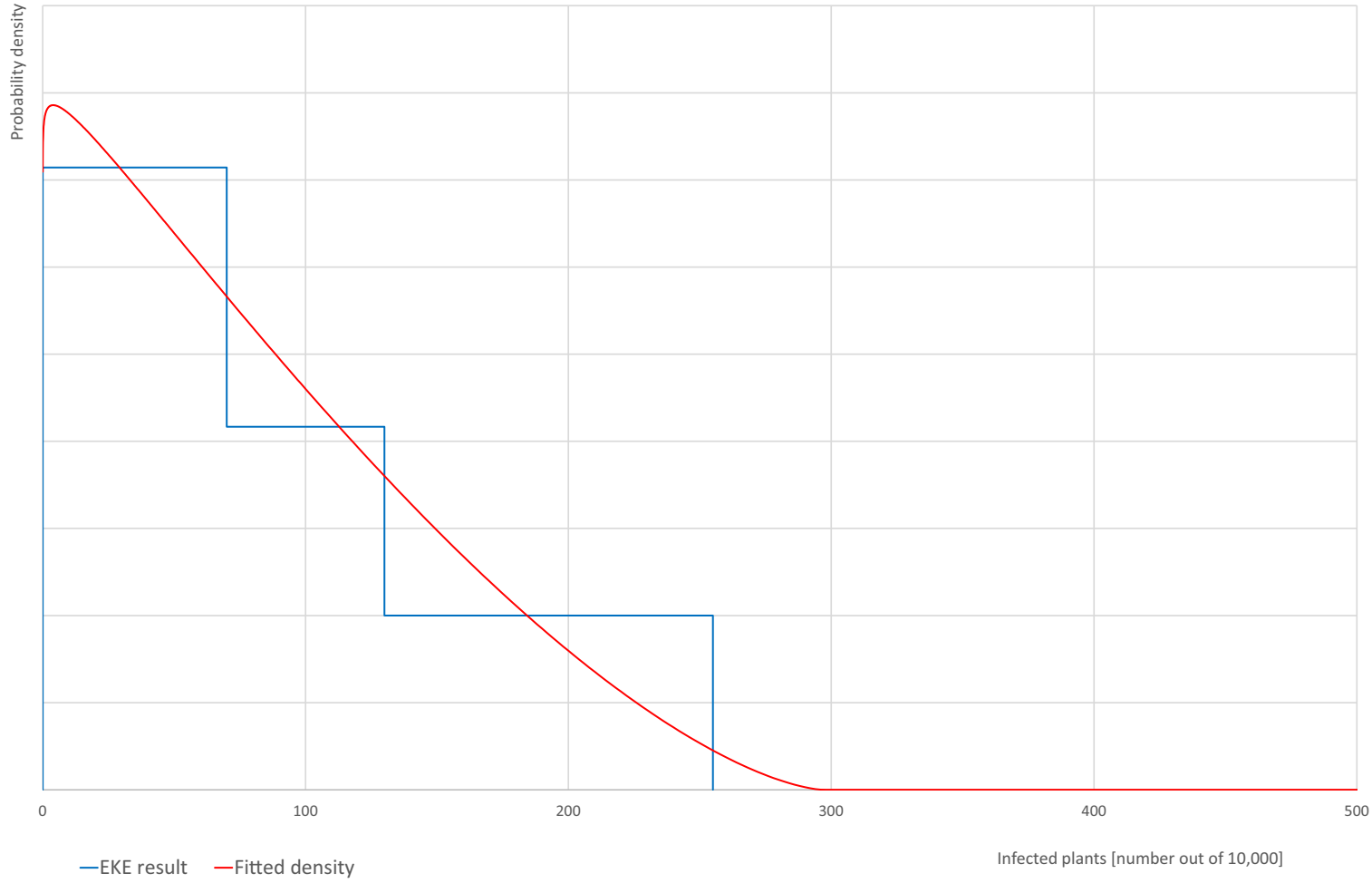
Based on the numbers of estimated infected plants the pest freedom was calculated (i.e. = 10,000 – number of infected plants per 10,000). The fitted values of the uncertainty distribution of the pest freedom are shown in Table A.40.

Table A.40: The uncertainty distribution of plants free of *Meloidogyne mali* and *M. fallax* per 10,000 plants calculated by Table A.39

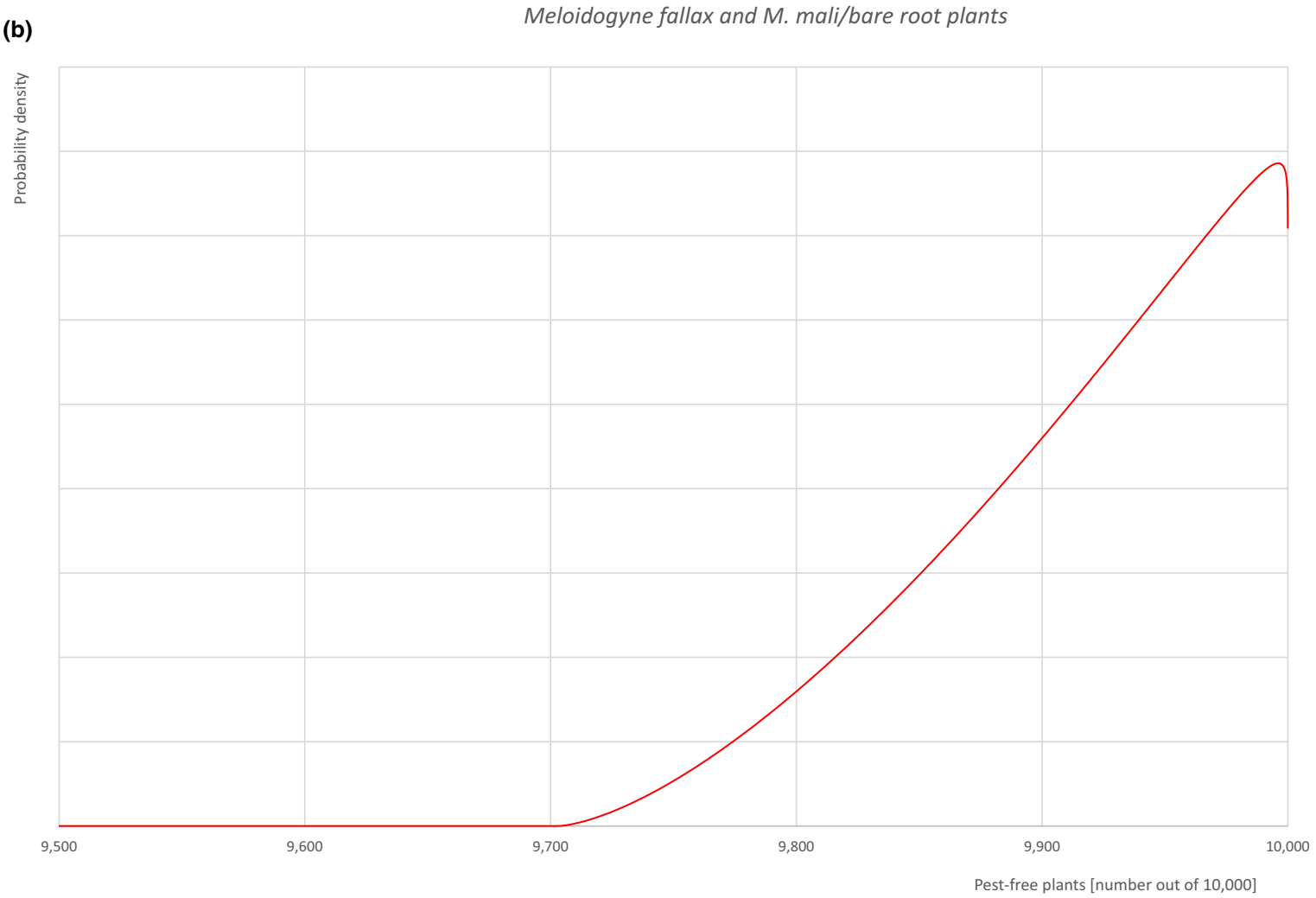
Percentile	1%	2.5%	5%	10%	17%	25%	33%	50%	67%	75%	83%	90%	95%	97.5%	99%
Values	9,750					9,870		9,930		9,965					9,999
EKE results	9,750	9,771	9,792	9,821	9,847	9,873	9,893	9,927	9,955	9,967	9,978	9,987	9,994	9,997	9,999

The EKE results are the fitted values.

(a) *Meloidogyne fallax and M. mali/bare root plants*



(b)


Meloidogyne fallax and M. mali/bare root plants
Probability density
9,500
9,600
9,700
9,800
9,900
10,000
Pest-free plants [number out of 10,000]

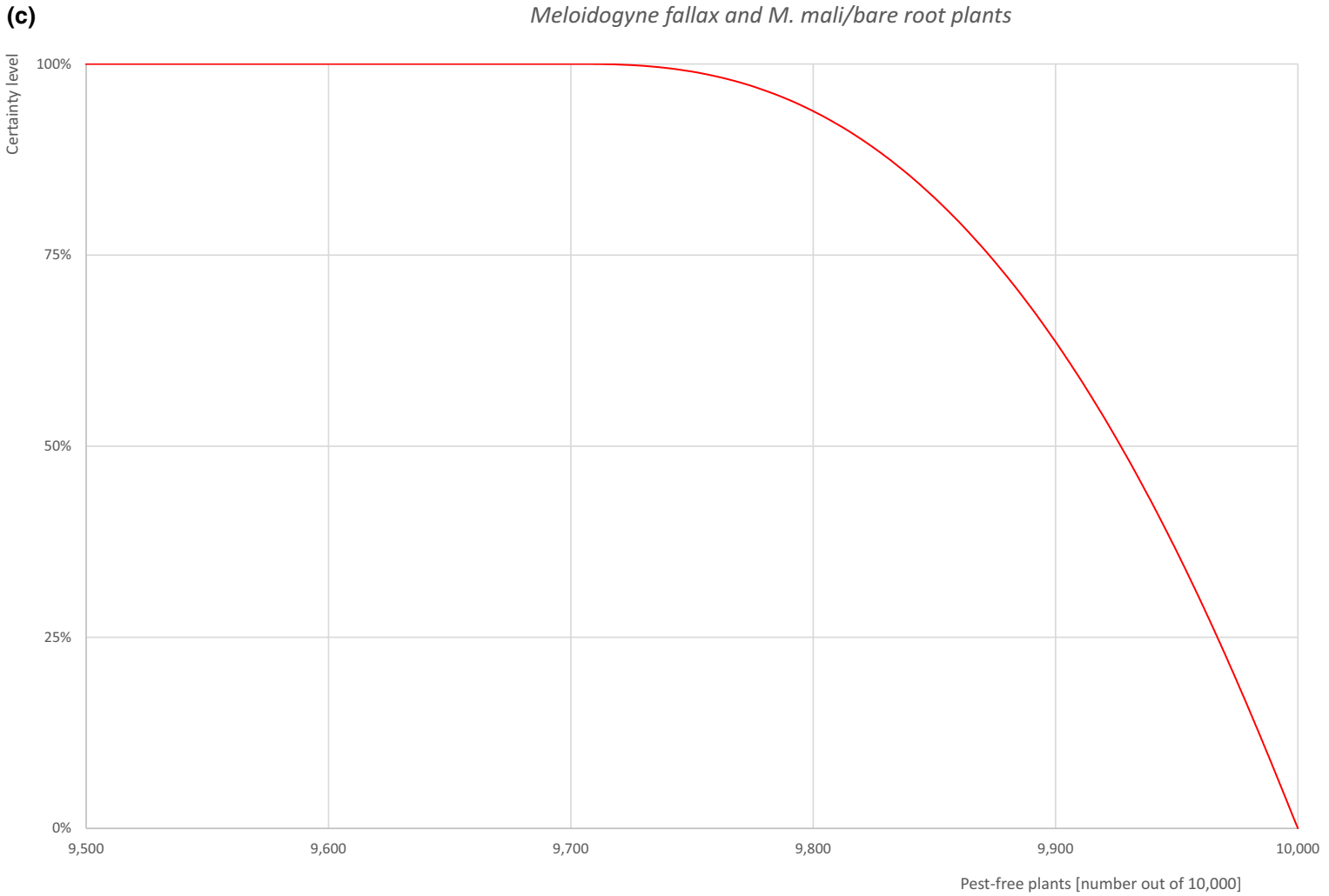


Figure A.20: (a) Elicited uncertainty of pest infection per 10,000 plants (histogram in blue – vertical blue line indicates the elicited percentile in the following order: 1%, 25%, 50%, 75%, 99%) and distributional fit (red line); (b) uncertainty of the proportion of pest-free plants per 10,000 (i.e. = 1 – pest infection proportion expressed as percentage); (c) descending uncertainty distribution function of pest infection per 10,000 plants

A.7.7. Overall likelihood of pest freedom for plants in pots up to 15 years old

A.7.7.1. Reasoning for a scenario which would lead to a reasonably low number of infected plants in pots up to 15 years old

The scenario assumes a low pressure of the pest in the nurseries and in the surroundings. Younger plants are exposed to the nematode for only short period of time. The scenario also assumes that root galls are visible while inspecting plants before export and that the root systems of plants have undergone washing and inspection before being transplanted in pots.

A.7.7.2. Reasoning for a scenario which would lead to a reasonably high number of infected plants in pots up to 15 years old

The scenario assumes a high pressure of the pest in the nurseries and in the surroundings as many potential hosts are present. Older plants are exposed to the nematode for longer period of time. The scenario also assumes that root galls are not easily recognisable while inspecting plants before export and that the root systems of plants did not undergone washing and inspection before being transplanted in pots.

A.7.7.3. Reasoning for a central scenario equally likely to over- or underestimate the number of infected plants in pots up to 15 years old (Median)

The scenario assumes a limited presence of the pest in the nurseries and the surroundings and that the plants are exposed to the nematode for a sufficient period of time for infection to occur. The movement of soil from the surrounding into the nurseries is not expected to be significant.

A.7.7.4. Reasoning for the precision of the judgement describing the remaining uncertainties (1st and 3rd quartile/interquartile range)

The limited information on occurrence of the pests in the UK including the nurseries and the surroundings results in high level of uncertainties for infestation rates below the median. Otherwise, the pest pressure from the surroundings is expected to be low giving less uncertainties for rates above the median.

A.7.7.5. Elicitation outcomes of the assessment of the pest freedom for *Meloidogyne mali* and *M. fallax* on plants in pots up to 15 years old

The following Tables show the elicited and fitted values for pest infection (Table A.41) and pest freedom (Table A.42).

Table A.41: Elicited and fitted values of the uncertainty distribution of pest infection by *Meloidogyne mali* and *M. fallax* per 10,000 plants

Percentile	1%	2.5%	5%	10%	17%	25%	33%	50%	67%	75%	83%	90%	95%	97.5%	99%
Elicited values	1					45		90		130					250
EKE	4.68	8.79	14.3	23.5	34.3	47.0	59.5	85.7	116	134	157	181	207	228	250

The EKE results is the BetaGeneral (1.4846, 3.5229, 0, 320) distribution fitted with @Risk version 7.6.

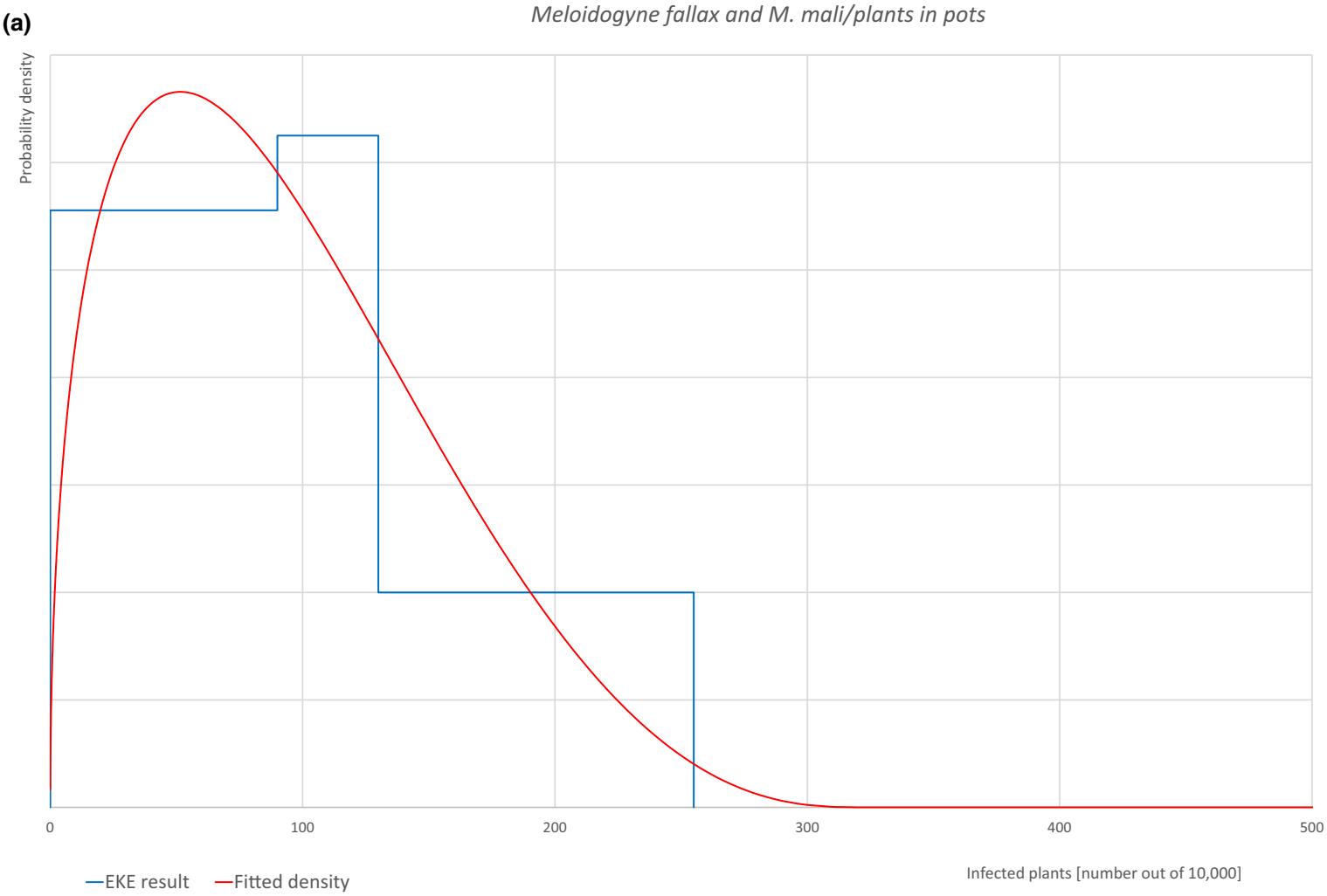
Based on the numbers of estimated infected plants the pest freedom was calculated (i.e. = 10,000 – number of infected plants per 10,000). The fitted values of the uncertainty distribution of the pest freedom are shown in Table A.42.

Table A.42: The uncertainty distribution of plants free of *Meloidogyne mali* and *M. fallax* per 10,000 plants calculated by Table A.41

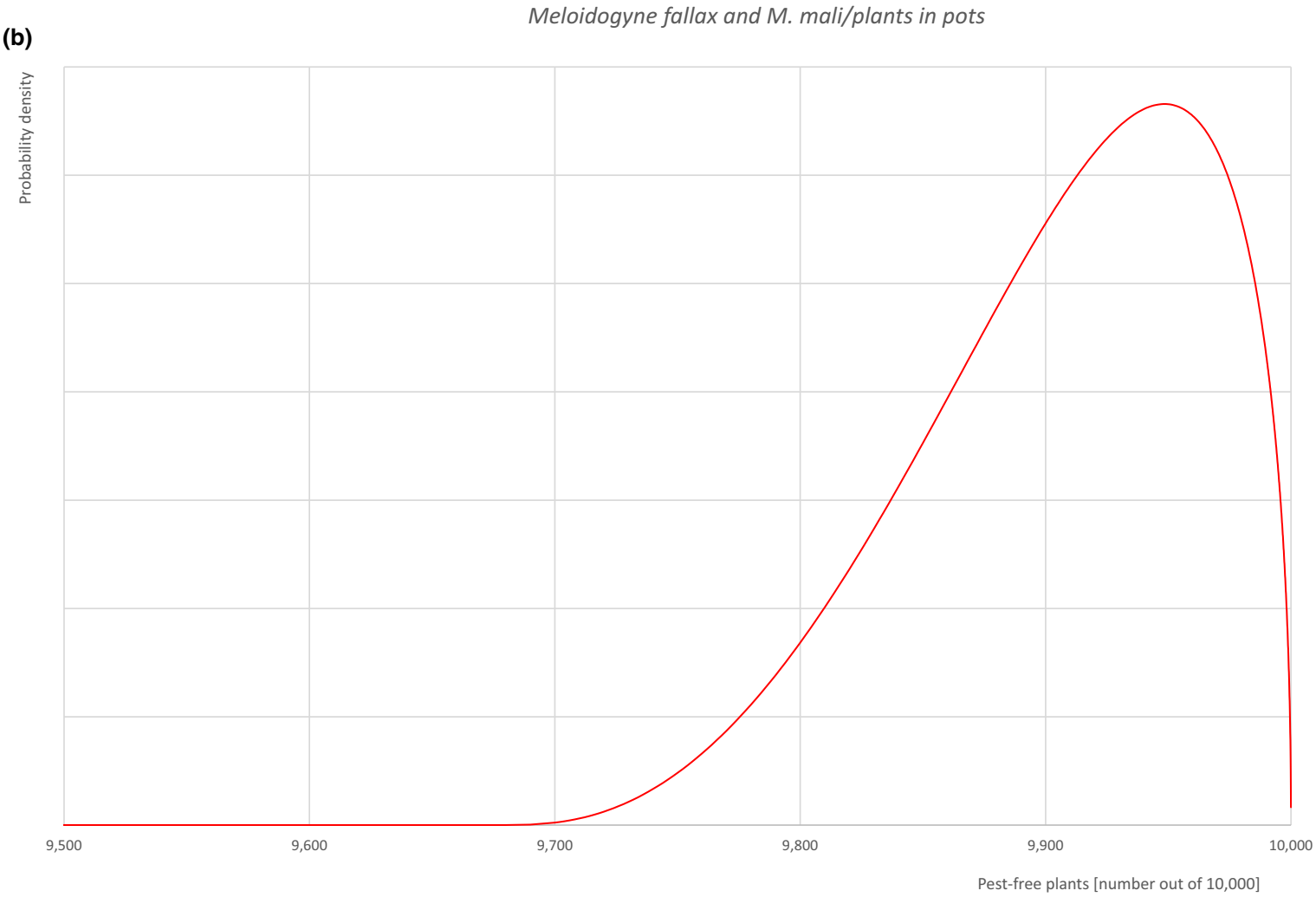
Percentile	1%	2.5%	5%	10%	17%	25%	33%	50%	67%	75%	83%	90%	95%	97.5%	99%
Values	9,750					9,870		9,910		9,955					9,999
EKE results	9,750	9,772	9,793	9,819	9,843	9,866	9,884	9,914	9,940	9,953	9,966	9,977	9,986	9,991	9,995

The EKE results are the fitted values.

(a)


Meloidogyne fallax and M. mali/plants in pots
Probability density
0
100
200
300
400
500
EKE result
Fitted density
Infected plants [number out of 10,000]

(b)


Meloidogyne fallax and M. mali/plants in pots
Probability density
9,500
9,600
9,700
9,800
9,900
10,000
Pest-free plants [number out of 10,000]

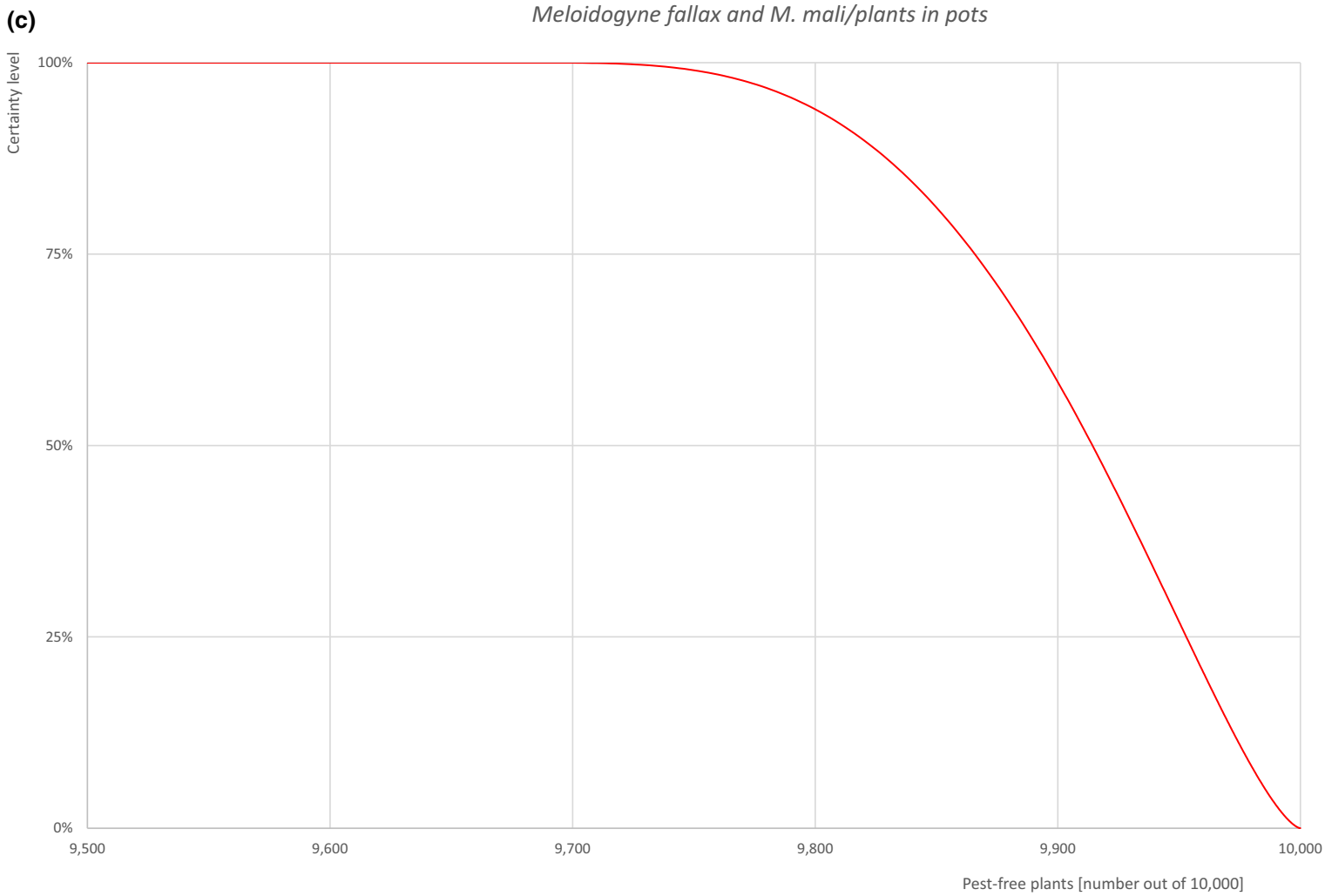


Figure A.21: (a) Elicited uncertainty of pest infection per 10,000 plants (histogram in blue – vertical blue line indicates the elicited percentile in the following order: 1%, 25%, 50%, 75%, 99%) and distributional fit (red line); (b) uncertainty of the proportion of pest-free plants per 10,000 (i.e. = 1 – pest infection proportion expressed as percentage); (c) descending uncertainty distribution function of pest infection per 10,000 plants

A.7.8. Reference list

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A.8. *Phytophthora ramorum*

A.8.1. Organism information

Taxonomic information	Current valid scientific name: *Phytophthora ramorum* Synonyms: – Name used in the EU legislation: *Phytophthora ramorum* (non-EU isolates) Werres, De Cock & Man in 't Veld [PHYTRA] Order: Peronosporales Family: Peronosporaceae Common name: Sudden Oak Death (SOD), ramorum bleeding canker, ramorum blight, ramorum leaf blight, twig and leaf blight Name used in the Dossier: *Phytophthora ramorum*
Group	Oomycetes
EPPO code	PHYTRA
Regulated status	The pathogen is listed in Annex II of Commission Implementing Regulation (EU) 2019/2072 as *Phytophthora ramorum* (non-EU isolates) Werres, De Cock & Man in 't Veld [PHYTRA]. The EU isolates of *P. ramorum* are listed as protected zone quarantine pest. The pathogen is included in the EPPO A2 list (EPPO, online_a). *Phytophthora ramorum* is quarantine in Canada, Israel, Mexico, Morocco and the UK. It is on A1 list of Brazil, Chile, Egypt, Kazakhstan, Türkiye and EAEU (=Eurasian Economic Union: Armenia, Belarus, Kazakhstan, Kyrgyzstan and Russia) (EPPO, online_b).
Pest status in the UK	*Phytophthora ramorum* is present in the UK (Brown and Brasier, 2007; Dossier Sections 2.0 and 5.0; CABI, online; EPPO, online_c). According to the Dossier Section 5.0, European isolates of *Phytophthora ramorum* are present in the UK: not widely distributed and under official control. It has been found in most regions of the UK, but it is more often reported in wetter, western regions.
Pest status in the EU	*Phytophthora ramorum* is present in the EU and it is currently reported in the following EU Member States: Belgium, Croatia, Denmark, Finland, France, Germany, Ireland, the Netherlands, Poland, Portugal and Slovenia (EPPO, online_c).
Host status on *Acer*	*Acer pseudoplatanus* is a reported host of *Phytophthora ramorum* (Brown and Brasier, 2007; King et al., 2015; CABI, online; EPPO, online_d; Farr and Rossman, online). *Phytophthora ramorum* is a pathogen of other *Acer* species such as *Acer circinatum*, *Acer davidii*, *Acer laevigatum* and *Acer macrophyllum* (Hayden et al., 2004; Cave et al., 2008; DiLeo et al., 2008; King et al., 2015; CABI, online; EPPO, online_d; Farr and Rossman, online). There is no information on whether *Phytophthora ramorum* can also attack *Acer campestre*.
PRA information	Pest Risk Assessments available: – Risk analysis for *Phytophthora ramorum* Werres, de Cock & Man in't Veld, causal agent of sudden oak death, ramorum leaf blight and ramorum dieback (Cave et al., 2008); – Risk analysis of *Phytophthora ramorum*, a newly recognised pathogen threat to Europe and the cause of sudden oak death in the USA (Sansford et al., 2009); – Scientific opinion on the pest risk analysis on *Phytophthora ramorum* prepared by the FP6 project RAPRA (EFSA PLH Panel, 2011); – Pest risk management for *Phytophthora kernoviae* and *Phytophthora ramorum* (EPPO, 2013); – UK Risk Register Details for *Phytophthora ramorum* (DEFRA, online).

Other relevant information for the assessment	
Biology	*Phytophthora ramorum* is most probably native to East Asia (Poimala and Lilja, 2013; Jung et al., 2021). The pathogen is present in Asia (Japan, Vietnam), Europe (Belgium, Croatia, Denmark, Finland, France, Germany, Guernsey, Ireland, Luxembourg, the Netherlands, Norway, Poland, Portugal, Slovenia, the UK), North America (Canada, the US) and South America (Argentina) (EPPO, online_c). So far there are 12 known lineages of *P. ramorum*: NA1 and NA2 from North American, EU1 from Europe (including the UK) and North America (Grünwald et al., 2009), EU2 from Northern Ireland and western Scotland (Van Poucke et al., 2012), IC1 to IC5 from Vietnam and NP1 to NP3 from Japan (Jung et al., 2021). *Phytophthora ramorum* is heterothallic oomycete species belonging to clade 8c (Blair et al., 2008) with two mating types: A1 and A2 (Boutet et al., 2010). *Phytophthora* species generally reproduce through a) dormant (resting) spores which can be either sexual (oospores) or asexual (chlamydospores); and b) fruiting structures (sporangia) which contain zoospores (Erwin and Ribeiro, 1996). *Phytophthora ramorum* produces sporangia on the surfaces of infected leaves and twigs of host plants. These sporangia can be splash-dispersed to other close or carried by wind and rain to longer distances. The sporangia germinate to produce zoospores that penetrate and initiate an infection on new hosts. In infected plant material the chlamydospores are produced and can serve as resting structures (Davidson et al., 2005; Grünwald et al., 2008). Trunk cankers (e.g. on *Quercus*) are not known to support sporulation and therefore do not transmit the pathogen (DEFRA, 2008). The pathogen is also able to survive in soil (Shishkoff, 2007). In the west of Scotland, it persisted in soil for at least 2 years after its hosts were removed (Elliot et al., 2013). Oospores were only observed in pairing tests under controlled laboratory conditions (Brasier and Kirk, 2004). Optimal temperatures under laboratory conditions were 16–26°C for growth, 14–26°C for chlamydospore production and 16–22°C for sporangia production (Englander et al., 2006). *Phytophthora ramorum* is mainly a foliar pathogen, however it was also reported to infect shoots, stems and occasionally roots of various host plants (Grünwald et al, 2008, Parke and Lewis, 2007). According to Brown and Brasier (2007), *P. ramorum* commonly occupies xylem beneath phloem lesions and may spread within xylem and possibly recolonise the phloem from the xylem. *Phytophthora ramorum* can remain viable within xylem for two or more years after the overlying phloem had been excised. *Phytophthora ramorum* can disperse by aerial dissemination, water, movement of infested plant material and soil containing propagules on footwear, tires of trucks and mountain bikes or the feet of animals (Davidson et al., 2002; Brasier, 2008). Infected foliar hosts can be a major source of inoculum, which can lead to secondary infections on nearby host plants. Important foliar hosts in Europe are *Rhododendron* spp. and *Larix kaempferi* (Brasier and Webber, 2010, Grünwald et al., 2008). Possible pathways of entry for *Phytophthora ramorum* are plants for planting (excluding seed and fruit) of known susceptible hosts; plants for planting (excluding seed and fruit) of non-host plant species accompanied by contaminated attached growing media; soil/growing medium (with organic matter) as a commodity; soil as a contaminant; foliage or cut branches; seed and fruits; susceptible (isolated) bark and susceptible wood (EFSA PLH Panel, 2011). *Phytophthora ramorum* caused rapid decline of *Lithocarpus densiflorus* and *Quercus agrifolia* in forests of California and Oregon (Rizzo et al., 2005) and *Larix kaempferi* in plantations of southwest England (Brasier and Webber, 2010).

Symptoms	**Main type of symptoms**	*Phytophthora ramorum* causes different types of symptoms depending on the host species and the plant tissue infected. According to DEFRA (2008) *P. ramorum* causes three different types of disease: a) 'Ramorum bleeding canker' – cankers on trunks of trees, which emit a dark ooze. As they increase in size they can lead to tree death. b) 'Ramorum leaf blight' – infection of the foliage, leading to discoloured lesions on the leaves. c) 'Ramorum dieback' – shoot and bud infections which result in wilting, discolouration and dying back of affected parts. Symptoms on *Quercus* species are cankers of red, brown or black color on trunk, browning of the crown, gradual leaf loss and death of trees (Davidson et al., 2003). Leaf lesions and shoot dieback can be observed on foliar hosts such as *Rhododendron*, *Viburnum*, *Pieris* and *Camellia*. (Davidson et al., 2003, EPPO, online_e). On *Larix kaempferi*, *P. ramorum* causes foliage and bark infection that are visible as wilted shoot tips with blackened needles and stem lesions with resin bleeding (Braiser and Webber, 2010). Symptoms on *Lithocarpus densiflorus* are lesions on leaves, cankers on trunk, branches and twigs; shoot tip dieback, leaf flagging and formation of a Shepard's crook. The trees can die within 1 year (Davidson et al., 2003). *Acer macrophyllum* is affected by discoloration of leaves ranging from orange to brown color, which normally starts from the leaf edges (Davidson et al., 2003). *On Acer pseudoplatanus, P. ramorum* has been isolated from bleeding bark lesions (Brown and Brasier, 2007). In an inoculation experiment with *P. ramorum*, low levels of necrosis on leaves were observed on this host species (Denman et al., 2005).
	Presence of asymptomatic plants	If roots are infected by *P. ramorum,* the plants can be without aboveground symptoms for months until developmental or environmental factors trigger disease expression (Roubtsova and Bostock, 2009; Thompson et al., 2021). Application of some fungicides may reduce symptoms and therefore mask infection, making it more difficult to determine whether the plant is pathogen-free (DEFRA, 2008).
	Confusion with other pests	Various symptoms caused by *P. ramorum* can be confused with other pathogens, such as: canker and foliar symptoms caused by other *Phytophthora* species (*P. cinnamomi*, *P. citricola* and *P. cactorum*); leaf lesions caused by rust in early stages; leafspots caused by sunburn; dieback of twigs and leaves caused by *Botryosphaeria dothidea* (Davidson et al., 2003). Symptoms in *Acer macrophyllum* can be confused with drought stress, *Xylella* leaf scorch and anthracnose (Davidson et al., 2003). *Phytophthora ramorum* can be easily distinguished from other *Phytophthora* species based on morphology (Grünwald et al., 2008) and molecular tests.

Host plant range	*Phytophthora ramorum* has a very wide host range, which is expanding. Main host plants include *Camellia* spp., *Larix decidua*, *L. kaempferi*, *Pieris* spp., *Rhododendron* spp., *Syringa vulgaris, Viburnum* spp. and the North American trees species, *Lithocarpus densiflorus* and *Quercus agrifolia* (EPPO online_d). Further proven hosts confirmed by Koch's postulates are *Abies grandis*, *A. magnifica*, *Acer circinatum*, *A. macrophyllum, A. pseudoplatanus*, *Adiantum aleuticum, A. jordanii, Aesculus californica*, *A. hippocastanum*, *Arbutus menziesii*, *A. unedo*, *Arctostaphylos columbiana*, *A. glauca*, *A. hooveri*, *A. manzanita, A. montereyensis*, *A. morroensis*, *A. pilosula*, *A. pumila*, *A. silvicola*, *A. viridissima*, *Calluna vulgaris*, *Castanea sativa*, *Ceanothus thyrsiflorus*, *Chamaecyparis lawsoniana*, *Chrysolepis chrysophylla*, *Cinnamomum camphora*, *Corylus cornuta*, *Fagus sylvatica*, *Frangula californica*, *Frangula purshiana*, *Fraxinus excelsior*, *Gaultheria procumbens*, *G. shallon*, *Griselinia littoralis*, *Hamamelis virginiana*, *Heteromeles arbutifolia*, *Kalmia* spp., *Larix* × *eurolepis*, *Laurus nobilis*, *Lonicera hispidula*, *Lophostemon confertus*, *Loropetalum chinense*, *Magnolia* × *loebneri*, *M. oltsopa*, *M. stellata*, *Mahonia aquifolium*, *Maianthemum racemosum*, *Parrotia persica*, *Photinia fraseri*, *Phoradendron serotinum* subsp. *macrophyllum*, *Photinia* × fraseri, *Prunus laurocerasus*, *Pseudotsuga menziesii* var. *menziesii*, *Quercuscerris*, *Q. chrysolepis*, *Q. falcata Q. ilex*, *Q. kelloggii*, *Q. parvula* var. *shrevei*, *Rosa gymnocarpa*, *Salix caprea*, *Sequoia sempervirens*, *Taxus baccata*, *Trientalis latifolia*, *Umbellularia californica*, *Vaccinium myrtillus*, *V. ovatum*, *V. parvifolium* and *Vinca minor* (Cave et al., 2008; APHIS USDA, 2022).
Reported evidence of impact	*Phytophthora ramorum* is an EU quarantine pest.
Evidence that the commodity is a pathway	*Phytophthora ramorum* is continuously intercepted in the EU on different plant species intended for planting (EUROPHYT/TRACES-NT, online) and according to EFSA PLH Panel (2011), *P. ramorum* can travel with plants for planting. Therefore, plants for planting are possible pathway of entry for *P. ramorum*.
Surveillance information	*Phytophthora ramorum* at growing sites: infested plants are destroyed and potentially infested plants are 'held' (prohibited from moving). The UK has a containment policy in the wider environment with official action taken to remove infected trees (Dossier Section 3.0). As part of an annual survey at ornamental retail and production sites (frequency of visits determined by a decision matrix) *Phytophthora ramorum* is inspected on common host plants. An additional inspection, during the growing period, is carried out at plant passport production sites. Inspections are carried out at a survey to 300 non-woodland wider environment sites annually (Dossier Sections 3.0 and 5.0).

A.8.2. Possibility of pest presence in the nursery

A.8.2.1. Possibility of entry from the surrounding environment

Phytophthora ramorum is present in the UK, it has been found in most regions of the UK, but it is more often reported in wetter, western regions (Dossier Section 5.0).

The possible entry of *P. ramorum* from surrounding environment to the nurseries may occur through aerial dissemination, water and animals (Davidson et al., 2002).

Phytophthora ramorum has wide host range and can infect number of different plants. Suitable hosts of *P. ramorum* like *Abies* spp., *Acer* spp., *Aesculus* spp., *Camellia* spp., *Castanea* spp., *Fagus* spp., *Fraxinus* spp., *Magnolia* spp., *Prunus* spp., *Quercus* spp., *Rhododendron* spp., *Rosa* spp., *Salix* spp., *Syringa* spp. and *Viburnum* spp. are present within 2 km from the nurseries (Dossier Section 3.0).

Uncertainties:

- The dispersal range of *P. ramorum* sporangia.
- No information available on the distance of the nurseries to sources of pathogen in the surrounding environment.

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

area, suitable hosts are present and the pathogen can spread by wind, rain and infested soil propagules on feet of animals entering the nurseries.

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

The starting materials are either seeds, seedlings or scion woods/buds. Seeds are certified and coming from the UK. Seedlings are either from the UK, the EU (mostly the Netherlands) or New Zealand (Dossier Section 3.0). Seeds are not a pathway for the pathogen.

In addition to *Acer* plants, the nurseries also produce other plants (Dossier Section 6.0). Out of them, there are many suitable hosts for the pathogen (such as *Abies* spp., *Aesculus* spp., *Arbutus* spp., *Calluna* spp., *Castanea* spp., *Ceanothus* spp., *Chamaecyparis* spp., *Larix* spp., etc.). However, there is no information on how and where the plants are produced. Therefore, if the plants are first produced in another nursery, the pathogen could possibly travel with them.

The nurseries are using virgin peat or peat-free compost (a mixture of coir, tree bark, wood fibre, etc.) as a growing media (Dossier Section 1.0). *Phytophthora ramorum* is able to survive in soil (Shishkoff, 2007) and therefore could potentially enter with infested soil/growing media. However, the growing media is certified and heat-treated by commercial suppliers during production to eliminate pests and diseases (Dossier Section 3.0).

Uncertainties:

- No information is available on the provenance of plants other than *Acer* used for plant production in the nurseries.

Taking into consideration the above evidence and uncertainties, the Panel considers that it is possible for the pathogen to enter the nurseries with new seedlings of *Acer* and new plants of other species used for plant production in the area. The entry of the pathogen with seeds and the growing media the Panel considers as not possible.

A.8.2.3. Possibility of spread within the nursery

Acer plants are either grown in containers (cells, pots, tubes, etc.) outdoors/ in the open air or in field. Cell grown trees may be grown in greenhouses, however most plants will be field grown or field grown in containers (Dossier Section 1.0). There are no mother plants present in the nurseries (Dossier Section 3.0).

The pathogen can infect other suitable plants (such as *Abies* spp., *Aesculus* spp., *Castanea* spp., *Larix* spp., etc.) present within the nurseries and hedges surrounding the nurseries (*Prunus* spp.) (Dossier Sections 3.0 and 6.0).

Phytophthora ramorum can spread within the nurseries by aerial dissemination, soil, water, movement of infested plant material and animals (Davidson et al., 2002).

Uncertainties:

- None.

Taking into consideration the above evidence and uncertainties, the Panel considers that the spread of the pathogen within the nurseries is possible either by aerial dissemination, animals, movement of infested plant material, soil and water.

A.8.3. Information from interceptions

In the EUROPHYT/TRACES-NT database there are no records of notification of *Acer* plants for planting neither from the UK nor from other countries due to the presence of *Phytophthora ramorum* between the years 1995 and December 2022 (EUROPHYT/TRACES-NT, online).

A.8.4. Evaluation of the risk mitigation measures

In the table below, all risk mitigation measures currently applied in the UK are listed and an indication of their effectiveness on *Phytophthora ramorum* is provided. The description of the risk mitigation measures currently applied in the UK is provided in the Table 6.

N	Risk mitigation measure	Effect on the pest	Evaluation and uncertainties
1	Registration of production sites	Yes	*Phytophthora ramorum* is a quarantine organism in the UK and targeted by this measure. Uncertainties: – Whether disease symptoms on *Acer* are recognisable, particularly at an early stage of infection.
2	Physical separation	No	Not relevant.
3	Certified plant material	Yes	*Phytophthora ramorum* is a quarantine organism in the UK and targeted by this measure. Uncertainties: – Whether disease symptoms on *Acer* are recognisable, particularly at an early stage of infection.
4	Growing media	Yes	This measure should ensure pest-free growing media and is expected to prevent the introduction of the pathogen into the nurseries with growing media. Uncertainties: – None.
5	Surveillance, monitoring and sampling	Yes	This measure has an effect as the pathogen would be detected on nursery-grown plants, as well as on incoming plant material and growing media, and suspected plant material quarantined. Uncertainties: – Whether disease symptoms on *Acer* are recognisable, particularly at an early stage of infection.
6	Hygiene measures	Yes	General hygiene measures will reduce the likelihood of the pathogen being spread by tools and equipment, although this is not a major pathway for the pest. Uncertainties: – None.
7	Removal of infested plant material	Yes	This measure could have some effect by removing potentially infested plant material, thus reducing the spread of the pathogen within the nursery. Uncertainties: – None.
8	Irrigation water	Yes	Testing of irrigation water would detect the pathogen, which can spread by water. Overhead irrigation could favour foliar infections and spread of the pathogen by water splash. Uncertainties: – Whether irrigation water is tested for *P. ramorum*.
9	Application of pest control products	Yes	Some fungicides could reduce the likelihood of foliar infection by the pathogen. Uncertainties: – No specific information on the fungicides used. – The level of efficacy of fungicides in reducing infection of *P. ramorum*.

N	Risk mitigation measure	Effect on the pest	Evaluation and uncertainties
10	Measures against soil pests	Yes	This measure could have some effect by preventing root contact with soil where the pathogen may be present. Uncertainties: – None.
11	Inspections and management of plants before export	Yes	*P. ramorum* is a quarantine organism in the UK and the EU and this measure is expected to reduce the likelihood of infested plants being exported. Uncertainties: – Whether disease symptoms on *Acer* are recognisable, particularly at an early stage of infection.
12	Separation during transport to the destination	No	Not relevant.

A.8.5. Overall likelihood of pest freedom for bundles of whips and seedlings

A.8.5.1. Reasoning for a scenario which would lead to a reasonably low number of infected bundles of whips and seedlings

The scenario assumes a low pressure of the pathogen in the nurseries and in the surroundings. The plants are exposed to the pathogen for only short period of time and are exported without leaves. The scenario assumes *Acer* spp. to be minor hosts for the pathogen. The scenario also assumes that symptoms of the disease are visible and promptly detected during inspections.

A.8.5.2. Reasoning for a scenario which would lead to a reasonably high number of infected bundles of whips and seedlings

The scenario assumes a high pressure of the pathogen in the nurseries and in the surroundings as suitable hosts are present. The scenario assumes that the pathogen infects leaves, which may still be present on the plants at the time of export. The scenario also assumes that symptoms of the disease are not easily recognisable during inspections.

A.8.5.3. Reasoning for a central scenario equally likely to over- or underestimate the number of infected bundles of whips and seedlings (Median)

The scenario assumes a limited presence of the pathogen in the nurseries and the surroundings, and a limited susceptibility of *Acer* spp. The pathogen is a regulated quarantine pest in the UK and under official control.

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

The limited information on the susceptibility of *Acer* spp. and the occurrence of the pathogen in the nurseries and the surroundings results in high level of uncertainties for infestation rates below the median. Otherwise, the pest pressure from the surroundings is expected to be low giving less uncertainties for rates above the median.

A.8.5.5. Elicitation outcomes of the assessment of the pest freedom for *Phytophthora ramorum* on bundles of whips and seedlings

The following Tables show the elicited and fitted values for pest infection (Table A.43) and pest freedom (Table A.44).

Table A.43: Elicited and fitted values of the uncertainty distribution of pest infection by *Phytophthora ramorum* per 10,000 bundles

Percentile	1%	2.5%	5%	10%	17%	25%	33%	50%	67%	75%	83%	90%	95%	97.5%	99%
Elicited values	3					20		40		80					150
EKE	3.00	3.62	4.85	7.74	12.2	18.6	25.7	42.8	64.4	77.7	93.9	111	128	140	151

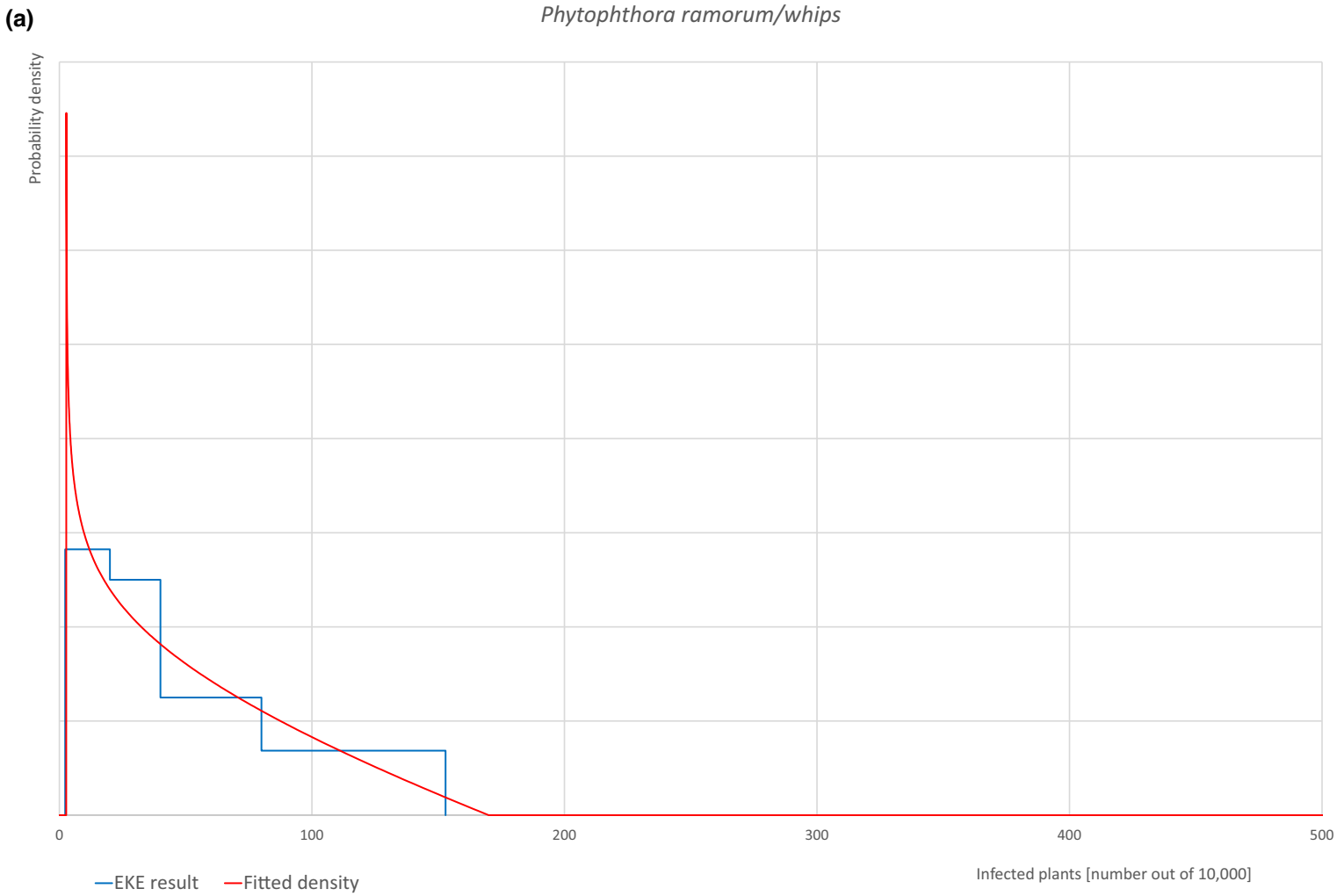
The EKE results is the BetaGeneral (0.82439, 1.9948, 2.7, 170) distribution fitted with @Risk version 7.6.

Based on the numbers of estimated infected bundles the pest freedom was calculated (i.e. = 10,000 – number of infected bundles per 10,000). The fitted values of the uncertainty distribution of the pest freedom are shown in Table A.44.

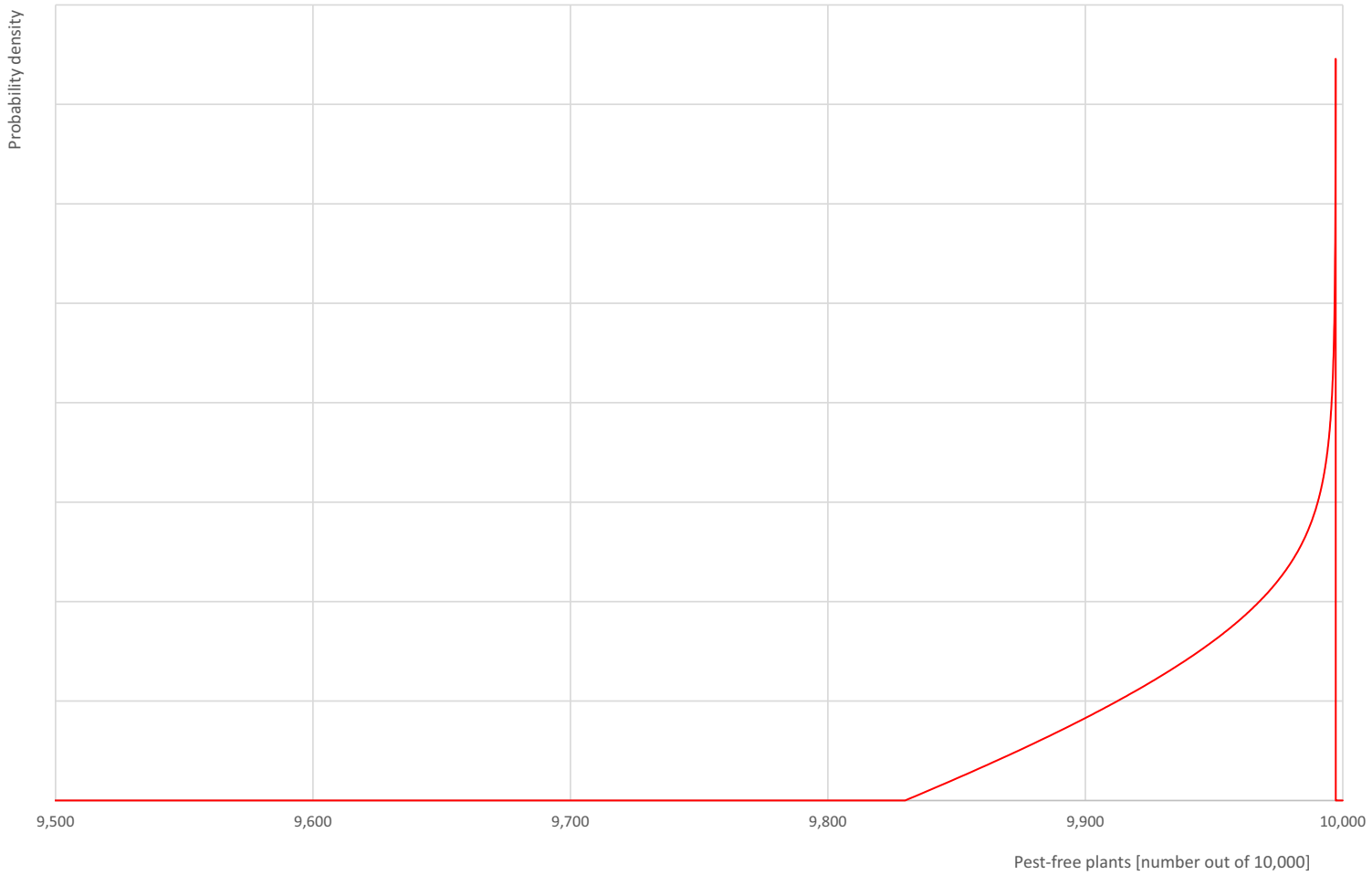
Table A.44: The uncertainty distribution of bundles free of *Phytophthora ramorum* per 10,000 bundles calculated by Table A43

Percentile	1%	2.5%	5%	10%	17%	25%	33%	50%	67%	75%	83%	90%	95%	97.5%	99%
Values	9,850					9,920		9,960		9,980					9,997
EKE results	9,849	9,860	9,872	9,889	9,906	9,922	9,936	9,957	9,974	9,981	9,988	9,992	9,995	9,996	9,997

The EKE results are the fitted values.


(a)
Phytophthora ramorum/whips
Probability density
0
100
200
300
400
500
Infected plants [number out of 10,000]
EKE result
Fitted density

(b) *Phytophthora ramorum/whips*



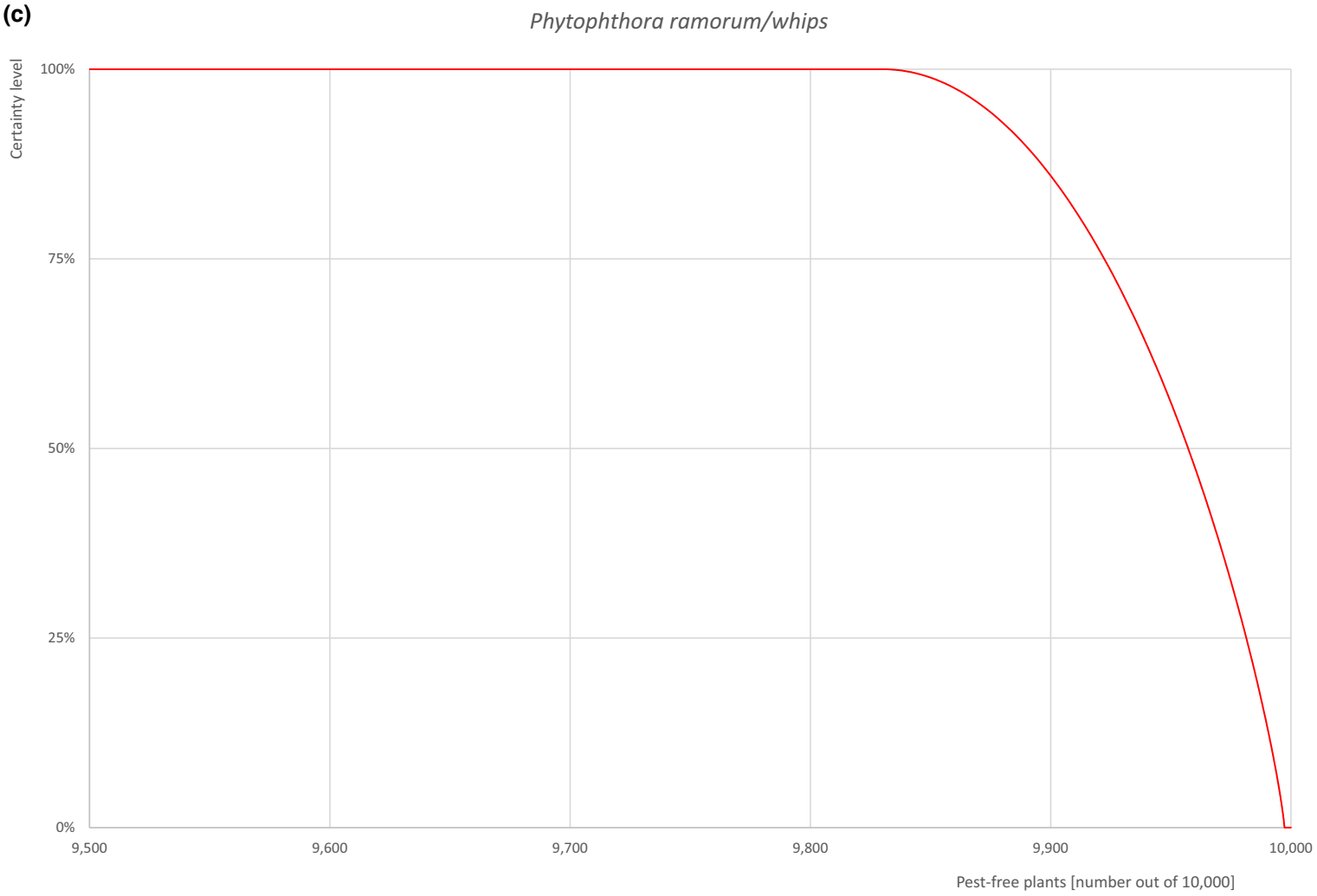


Figure A.22: (a) Elicited uncertainty of pest infection per 10,000 bundles (histogram in blue – vertical blue line indicates the elicited percentile in the following order: 1%, 25%, 50%, 75%, 99%) and distributional fit (red line); (b) uncertainty of the proportion of pest-free bundles per 10,000 (i.e. = 1 – pest infection proportion expressed as percentage); (c) descending uncertainty distribution function of pest infection per 10,000 bundles

A.8.6. Overall likelihood of pest freedom for bare root plants/trees up to 7 years old

A.8.6.1. Reasoning for a scenario which would lead to a reasonably low number of infected bare root plants/trees up to 7 years old

The scenario assumes a low pressure of the pathogen in the nurseries and in the surroundings. Younger plants are exposed to the pathogen for only short period of time and are exported without leaves. The scenario assumes *Acer* spp. to be minor hosts for the pathogen. The scenario also assumes that symptoms of the disease are visible and promptly detected during inspections.

A.8.6.2. Reasoning for a scenario which would lead to a reasonably high number of infected bare root plants/trees up to 7 years old

The scenario assumes a high pressure of the pathogen in the nurseries and in the surroundings as suitable hosts are present. The scenario assumes that the pathogen infects leaves, which may still be present on the plants at the time of export. Older trees are more likely to become infected due to longer exposure time and larger size. The scenario also assumes that symptoms of the disease are not easily recognisable during inspections.

A.8.6.3. Reasoning for a central scenario equally likely to over- or underestimate the number of infected bare root plants/trees up to 7 years old (Median)

The scenario assumes a limited presence of the pathogen in the nurseries and the surroundings, and a limited susceptibility of *Acer* spp. The pathogen is a regulated quarantine pest in the UK and under official control.

A.8.6.4. Reasoning for the precision of the judgement describing the remaining uncertainties (1st and 3rd quartile/interquartile range)

The limited information on the susceptibility of *Acer* spp. and the occurrence of the pathogen in the nurseries and the surroundings results in high level of uncertainties for infestation rates below the median. Otherwise, the pest pressure from the surroundings is expected to be low giving less uncertainties for rates above the median.

A.8.6.5. Elicitation outcomes of the assessment of the pest freedom for *Phytophthora ramorum* on bare root plants/trees up to 7 years old

The following Tables show the elicited and fitted values for pest infection (Table A.45) and pest freedom (Table A.46).

Table A.45: Elicited and fitted values of the uncertainty distribution of pest infection by *Phytophthora ramorum* per 10,000 plants

Percentile	1%	2.5%	5%	10%	17%	25%	33%	50%	67%	75%	83%	90%	95%	97.5%	99%
Elicited values	2					18		35		65					150
EKE	2.01	3.04	4.67	7.81	12.0	17.4	23.1	36.2	53.0	63.9	78.0	94.4	114	131	150

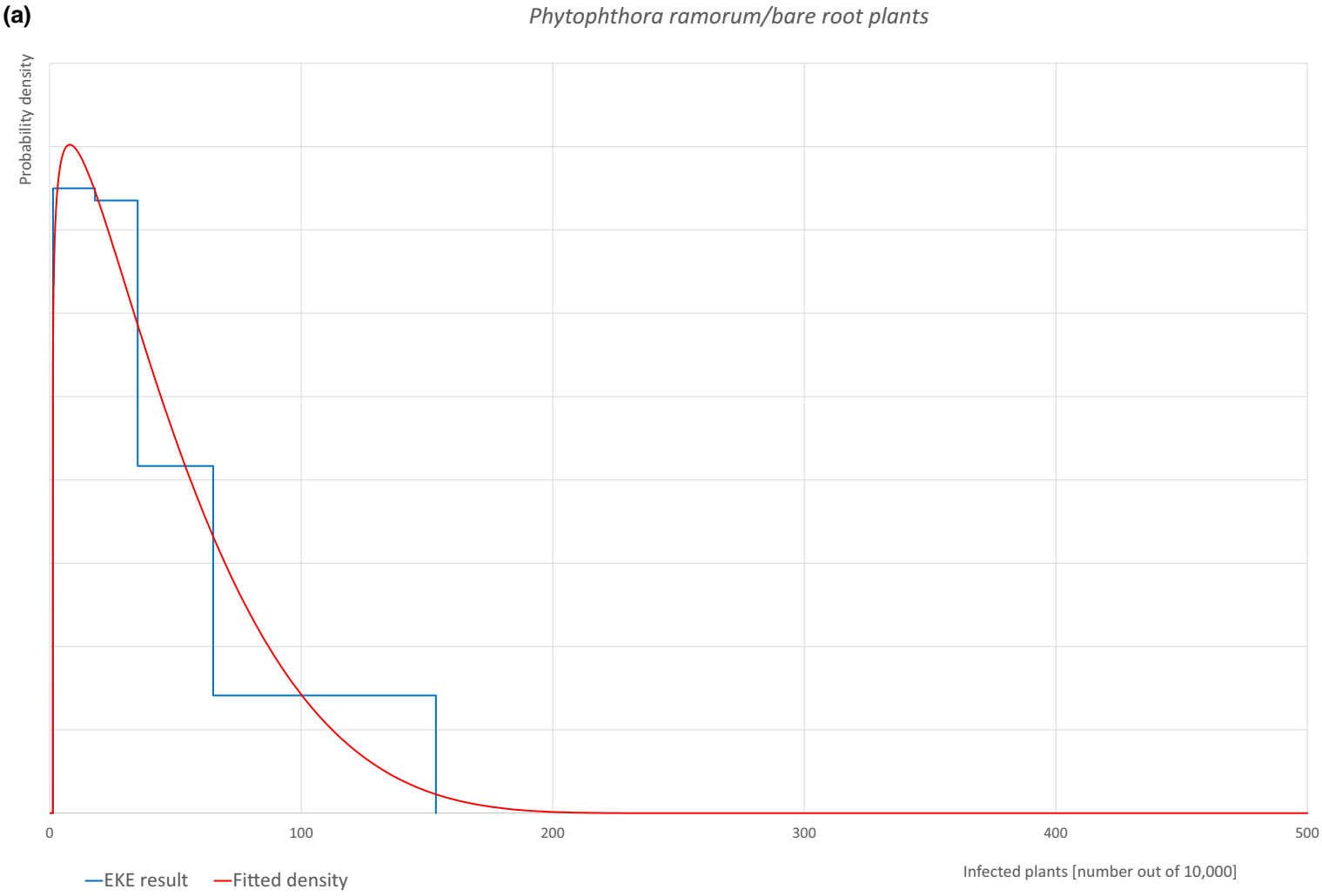
The EKE results is the BetaGeneral (1.1205, 5.2894, 1.2, 250) distribution fitted with @Risk version 7.6.

Based on the numbers of estimated infected plants the pest freedom was calculated (i.e. = 10,000 – number of infected plants per 10,000). The fitted values of the uncertainty distribution of the pest freedom are shown in Table A.46.

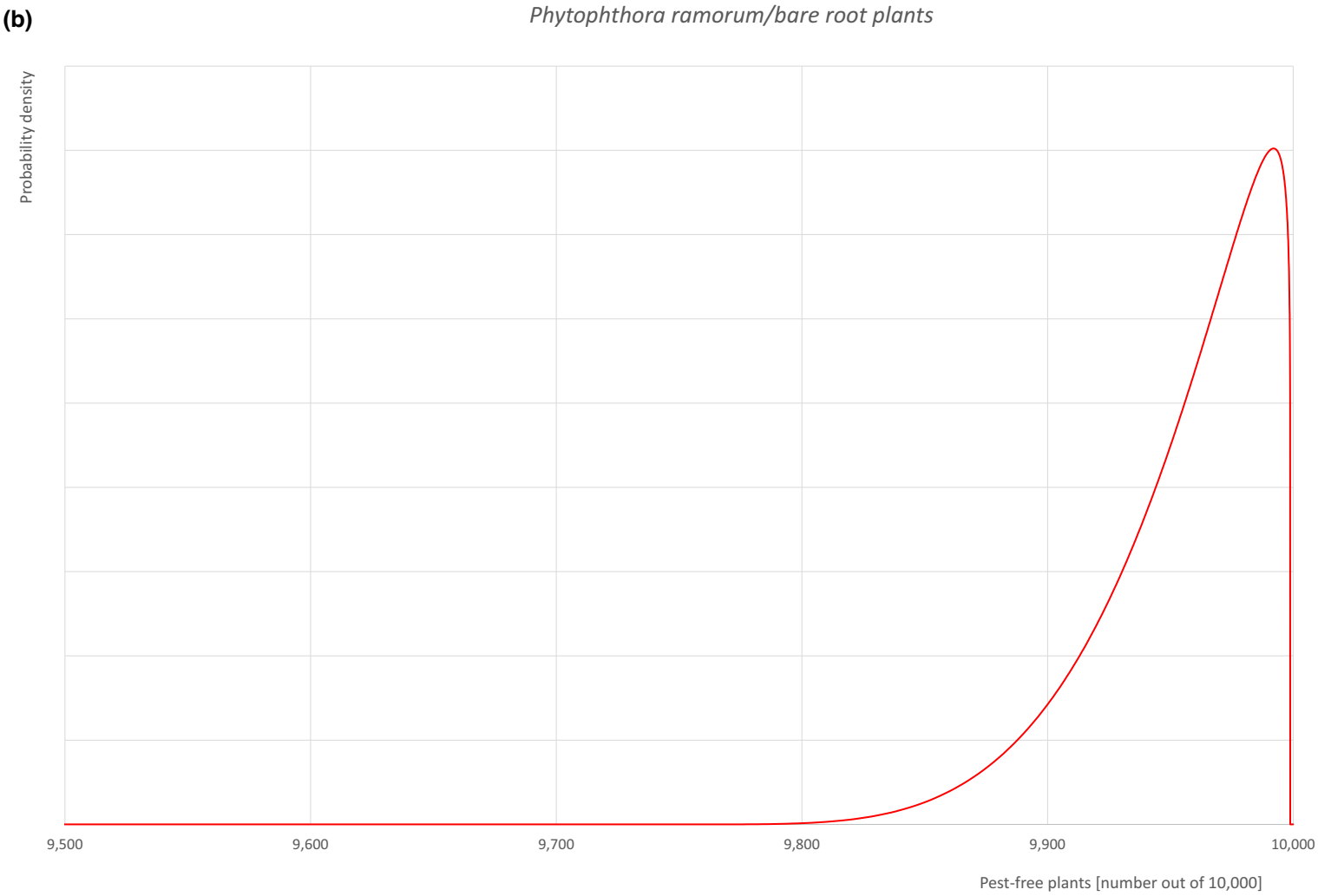
Table A.46: The uncertainty distribution of plants free of *Phytophthora ramorum* per 10,000 plants calculated by Table A.45

Percentile	1%	2.5%	5%	10%	17%	25%	33%	50%	67%	75%	83%	90%	95%	97.5%	99%
Values	9,850					9,935		9,965		9,982					9,998
EKE results	9,850	9,869	9,886	9,906	9,922	9,936	9,947	9,964	9,977	9,983	9,988	9,992	9,995	9,997	9,998

The EKE results are the fitted values.


(a)
Phytophthora ramorum/bare root plants
Probability density
0
100
200
300
400
500
Infected plants [number out of 10,000]
EKE result
Fitted density

(b)


Phytophthora ramorum/bare root plants
Probability density
9,500
9,600
9,700
9,800
9,900
10,000
Pest-free plants [number out of 10,000]

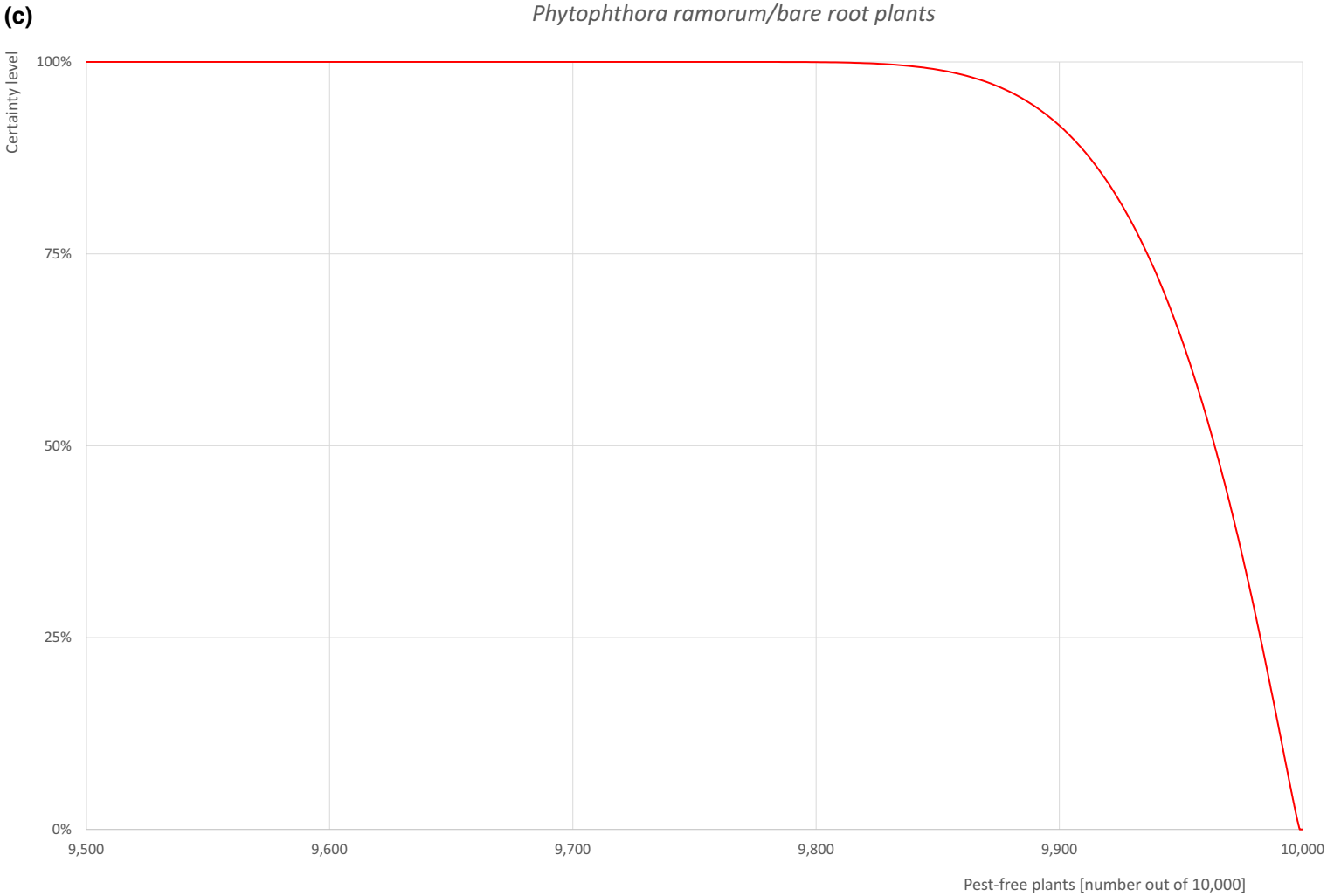


Figure A.23: (a) Elicited uncertainty of pest infection per 10,000 plants (histogram in blue – vertical blue line indicates the elicited percentile in the following order: 1%, 25%, 50%, 75%, 99%) and distributional fit (red line); (b) uncertainty of the proportion of pest-free plants per 10,000 (i.e. = 1 – pest infection proportion expressed as percentage); (c) descending uncertainty distribution function of pest infection per 10,000 plants

A.8.7. Overall likelihood of pest freedom for plants in pots up to 15 years old

A.8.7.1. Reasoning for a scenario which would lead to a reasonably low number of infected plants in pots up to 15 years old

The scenario assumes a low pressure of the pathogen in the nurseries and in the surroundings. Younger plants are exposed to the pathogen for only short period of time and are exported without leaves. The scenario assumes *Acer* spp. to be minor hosts for the pathogen. The scenario also assumes that symptoms of the disease are visible and promptly detected during inspections.

A.8.7.2. Reasoning for a scenario which would lead to a reasonably high number of infected plants in pots up to 15 years old

The scenario assumes a high pressure of the pathogen in the nurseries and in the surroundings as suitable hosts are present. The scenario assumes that the pathogen infects leaves, which may still be present on the plants at the time of export. Older trees are more likely to become infected due to longer exposure time and larger size. The scenario also assumes that symptoms of the disease are not easily recognisable during inspections.

A.8.7.3. Reasoning for a central scenario equally likely to over- or underestimate the number of infected plants in pots up to 15 years old (Median)

The scenario assumes a limited presence of the pathogen in the nurseries and the surroundings, and a limited susceptibility of *Acer* spp. The pathogen is a regulated quarantine pest in the UK and under official control.

A.8.7.4. Reasoning for the precision of the judgement describing the remaining uncertainties (1st and 3rd quartile/interquartile range)

The limited information on the susceptibility of *Acer* spp. and the occurrence of the pathogen in the nurseries and the surroundings results in high level of uncertainties for infestation rates below the median. Otherwise, the pest pressure from the surroundings is expected to be low giving less uncertainties for rates above the median.

A.8.7.5. Elicitation outcomes of the assessment of the pest freedom for *Phytophthora ramorum* on plants in pots up to 15 years old

The following Tables show the elicited and fitted values for pest infection (Table A.47) and pest freedom (Table A.48).

Table A.47: Elicited and fitted values of the uncertainty distribution of pest infection by *Phytophthora ramorum* per 10,000 plants

Percentile	1%	2.5%	5%	10%	17%	25%	33%	50%	67%	75%	83%	90%	95%	97.5%	99%
Elicited values	3					35		70		145					300
EKE	3.00	4.30	6.75	12.3	20.5	32.1	44.9	75.6	115	140	172	206	243	272	301

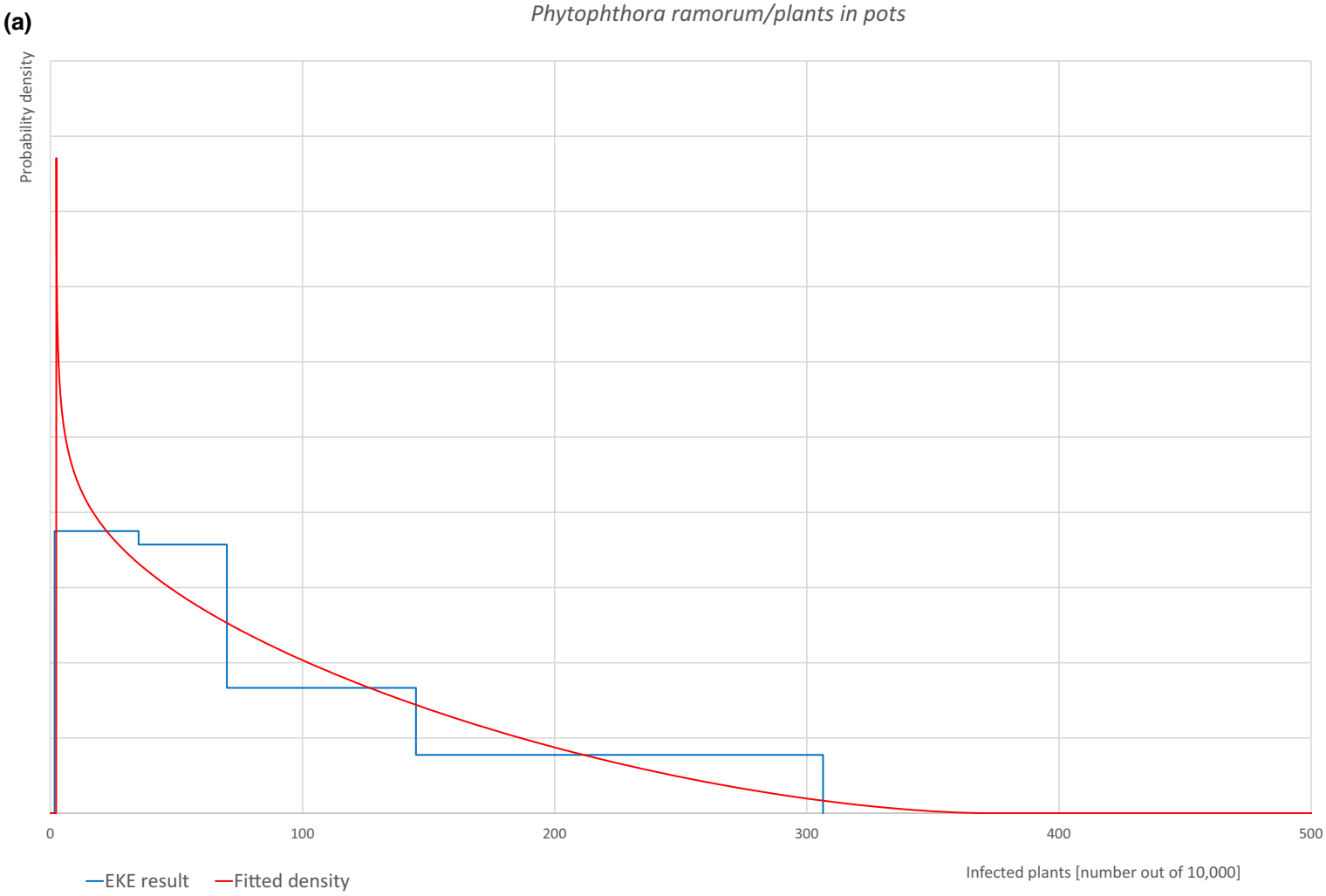
The EKE results is the BetaGeneral (0.8746, 2.6336, 2.3, 370) distribution fitted with @Risk version 7.6.

Based on the numbers of estimated infected plants the pest freedom was calculated (i.e. = 10,000 – number of infected plants per 10,000). The fitted values of the uncertainty distribution of the pest freedom are shown in Table A.48.

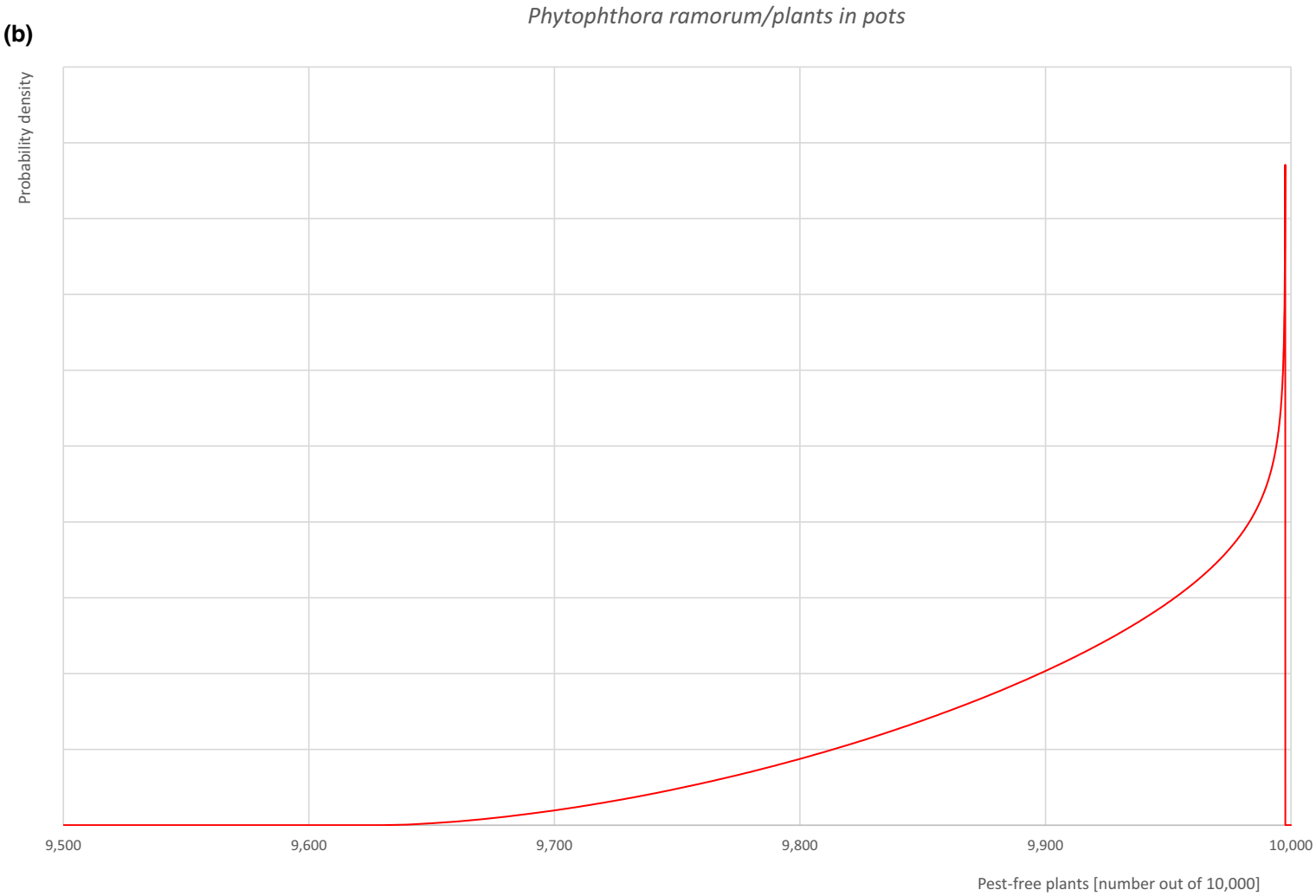
Table A.48: The uncertainty distribution of plants free of *Phytophthora ramorum* per 10,000 plants calculated by Table A.47

Percentile	1%	2.5%	5%	10%	17%	25%	33%	50%	67%	75%	83%	90%	95%	97.5%	99%
Values	9,700					9,855		9,930		9,965					9,997
EKE results	9,699	9,728	9,757	9,794	9,828	9,860	9,885	9,924	9,955	9,968	9,979	9,988	9,993	9,996	9,997

The EKE results are the fitted values.


(a)
Phytophthora ramorum/plants in pots
Probability density
0
100
200
300
400
500
Infected plants [number out of 10,000]
EKE result
Fitted density

(b)


Phytophthora ramorum/plants in pots
Probability density
9,500
9,600
9,700
9,800
9,900
10,000
Pest-free plants [number out of 10,000]

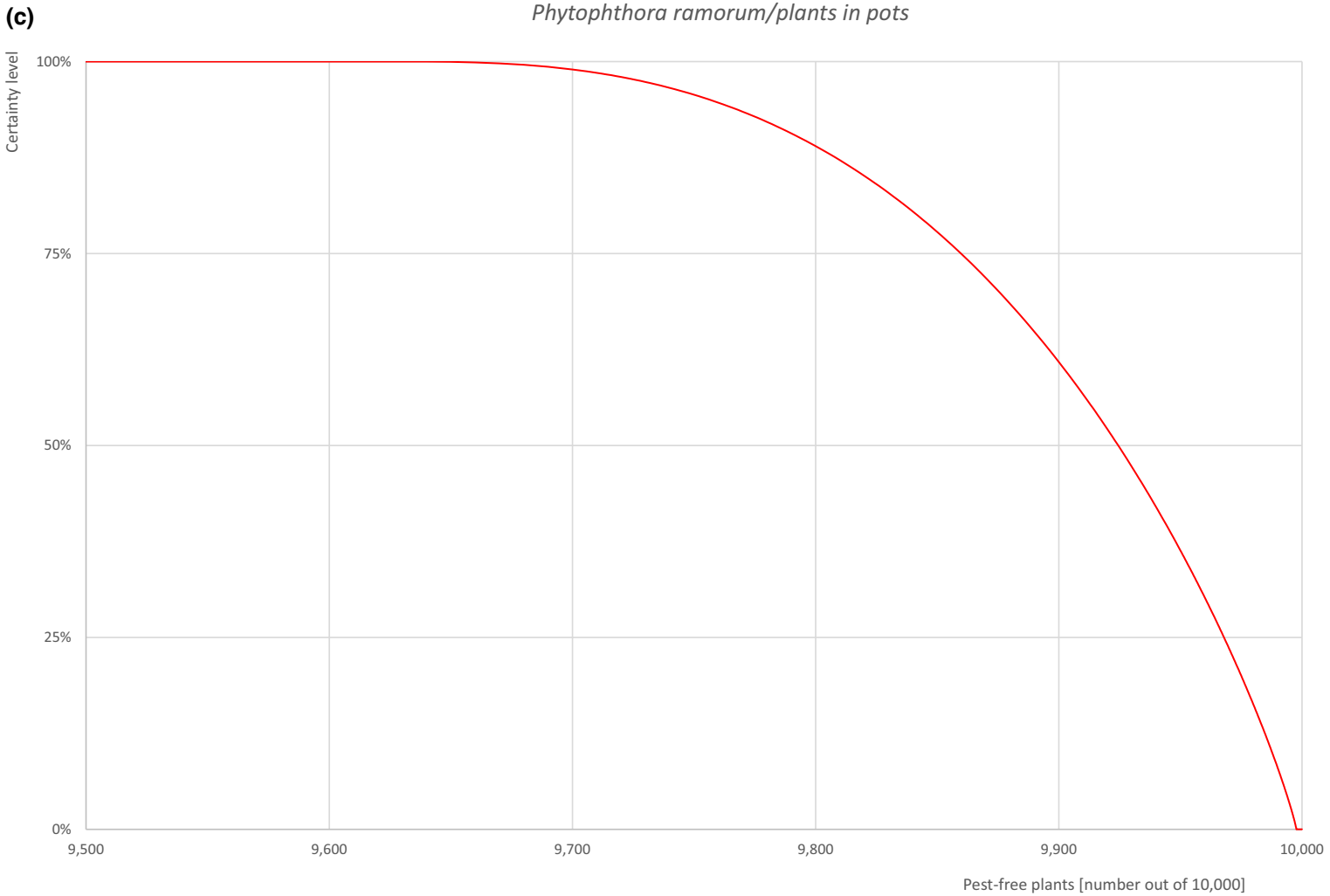


Figure A.24: (a) Elicited uncertainty of pest infection per 10,000 plants (histogram in blue – vertical blue line indicates the elicited percentile in the following order: 1%, 25%, 50%, 75%, 99%) and distributional fit (red line); (b) uncertainty of the proportion of pest-free plants per 10,000 (i.e. = 1 – pest infection proportion expressed as percentage); (c) descending uncertainty distribution function of pest infection per 10,000 plants

A.8.8. Reference list

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A.9. *Scirtothrips dorsalis*

A.9.1. 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 of Commission Implementing Regulation (EU) 2019/2072 as *Scirtothrips dorsalis* Hood [SCITDO]. *Scirtothrips dorsalis* is included in the EPPO A2 list (EPPO, online_a). The species is a quarantine pest in Israel, Mexico, Morocco and Tunisia. It is on A1 list of Brazil, Chile, Egypt, Kazakhstan, Russia, Türkiye, Ukraine, the UK and EAEU (Eurasian Economic Union – Armenia, Belarus, Kazakhstan, Kyrgyzstan and Russia). It is on A2 list of Bahrain (EPPO, online_b).
Pest status in the UK	*Scirtothrips dorsalis* was found for the first time in the UK in December 2007 in a greenhouse (Palm House) at Royal Botanic Garden Kew in South England (Scott-Brown et al., 2018). Since 2008 the discovered population has been under official control by the plant health authorities with the objective of achieving complete eradication (Collins, 2010). Eradication measures were applied and since 2019 the pest was no longer found (EPPO, online_c). According to the Dossier Section 5.0 *S. dorsalis* is present: not widely distributed and under official control. This is a regulated quarantine pest for GB. It has been found in one tropical glasshouse at Kew (Botanic Gardens, Richmond, London), and at no other location. It has been subject to control measures for many years, and there have been no recent records – last official records are from 2012. It is possible that this pest has been eradicated, but the UK is unable to officially confirm this at this time. Therefore, the Panel cannot exclude that the pest is still present in the UK.
Pest status in the EU	*Scirtothrips dorsalis* is present with restricted distribution in Spain and transient in the Netherlands (EPPO, online_c). According to EUROPHYT Oubreaks database (online) there were three outbreaks, which are under eradication: 1) in the Netherlands (2019) on plants for planting of *Podocarpus;* 2) in Spain (2016) on plants of citrus and pomegranate; 3) in Spain (2019) in mango greenhouses. *Scirtothrips dorsalis* is continuously intercepted in the EU points-of-entry on different commodities: plants for planting; cut flowers and branches with foliage; fruits and vegetables (EUROPHYT/TRACES-NT, online).

Host status on *Acer*	*Acer palmatum* is reported host of *S. dorsalis* (Ohkubo, 1995; CABI, online). *Scirtothrips dorsalis* is a pest of other *Acer* species such as *A. buergerianum* and *A. sieboldianum* (Ohkubo, 1995; CABI, online). There is no information on whether *S. dorsalis* can also attack *A. campestre*.
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); – Scientific opinion on the commodity risk assessment of *Jasminum polyanthum* plants from Israel (EFSA PLH Panel, 2020); – Scientific Opinion on the commodity risk assessment of *Ficus carica* plants from Israel (EFSA PLH Panel, 2021a); – Scientific Opinion on the commodity risk assessment of *Persea americana* from Israel (EFSA PLH Panel, 2021b); – Scientific Opinion on the commodity risk assessment of *Jasminum polyanthum* unrooted cuttings from Uganda (EFSA PLH Panel, 2022a); – Scientific Opinion on the commodity risk assessment of *Ligustrum delavayanum* topiary plants grafted on *Ligustrum japonicum* from the UK (EFSA PLH Panel, 2022b); – UK Risk Register Details for *Scirtothrips dorsalis* (DEFRA, online).
Other relevant information for the assessment	
Biology	*Scirtothrips dorsalis* is a thrips present in Africa (Cote d'Ivoire, Kenya, Uganda), Asia (Bangladesh, Brunei Darussalam, China, India, Indonesia, Iran, Israel, Japan, Malaysia, Myanmar, North Korea, Pakistan, Philippines, South Korea, Sri Lanka, Taiwan, Thailand, Vietnam), Europe (the Netherlands, Spain, Türkiye, the UK), North America (Caribbean, Florida, Georgia, Hawaii, Mexico, Texas), Oceania (Australia, Papua New Guinea, Solomon Islands) and South America (Brazil, Colombia, French Guiana, Suriname, Venezuela) (CABI, online; EPPO, online_c). In the literature its origin is contradictory, it is reported as either native to Asia, Australasia or South Africa. For more details refer to Mound and Palmer (1981), Seal et al. (2006), Hoddle et al. (2008), Kumar et al. (2013) and CABI (online). According to Dickey et al. (2015) *S. dorsalis* is a species complex that includes at least nine cryptic species and two morphologically distinguishable species (*S. oligochaetus* and *S. aff. dorsalis*). *Scirtothrips dorsalis* develops through five life stages: egg, larva (two instars), prepupa, pupa and adult (Dev, 1964; Kumar et al., 2013). They can be found on all the aboveground plant parts (Kumar et al., 2014), and they damage young leaves, buds, tender stems and fruits by sucking tender tissues with their stylets (Kumar et al., 2013). Temperature thresholds for development are 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 13–15 days (Kumar et al., 2013, citing others). *Scirtothrips dorsalis* can have annually up to 8 generations in Japan (Tatara, 1994). In the US it was estimated by a degree day model that in some of the southern states the thrip can potentially have up to 18 generations per year (Nietschke et al., 2008). *Scirtothrips dorsalis* can reproduce both sexually and by haplo-diploid parthenogenesis, with females developing from fertilised and males from unfertilised eggs (Dev, 1964). Female can lay between 60 and 200 eggs (Seal and Klassen, 2012), which are inserted into soft plant tissues of buds and young leaves near the mid rib or into the veins. But sometimes they are also laid into older leaves (Dev, 1964). The eggs hatch in 6–8 days (Seal and Klassen, 2012). Eggs are glassy white about 0.25 mm long and 0.1 mm wide. First and second instar larvae are white,

		yellow to light orange and their length size ranges between 0.29–0.32 and 0.48–0.59 mm, respectively (Dev, 1964). Prepupa is yellowish and pupa dark yellow (CABI, online) with 0.59–0.63 mm in length (Dev, 1964). Adults are pale yellow to greyish white in colour (Seal and Klassen, 2012). Female is approximately 1.05 mm long and 0.19 mm wide. Males are smaller 0.71 mm long and 0.14 mm wide (Dev, 1964). 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 (MacLeod and Collins, 2006; Kumar et al., 2013). Prepupa and pupa stages never feed (Tatara, 1994). Adults fly actively for short distances – tens of metres (Masui, 2007a) and passively on wind currents, which enables long-distance spread (EFSA PLH Panel, 2014). They overwinter as adults (Okada and Kudo, 1982) in bark, litter, soil and protected in plant parts (Shibao, 1991; Holtz, 2006). The thrips cannot survive if the temperature remains below – 4°C for 5 or more days (Nietschke et al., 2008). *Scirtothrips dorsalis* is a vector of plant viruses including capsicum chlorosis virus (CaCV), chilli leaf curl virus (CLC), melon yellow spot virus (MYSV), peanut chlorotic fan virus (PCFV), peanut necrosis virus (PBNV), peanut yellow spot virus (PYSV), tobacco streak virus (TSV) and watermelon silver mottle virus (WsMoV) (Satyanarayana et al., 1996; Rao et al., 2003; Seal et al., 2010; Kumar et al., 2013). However, these viruses are not reported to infect *Acer* species. Possible pathways of entry for *S. dorsalis* are plants for planting, cut flowers, fruits, vegetables, soil and growing media (EFSA PLH Panel, 2014). *Scirtothrips dorsalis* causes economic loses to chilli (*Capsicum annuum*) in India with yield loss estimated between 61–74% (Kumar et al., 2013, citing others), mango in Malaysia (Aliakbarpour et al., 2010), vegetables in China and the US (Reitz et al., 2011), tea, grapevine and citrus in Japan (Tatara, 1994, citing others; Masui, 2007b). No information is available about damage on *Acer* species.
Symptoms	**Main type of symptoms**	According to Dev (1964) and Kumar et al. (2013; 2014) main symptoms caused by *S. dorsalis* 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; – corky tissues on fruits; – grey to black markings on fruits; – fruit distortion; – early senescence of leaves; – defoliation. When the population is high, thrips may feed on the upper surfaces of leaves and cause defoliation and yield loss (Kumar et al., 2013). There is no information on the symptoms caused to *Acer* plants.
	Presence of asymptomatic plants	Plant damage might not be obvious in early infestation or during dormancy (due to absence of leaves). The presence of *S. dorsalis* on the plants could hardly be observed.
	Confusion with other pests	Plants infested by *S. dorsalis* appear similar to plants damaged by the feeding of broad mites (Kumar et al., 2013). 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).

Host plant range	*Scirtothrips dorsalis* is a polyphagous pest with more than 100 reported hosts (Kumar et al., 2013). The pest can infest many more plant species, but they are not considered true hosts, since the pest cannot reproduce on them (EFSA PLH Panel, 2014). Some of the many hosts of *Scirtothrips dorsalis* are (alphabetically): *Abelmoschus esculentus*, *Acacia auriculiformis*, *Acacia brownii*, *Acer palmatum*, *A. buergerianum, A. sieboldianum, Actinidia deliciosa*, *Allium cepa*, *Allium sativum*, *Anacardium occidentale*, *Arachis hypogaea*, *Asparagus officinalis*, *Beta vulgaris*, *Camellia sinensis*, *Capsicum annuum*, *Capsicum frutescens*, *Citrus* spp., *Citrus aurantiifolia*, *Citrus sinensis*, *Cucumis melo*, *Cucumis sativus*, *Cucurbita pepo*, *Dahlia pinnata*, *Dimocarpus longan*, *Diospyros kaki*, *Fagopyrum esculentum*, *Ficus* spp., *Ficus carica*, *Fragaria* spp., *Fragaria ananassa*, *Fragaria chiloensis*, *Glycine max*, *Gossypium* spp., *Gossypium hirsutum*, *Hedera helix*, *Helianthus annuus*, *Hevea brasiliensis*, *Hydrangea* spp., *Ipomoea batatas*, *Lablab purpureus*, *Ligustrum japonicum, Litchi chinensis*, *Mangifera indica*, *Melilotus indica*, *Mimosa* spp., *Morus* spp., *Nelumbo* spp., *Nelumbo lutea*, *Nelumbo nucifera*, *Nephelium lappaceum*, *Nicotiana tabacum*, *Passiflora edulis*, *Persea americana*, *Phaseolus vulgaris*, *Populus deltoides*, *Portulaca oleracea*, *Prunus* spp., *Prunus persica*, *Punica granatum*, *Pyrus* spp., *Ricinus communis*, *Rosa* spp., *Rubus* spp., *Saraca* spp., *Solanum* spp., *Solanum lycopersicum*, *Solanum melongena*, *Solanum nigrum*, *Syzygium samarangense*, *Tamarindus indica*, *Viburnum* spp., *Vigna radiata*, *Vitis* spp., *Vitis vinifera*, *Zea mays* subsp. *mays* and *Ziziphus mauritiana* (Ohkubo, 1995; Hodges et al., 2005; Kumar et al., 2014; CABI, online). For a full host list refer to Ohkubo (1995), Hodges et al. (2005), Kumar et al. (2014), CABI (online).
Reported evidence of impact	*Scirtothrips dorsalis* is an EU quarantine pest.
Evidence that the commodity is a pathway	*Scirtothrips dorsalis* is continuously intercepted in the EU on different commodities including plants for planting (EUROPHYT/TRACES-NT, online) and according to EFSA PLH Panel (2014), *S. dorsalis* can travel with plants for planting. Therefore, plants for planting are possible pathways of entry for *S. dorsalis*.
Surveillance information	*Scirtothrips dorsalis* has been found in one tropical glasshouse at Kew (Botanic Gardens, Richmond, London), and at no other location. This pest has been subject to control measures for many years, and there have been no recent records. FERA diagnostics records show that sticky trap surveys at Kew were carried out in Nov 2007; Jan 2008; Sept 2022; Oct 2022 and Nov 2022 - all proved negative for the presence of this pest. It is possible that this pest has been eradicated, but the UK is unable to officially confirm this at this time (Dossier Section 3.0).

A.9.2. Possibility of pest presence in the nursery

A.9.2.1. Possibility of entry from the surrounding environment

Scirtothrips dorsalis was found in a greenhouse at Kew Gardens in South England in 2007 (Scott-Brown et al., 2018) and since then it has been under official control (Dossier Section 5.0), although last official records are from 2012. However, there is no information of the thrips being able to spread beyond the greenhouse.

The possible entry of *S. dorsalis* from surrounding environment to the nurseries may occur through adult dispersal and passively on wind currents (EFSA PLH Panel, 2014).

Scirtothrips dorsalis is polyphagous species that can infest a number of different plants. Suitable hosts of *S. dorsalis* like *Acer* spp., *Beta vulgaris*, *Camellia* spp., *Capsicum annuum*, *Hedera* spp., *Morus* spp., *Populus* spp., *Prunus* spp., *Rhododendron* spp., *Rosa* spp., *Solanum lycopersicum, Viburnum* spp. and *Zea mays* are present within 2 km from the nurseries.

Uncertainties:

- Presence of the thrips in the UK.
- Possibility of spread beyond the infested greenhouse.
- Possibility of the thrips to survive the UK winter and summer in outdoor conditions.

Taking into consideration the above evidence and uncertainties, the Panel cannot exclude that the pest is present in the surrounding environment and can enter the nurseries, even though it was found only in one greenhouse. In the surrounding area, suitable hosts are present and the pest can spread by wind and adult flight.

A.9.2.2. Possibility of entry with new plants/seeds

The starting materials are either seeds, seedlings or scion woods/buds. Seeds are certified and coming from the UK. Seedlings are either from the UK, the EU (mostly the Netherlands) or New Zealand (Dossier Section 3.0). Seeds are not a pathway for the thrips.

In addition to *Acer* plants, the nurseries also produce other plants (Dossier Section 6.0). Out of them, there are many suitable hosts for the thrips (such as *Euphorbia* spp., *Gaura* spp., *Hedera* spp., *Ligustrum* spp., *Pittosporum* spp., *Populus* spp., *Prunus* spp., *Rosa* spp., etc.). However, there is no information on how and where the plants are produced. Therefore, if the plants are first produced in another nursery, the thrips could possibly travel with them.

According to Shibao (1991) and Holtz (2006), adults overwinter in leaf litter and potting soil. The nurseries are using virgin peat or peat-free compost (a mixture of coir, tree bark, wood fibre, etc.) as a growing media (Dossier Section 1.0).

Uncertainties:

- No information is available on the provenance of plants other than *Acer* used for plant production in the nurseries.

Taking into consideration the above evidence and uncertainties, the Panel considers that it is possible for the pest to enter the nurseries with new seedlings of *Acer* and new plants of other species used for plant production in the area. The entry of the pest with seeds and the growing media the Panel considers as not possible.

A.9.2.3. Possibility of spread within the nursery

Acer plats are either grown in containers (cells, pots, tubes, etc.) outdoors/ in the open air or in field. Cell grown trees may be grown in greenhouses, however most plants will be field grown or field grown in containers (Dossier Section 1.0). There are no mother plants present in the nurseries (Dossier Section 3.0).

The thrips can attack other suitable plants (such as *Euphorbia* spp., *Gaura* spp., *Hedera* spp., etc.), present within the nurseries and hedges surrounding the nurseries (*Hedera* spp. and *Prunus* spp.) (Dossier Sections 3.0 and 6.0).

The thrips within the nurseries can spread by adult flight, wind or infested soil. Spread within the nurseries through equipment and tools is not relevant.

Uncertainties:

- Possibility of the thrips to survive the UK winter in outdoor conditions.
- Possibility of different plant host species for trade.
- Possibility that polytunnels are used in a way that allows the pest to overwinter.

Taking into consideration the above evidence and uncertainties, the Panel considers that the spread of the pest within the nurseries is possible either by wind, active flight or infested soil.

A.9.3. Information from interceptions

In the EUROPHYT/TRACES-NT database there are no records of notification of *Acer* plants for planting neither from the UK nor from other countries due to the presence of *Scirtothrips dorsalis* between the years 1995 and December 2022 (EUROPHYT/TRACES-NT, online).

A.9.4. Evaluation of the risk mitigation measures

In the table below, all risk mitigation measures currently applied in the UK are listed and an indication of their effectiveness on *Scirtothrips dorsalis* is provided. The description of the risk mitigation measures currently applied in the UK is provided in the Table 6.

N	Risk mitigation measure	Effect on the pest	Evaluation and uncertainties
1	Registration of production sites	Yes	As the plant passport is very similar to the EU one, the *Acer* plants shall be free from quarantine pests. Uncertainties: – None.
2	Physical separation	No	Not relevant. Physical separation is not a barrier for *S. dorsalis* because the adults can fly.
3	Certified plant material	Yes	The measure is effective against the pest. Uncertainties: – None.
4	Growing media	No	Not relevant. *Scirtothrips dorsalis* is not present in soil.
5	Surveillance, monitoring and sampling	Yes	Although the incoming plant material is thoroughly checked, later infestation by *S. dorsalis* can go undetected, because its small size. Uncertainties: – Capacity of detection of the pest on *Acer* plants.
6	Hygiene measures	Yes	Weeding can have some effect on the reduction of *Scirtothrips* populations. The other measures are not relevant. Uncertainties: – None.
7	Removal of infested plant material	Yes	Removal of generically damaged plants will reduce the probability of carrying *S. dorsalis*. Uncertainties: – None.
8	Irrigation water	No	Not relevant.
9	Application of pest control products	Yes	Chemical control measures adopted when the pest is found may have a substantial effect of pest suppression. Uncertainties: – Thrips are difficult to control with chemicals because of hidden habits and potential resistance.
10	Measures against soil pests	No	Not relevant.
11	Inspections and management of plants before export	Yes	Inspection should detect *S. dorsalis* as symptoms are clear. Uncertainties: – Capacity of detecting symptoms at low pest density.
12	Separation during transport to the destination	No	Not relevant. *Acer* plants are not individually separated during transportation. The pest can infest other plants carrying leaves.

A.9.5. Overall likelihood of pest freedom for bundles of whips and seedlings

A.9.5.1. Reasoning for a scenario which would lead to a reasonably low number of infested bundles of whips and seedlings

This scenario assumes absence of the pest in the nurseries and the surrounding as the species was never recorded again after the first detection in the palm house at Kew Garden and it has been never found outside of the greenhouse.

A.9.5.2. Reasoning for a scenario which would lead to a reasonably high number of infested bundles of whips and seedlings

This scenario assumes the pest is present in the nurseries and the surrounding although with very low density and low capacity to adapt to the local climatic conditions.

A.9.5.3. Reasoning for a central scenario equally likely to over- or underestimate the number of infested bundles of whips and seedlings (Median)

This scenario assumes that the presence of the pest in the nurseries is skewed to the lower values because the conditions for its survival and spread are generally not met. The lack of finding after the first detection indicates a likely absence of the pest and its low capacity to establish on *Acer* plants in the growing conditions indicated in the Dossier.

A.9.5.4. Reasoning for the precision of the judgement describing the remaining uncertainties (1st and 3rd quartile/interquartile range)

The Panel assumes a high uncertainty in the first quartile, and a medium uncertainty above the median, because symptoms are generic and require an expert identification integrated with molecular methods.

A.9.5.5. Elicitation outcomes of the assessment of the pest freedom for *Scirtothrips dorsalis* on bundles of whips and seedlings

The following Tables show the elicited and fitted values for pest infestation (Table A.49) and pest freedom (Table A.50).

Table A.49: Elicited and fitted values of the uncertainty distribution of pest infestation by *Scirtothrips dorsalis* per 10,000 bundles

Percentile	1%	2.5%	5%	10%	17%	25%	33%	50%	67%	75%	83%	90%	95%	97.5%	99%
Elicited values	0					1		3		6					20
EKE	0.0175	0.0548	0.131	0.314	0.609	1.04	1.56	2.88	4.80	6.15	8.05	10.4	13.5	16.4	20.0

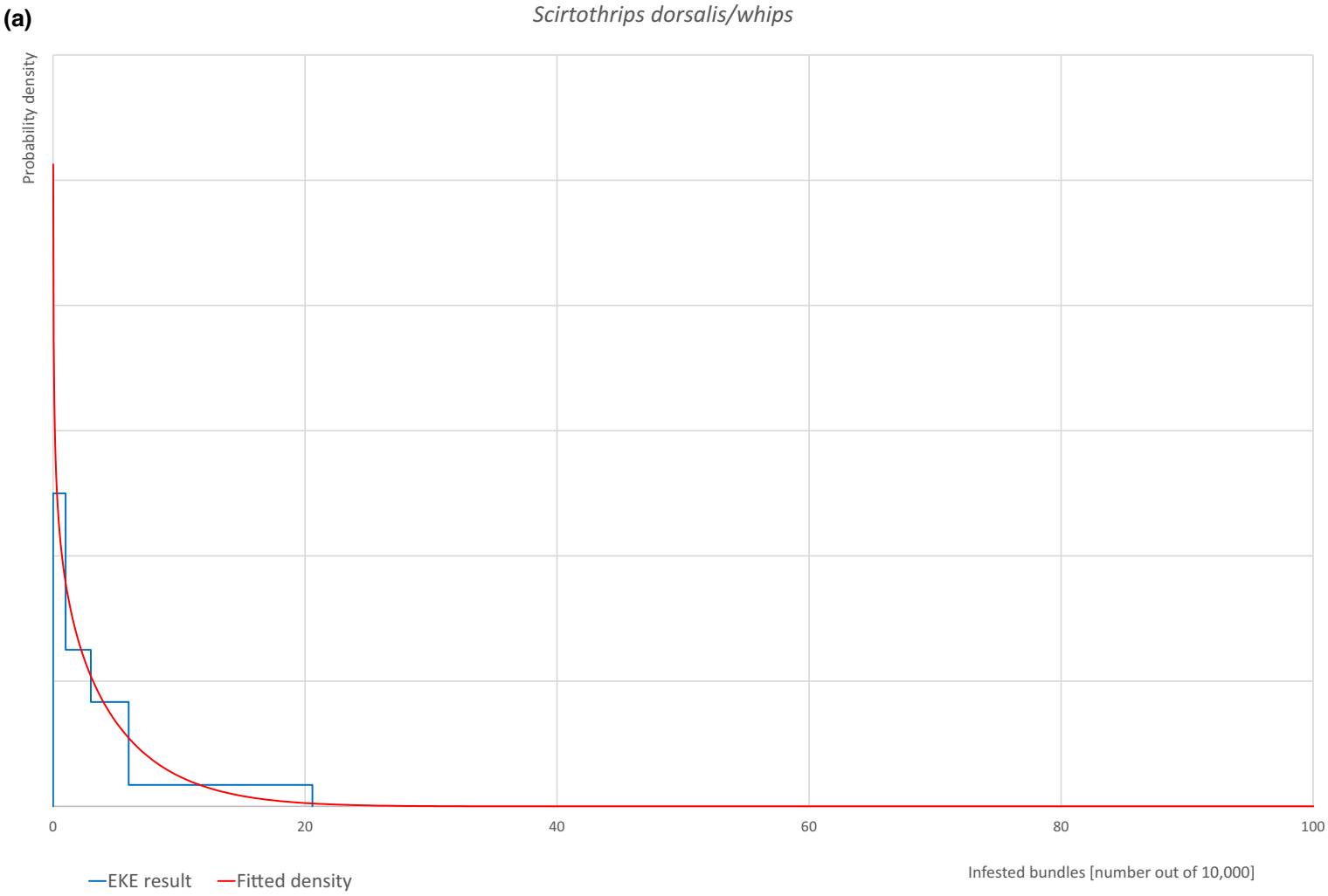
The EKE results is the BetaGeneral (0.80489, 10.921, 0, 63) distribution fitted with @Risk version 7.6.

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

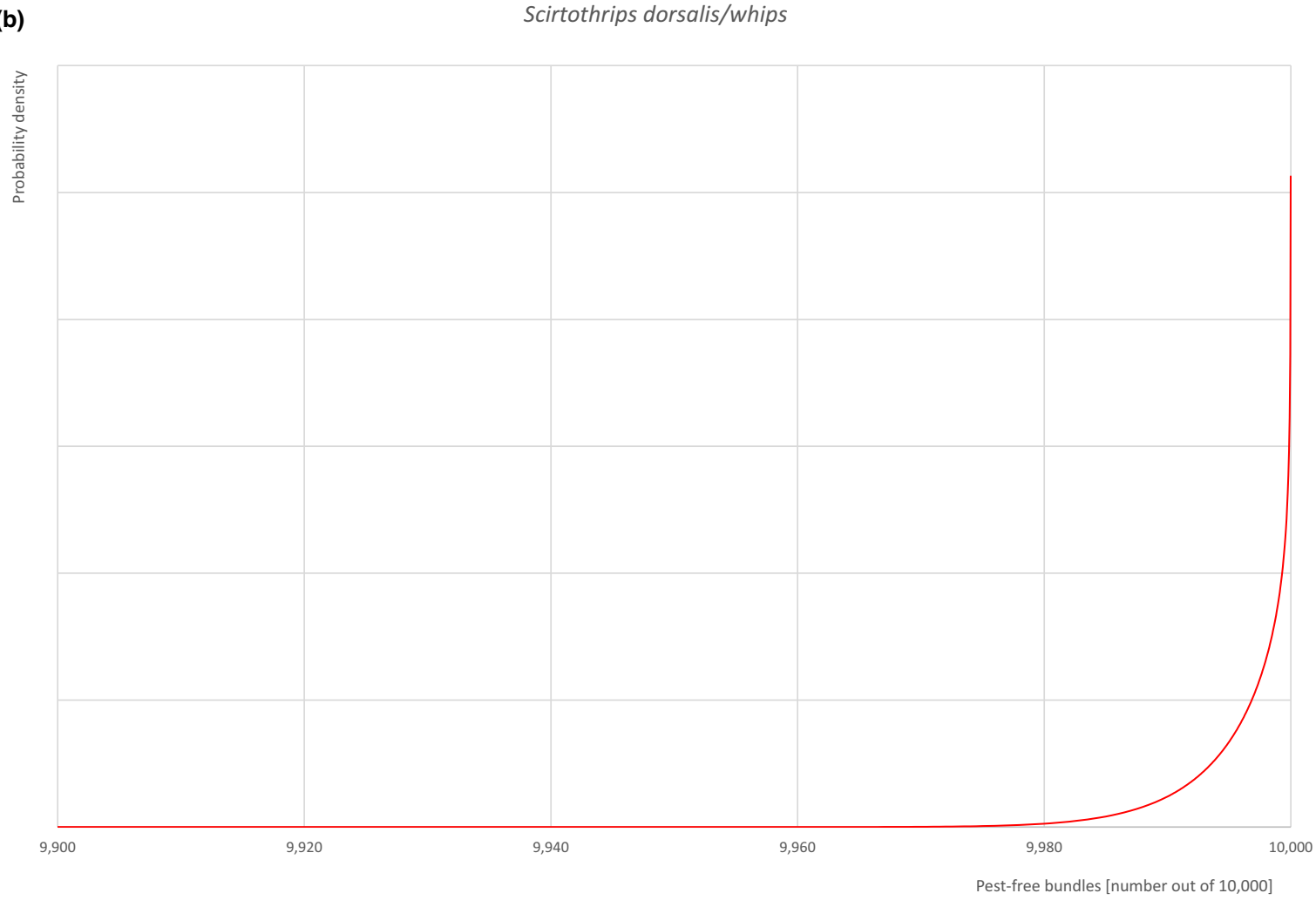
Table A.50: The uncertainty distribution of bundles free of *Scirtothrips dorsalis* per 10,000 bundles calculated by Table A.49

Percentile	1%	2.5%	5%	10%	17%	25%	33%	50%	67%	75%	83%	90%	95%	97.5%	99%
Values	9,980					9,994		9,997		9,999					10,000
EKE results	9,980	9,984	9,987	9,990	9,992	9,994	9,995	9,997	9,998	9,999.0	9,999.4	9,999.7	9,999.87	9,999.95	9,999.98

The EKE results are the fitted values.


(a)
Scirtothrips dorsalis/whips
Probability density
0
20
40
60
80
100
Infested bundles [number out of 10,000]
EKE result
Fitted density

(b)


Scirtothrips dorsalis/whips
Probability density
9,900
9,920
9,940
9,960
9,980
10,000
Pest-free bundles [number out of 10,000]

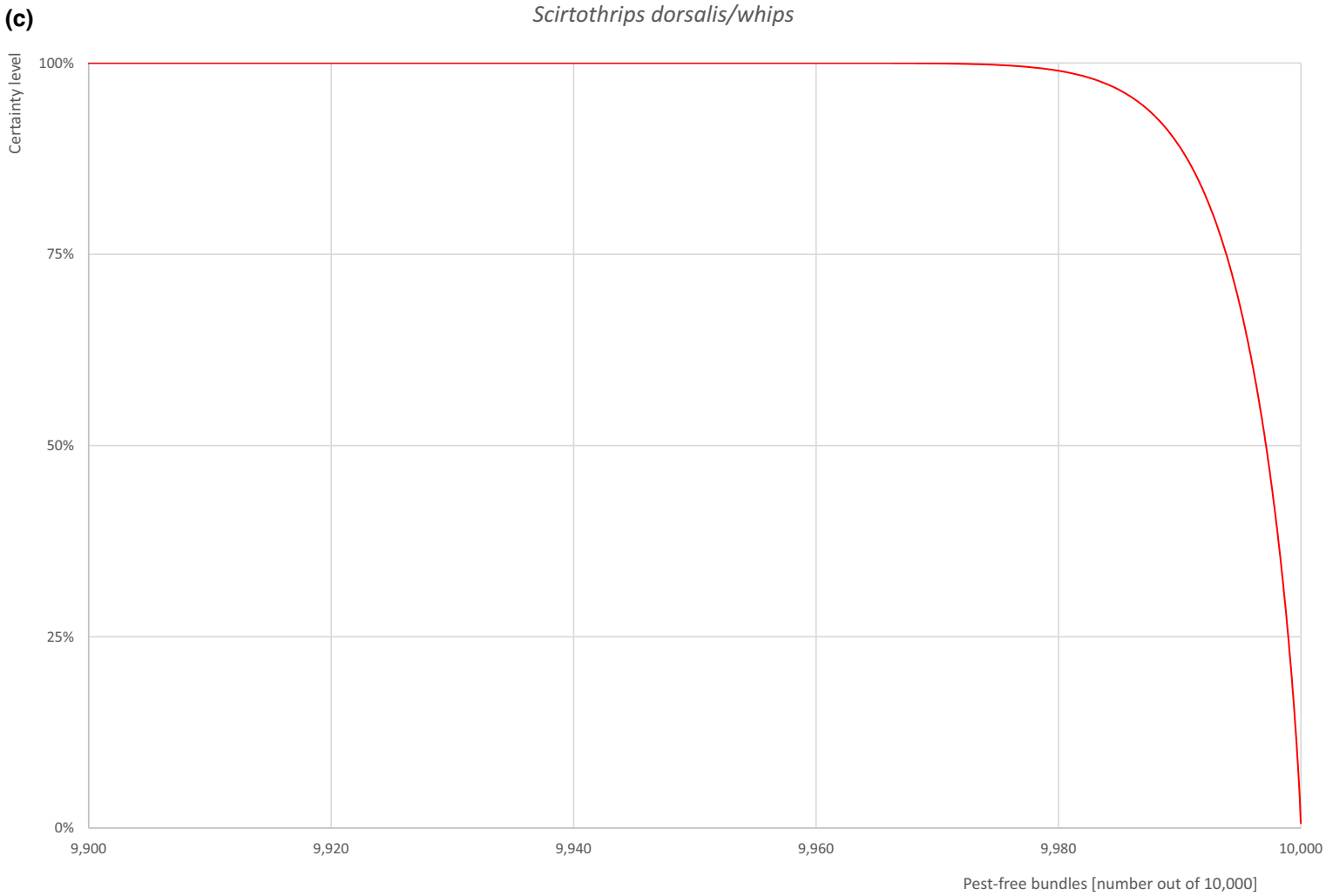


Figure A.25: (a) Elicited uncertainty of pest infestation per 10,000 bundles (histogram in blue – vertical blue line indicates the elicited percentile in the following order: 1%, 25%, 50%, 75%, 99%) and distributional fit (red line); (b) uncertainty of the proportion of pest-free bundles per 10,000 (i.e.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

A.9.6. Overall likelihood of pest freedom for bare root plants/trees up to 7 years old

A.9.6.1. Reasoning for a scenario which would lead to a reasonably low number of infested bare root plants/trees up to 7 years old

This scenario assumes absence of the pest in the nurseries and the surrounding as the species was never recorded again after the first detection in the palm house at Kew Garden and it has been never found outside of the greenhouse.

A.9.6.2. Reasoning for a scenario which would lead to a reasonably high number of infested bare root plants/trees up to 7 years old

This scenario assumes the pest is present in the nurseries and the surrounding although with very low density and low capacity to adapt to the local climatic conditions. Older plants could carry a higher number of leaves promoting the establishment of the pest if present in the surroundings.

A.9.6.3. Reasoning for a central scenario equally likely to over- or underestimate the number of infested bare root plants/trees up to 7 years old (Median)

This scenario assumes that the presence of the pest in the nurseries is skewed to the lower values because the conditions for its survival and spread are generally not met. The lack of finding after the first detection indicates a likely absence of the pest and its low capacity to establish on *Acer* plants in the growing conditions indicated in the Dossier.

A.9.6.4. Reasoning for the precision of the judgement describing the remaining uncertainties (1st and 3rd quartile/interquartile range)

The Panel assumes a high uncertainty in the first quartile, and a medium uncertainty above the median, because symptoms are generic and require an expert identification integrated with molecular methods.

A.9.6.5. Elicitation outcomes of the assessment of the pest freedom for *Scirtothrips dorsalis* on bare root plants/trees up to 7 years old

The following Tables show the elicited and fitted values for pest infestation (Table A.51) and pest freedom (Table A.52).

Table A.51: Elicited and fitted values of the uncertainty distribution of pest infestation by *Scirtothrips dorsalis* 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					2		4		7					20
EKE	0.1741	0.3356	0.558	0.943	1.42	2.01	2.61	3.99	5.79	7.02	8.69	10.8	13.5	16.2	19.7

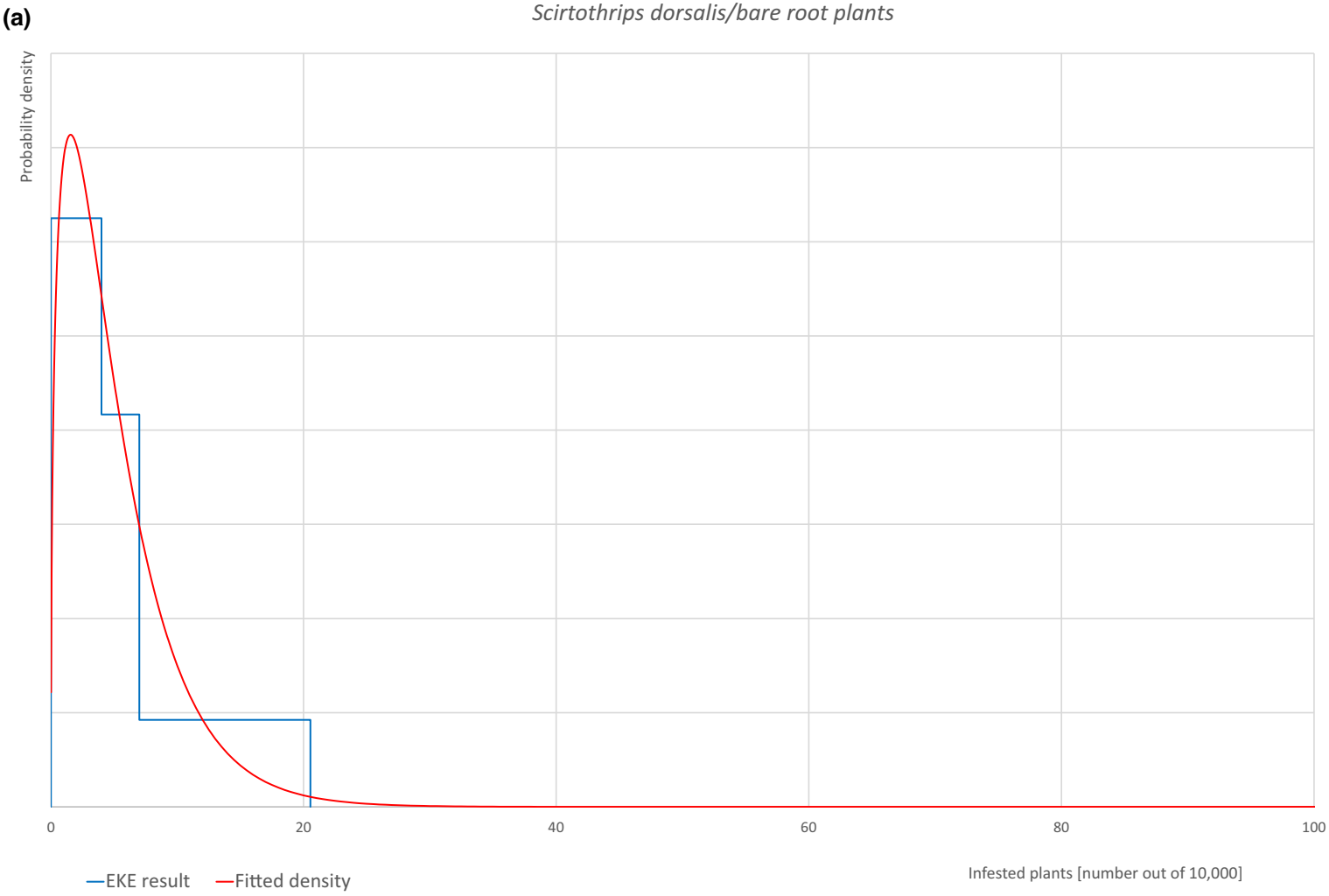
The EKE results is the BetaGeneral (1.4365, 2,808.7, 0, 10,000) distribution fitted with @Risk version 7.6.

Based on the numbers of estimated infested plants the pest freedom was calculated (i.e. = 10,000 – number of infested plants per 10,000). The fitted values of the uncertainty distribution of the pest freedom are shown in Table A.52.

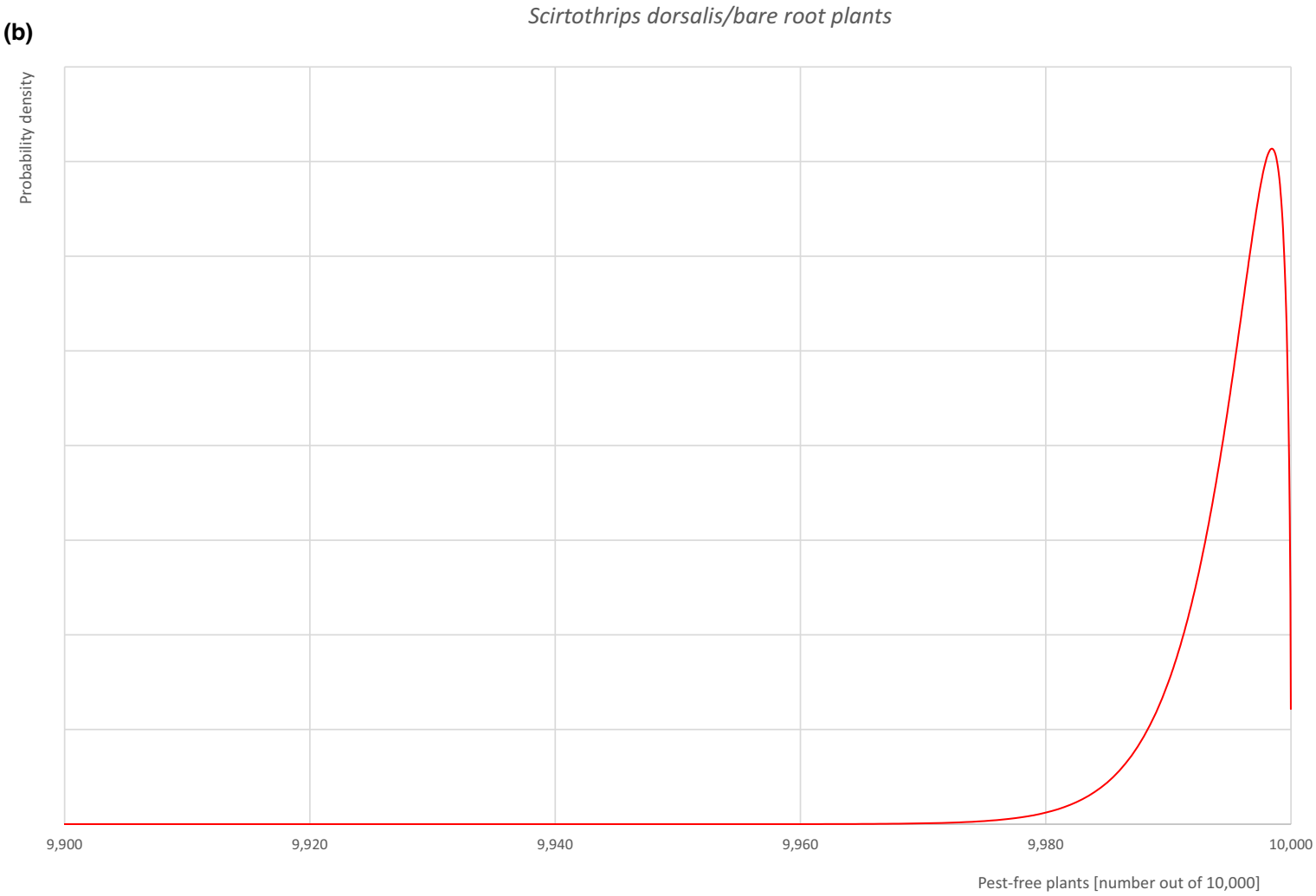
Table A.52: The uncertainty distribution of plants free of *Scirtothrips dorsalis* per 10,000 plants calculated by Table A.51

Percentile	1%	2.5%	5%	10%	17%	25%	33%	50%	67%	75%	83%	90%	95%	97.5%	99%
Values	9,980					9,993		9,996		9,998					10,000
EKE results	9,980	9,984	9,986	9,989	9,991	9,993	9,994	9,996	9,997	9,998.0	9,998.6	9,999.1	9,999.4	9,999.7	9,999.8

The EKE results are the fitted values.


(a)
Scirtothrips dorsalis/bare root plants
Probability density
0
20
40
60
80
100
EKE result
Fitted density
Infested plants [number out of 10,000]

(b)


Scirtothrips dorsalis/bare root plants
Probability density
9,900
9,920
9,940
9,960
9,980
10,000
Pest-free plants [number out of 10,000]

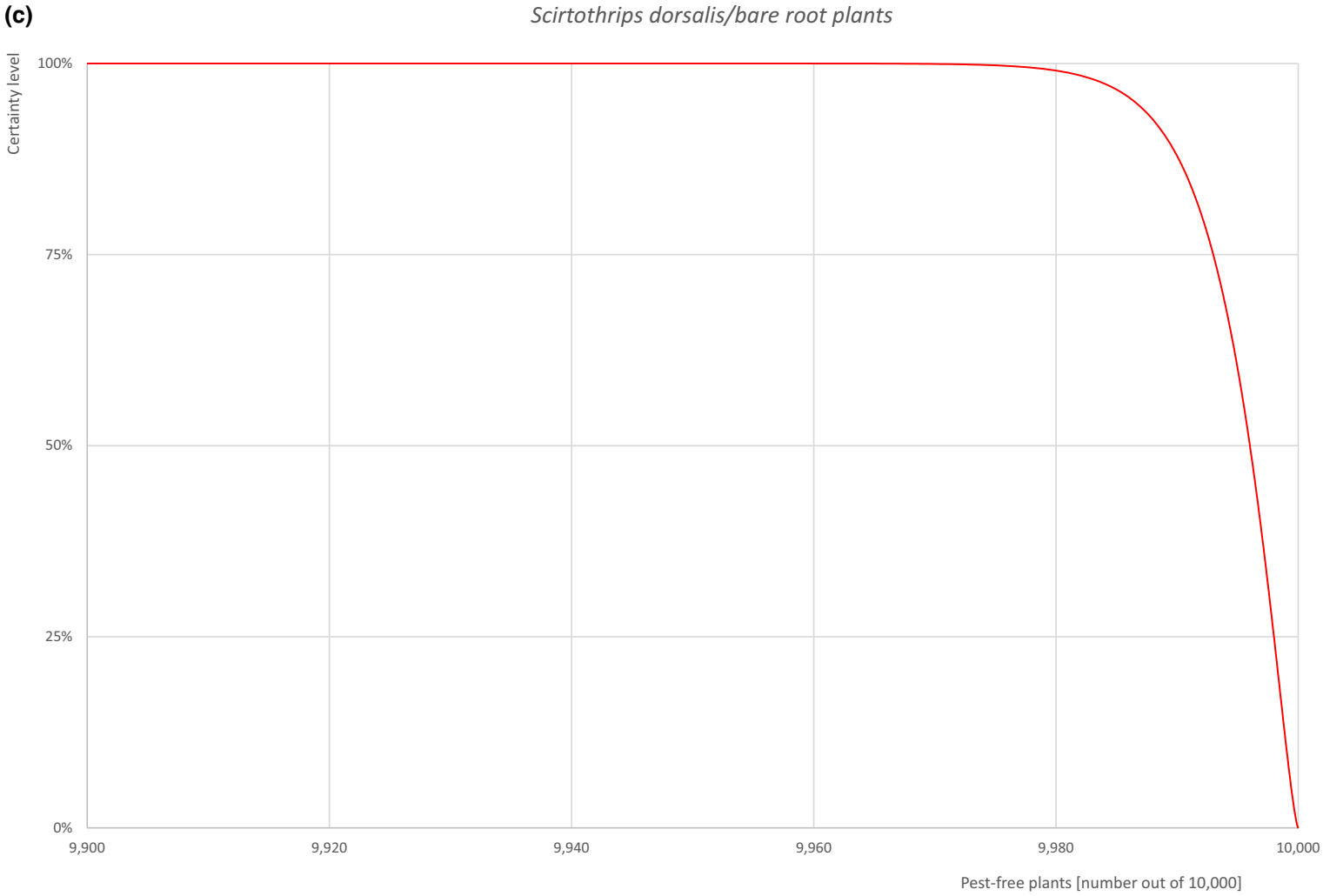


Figure A.26: (a) Elicited uncertainty of pest infestation per 10,000 plants (histogram in blue – vertical blue line indicates the elicited percentile in the following order: 1%, 25%, 50%, 75%, 99%) and distributional fit (red line); (b) uncertainty of the proportion of pest-free plants per 10,000 (i.e. = 1 – pest infestation proportion expressed as percentage); (c) descending uncertainty distribution function of pest infestation per 10,000 plants

A.9.7. Overall likelihood of pest freedom for plants in pots up to 15 years old

A.9.7.1. Reasoning for a scenario which would lead to a reasonably low number of infested plants in pots up to 15 years old

This scenario assumes absence of the pest in the nurseries and the surrounding as the species was never recorded again after the first detection in the palm house at Kew Garden and it has been never found outside of the greenhouse.

A.9.7.2. Reasoning for a scenario which would lead to a reasonably high number of infested plants in pots up to 15 years old

This scenario assumes the pest is present in the nurseries and the surrounding although with very low density and low capacity to adapt to the local climatic conditions. Older plants could carry a higher number of leaves promoting the establishment of the pest if present in the surroundings. There could be insects overwintering in the soil and these are extremely difficult to detect.

A.9.7.3. Reasoning for a central scenario equally likely to over- or underestimate the number of infested plants in pots up to 15 years old (Median)

This scenario assumes that the presence of the pest in the nurseries is skewed to the lower values because the conditions for its survival and spread are generally not met. The lack of finding after the first detection indicates a likely absence of the pest and its low capacity to establish on *Acer* plants in the growing conditions indicated in the Dossier.

A.9.7.4. Reasoning for the precision of the judgement describing the remaining uncertainties (1st and 3rd quartile/interquartile range)

The Panel assumes a high uncertainty in the first quartile, and a medium uncertainty above the median, because symptoms are generic and require an expert identification integrated with molecular methods and careful soil inspection with appropriate methods.

A.9.7.5. Elicitation outcomes of the assessment of the pest freedom for *Scirtothrips dorsalis* on plants in pots up to 15 years old

The following Tables show the elicited and fitted values for pest infestation (Table A.53) and pest freedom (Table A.54).

Table A.53: Elicited and fitted values of the uncertainty distribution of pest infestation by *Scirtothrips dorsalis* 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					2		5		9					25
EKE	0.0759	0.1893	0.380	0.774	1.33	2.07	2.88	4.83	7.44	9.20	11.56	14.4	17.9	21.1	25.0

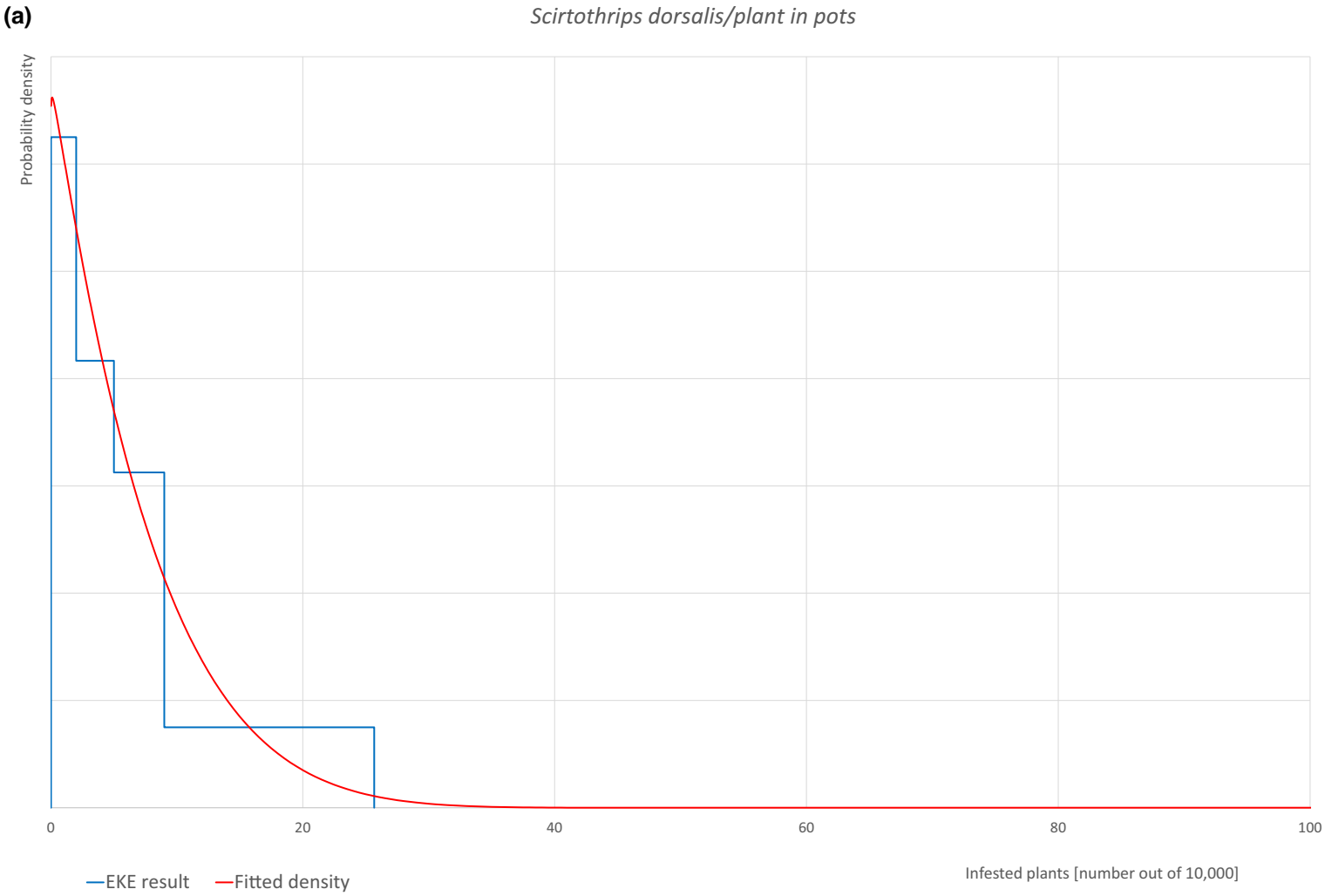
The EKE results is the BetaGeneral (1.01, 7.6454, 0, 55) distribution fitted with @Risk version 7.6.

Based on the numbers of estimated infested plants the pest freedom was calculated (i.e. = 10,000 – number of infested plants per 10,000). The fitted values of the uncertainty distribution of the pest freedom are shown in Table A.54.

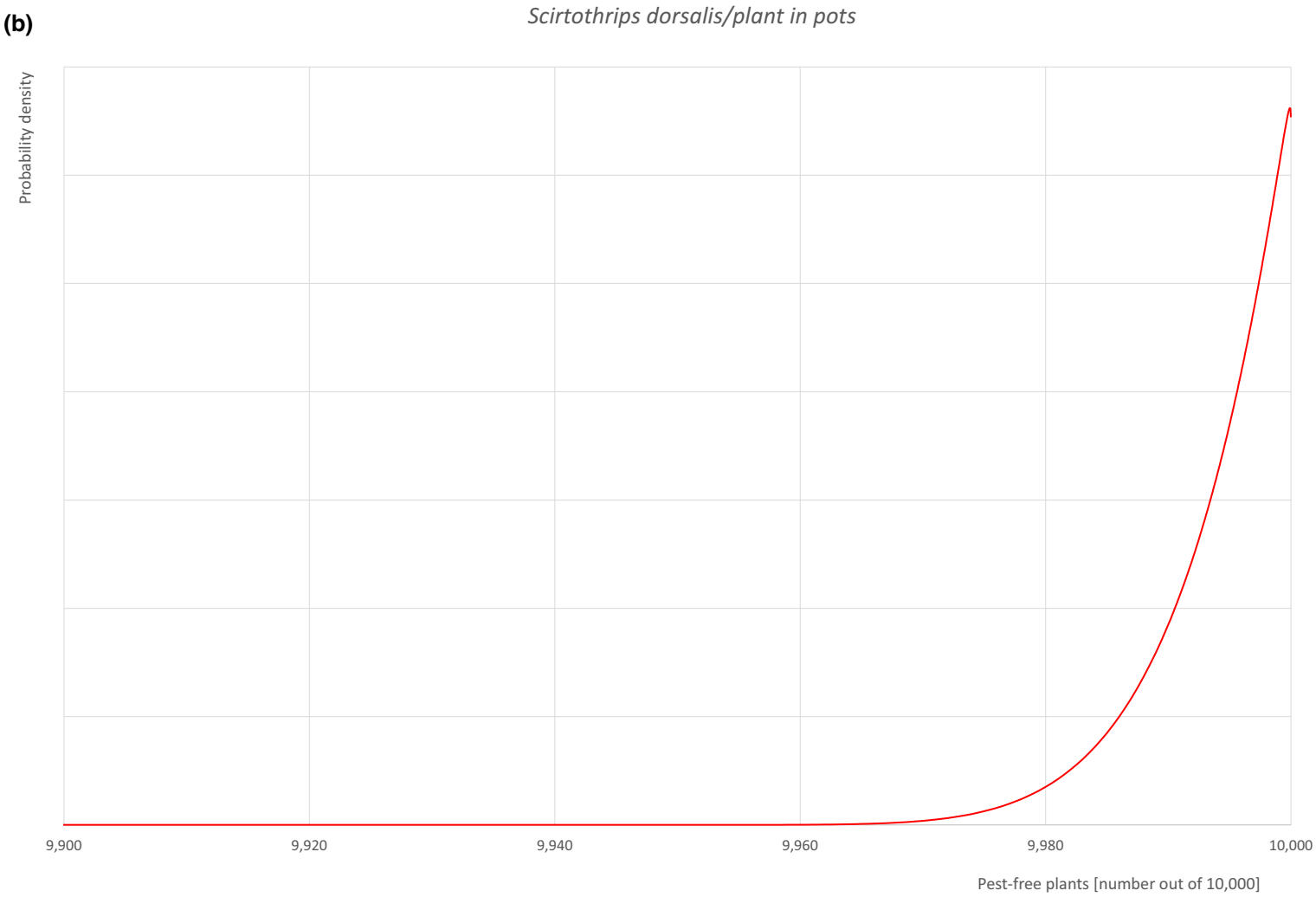
Table A.54: The uncertainty distribution of plants free of *Scirtothrips dorsalis* per 10,000 plants calculated by Table A.53

Percentile	1%	2.5%	5%	10%	17%	25%	33%	50%	67%	75%	83%	90%	95%	97.5%	99%
Values	9,975					9,991		9,995		9,998					10,000
EKE results	9,975	9,979	9,982	9,986	9,988	9,991	9,993	9,995	9,997.1	9,997.9	9,998.7	9,999.23	9,999.62	9,999.81	9,999.92

The EKE results are the fitted values.


(a)
Scirtothrips dorsalis/plant in pots
Probability density
0
20
40
60
80
100
Infested plants [number out of 10,000]
EKE result
Fitted density

(b)


Scirtothrips dorsalis/plant in pots
Probability density
9,900
9,920
9,940
9,960
9,980
10,000
Pest-free plants [number out of 10,000]

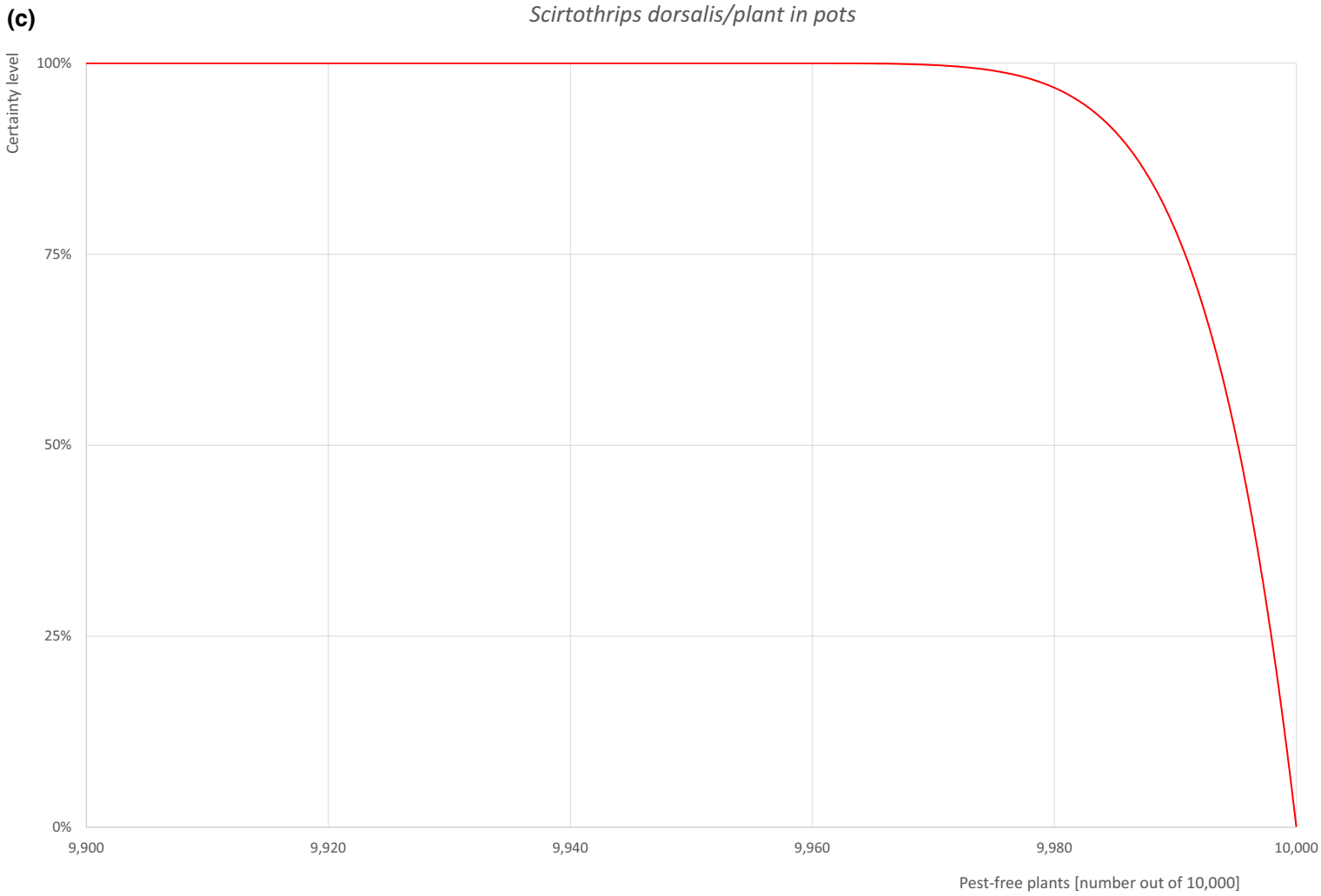


Figure A.27: (a) Elicited uncertainty of pest infestation per 10,000 plants (histogram in blue – vertical blue line indicates the elicited percentile in the following order: 1%, 25%, 50%, 75%, 99%) and distributional fit (red line); (b) uncertainty of the proportion of pest-free plants per 10,000 (i.e. = 1 – pest infestation proportion expressed as percentage); (c) descending uncertainty distribution function of pest infestation per 10,000 plants

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A.10. *Takahashia japonica*

A.10.1. Organism information

Taxonomic information	Current valid scientific name: *Takahashia japonica* Synonyms: *Pulvinaria japonica*, *Takahashia wuchangensis* Name used in the EU legislation: – Order: Hemiptera Family: Coccidae Common name: Asiatic string cottony scale, string cottony scale Name used in the Dossier: *Takahashia japonica*
Group	Insects
EPPO code	TAKAJA
Regulated status	*Takahashia japonica* is neither regulated in the EU, nor anywhere in the world. *T. japonica* meets the criteria that are within the remit of EFSA to assess for this species to be regarded as a potential Union quarantine pest (EFSA PLH Panel, 2023a).
Pest status in the UK	*Takahashia japonica* is present in the UK (Tuffen et al., 2019). The pest was recorded from West Berkshire in 2018 on *Magnolia* in a private garden (Malumphy et al., 2019; Tuffen et al., 2019). According to the Dossier Section 5.0 *T. japonica* is present in the UK: not widely distributed and not under official control.
Pest status in the EU	*Takahashia japonica* is present in Croatia and Italy (Limonta and Pellizzari, 2018; Landeka et al., 2021). In Italy the pest was first reported in 2017 from the Northern provinces of Milano and Varese. High infestations of *T. japonica* indicated that the pest was most probably introduced some years before its detection (Limonta and Pellizzari, 2018). In Croatia the pest was observed for the first time in 2019 from the city of Pula (Landeka et al., 2021) and eradication measures were applied by cutting down the infested branches and by applying insecticides (EPPO, online). There is no information whether the eradication was successful or not.
Host status on *Acer*	*Acer pseudoplatanus* (Limonta and Pellizzari, 2018), *A. buergerianum* (Wang et al., 2016), *A. negundo* and *A. pseudosieboldianum* (Suh, 2020) are reported to be hosts for *T. japonica*. There is no information on whether *A. campestre* may be a host for *T. japonica*.
PRA information	Available Pest Risk Assessments: – Scientific Opinion on the pest categorisation of *Takahashia japonica* (EFSA PLH Panel, 2023a); – Scientific Opinion on the commodity risk assessment of *Malus domestica* plants from United Kingdom (EFSA PLH Panel, 2023b); – UK Risk Register Details for *Takahashia japonica* (DEFRA, online).
Other relevant information for the assessment	
Biology	*Takahashia japonica* is a soft scale insect native to Asia (Limonta et al., 2022), where it is reported from China, India, Japan, South Korea and Taiwan. The species has been introduced in Europe (Croatia, Italy and the UK) (Limonta et al., 2022; García Morales et al., online). *Takahashia japonica* is a parthenogenetic species. The scale has three development stages: egg, nymph (two instars) and adult. In Italy it has one generation annually. Females start laying eggs from late April till early May. The female settles on the twig and in several days creates an ovisac. The ovisac is white string-like loop that can be up to 7 cm long. Fecundity is very high. It was counted that there are around 1,200 eggs in a 1 cm length of the ovisac. Eggs start to hatch into first instar nymphs (crawlers) in early June. The crawlers are small, about 740 μm

	long and 325 μm wide. The crawlers are the main natural dispersal stage, and they migrate from twigs to underside of leaves. During this migration, the crawlers can be easily carried by the wind, insects or birds to other host plants. Long distance dispersal is with infested traded plants. In late August and in September, the population consists of second instar nymphs, which are about 1.3 mm long. In September and October, the second instar nymphs migrate back from leaves to twigs, to overwinter. Overwintering second instar nymphs are brown and covered by transparent wax plates. After overwintering, the nymphs resume activity from March onwards and reach the length of about 1.5 mm and the width of 0.5 mm. The moult to the adult female occurs at the same overwintering site. The first moults occur in early April, and the whole population reaches the adult stage over about 10 days. The adult female's body size increases quickly from about 1.5 to 6–7 mm long and 5 mm wide. In this growing phase, the pre-ovigerous females feed and produce honeydew droplets (Limonta et al., 2022). Several natural enemies of *T. japonica* are recorded in the literature. The scale was found to have been parasitised in Italy and the UK (Tuffen et al., 2019; Limonta et al., 2022). Possible pathways of entry for *T. japonica* are plants for planting (except seeds bulbs and tubers) (DEFRA, online).
Symptoms	**Main type of symptoms**	Heavy infestations of *T. japonica* on twigs cause dieback and necrosis of buds. It is mainly harmful to young trees (Limonta et al., 2022). The production of honeydew by females is limited (Limonta et al., 2022). From late April onwards (when the females start oviposition) the long white ovisacs hanging from the twigs and branches can be seen. Moreover, the ovisacs persist on the plants long after the eggs have hatched and are still present in winter (Limonta et al., 2022).
	Presence of asymptomatic plants	Low initial infestations in the absence of ovisacs may be overlooked.
	Confusion with other pests	*Takahashia japonica* can be hardly confused with other scales, due to the characteristic ovisacs hanging from the twigs and branches (Malumphy et al., 2019).
Host plant range	*Takahashia japonica* is highly polyphagous species with total of 35 known host species in 17 families (Limonta et al., 2022). The hosts are *Acer negundo*, *A. buergerianum*, *A. pseudoplatanus*, *A. pseudosieboldianum*, *Albizia julibrissin*, *Alnus japonica*, *Carpinus betulus*, *Celtis australis*, *C. sinensis*, *Citrus* sp., *Cornus officinalis*, *Cydonia oblonga*, *Diospyros kaki*, *Juglans regia*, *Lespedeza* sp., *Lespedeza bicolor*, *Liquidambar styraciflua*, *Loropetalum chinense*, *Magnolia kobus*, *M. obovate*, *Malus pumila*, *Morus* sp., *M. alba*, *M. nigra*, *Parthenocissus tricuspidata*, *Prunus cerasifera*, *P. glandulosa*, *P. salicina*, *P. tomentosa*, *Pyrus serotina*, *Rhododendron schlippenbachii*, *Robinia pseudoacacia*, *Salix chaenomeloides*, *S. glandulosa*, *Styphnolobium japonicum*, *Ulmus davidiana* and *Zelkova serrata* (Wang et al., 2016; Limonta and Pellizzari, 2018; Suh, 2020; Limonta et al., 2022; García Morales et al., online).	
Reported evidence of impact	There are no reports of economic or ecological damage induced by *T. japonica* in Asia (Malumphy et al., 2019). According to Limonta et al. (2022) in Italy its impact on urban trees has mostly involved some honeydew production and the unsightly appearance of infested trees – long white ovisacs hanging from the branches. *Takahashia japonica* can potentially reduce esthetical value of plants (Malumphy et al., 2019). No data about damage on *Acer* species is available.	
Evidence that the commodity is a pathway	According to DEFRA (online) *T. japonica* can travel with plants for planting. Therefore, the commodity is a pathway for *T. japonica*.	
Surveillance information	According to the Dossier Section 5.0 *T. japonica* is not under official surveillance in the UK, as does not meet criteria of quarantine pest for Great Britain.	

A.10.2. Possibility of pest presence in the nursery

A.10.2.1. Possibility of entry from the surrounding environment

Takahashia japonica is present in the UK, not widely distributed and not under official control (Dossier Section 5.0). The scale was recorded from West Berkshire in 2018 on *Magnolia* in a private garden (Malumphy et al., 2019; Tuffen et al., 2019).

The possible entry of *T. japonica* from surrounding environment to the nurseries may occur through crawler dispersal by wind, infested machinery, with other insects and birds.

Takahashia japonica is polyphagous species that can infest a number of different plants. Suitable hosts of *T. japonica* like *Acer* spp., *Juglans regia*, *Magnolia* spp., *Malus* spp., *Morus* spp., *Prunus* spp., *Salix* spp. and *Ulmus* spp. are present within 2 km from the nurseries.

Uncertainties:

- None.

Taking into consideration the above evidence and uncertainties, the Panel considers that it is possible for the pest to enter the nursery. The pest could be present in the surrounding areas because of suitable hosts and the transferring rate could be enhanced by crawler dispersal, via infested machinery, with other insects and birds.

A.10.2.2. Possibility of entry with new plants/seeds

The starting materials are either seeds, seedlings or scion woods/buds. Seeds are certified and coming from the UK. Seedlings are either from the UK, the EU (mostly the Netherlands) or New Zealand (Dossier Section 3.0). Seeds are not a pathway for the scale.

In addition to *Acer* plants, the nurseries also produce other plants (Dossier Section 6.0). Out of them, there are many suitable hosts for the scale (such as *Alnus* spp., *Carpinus betulus, Celtis australis*, *Cornus* spp., *Prunus* spp., etc.). However, there is no information on how and where the plants are produced. Therefore, if the plants are first produced in another nursery, the scale could possibly travel with them.

The nurseries are using virgin peat or peat-free compost (a mixture of coir, tree bark, wood fibre, etc.) as a growing media (Dossier Section 1.0). The growing media is certified and heat-treated by commercial suppliers during production to eliminate pests and diseases (Dossier Section 3.0). Soil is not a pathway for the scale.

Uncertainties:

- No information is available on the provenance of plants other than *Acer* used for plant production in the nurseries.

Taking into consideration the above evidence and uncertainties, the Panel considers that it is possible for the pest to enter the nurseries with new seedlings of *Acer* and new plants of other species used for plant production in the area. The entry of the pest with seeds and the growing media the Panel considers as not possible.

A.10.2.3. Possibility of spread within the nursery

Acer plats are either grown in containers (cells, pots, tubes, etc.) outdoors/ in the open air or in field. Cell grown trees may be grown in greenhouses, however most plants will be field grown or field grown in containers (Dossier Section 1.0). There are no mother plants present in the nurseries (Dossier Section 3.0).

The scale can attack other suitable plants (such as *Alnus* spp., *Carpinus betulus, Celtis australis*, etc.), present within the nurseries and hedges surrounding the nurseries (*Prunus* spp.) (Dossier Sections 3.0 and 6.0).

The scale within the nurseries can spread by crawler dispersal (wind), nursery workers and machinery. Spread within the nurseries through equipment and clothing is less relevant as the distance walked is very limited and of a short duration.

Uncertainties:

- None.

Taking into consideration the above evidence and uncertainties, the Panel considers that the spread of the pest within the nurseries is possible either by wind, nursery workers, machinery, equipment and clothing.

A.10.3. Information from interceptions

In the EUROPHYT/TRACES-NT database there are no records of notification of *Acer* plants for planting neither from the UK nor from other countries due to the presence of *Takahashia japonica* between the years 1995 and December 2022 (EUROPHYT/TRACES-NT, online).

A.10.4. Evaluation of the risk mitigation measures

In the table below, all risk mitigation measures currently applied in the UK are listed and an indication of their effectiveness on *Takahashia japonica* is provided. The description of the risk mitigation measures currently applied in the UK is provided in the Table 6.

N	Risk mitigation measure	Effect on the pest	Evaluation and uncertainties
1	Registration of production sites	Yes	Although *T. japonica* is not a quarantine pest, it is easy to spot. The risk mitigation measure could have some effects in reducing the likelihood of presence of the pest on the commodity. Uncertainties: – None.
2	Physical separation	No	Not relevant. Physical separation is not a barrier for *T. japonica* because crawlers can be easily spread by wind and air currents.
3	Certified plant material	Yes	The risk mitigation measure could have some effects in reducing the likelihood of presence of the pest on the commodity. Uncertainties: – None.
4	Growing media	No	Not relevant. *Takahashia japonica* is not present in soil.
5	Surveillance, monitoring and sampling	Yes	Incoming plant material is thoroughly checked, *T. japonica* is easy to spot. The risk mitigation measure could have some effects in reducing the likelihood of presence of the pest on the commodity. Uncertainties: – None.
6	Hygiene measures	Yes	Nymphs could move with equipment/clothes of the nursery staff. The described measures could have very little effect in reducing the likelihood of presence of the pest on the commodity. *Takahashia japonica* is not present on weeds. Uncertainties: – None.
7	Removal of infested plant material	Yes	Removal of generically damaged plants could reduce the probability of carrying *T. japonica,* but dieback and necrosis of buds are only expected in heavy infestations. Uncertainties: – None.
8	Irrigation water	No	Not relevant.
9	Application of pest control products	Yes	Chemical control measures adopted when the pest is found may have a substantial effect of pest suppression.

N	Risk mitigation measure	Effect on the pest	Evaluation and uncertainties
			Uncertainties: – The active ingredients of chemical treatments and their level of efficacy against the pest.
10	Measures against soil pests	No	Not relevant.
11	Inspections and management of plants before export	Yes	Inspection should detect *T. japonica* as signs are clear. Uncertainties: – Capacity of detecting symptoms at low pest density.
12	Separation during transport to the destination	No	Not relevant. *Acer* plants are not individually separated during transportation.

A.10.5. Overall likelihood of pest freedom for bundles of whips and seedlings

A.10.5.1. Reasoning for a scenario which would lead to a reasonably low number of infested bundles of whips and seedlings

This scenario assumes a low pressure of the pest in the nurseries and the surrounding: there is only one report from the UK in a private garden in West Berkshire. In this scenario it is also assumed that signs of the pest are easy to spot as ovisacs are clearly visible and very conspicuous, and because small plants are easier to handle. Therefore, measures against the pest can be taken.

A.10.5.2. Reasoning for a scenario which would lead to a reasonably high number of infested bundles of whips and seedlings

This scenario assumes that the pest is present in the nurseries and the surrounding. It also assumes that, although there is only one report from the UK in a private garden in West Berkshire, this report is very recent (2018), so pest may be spreading. The scenario assumes that, in the case of low-density populations or initial stages of infestation, nymphs can be overlooked during inspections, and mode of action of the pesticides used may not be effective against the pest. Moreover, ovisacs are less frequent in younger plants and therefore not so easily noticed. Finally, the scenario assumes that pest is coming from the surroundings and a bundle effect is expected to increase the number of infestations.

A.10.5.3. Reasoning for a central scenario equally likely to over- or underestimate the number of infested bundles of whips and seedlings (Median)

The Panel assumes a high efficacy of the surveillance and inspections conducted in the nursery due to conspicuous aspect of the ovisacs of adult female, therefore, measures against the pest can be taken. The Panel also assumes a very low pressure of the pest from the surroundings. These considerations lead Panel to indicate low value of the median.

A.10.5.4. Reasoning for the precision of the judgement describing the remaining uncertainties (1st and 3rd quartile/interquartile range)

The Panel assumes a high uncertainty in the first quartile, and a medium uncertainty above the median, because of the ease of detection of signs of the pest, because of the low pressure of the pest from the surroundings, and because of effectiveness of measures conducted to control the pest in the nursery.

A.10.5.5. Elicitation outcomes of the assessment of the pest freedom for *Takahashia japonica* on bundles of whips and seedlings

The following Tables show the elicited and fitted values for pest infestation (Table A.55) and pest freedom (Table A.56).

Table A.55: Elicited and fitted values of the uncertainty distribution of pest infestation by *Takahashia japonica* per 10,000 bundles

Percentile	1%	2.5%	5%	10%	17%	25%	33%	50%	67%	75%	83%	90%	95%	97.5%	99%
Elicited values	1					13		25		55					125
EKE	1.01	1.48	2.37	4.37	7.38	11.6	16.3	27.7	42.8	52.7	65.5	80.0	96.7	111	125

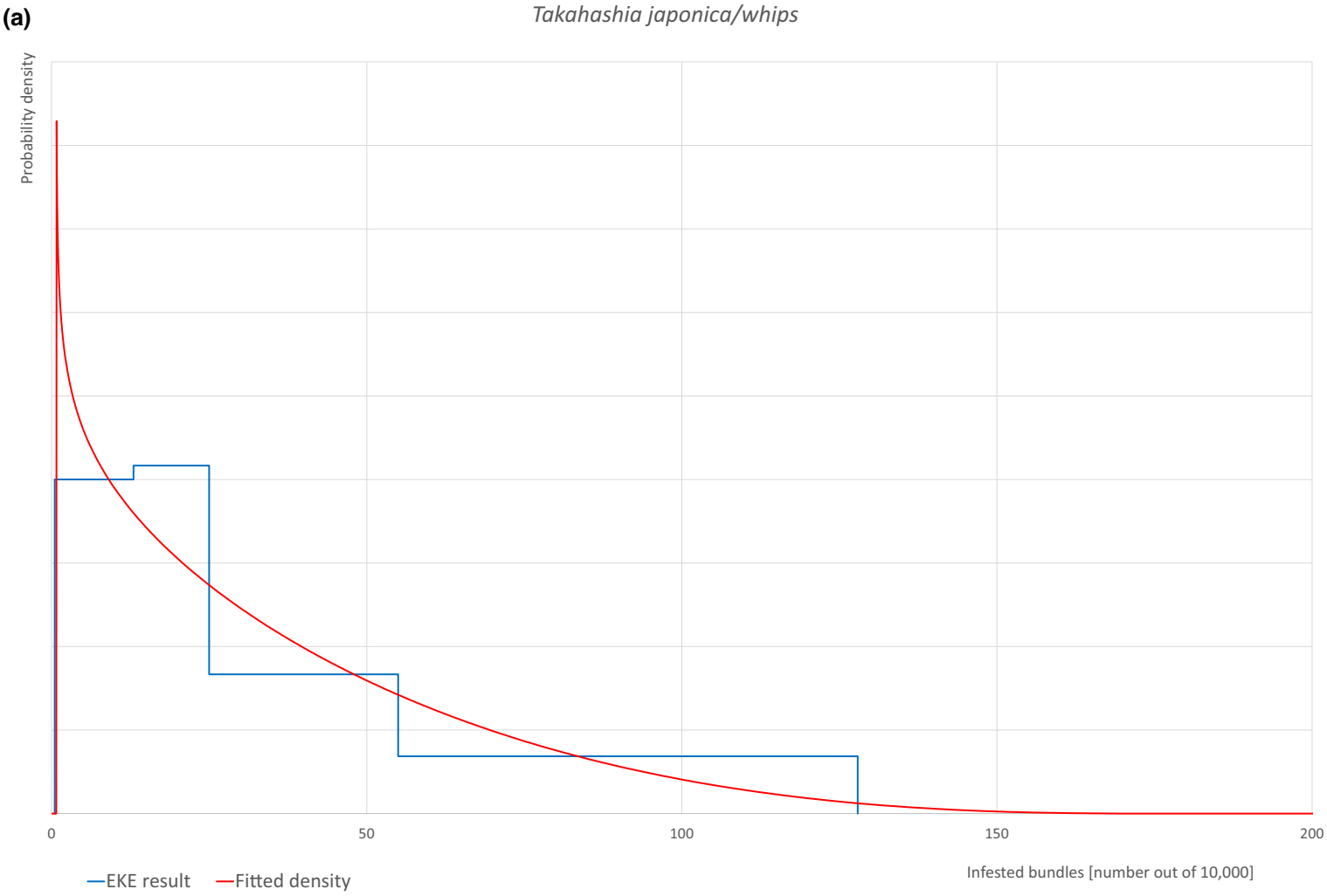
The EKE results is the BetaGeneral (0.88135, 3.505, 0.75, 175) distribution fitted with @Risk version 7.6.

Based on the numbers of estimated infested bundles the pest freedom was calculated (i.e. = 10,000 – number of infested bundles per 10,000). The fitted values of the uncertainty distribution of the pest freedom are shown in Table A.56.

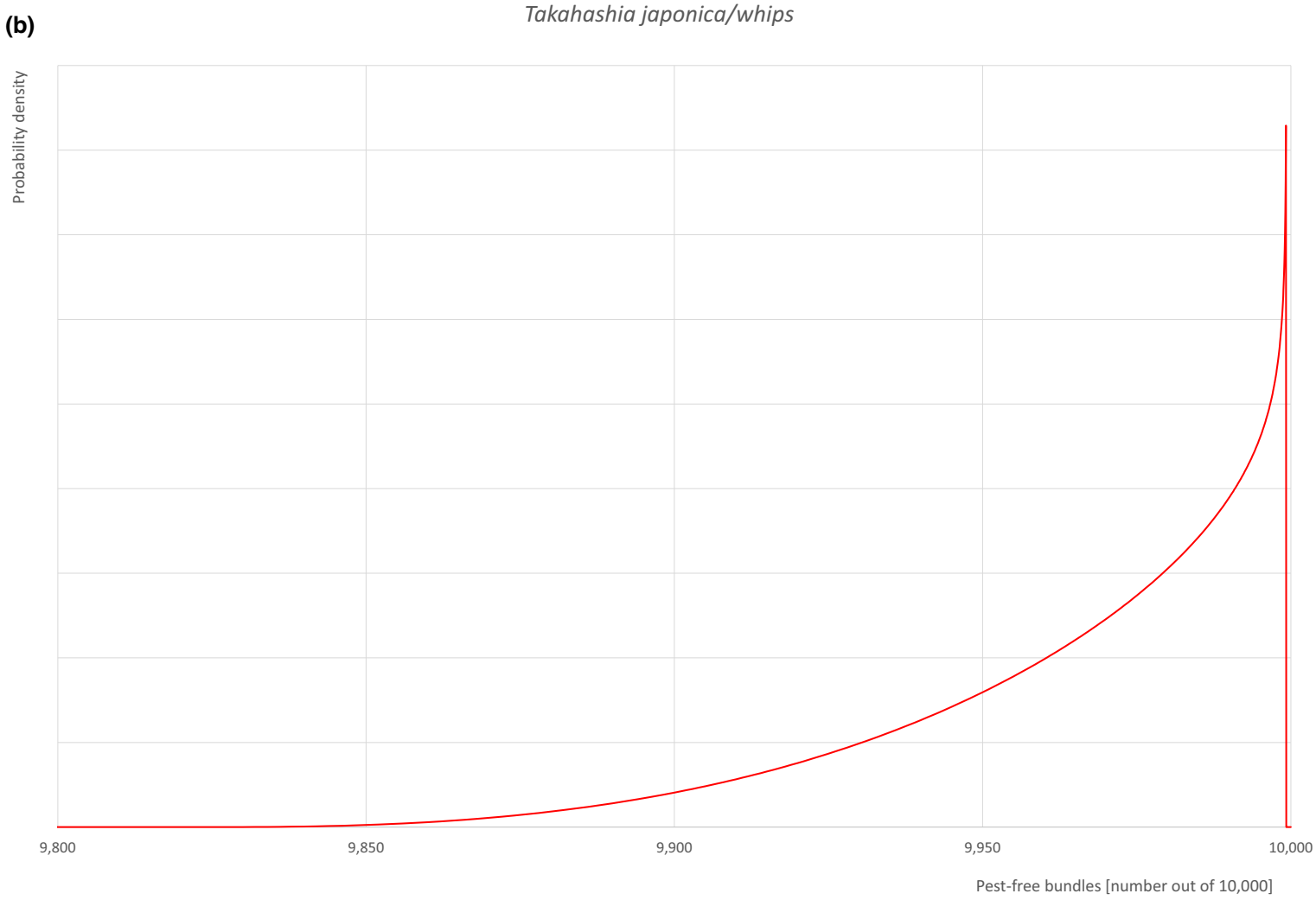
Table A.56: The uncertainty distribution of bundles free of *Takahashia japonica* per 10,000 bundles calculated by Table A.55

Percentile	1%	2.5%	5%	10%	17%	25%	33%	50%	67%	75%	83%	90%	95%	97.5%	99%
Values	9,875					9,945		9,975		9,987					9,999
EKE results	9,875	9,889	9,903	9,920	9,934	9,947	9,957	9,972	9,984	9,988	9,993	9,996	9,997.6	9,998.5	9,999.0

The EKE results are the fitted values.


(a)
Takahashia japonica/whips
Probability density
0
50
100
150
200
Infested bundles [number out of 10,000]
EKE result
Fitted density

(b)


Takahashia japonica/whips
Probability density
9,800
9,850
9,900
9,950
10,000
Pest-free bundles [number out of 10,000]

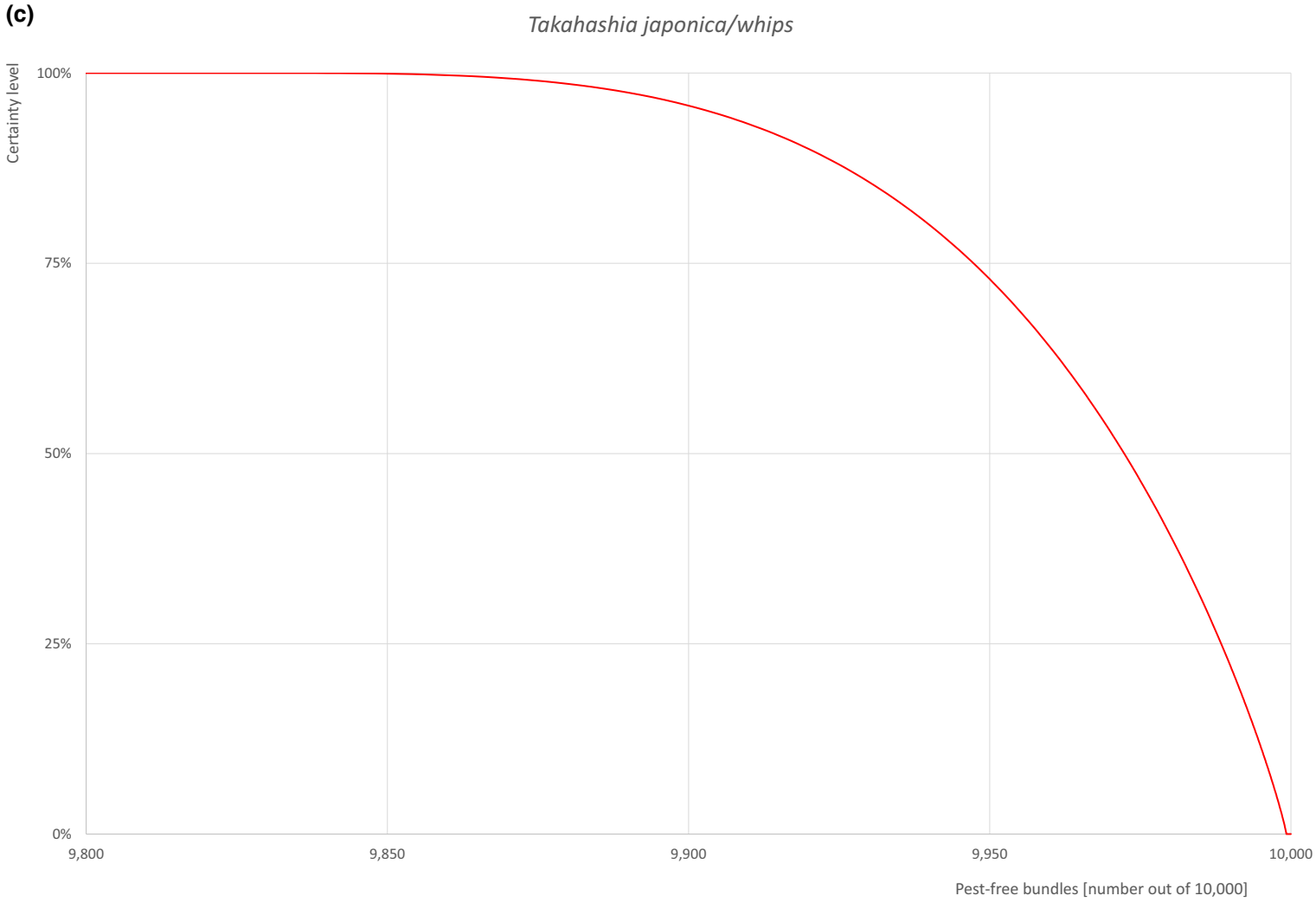


Figure A.28: (a) Elicited uncertainty of pest infestation per 10,000 bundles (histogram in blue – vertical blue line indicates the elicited percentile in the following order: 1%, 25%, 50%, 75%, 99%) and distributional fit (red line); (b) uncertainty of the proportion of pest-free bundles per 10,000 (i.e. = 1 – pest infestation proportion expressed as percentage); (c) descending uncertainty distribution function of pest infestation per 10,000 bundles

A.10.6. Overall likelihood of pest freedom for bare root plants/trees up to 7 years old

A.10.6.1. Reasoning for a scenario which would lead to a reasonably low number of infested bare root plants/trees up to 7 years old

This scenario assumes a low pressure of the pest in the nurseries and the surrounding: there is only one report from the UK in a private garden in West Berkshire. In this scenario it is also assumed that signs of the pest are easy to spot as ovisacs are clearly visible and very conspicuous. Therefore, measures against the pest can be taken.

A.10.6.2. Reasoning for a scenario which would lead to a reasonably high number of infested bare root plants/trees up to 7 years old

This scenario assumes that the pest is present in the nurseries and the surrounding. It also assumes that, although there is only one report from the UK in a private garden in West Berkshire, this report is very recent (2018), so pest may be spreading. The scenario assumes that, in the case of low-density populations or initial stages of infestation, nymphs can be overlooked during inspections and mode of action of the pesticides used may not be effective against the pest.

A.10.6.3. Reasoning for a central scenario equally likely to over- or underestimate the number of infested bare root plants/trees up to 7 years old (Median)

The Panel assumes a high efficacy of the surveillance and inspections conducted in the nursery due to conspicuous aspect of the ovisacs of adult female, therefore, measures against the pest can be taken. The Panel also assumes a very low pressure of the pest from the surroundings. These considerations lead Panel to indicate low value of the median.

A.10.6.4. Reasoning for the precision of the judgement describing the remaining uncertainties (1st and 3rd quartile/interquartile range)

The Panel assumes a high uncertainty in the first quartile, and a medium uncertainty above the median, because of the ease of detection of signs of the pest, because of the low pressure of the pest from the surroundings, and because of effectiveness of measures conducted to control the pest in the nursery.

A.10.6.5. Elicitation outcomes of the assessment of the pest freedom for *Takahashia japonica* on bare root plants/trees up to 7 years old

The following Tables show the elicited and fitted values for pest infestation (Table A.57) and pest freedom (Table A.58).

Table A.57: Elicited and fitted values of the uncertainty distribution of pest infestation by *Takahashia japonica* per 10,000 plants

Percentile	1%	2.5%	5%	10%	17%	25%	33%	50%	67%	75%	83%	90%	95%	97.5%	99%
Elicited values	1					10		18		50					100
EKE	0.988	1.12	1.45	2.47	4.42	7.63	11.7	22.5	37.5	47.1	59.0	71.3	83.7	92.2	99.5

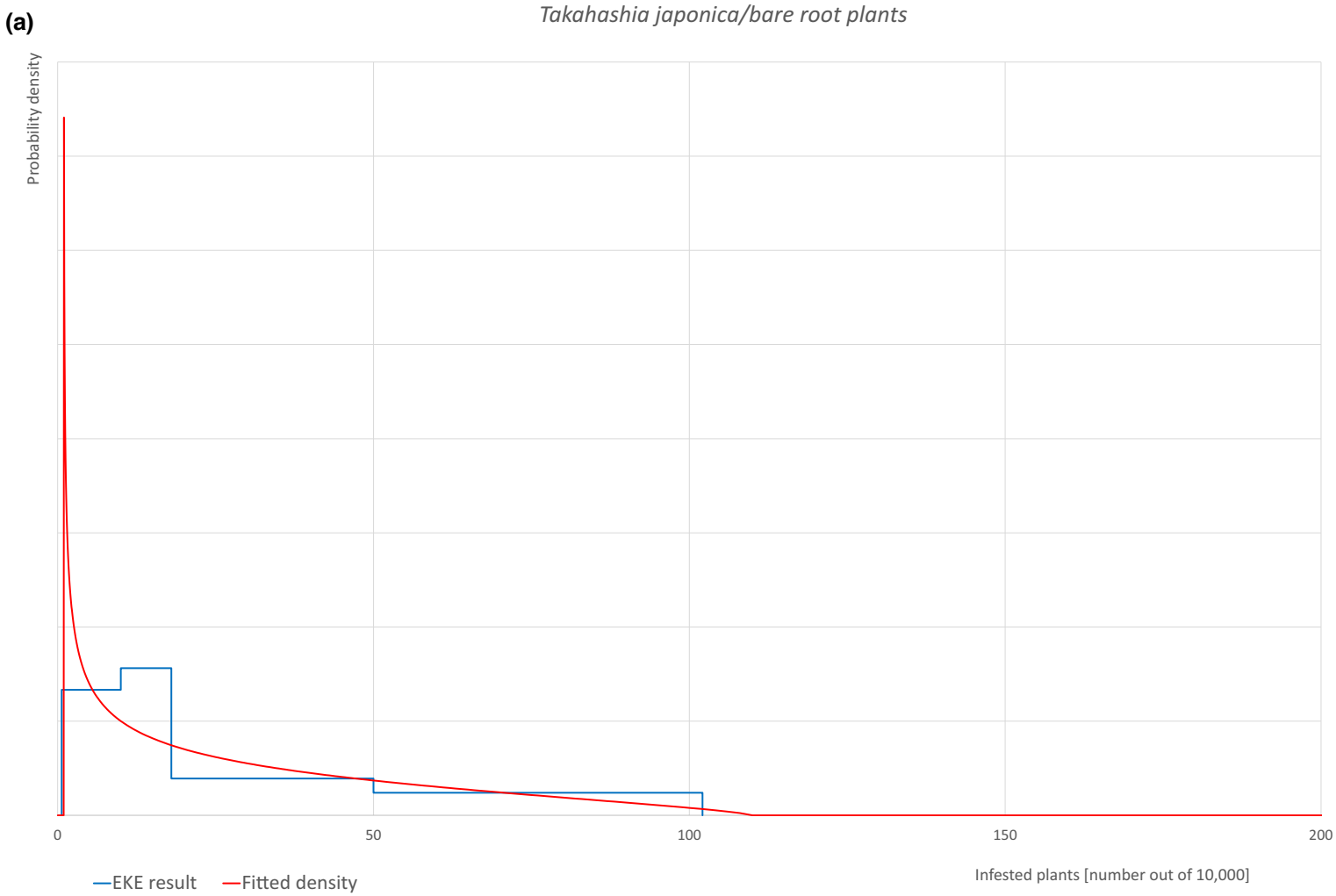
The EKE results is the BetaGeneral (0.62668, 1.7132, 0.95, 110) distribution fitted with @Risk version 7.6.

Based on the numbers of estimated infested plants the pest freedom was calculated (i.e. = 10,000 – number of infested plants per 10,000). The fitted values of the uncertainty distribution of the pest freedom are shown in Table A.58.

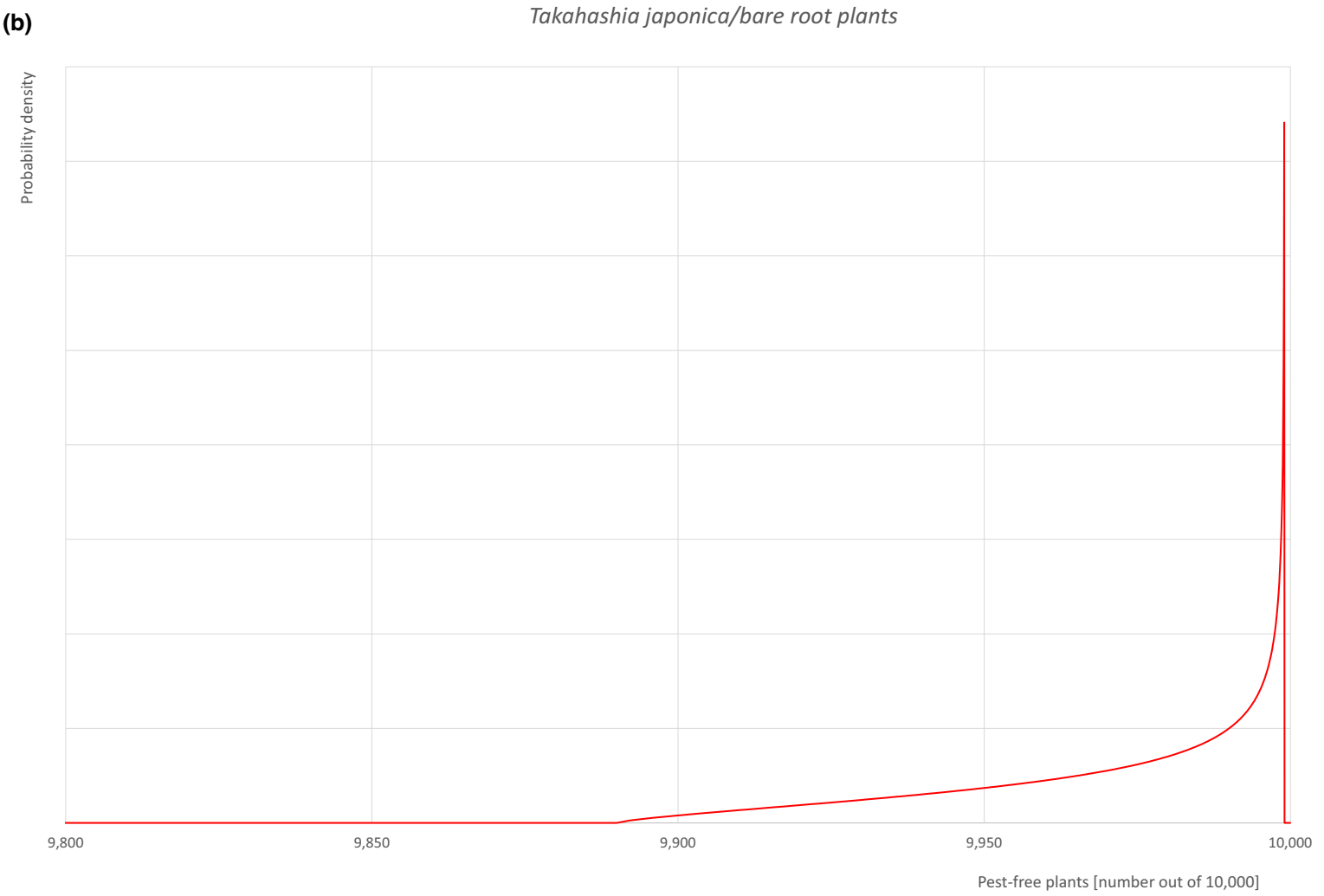
Table A.58: The uncertainty distribution of plants free of *Takahashia japonica* per 10,000 plants calculated by Table A.57

Percentile	1%	2.5%	5%	10%	17%	25%	33%	50%	67%	75%	83%	90%	95%	97.5%	99%
Values	9,900					9,950		9,982		9,990					9,999
EKE results	9,901	9,908	9,916	9,929	9,941	9,953	9,963	9,978	9,988	9,992	9,996	9,998	9,998.6	9,998.9	9,999.0

The EKE results are the fitted values.


(a)
Takahashia japonica/bare root plants
Probability density
0
50
100
150
200
Infested plants [number out of 10,000]
EKE result
Fitted density

(b)


Takahashia japonica/bare root plants
Probability density
9,800
9,850
9,900
9,950
10,000
Pest-free plants [number out of 10,000]

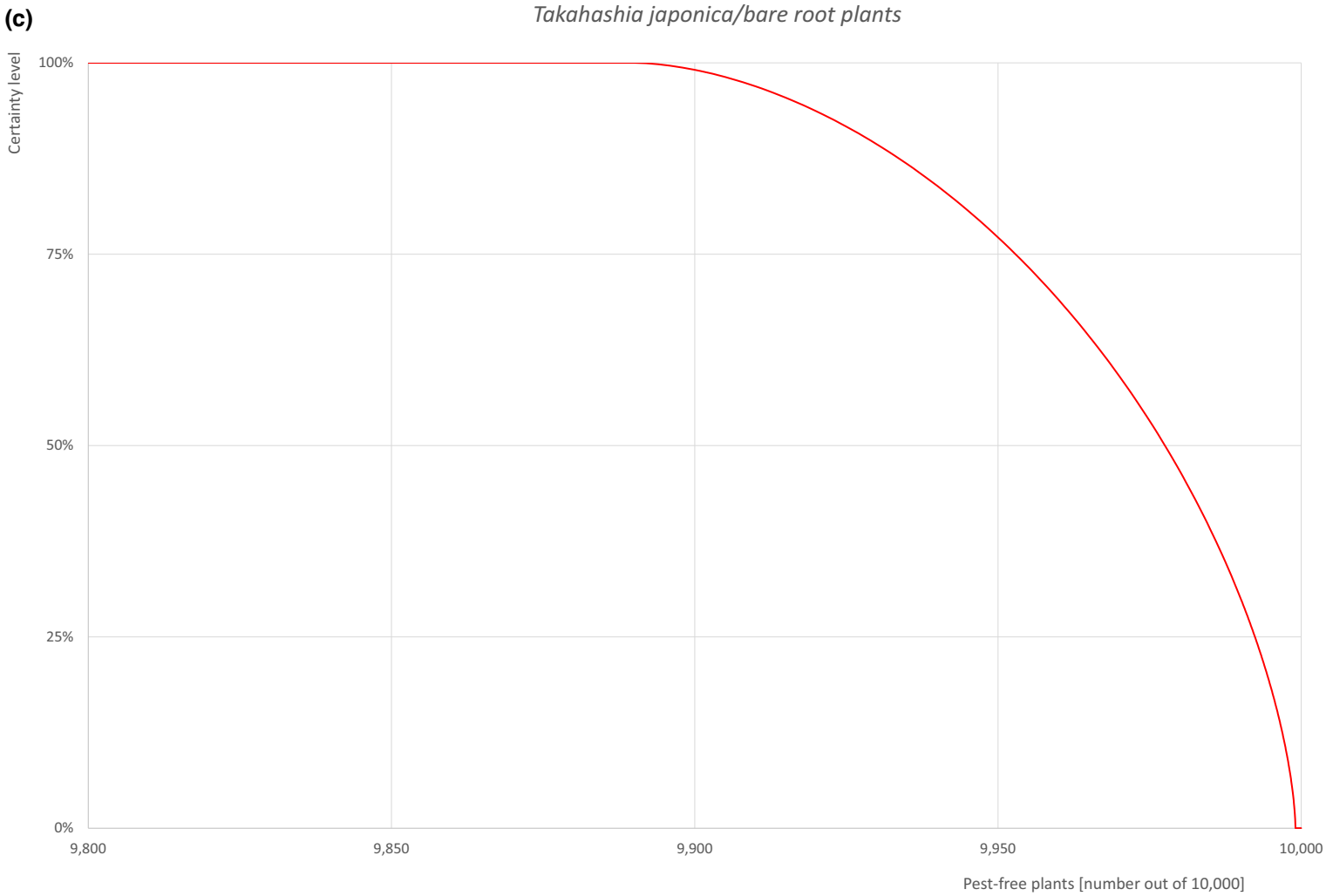


Figure A.29: (a) Elicited uncertainty of pest infestation per 10,000 plants (histogram in blue – vertical blue line indicates the elicited percentile in the following order: 1%, 25%, 50%, 75%, 99%) and distributional fit (red line); (b) uncertainty of the proportion of pest-free plants per 10,000 (i.e. = 1 – pest infestation proportion expressed as percentage); (c) descending uncertainty distribution function of pest infestation per 10,000 plants

A.10.7. Overall likelihood of pest freedom for plants in pots up to 15 years old

A.10.7.1. Reasoning for a scenario which would lead to a reasonably low number of infested plants in pots up to 15 years old

This scenario assumes a low pressure of the pest in the nurseries and the surrounding: there is only one report from the UK in a private garden in West Berkshire. In this scenario it is also assumed that signs of the pest are easy to spot as ovisacs are clearly visible and very conspicuous. Therefore, measures against the pest can be taken.

A.10.7.2. Reasoning for a scenario which would lead to a reasonably high number of infested plants in pots up to 15 years old

This scenario assumes that the pest is present in the nurseries and the surrounding. It also assumes that, although there is only one report from the UK in a private garden in West Berkshire, this report is very recent (2018), so pest may be spreading. Moreover, the scenario assumes that, in the case of low-density populations or initial stages of infestation, nymphs can be overlooked during inspections, and mode of action of the pesticides used may not be effective against the pest. Finally, this scenario assumes that plants can be exported all year round, and the presence of leaves and the possible presence of undetected nymphs at early stages of infestation could increase the number of infested plants during export.

A.10.7.3. Reasoning for a central scenario equally likely to over- or underestimate the number of infested plants in pots up to 15 years old (Median)

The Panel assumes a high efficacy of the surveillance and inspections conducted in the nursery due to conspicuous aspect of the ovisacs of adult female, therefore, measures against the pest can be taken. The Panel also assumes a very low pressure of the pest from the surroundings. These considerations lead Panel to indicate low value of the median.

A.10.7.4. Reasoning for the precision of the judgement describing the remaining uncertainties (1st and 3rd quartile/interquartile range)

The Panel assumes a high uncertainty in the first quartile, and a medium uncertainty above the median, because of the ease of detection of signs of the pest, because of the low pressure of the pest from the surroundings, and because of effectiveness of measures conducted to control the pest in the nursery.

A.10.7.5. Elicitation outcomes of the assessment of the pest freedom for *Takahashia japonica* on plants in pots up to 15 years old

The following Tables show the elicited and fitted values for pest infestation (Table A.59) and pest freedom (Table A.60).

Table A.59: Elicited and fitted values of the uncertainty distribution of pest infestation by *Takahashia japonica* per 10,000 plants

Percentile	1%	2.5%	5%	10%	17%	25%	33%	50%	67%	75%	83%	90%	95%	97.5%	99%
Elicited values	2					15		30		65					135
EKE	1.99	2.41	3.27	5.35	8.69	13.5	19.1	32.9	51.0	62.6	77.1	92.8	110	123	135

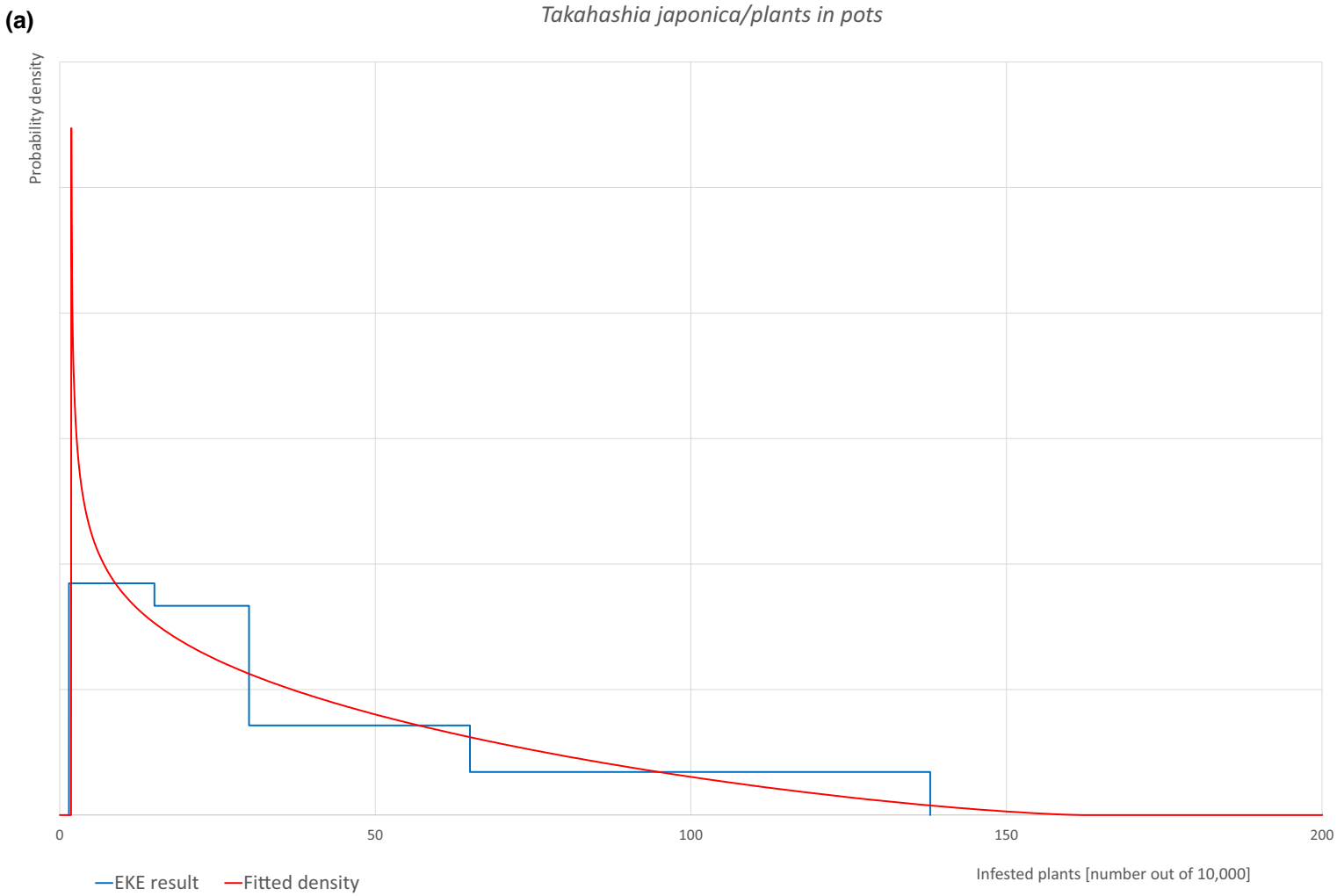
The EKE results is the BetaGeneral (0.79276, 2.3895, 1.8, 162) distribution fitted with @Risk version 7.6.

Based on the numbers of estimated infested plants the pest freedom was calculated (i.e. = 10,000 – number of infested plants per 10,000). The fitted values of the uncertainty distribution of the pest freedom are shown in Table A.60.

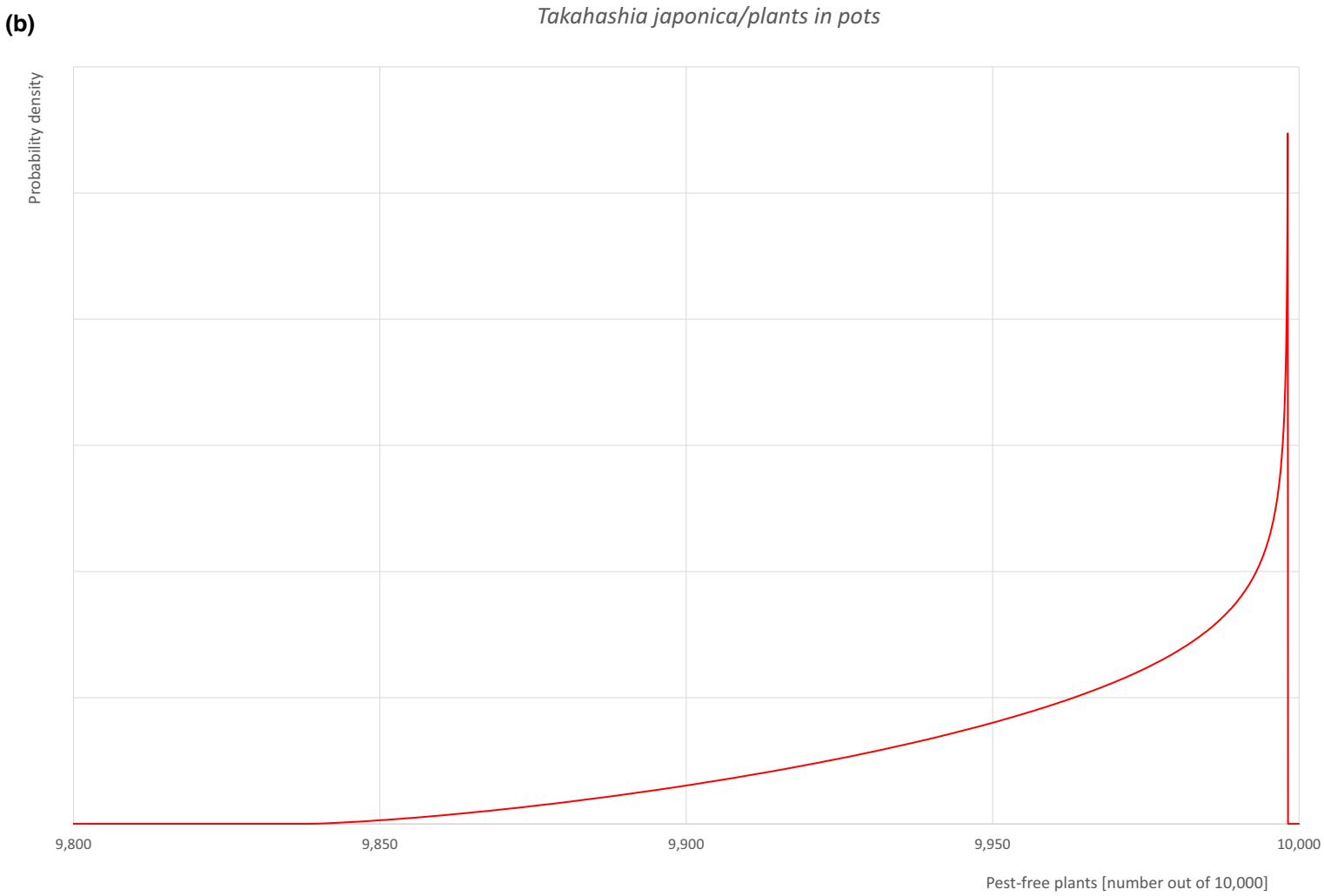
Table A.60: The uncertainty distribution of plants free of *E* per 10,000 plants calculated by Table A.59

Percentile	1%	2.5%	5%	10%	17%	25%	33%	50%	67%	75%	83%	90%	95%	97.5%	99%
Values	9,865					9,935		9,970		9,985					9,998
EKE results	9,865	9,877	9,890	9,907	9,923	9,937	9,949	9,967	9,981	9,986	9,991	9,995	9,997	9,998	9,998

The EKE results are the fitted values.


(a)
Takahashia japonica/plants in pots
Probability density
0
50
100
150
200
Infested plants [number out of 10,000]
EKE result
Fitted density

(b)


Takahashia japonica/plants in pots
Probability density
9,800
9,850
9,900
9,950
10,000
Pest-free plants [number out of 10,000]

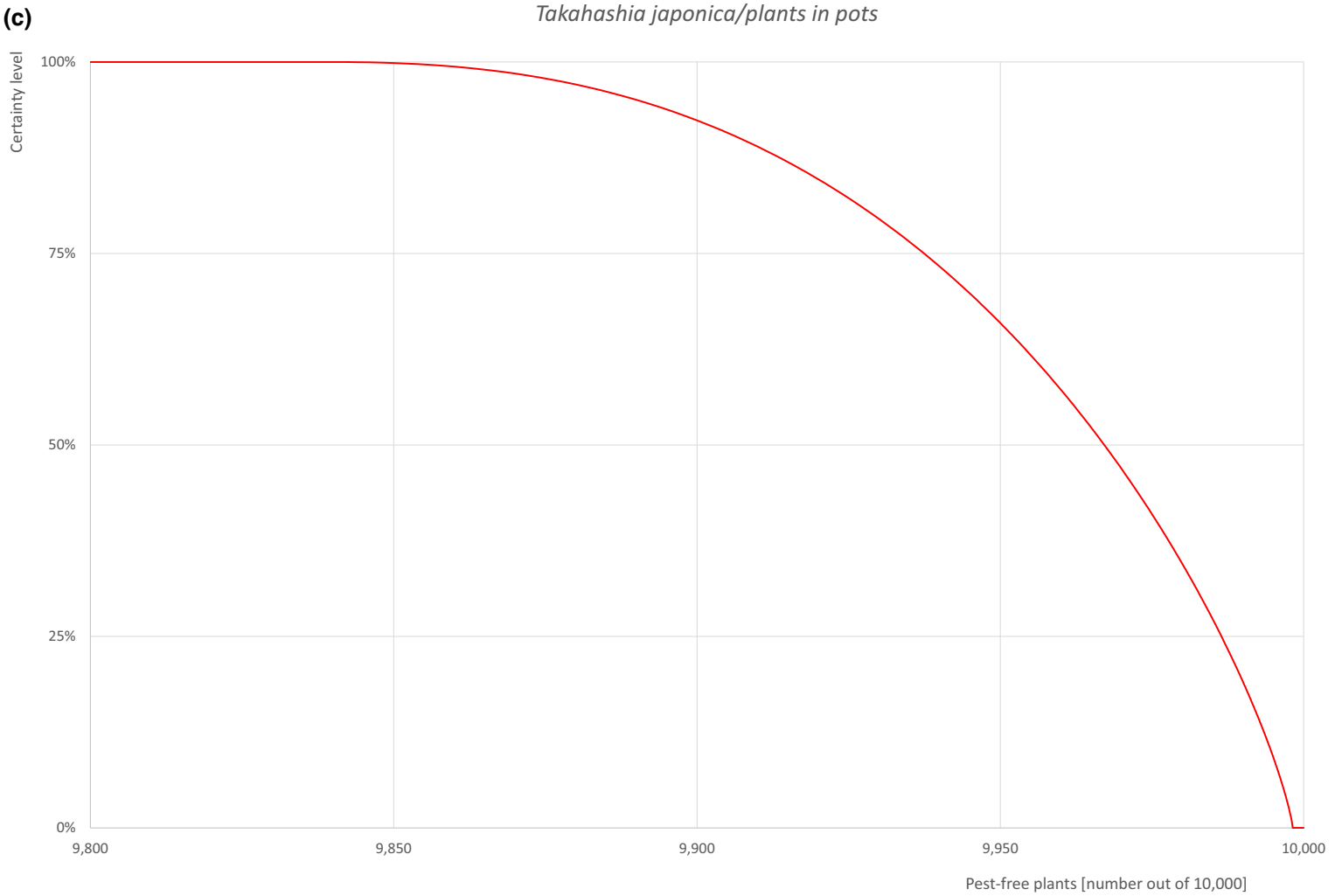


Figure A.30: (a) Elicited uncertainty of pest infestation per 10,000 plants (histogram in blue – vertical blue line indicates the elicited percentile in the following order: 1%, 25%, 50%, 75%, 99%) and distributional fit (red line); (b) uncertainty of the proportion of pest-free plants per 10,000 (i.e. = 1 – pest infestation proportion expressed as percentage); (c) descending uncertainty distribution function of pest infestation per 10,000 plants

A.10.8. Reference list

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Appendix B – Web of Science All Databases Search String

In the Table B.1, the search string for *Acer campestre* used in Web of Science is reported. Totally, 30 papers were retrieved. Titles and abstracts were screened and 15 pests were added to the list of pests (see Appendix F).

In the Table B.2, the search string for *Acer*, *Acer* sp. and *Acer* spp. used in Web of Science is reported. Totally, 772 papers were retrieved. Titles and abstracts were screened and 31 pests were added to the list of pests (see Appendix F).

Table B.1: String for *Acer campestre*

Web of Science All databases	**TOPIC:** ("Acer campestre" OR "common maple" OR "field maple" OR "hedge maple" OR "Acer affine" OR "Acer bedoi" OR "Acer collinum" OR "Acer eriocarpon" OR "Acer erythrocarpum" OR "Acer haplolobum" OR "Acer heterolobum" OR "Acer heterotomum" OR "Acer macrocarpon" OR "Acer marucum" OR "Acer microcarpon" OR "Acer microphyllum" OR "Acer mole" OR "Acer orthopteron" OR "Acer palmatisectum" OR "Acer polycarpon" OR "Acer praecox" OR "Acer quinquelobatum" OR "Acer robustum" OR "Acer suberosum" OR "Acer sylvestre" OR "Acer tauricum" OR "Acer tauschianum" OR "Acer tomentosum" OR "Acer trilobum") **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:** ("winged seeds" OR metabolites OR *tannins OR climate OR "maple syrup" OR syrup OR mycorrhiz* OR "carbon loss" OR pollut* OR weather OR propert* OR probes OR spectr* OR antioxidant$ OR transformation OR RNA OR DNA OR "Secondary plant metabolite$" OR metabol* OR "Phenolic compounds" OR Quality OR Abiotic OR Storage OR Pollen* OR fertil* OR Mulching OR Nutrient* OR Pruning OR drought OR "human virus" OR "animal disease*" OR "plant extracts" OR immunological OR "purified fraction" OR "traditional medicine" OR medicine OR mammal* OR bird* OR "human disease*" OR biomarker$ OR "health education" OR bat$ OR "seedling$ survival" OR "anthropogenic disturbance" OR "cold resistance" OR "salt stress" OR salinity OR "aCER method" OR "adaptive cognitive emotion regulation" OR nitrogen OR hygien* OR "cognitive function$" OR fossil$ OR *toxicity OR Miocene OR postglacial OR "weed control" OR landscape)

Table B.2: String for *Acer*, *Acer* sp. and *Acer* spp.

Web of Science All databases	**TOPIC:** ("Acer" OR "Acer sp." OR "Acer spp." OR "maple") **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: ("winged seeds" OR metabolites OR *tannins OR climate OR "maple syrup" OR syrup OR mycorrhiz* OR "carbon loss" OR pollut* OR weather OR propert* OR probes OR spectr* OR antioxidant$ OR transformation OR RNA OR DNA OR "Secondary plant metabolite$" OR metabol* OR "Phenolic compounds" OR Quality OR Abiotic OR Storage OR Pollen* OR fertil* OR Mulching OR Nutrient* OR Pruning OR drought OR "human virus" OR "animal disease*" OR "plant extracts" OR immunological OR "purified fraction" OR "traditional medicine" OR medicine OR mammal* OR bird* OR "human disease*" OR biomarker$ OR "health education" OR bat$ OR "seedling$ survival" OR "anthropogenic disturbance" OR "cold resistance" OR "salt stress" OR salinity OR "aCER method" OR "adaptive cognitive emotion regulation" OR nitrogen OR hygien* OR "cognitive function$" OR fossil$ OR *toxicity OR Miocene OR postglacial OR "weed control" OR landscape)

NOT

TOPIC: ("Acer acuminatum" OR "Acer amamiense" OR "Acer amplum" OR "Acer argutum" OR "Acer barbinerve" OR "Acer brachystephyanum" OR "Acer buergerianum" OR "Acer caesium" OR "Acer calcaratum" OR "Acer caloneurum" OR "Acer campbellii" OR "Acer campestre" OR "Acer capillipes" OR "Acer cappadocicum" OR "Acer carpinifolium" OR "Acer caudatifolium" OR "Acer caudatum" OR "Acer ceriferum" OR "Acer chapaense" OR "Acer chiangdaoense" OR "Acer cinerascentiforme" OR "Acer circinatum" OR "Acer cissifolium" OR "Acer confertifolium" OR "Acer cordatum" OR "Acer coriaceifolium" OR "Acer crassum" OR "Acer crataegifolium" OR "Acer davidii" OR "Acer diabolicum" OR "Acer discolor" OR "Acer distylum" OR "Acer duplicatoserratum" OR "Acer elegantulum" OR "Acer emeiense" OR "Acer erianthum" OR "Acer erythranthum" OR "Acer eucalyptoides" OR "Acer fabri" OR "Acer fengii" OR "Acer fenzelianum" OR "Acer foveolatum" OR "Acer garrettii" OR "Acer glabrum" OR "Acer gracilifolium" OR "Acer granatense" OR "Acer griseum" OR "Acer guanense" OR "Acer guizhouense" OR "Acer hainanense" OR "Acer heldreichii" OR "Acer henryi" OR "Acer huangpingense" OR "Acer hyrcanum" OR "Acer japonicum" OR "Acer jingdongense" OR "Acer laevigatum" OR "Acer laisuense" OR "Acer lanpingense" OR "Acer laurinum" OR "Acer lauyuense" OR "Acer legonsanicum" OR "Acer leipoense" OR "Acer leptophyllum" OR "Acer lichuanense" OR "Acer linganense" OR "Acer longipedicellatum" OR "Acer longipes" OR "Acer lucidum" OR "Acer macrophyllum" OR "Acer mairei" OR "Acer mandshuricum" OR "Acer mapienense" OR "Acer maximowiczianum" OR "Acer mazandaranicum" OR "Acer medogense" OR "Acer miaoshanicum" OR "Acer micranthum" OR "Acer mirabile" OR "Acer miyabei" OR "Acer monspessulanum" OR "Acer morifolium" OR "Acer nayongense" OR "Acer negundo" OR "Acer nipponicum" OR "Acer oblongum" OR "Acer obtusifolium" OR "Acer okamotoi" OR "Acer oligocarpum" OR "Acer olivaceum" OR "Acer oliverianum" OR "Acer opalus" OR "Acer palmatum" OR "Acer pauciflorum" OR "Acer paxii" OR "Acer pectinatum" OR "Acer pehpeiense" OR "Acer pensylvanicum" OR "Acer pentaphyllum" OR "Acer pentapomicum" OR "Acer pictum" OR "Acer pilosum" OR "Acer platanoides" OR "Acer pluridens" OR "Acer poliophyllum" OR "Acer pseudoplatanus" OR "Acer pseudosieboldianum" OR "Acer pseudowilsonii" OR "Acer pubipalmatum" OR "Acer pycnanthum" OR "Acer robustum" OR "Acer rubescens" OR "Acer rubronervium" OR "Acer rubrum" OR "Acer rufinerve" OR "Acer saccharinum" OR "Acer saccharum" OR "Acer salweenense" OR "Acer schneiderianum" OR "Acer sempervirens" OR "Acer shangszeense" OR "Acer shenkanense" OR "Acer shensiense" OR "Acer shihweii" OR "Acer shirasawanum" OR "Acer sichourense" OR "Acer sieboldianum" OR "Acer sikkimense" OR "Acer sino-oblongum" OR "Acer sinopurpurascens" OR "Acer spicatum" OR "Acer stachyophyllum" OR "Acer sterculiaceum" OR "Acer sutchuenense" OR "Acer sycopseoides" OR "Acer taipuense" OR "Acer tataricum" OR "Acer tegmentosum" OR "Acer tenellum" OR "Acer tibetense" OR "Acer tonkinense" OR "Acer trialatum" OR "Acer tricaudatum" OR "Acer triflorum" OR "Acer truncatum" OR "Acer tschonoskii" OR "Acer turcomanicum" OR "Acer tutcheri" OR "Acer undulatum" OR "Acer velutinum" OR "Acer wangchii" OR "Acer wardii" OR "Acer wuyishanicum" OR "Acer wuyuanense" OR "Acer yangbiense" OR "Acer yaoshanicum" OR "Acer yinkunii" OR "Acer yui" OR "Acer × bornmuelleri" OR

"Acer × coriaceum" OR "Acer × freemanii" OR "Acer × martini" OR "Acer × schwerinii" OR "Acer × varbossanium")

NOT

TOPIC: ("Anoplophora chinensis" OR "Anoplophora glabripennis" OR "Cacoecimorpha pronubana" OR "Candidatus Phytoplasma fragariae" OR "Ceroplastes ceriferus" OR "Choristoneura conflictana" OR "Choristoneura rosaceana" OR "Comstockaspis perniciosa" OR "Cryphonectria parasitica" OR "Cryptostroma corticale" OR "Diabrotica undecimpunctata undecimpunctata" OR "Euwallacea fornicatus sensu stricto" OR "Halyomorpha halys" OR "Hyphantria cunea" OR "Lopholeucaspis japonica" OR "Malacosoma disstria" OR "Maple mosaic agent" OR "Oemona hirta" OR "Orgyia leucostigma" OR "Ricania speculum" OR "Trichoferus campestris" OR "Trirachys sartus" OR "Xanthomonas acernea" OR "Xylosandrus germanus" OR "Anoplophora glabripennis" OR "Cacoecimorpha pronubana" OR "Cossus cossus" OR "Fomes fomentarius" OR "Hemiberlesia rapax" OR "Inonotus hispidus" OR "Monema flavescens" OR "Operophtera brumata" OR "Phellinus igniarius" OR "Phytophthora cactorum" OR "Popillia japonica" OR "Sawadaea bicornis" OR "Sawadaea tulasnei" OR "Xiphinema rivesi" OR "Xylella fastidiosa" OR "Xylosandrus mutilatus" OR "Anoplophora chinensis" OR "Apiognomonia errabunda" OR "Armillaria mellea" OR "Belonolaimus longicaudatus" OR "Bemisia tabaci" OR "Brevipalpus phoenicis" OR "Chinavia hilaris" OR "Chionaspis acer" OR "Coccus hesperidum" OR "Diaspidiotus perniciosus" OR "Euproctis chrysorrhoea" OR "Ganoderma lucidum" OR "Glomerella cingulata" OR "Lopholeucaspis japonica" OR "Lymantria dispar" OR "Paracolomerus fopingacer" OR "Parthenolecanium corni" OR "Phytoplasma fragariae" OR "Pseudaulacaspis pentagona" OR "Raoiella indica" OR "Rhizobium radiobacter" OR "Rhizobium rhizogenes" OR "Rosellinia necatrix" OR "Tetropium castaneum" OR "Tortrix viridana" OR "Trirachys sartus" OR "Zeuzera pyrina" OR "Ceroplastes rubens" OR "Hyphantria cunea" OR "Peridroma saucia" OR "Pratylenchus penetrans" OR "Saturnia pyri" OR "Sowbane mosaic virus" OR "Taeniothrips inconsequens" OR "Xestia c-nigrum" OR "Diaspidiotus ostreaeformis" OR "Boisea trivittata" OR "Cryptostroma corticale" OR "Dothiorella iberica" OR "Drepanosiphum platanoidis" OR "Fusarium" OR "Heterarthrus aceris" OR "Heterarthrus leucomelus" OR "Megaplatypus mutatus" OR "Melanaspis tenebricosa" OR "Myrmica rubra" OR "Ossiannilssonola callosa" OR "Pammene fasciana" OR "Periphyllus californiensis" OR "Phomopsis" OR "Phytophthora cambivora" OR "Pratylenchus coffeae" OR "Pterostichus coracinus" OR "Ptilophora plumigera" OR "Pulvinaria regalis" OR "Rhytisma acerinum" OR "Ricania speculum" OR "Synanthedon resplendens" OR "Trichodorus viruliferus" OR "Trichoferus campestris" OR "Valsa sordida" OR "Periphyllus bengalensis" OR "Stomaphis aceris" OR "Yamatocallis obscura" OR "Trichaitophorus acerifolius" OR "Yamatocallis sauteri" OR "Yamatocallis acerisucta" OR "Periphyllus himalayensis" OR "Periphyllus pallidus" OR "Periphyllus tokyoensis" OR "Coptophylla gymnaspis" OR "Eotetranychus carpini" OR "Eotetranychus carpini" OR "Eotetranychus tiliarum" OR "Agrilus viridis" OR "Cerambyx scopolii" OR "Leiopus nebulosus" OR "Anaglyptus mysticus" OR "Saperda scalaris" OR "Orsodacne cerasi" OR "Cryptocephalus pusillus" OR "Crepidodera aurata" OR "Mesites tardii" OR "Rhyncolus gracilis" OR "Barypeithes pellucidus" OR "Phyllobius argentatus" OR "Phyllobius calcaratus" OR "Phyllobius maculicornis" OR "Phyllobius oblongus" OR "Phyllobius roboretanus" OR "Polydrusus cervinus" OR "Polydrusus marginatus" OR "Strophosomus melanogrammus" OR "Hylesinus crenatus" OR "Xyloterus domesticum" OR "Ischnodes sanguinicollis" OR "Melanotus erythropus" OR "Hylecoetus dermestoides" OR "Ischnomera caerulea" OR "Arboridia ribauti" OR "Edwardsiana alnicola" OR "Edwardsiana diversa" OR "Edwardsiana lethierryi" OR "Alebra wahlbergi" OR "Idiocerus vittifrons" OR "Lindbergina aurovittata" OR "Ribautiana debilis" OR "Ribautiana tenerrima" OR "Zygina suavis" OR "Physatocheila harwoodi" OR "Cerostegia japonica" OR "Pulvinaria regalis" OR "Chionaspis salicis" OR "Parlatoria theae" OR "Pseudaulacaspis pentagona" OR "Quadraspidiotus ostreaeformis" OR "Myzus persicae" OR "Drepanosiphum platanoidis" OR "Periphyllus testudinaceus" OR "Tremex columba" OR "Croesus septentrionalis" OR "Zeuzera pyrina" OR "Operophtera brumata" OR "Cyclophora annulata" OR "Actinotia polyodon" OR "Mimas tiliae" OR "Coleophora badiipennella" OR "Incurvaria pectinea" OR "Clepsis rurinana" OR "Aleimma loeflingiana" OR "Pandemis cerasana" OR "Pandemis cinnamomeana" OR "Argyresthia bonnetella" OR "Roeslerstammia erxlebella" OR "Taeniothrips inconsequens" OR "Lymantor coryli" OR "Xyleborus dispar" OR "Xyleborus saxeseni" OR

	"Acronicta aceris" OR "Ptilodontella cucullina" OR "Meconema thalassinum" OR "Pammene regiana" OR "Acleris sparsana" OR "Apatelodes torrefacta" OR "Halysidota tessellaris" OR "Hyphantria cunea" OR "Lophocampa maculata" OR "Pyrrharctia isabella" OR "Bucculatrix demaryella" OR "Bucculatrix thoracella" OR "Prionoxystus macmurtrei" OR "Prionoxystus robiniae" OR "Zeuzera pyrina" OR "Pseudothyatira cymatophoroides" OR "Dichomeris ustalella" OR "Faristenia acerella" OR "Faristenia geminisignella" OR "Gelechia sestertiella" OR "Alsophila pometaria" OR "Anavitrinella pampinaria" OR "Antepione thisoaria" OR "Ascotis selenaria" OR "Besma endropiaria" OR "Biston betularia" OR "Biston robustus" OR "Campaea perlata" OR "Carsia sororiata" OR "Cepphis armataria" OR "Chloroclysta siterata" OR "Cladara atroliturata" OR "Colotois pennaria" OR "Cyclophora annulata" OR "Ectropis crepuscularia" OR "Endropiodes sp. B" OR "Ennomos magnaria" OR "Ennomos subsignaria" OR "Epirrita dilutata" OR "Erannis defoliaria" OR "Erannis tiliaria" OR "Eubaphe mendica" OR "Euchlaena irraria" OR "Euchlaena serrata" OR "Eupithecia inturbata" OR "Eutrapela clemataria" OR "Heterophleps triguttaria" OR "Hydriomena albifasciata" OR "Inurois fletcheri" OR "Iridopsis larvaria" OR "Itame plumosata" OR "Itame pustularia" OR "Lambdina fervidaria" OR "Lambdina fiscellaria" OR "Lambdina vitraria" OR "Lycia ursaria" OR "Lytrosis unitaria" OR "Melanolophia signataria" OR "Nematocampa limbata" OR "Obrussa sericopeza" OR "Operophtera bruceata" OR "Operophtera brumata" OR "Operophtera occidentalis" OR "Paleacrita vernata" OR "Pero hubneraria" OR "Phigalia titea" OR "Plagodis fervidaria" OR "Plagodis pulveraria" OR "Plagodis serinaria" OR "Probole amicaria" OR "Prochoerodes forficaria" OR "Prochoerodes transversata" OR "Sabulodes caberata" OR "Selenia alciphearia" OR "Selenia kentaria" OR "Xanthorhoe defensaria" OR "Caloptilia aceriella" OR "Caloptilia acerifoliella" OR "Caloptilia bimaculatella" OR "Caloptilia negundella" OR "Caloptilia packardella" OR "Caloptilia sp. A" OR "Caloptilia wakayamensis" OR "Cameraria aceriella" OR "Cameraria saccharella" OR "Phyllonorycter acericola" OR "Phyllonorycter aceripestis" OR "Phyllonorycter clemensella" OR "Phyllonorycter geniculella" OR "Phyllonorycter ginnalae" OR "Phyllonorycter lucidicostella" OR "Phyllonorycter orientalis" OR "Phyllonorycter trinotella" OR "Paraclemensia acerifoliella" OR "Malacosoma americana" OR "Malacosoma disstria" OR "Malacosoma neustria" OR "Phyllodesma americana" OR "Tolype velleda" OR "Acharia stimulea" OR "Heterogenea asella" OR "Lithacodes fasciola" OR "Monema flavescens" OR "Parasa latistriga" OR "Phobetron pithecium" OR "Euproctis celebensis" OR "Euproctis chrysorrhoea" OR "Lymantria dispar" OR "Orgyia antiqua" OR "Orgyia leucostigma" OR "Megalopyge opercularis" OR "Ectoedemia decentella" OR "Ectoedemia sericopeza" OR "Etainia ochrefasciella" OR "Glaucolepis saccharella" OR "Stigmella aceris" OR "Stigmella apicialbella" OR "Achatia distincta" OR "Acronicta aceris" OR "Acronicta alni" OR "Acronicta americana" OR "Acronicta funeralis" OR "Acronicta hastulifera" OR "Acronicta impleta" OR "Acronicta interrupta" OR "Acronicta retardata" OR "Acronicta tristis" OR "Actebia fennica" OR "Amphipyra pyramidoides" OR "Apamea castanea" OR "Aseptis binotata" OR "Brachionycha atossa" OR "Cosmia trapezina" OR "Eucirroedia pampina" OR "Eupsilia transversa" OR "Eupsilia vinulenta" OR "Eurois astricta" OR "Eurois occulta" OR "Euxoa auxiliaris" OR "Homorthodes furfurata" OR "Hypena baltimoralis" OR "Hypena scabra" OR "Lacanobia subjuncta" OR "Lithophane antennata" OR "Lithophane bethunei" OR "Lithophane grotei" OR "Lithophane laticinerea" OR "Lithophane patefacta" OR "Lithophane unimoda" OR "Melanchra adjuncta" OR "Morrisonia confusa" OR "Orthosia pacifica" OR "Orthosia rubescens" OR "Palthis angulalis" OR "Papaipema furcata" OR "Parallelia bistriaris" OR "Peridroma saucia" OR "Polia nimbosa" OR "Polia purpurissata" OR "Psaphida resumens" OR "Pseudohermonassa bicarnea" OR "Spaelotis clandestina" OR "Spiramater lutra" OR "Sunira bicolorago" OR "Sunira decipiens" OR "Xestia c-nigrum" OR "Xestia dolosa" OR "Zale galbanata" OR "Zale lunata" OR "Zale minerea" OR "Clostera inclusa" OR "Datana ministra" OR "Fusapteryx ladislai" OR "Heterocampa biundata" OR "Heterocampa guttivitta" OR "Heterocampa subrotata" OR "Heterocampa umbrata" OR "Himeropteryx miraculosa" OR "Macrurocampa marthesia" OR "Microphalera grisea" OR "Nadata gibbosa" OR "Oligocentria semirufescens" OR "Ptilodon hoegei" OR "Ptilodon okanoi" OR "Ptilophora jezoensis" OR "Ptilophora nohirae" OR "Schizura concinna" OR "Schizura ipomoeae" OR "Schizura unicornis" OR "Semidonta biloba" OR "Shaka atrovittatus" OR "Stauropus fagi" OR "Symmerista albifrons" OR "Symmerista canicosta" OR "Symmerista leucitys" OR "Tarsolepis japonica" OR "Togepteryx velutina" OR "Neptis philyra" OR "Nymphalis antiopa" OR "Agonopterix pallidior" OR "Antaeotricha leucillana" OR "Cheimophila salicella" OR

	"Hofmannophila pseudospretella" OR "Machimia tentoriferella" OR "Psilocorsis cryptolechiella" OR "Psilocorsis reflexella" OR "Charadra deridens" OR "Colocasia coryli" OR "Colocasia propinquilinea" OR "Papilio glaucus" OR "Thyridopteryx ephemeraeformis" OR "Glyptocera consobrinella" OR "Oreana unicolorella" OR "Pococera asperatella" OR "Actias artemis" OR "Actias luna" OR "Anisota senatoria" OR "Anisota virginiensis" OR "Antheraea polyphemus" OR "Automeris coresus" OR "Automeris io" OR "Caligula boisduvali" OR "Caligula japonica" OR "Callosamia promethea" OR "Dryocampa rubicunda" OR "Eacles imperialis" OR "Hemileuca eglanterina" OR "Hyalophora cecropia" OR "Hyalophora columbia" OR "Hyalophora euryalus" OR "Hylesia nigricans" OR "Leucanella memusae" OR "Leucanella viridescens" OR "Rhodinia fugax" OR "Rhodinia newara" OR "Saturnia lindia" OR "Carmenta corni" OR "Synanthedon acerni" OR "Synanthedon acerrubri" OR "Synanthedon spuleri" OR "Paonias excaecata" OR "Acleris chalybeana" OR "Acleris forskaleana" OR "Acleris negundana" OR "Acleris semiannula" OR "Acleris sparsana" OR "Aleimma loeflingiana" OR "Ancylis platanana" OR "Apotomis tertiana" OR "Archips argyrospila" OR "Archips fuscocupreanus" OR "Archips ingentana" OR "Archips negundana" OR "Archips rosana" OR "Archips semiferanus" OR "Archips xylosteana" OR "Argyrotaenia mariana" OR "Argyrotaenia velutinana" OR "Choristoneura conflictana" OR "Choristoneura fractivittana" OR "Choristoneura rosaceana" OR "Clepsis persicana" OR "Clepsis rurinana" OR "Cydia candana" OR "Cydia inquinatana" OR "Epinotia rasdolynana" OR "Episimus tyrius" OR "Eucosma rasdolnyana" OR "Eucosma variana" OR "Gypsonoma substitutionis" OR "Homonopsis illotana" OR "Isotrias hybridana" OR "Olethreutes glaciana" OR "Olethreutes nigranum" OR "Pammene regiana" OR "Pandemis cerasana" OR "Pandemis cinnamomeana" OR "Pandemis heparana" OR "Pandemis lamprosana" OR "Parapammene petulantana" OR "Platynota flavedana" OR "Proteoteras aesculana" OR "Proteoteras crescentana" OR "Proteoteras moffatiana" OR "Proteoteras naracana" OR "Proteoteras sp." OR "Proteoteras willingana" OR "Pseudexentera spoliana" OR "Ptycholoma circumclusana" OR "Ptycholoma lecheana" OR "Sonia canadana" OR "Sparganothis acerivorana" OR "Sparganothis albicaudana" OR "Sparganothis pettitana" OR "Sparganothis reticulatana" OR "Tortrix viridana" OR "Argyresthia subreticulata" OR "Cnephasia incertana" OR "Mesocriconema xenoplax" OR "Ogma octangularis" OR "Paratrichodorus minor" OR "Criconemoides incrassata" OR "Criconemoides parvus" OR "Criconema mutabile" OR "Gracilacus straeleni" OR "Helicotylenchus digonicus" OR "Rotylenchus sp." OR "Trichodorus beirensis" OR "Helicotylenchus erythrinae" OR "Pratylenchus crenatus" OR "Meloidogyne sp." OR "Hemicycliophora uniformis" OR "Hemicycliophora zuckermani" OR "Pratylenchus neglectus" OR "Tylenchorhynchus claytoni" OR "Tylenchorhynchus cylindricus" OR "Xiphinema americanum" OR "Xiphinema sp." OR "Longidorus elongatus" OR "Longidorus paralongicaudatus" OR "Longidorus paravineacola" OR "Pratylenchus vulnus" OR "Merlinius brevidens" OR "Hemicycliophora similis" OR "Tylenchorhynchus maximus" OR "Pratylenchus penetrans" OR "Pratylenchus sp." OR "Xiphinema bernardi" OR "Xiphinema chambersi" OR "Acanthococcus acericola" OR "Acanthococcus aceris" OR "Acanthococcus azaleae" OR "Acanthococcus macedoniensis" OR "Acanthococcus tokaedae" OR "Acanthomytilus kurdicus" OR "Aonidiella aurantii" OR "Aonidiella orientalis" OR "Aspidiotus hedericola" OR "Aspidiotus mousavii" OR "Aulacaspis aceris" OR "Aulacaspis ligulata" OR "Aulacaspis tubercularis" OR "Cerococcus koebelei" OR "Cerococcus parrotti" OR "Ceroplastes ceriferus" OR "Ceroplastes japonicus" OR "Ceroplastes pseudoceriferus" OR "Ceroplastes rubens" OR "Chionaspis acer" OR "Chionaspis acericola" OR "Chionaspis salicis" OR "Chionaspis sozanica" OR "Chrysomphalus dictyospermi" OR "Clavaspis ulmi" OR "Coccus hesperidum hesperidum" OR "Comstockaspis perniciosa" OR "Crisicoccus matsumotoi" OR "Cryptococcus aceris" OR "Cryptococcus williamsi" OR "Cryptoparlatoreopsis longispina" OR "Diaspidiotus aesculi" OR "Diaspidiotus africanus" OR "Diaspidiotus ancylus" OR "Diaspidiotus forbesi" OR "Diaspidiotus juglansregiae" OR "Diaspidiotus liquidambaris" OR "Diaspidiotus osborni" OR "Diaspidiotus ostreaeformis" OR "Drosicha corpulenta" OR "Drosicha mangiferae" OR "Drosicha stebbingii" OR "Dynaspidiotus abietis" OR "Dysmicoccus wistariae" OR "Epidiaspis leperii" OR "Eulecanium cerasorum" OR "Eulecanium ciliatum" OR "Eulecanium giganteum" OR "Eulecanium nocivum" OR "Eulecanium paucispinosum" OR "Eulecanium tiliae" OR "Ferreroaspis hungarica" OR "Formicococcus acerneus" OR "Heliococcus osborni" OR "Heliococcus stachyos" OR "Icerya purchasi" OR "Kerria communis" OR "Lecanodiaspis prosopidis" OR "Lepidosaphes conchiformis" OR "Lepidosaphes coreana" OR "Lepidosaphes malicola" OR "Lepidosaphes towadensis" OR "Lepidosaphes ulmi" OR

	"Lepidosaphes yanagicola" OR "Lopholeucaspis japonica" OR "Melanaspis inopinata" OR "Melanaspis louristana" OR "Melanaspis nigropunctata" OR "Melanaspis obscura" OR "Melanaspis tenebricosa" OR "Mesolecanium nigrofasciatum" OR "Mirococcus ostiaplurimus" OR "Morganella cueroensis" OR "Morganella longispina" OR "Neochionaspis kirgisica" OR "Neopinnaspis harperi" OR "Neopulvinaria innumerabilis innumerabilis" OR "Neosteingelia texana" OR "Newsteadia floccosa" OR "Nipponpulvinaria horii" OR "Palaeococcus fuscipennis" OR "Paratachardina pseudolobata" OR "Parlatoreopsis acericola" OR "Parlatoreopsis pyri" OR "Parlatoria camelliae" OR "Parlatoria crotonis" OR "Parlatoria octolobata" OR "Parlatoria oleae" OR "Parlatoria theae" OR "Parthenolecanium cerasifex" OR "Parthenolecanium corni corni" OR "Parthenolecanium glandi" OR "Parthenolecanium persicae" OR "Phenacoccus acericola" OR "Phenacoccus aceris" OR "Phenacoccus grandicarpus" OR "Phenacoccus hortonarum" OR "Phenacoccus insularis" OR "Planococcus angkorensis" OR "Planococcus japonicus" OR "Pseudaonidia duplex" OR "Pseudaulacaspis pentagona" OR "Pseudaulacaspis prunicola prunicola" OR "Pseudococcus comstocki" OR "Pseudococcus maritimus" OR "Pseudococcus sorghiellus" OR "Pseudococcus viburni" OR "Pulvinaria acericola" OR "Pulvinaria brachiungualis" OR "Pulvinaria camelicola" OR "Pulvinaria kuwacola" OR "Pulvinaria nipponica" OR "Pulvinaria nishigaharae" OR "Pulvinaria peregrina" OR "Pulvinaria pulchra" OR "Pulvinaria regalis" OR "Pulvinaria shinjii" OR "Pulvinaria vitis" OR "Rutherfordia major" OR "Spilococcus pacificus" OR "Steingelia gorodetskia" OR "Suturaspis archangelskyae" OR "Takahashia japonica" OR "Takahashiaspis macroporana" OR "Trionymus americanus" OR "Unaspis euonymi" OR "Velataspis dentata" OR "Xylococculus betulae" OR "Amphitetranychus viennensis" OR "Bryobia neoribis" OR "Bryobia praetiosa" OR "Bryobia rubrioculus" OR "Bryobia sarothamni" OR "Eotetranychus aceri" OR "Eotetranychus boreus" OR "Eotetranychus carpini" OR "Eotetranychus coryli" OR "Eotetranychus crossleyi" OR "Eotetranychus dissectus" OR "Eotetranychus pruni" OR "Eotetranychus sexmaculatus" OR "Eotetranychus spectabilis" OR "Eotetranychus tiliarium" OR "Eotetranychus uncatus" OR "Eotetranychus willamettei" OR "Eutetranychus orientalis" OR "Oligonychus aceris" OR "Oligonychus bicolor" OR "Oligonychus endytus" OR "Oligonychus ununguis" OR "Schizotetranychus garmani" OR "Tetranychus canadensis" OR "Tetranychus mcdanieli" OR "Tetranychus turkestani" OR "Tetranychus urticae" OR "Xinella huangshanensis" OR "Abortiporus fractipes" OR "Acanthonitschkea tristis" OR "Acarosporina microspora" OR "Acrothecium apicale" OR "Agaricus primitivus" OR "Agrocybe cylindracea" OR "Aleurocorticium acerinum" OR "Aleurocorticium alliaceum" OR "Aleurocorticium candidum" OR "Aleurocorticium dryinum" OR "Aleurocorticium microsporum" OR "Aleurodiscus acerinus" OR "Aleurodiscus canadensis" OR "Aleurodiscus cerussatus" OR "Allophylaria crystallifera" OR "Alternaria sp." OR "Ambrosiella brunnea" OR "Ambrosiella hartigii" OR "Amphisphaeria celata" OR "Amylocorticium cebennense" OR "Anthostoma acerinum" OR "Anthostoma saprophilum" OR "Anthostomella eructans" OR "Antrodia malicola" OR "Antrodiella romellii" OR "Antrodiella semisupina" OR "Antrodiella zonata" OR "Apiognomonia errabunda" OR "Apiognomonia hystrix" OR "Apiognomonia sp." OR "Aporpium caryae" OR "Aquanectria penicillioides" OR "Armillaria gallica" OR "Armillaria mellea" OR "Armillaria ostoyae" OR "Armillaria sinapina" OR "Arthrobotrys arthrobotryoides" OR "Arthrobotryum robustum" OR "Ascochyta sp." OR "Ascotremella faginea" OR "Ascotremella turbinata" OR "Aspergillus fumigatus" OR "Aspergillus sp." OR "Asteromella platanoidis" OR "Athelia coprophila" OR "Aureobasidium apocryptum" OR "Auricularia auricula" OR "Auricularia auricula-judae" OR "Auricularia fuscosuccinea" OR "Auricularia mesenterica" OR "Bactrodesmium abruptum" OR "Bactrodesmium spilomeum" OR "Basidiodendron eyrei" OR "Bertia moriformis" OR "Biscogniauxia capnodes" OR "Biscogniauxia mediterranea" OR "Bispora betulina" OR "Botryobasidium pruinatum" OR "Botryodiplodia acerina" OR "Botryohypochnus isabellinus" OR "Botryosphaeria dothidea" OR "Botryosphaeria obtusa" OR "Botryosphaeria ribis" OR "Botryosphaeria sp." OR "Botrytis cinerea" OR "Botrytis fuliginosa" OR "Botrytis olivascens" OR "Botrytis pannosa" OR "Botrytis sp." OR "Brachysporium canadense" OR "Brachysporium nigrum" OR "Brachysporium obovatum" OR "Bulgaria inquinans" OR "Byssochlamys nivea" OR "Byssocorticium atrovirens" OR "Cacumisporium capitulatum" OR "Cacumisporium tenebrosum" OR "Calocera cornea" OR "Calocera palmata" OR "Calonectria morganii" OR "Calonectria pseudopeziza" OR "Caloplaca ulcerosa" OR "Calosphaeria acerina" OR "Calospora platanoidis" OR "Camarophyllus virgineus var. curtipes" OR "Camarops pugillus" OR "Camarosporium acerinum" OR "Candelabrochaete septocystidia" OR "Candelariella xanthostigma" OR "Candida sp."

	OR "Cenangium griseum" OR "Centrospora acerina" OR "Cephalosporium sp." OR "Ceraceomyces americanus" OR "Ceratocystis virescens" OR "Ceratostomella ampullasca" OR "Ceratostomella echinella" OR "Cercophora caudata" OR "Cercospora acericola" OR "Cercospora acerigena" OR "Cercospora acerina" OR "Cercospora aceris" OR "Cercospora sp." OR "Cerocorticium confluens" OR "Cerrena unicolor" OR "Chaetomella acutiseta var. acutiseta" OR "Chaetomium graminiforme" OR "Chaetosphaerella fusca" OR "Chaetosphaerella fusispora" OR "Chaetosphaerella phaeostroma" OR "Chaetosphaeria myriocarpa" OR "Chaetosphaeria pulviscula" OR "Chlorencoelia torta" OR "Chlorosplenium aeruginascens" OR "Chondrostereum purpureum" OR "Ciboria acericola" OR "Ciboria acerina" OR "Ciboria rufescens" OR "Ciboriopsis simulata" OR "Cirrenalia acericola" OR "Cistella chlorosticta" OR "Cistella dentata" OR "Cladosporium britannicum" OR "Cladosporium cladosporioides" OR "Cladosporium epiphyllum" OR "Cladosporium epiphyllum var. acerinum" OR "Cladosporium sp." OR "Cladosporium vagans" OR "Clasterosporium caespitulosum" OR "Claussenomyces atrovirens" OR "Claussenomyces prasinula" OR "Clavicorona pyxidata" OR "Climacodon septentrionalis" OR "Clitocybe truncicola" OR "Clypeosphaeria mamillana" OR "Coccomyces coronatus" OR "Coccomyces tumidus" OR "Collema occultatum" OR "Colletotrichum sp." OR "Collybia lacunosa" OR "Comatricha typhoides" OR "Coniella castaneicola" OR "Coniochaeta ligniaria" OR "Coniophora capnoides" OR "Coniosporium corticale" OR "Coniothecium applanatum" OR "Conoplea globosa" OR "Conoplea olivacea" OR "Conoplea sphaerica" OR "Cordana pauciseptata" OR "Coriolopsis gallica" OR "Coriolopsis rigida" OR "Coriolus pubescens" OR "Coriolus versicolor" OR "Coronophora angustata" OR "Coronophora annexa" OR "Corticium caeruleum" OR "Corticium effuscatum" OR "Corticium galactinum" OR "Corticium rallum" OR "Corticium subgiganteum" OR "Corticium vellereum" OR "Cosmospora arxii" OR "Crepidotus hamulatus" OR "Crepidotus herbarum" OR "Cristella sulphurea" OR "Cristulariella moricola" OR "Crocicreas subhyalinum" OR "Cryphonectria parasitica" OR "Cryptadelphia groenendalensis" OR "Cryptendoxyla hypophloia" OR "Cryptocoryneum condensatum" OR "Cryptodiaporthe acerina" OR "Cryptodiaporthe acerinum" OR "Cryptodiaporthe hystrix" OR "Cryptodiaporthe lebiseyi" OR "Cryptodiaporthe magnispora" OR "Cryptodiscus pallidus" OR "Cryptostroma corticale" OR "Cryptovalsa protracta" OR "Cucurbitaria homalea" OR "Curvularia sp." OR "Cyathicula subhyalina" OR "Cyathus striatus" OR "Cylindrobasidium evolvens" OR "Cylindrocarpon candidulum" OR "Cylindrocarpon ianthothele var. majus" OR "Cylindrocarpon ianthothele var. rugulosum" OR "Cylindrosporium sp." OR "Cyptotrama asprata" OR "Cystostereum murrayi" OR "Cytospora chrysosperma" OR "Cytospora leucosperma" OR "Cytospora lutea" OR "Cytospora pseudoplatani" OR "Cytospora pulcherrima" OR "Cytospora sp." OR "Cytosporella sp." OR "Dacryopinax elegans" OR "Dactylaria affinis" OR "Dactylaria echinophila" OR "Daedalea ambigua" OR "Daedalea quercina" OR "Daedalea unicolor" OR "Daldinia childiae" OR "Daldinia concentrica" OR "Daldinia loculatoides" OR "Daldinia petriniae" OR "Daldinia sp." OR "Daldinia vanderguchtiae" OR "Daldinia vernicosa" OR "Dasyscypha soppittii" OR "Dasyscyphus acerinus" OR "Dasyscyphus brevipilus" OR "Dasyscyphus minutissimus" OR "Dasyscyphus patulus" OR "Dasyscyphus pudibundus" OR "Dasyscyphus radotinensis" OR "Dasyscyphus rhytismatis" OR "Datronia mollis" OR "Dematioscypha richonis" OR "Dendrocorticium polygonioides" OR "Dendrophoma sp." OR "Dendrophora versiformis" OR "Dendrothele acerina" OR "Dendrothele alliacea" OR "Dendrothele candida" OR "Dendrothele dryina" OR "Dendrothele maculata" OR "Dendrothele microspora" OR "Dendrothele strumosa" OR "Dendryphiopsis atra" OR "Dentocorticium sulphurellum" OR "Dermea acerina" OR "Diaporthe acerina" OR "Diaporthe eres" OR "Diaporthe kadsurae" OR "Diaporthe microstroma" OR "Diaporthe ontariensis" OR "Diaporthe pustulata" OR "Diaporthe sp." OR "Diaporthe subcongrua" OR "Diaporthe varians" OR "Diatrype albopruinosa" OR "Diatrype decorticata" OR "Diatrype flavovirens" OR "Diatrype oregonensis" OR "Diatrype stigma" OR "Diatrypella frostii" OR "Diatrypella quercina" OR "Didymosporina aceris" OR "Dinemasporium acerinum" OR "Dinemasporium decipiens" OR "Diplodia atrata" OR "Diplodia subtecta" OR "Diplodina acerina" OR "Discella pilosula" OR "Discosia artocreas" OR "Doratomyces stemonitis" OR "Dothiorella sp." OR "Ellisembia adscendens" OR "Elmerina holophaea" OR "Endophragmia bisbyi" OR "Endophragmia boothii" OR "Endophragmiella biseptata" OR "Endophragmiella canadensis" OR "Endophragmiella collapsa" OR "Endophragmiella subolivacea" OR "Endothia sp." OR "Endoxyla acericola" OR "Entosordaria perfidiosa" OR "Epicoccum sp." OR "Erysiphe ljubarskii" OR "Eutypa acharii" OR "Eutypa flavovirens" OR "Eutypa lata" OR "Eutypa

	lata var. aceri" OR "Eutypa leioplaca" OR "Eutypa lejoplaca" OR "Eutypa limaeformis" OR "Eutypa ludibunda" OR "Eutypa maura" OR "Eutypa milliaria" OR "Eutypa spinosa" OR "Eutypa velutina" OR "Eutypella acericola" OR "Eutypella junglandicola" OR "Eutypella leprosa" OR "Eutypella oregonensis" OR "Eutypella paradisiaca" OR "Eutypella parasitica" OR "Eutypella stellulata" OR "Excipularia fusispora" OR "Exidia nucleata" OR "Exidia recisa" OR "Favolus rhipidium" OR "Favolus squamosus" OR "Fibricium subcarneum" OR "Flammulina velutipes" OR "Fomes annosus" OR "Fomes connatus" OR "Fomes fomentarius" OR "Fomes geotropus" OR "Fomes marmoratus" OR "Fomes meliae" OR "Fomes ohiensis" OR "Fomes pini" OR "Fomes populinus" OR "Fomes tenuis" OR "Fomitiporia punctata" OR "Fumago vagans" OR "Fusarium eumartii" OR "Fusarium roseum" OR "Fusarium sp." OR "Fusicoccum sp." OR "Ganoderma applanatum" OR "Ganoderma australe" OR "Ganoderma lipsiense" OR "Ganoderma lobatum" OR "Ganoderma lucidum" OR "Ganoderma resinaceum" OR "Ganoderma tsunodae" OR "Geotrichum sp." OR "Gliocladium viride" OR "Gloeocystidiellum porosum" OR "Gloeophyllum hirsutum" OR "Gloeosporium acericola" OR "Gloeosporium apocryptum" OR "Gloeosporium saccharinum" OR "Glonium stellatum" OR "Gnomonia acerophila" OR "Gnomonia cerastis" OR "Gnomonia setacea" OR "Goniosporium corticale" OR "Gonytrichum caesium var. subglobosum" OR "Grandinia coriaria" OR "Graphium sp." OR "Graphostroma platystoma" OR "Grifola frondosa" OR "Guepinia elegans" OR "Guepinia spathularia" OR "Gymnopilus spectabilis" OR "Gyromitra infula" OR "Gyrostroma missouriense" OR "Hapalopilus nidulans" OR "Haplographium delicatum" OR "Haploporus odorus" OR "Helicobasidium candidum" OR "Helicoma ambiens" OR "Helicoma perelegans" OR "Helicoma proliferens" OR "Helicoma sp." OR "Helicomyces roseus" OR "Helicosporium sp." OR "Helicosporium vegetum" OR "Helminthosporium brachytrichum" OR "Helminthosporium velutinum" OR "Helotium albovirens" OR "Helotium albumineum" OR "Helotium epiphyllum" OR "Helotium fraternum" OR "Helotium naviculisporum" OR "Hendersonia collapsa" OR "Hericium erinaceus" OR "Hericium ramosum" OR "Heterochaetella dubia" OR "Hirschioporus lacteus" OR "Hirschioporus pargamenus" OR "Holwaya leptosperma" OR "Humaria scutellata" OR "Hyalopeziza ciliata" OR "Hyaloscypha lachnobrachya" OR "Hydnum carbonarium" OR "Hymenochaete agglutinans" OR "Hymenochaete badioferruginea" OR "Hymenochaete biformis" OR "Hymenochaete carpatica" OR "Hymenochaete episphaeria" OR "Hymenochaete fuliginosa" OR "Hymenochaete mougeotii" OR "Hymenoscyphus caudatus" OR "Hymenoscyphus epiphyllus" OR "Hymenoscyphus foliicola" OR "Hymenoscyphus phyllogenus" OR "Hymenoscyphus subpallescens" OR "Hyphoderma leoninum" OR "Hyphoderma praetermissum" OR "Hyphoderma rimosum" OR "Hyphoderma setigerum" OR "Hypochnicium subrigescens" OR "Hypocrea gelatinosa" OR "Hypocrea rufa" OR "Hypoderma rufilabrum" OR "Hypoxylon caries" OR "Hypoxylon cohaerens" OR "Hypoxylon dearnessii" OR "Hypoxylon deustum" OR "Hypoxylon fragiforme" OR "Hypoxylon fuscum" OR "Hypoxylon howeanum" OR "Hypoxylon howeianum" OR "Hypoxylon macrocarpum" OR "Hypoxylon mammatum" OR "Hypoxylon mediterraneum" OR "Hypoxylon multiforme var. effusum" OR "Hypoxylon multiforme" OR "Hypoxylon regale" OR "Hypoxylon rubiginosum" OR "Hypoxylon serpens" OR "Hypoxylon serpens var. macrosporum" OR "Hypoxylon viridulosum" OR "Hypsizgus ulmarius" OR "Hypsizygus marmoreus" OR "Hysterium angustatum" OR "Hysterium pulicare" OR "Incrupila melatheja" OR "Incrupila viridipilosa" OR "Inonotus cuticularis" OR "Inonotus dryophilus" OR "Inonotus hispidus" OR "Inonotus radiatus" OR "Irpex griseofuscus" OR "Irpex lacteus" OR "Irpex mollis" OR "Isariopsis sp." OR "Ischnoderma resinosum" OR "Jattaea echinella" OR "Julella sericea" OR "Junghuhnia separabilima" OR "Kabatiella apocrypta" OR "Kabatiella polyspora" OR "Kalmusia clivensis" OR "Karschia lignyota" OR "Kavinia himantia" OR "Lachnum rhytismatis" OR "Lachnum virgineum" OR "Laestadia pseudoplatani" OR "Laeticorticium roseocarneum" OR "Laetiporus sulphureus var. miniatus" OR "Laetiporus sulphureus" OR "Lagynodella acerina" OR "Lambertella tubulosa" OR "Lampteromyces japonicus" OR "Lanzia luteovirescens" OR "Lanzia rufescens" OR "Lasiosphaeria caudata" OR "Lasiosphaeria glabrata" OR "Lasiosphaeria hirsuta" OR "Lasiosphaeria ovina" OR "Lasiosphaeria pezizula" OR "Lasiosphaeria strigosa" OR "Leiosphaerella falcata" OR "Lentaria byssiseda" OR "Lentomita stylophora" OR "Lentomitella cirrhosa" OR "Lenzites betulina" OR "Lenzites heteromorpha" OR "Lenzites tricolor var. tricolor" OR "Leptosphaeria controversa" OR "Leptosphaeria dioica" OR "Leptosphaeria leucoplaca" OR "Leptosphaeria muelleri" OR "Leptosporomyces ovoideus" OR "Licrostroma

	subgiganteum" OR "Lopadostoma saprophilum" OR "Lophiostoma microstomum" OR "Lophiostoma tingens" OR "Lophiostoma triseptatum var. pluriseptatum" OR "Lophiostoma viridarium" OR "Lophiotricha viridicoma" OR "Lulworthia grandispora var. apiculata" OR "Lulworthia submersa" OR "Lylea tetracoila" OR "Macrohyporia extensa" OR "Macrophoma haraeana" OR "Macrophoma sp." OR "Marasmiellus opacus" OR "Massaria inquinans" OR "Massaria lantanae" OR "Massaria vomitoria" OR "Melanconis everhartii" OR "Melanconis sudans" OR "Melanconium crinigerum" OR "Melanoleuca grammopodia var. macrocarpa" OR "Melanomma fuscidulum" OR "Melanomma longicolle" OR "Melanomma medium" OR "Melanomma pulvis-pyrius" OR "Melasmia acerina" OR "Melasmia aceris-trifidi" OR "Melogramma aceris" OR "Menispora ciliata" OR "Menispora glauconigra" OR "Menispora tortuosa" OR "Merulius hirtellus" OR "Merulius tremellosus" OR "Moellerodiscus lentus" OR "Mollisia caespiticia" OR "Mollisia cinerea" OR "Mollisia ligni" OR "Mollisina acerina" OR "Monodictys castaneae" OR "Monodictys putredinis" OR "Morchella esculenta" OR "Mycena cyaneobasis" OR "Mycena radicatella" OR "Mycena subcaerulea" OR "Mycocentrospora acerina" OR "Mycoleptodonoides aitchisonii" OR "Mycosphaerella latebrosa" OR "Mycosphaerella maculiformis" OR "Mycosphaerella punctiformis" OR "Myxarium nucleatum" OR "Myxosporium seriatum" OR "Nectria cinnabarina" OR "Nectria coccinea" OR "Nectria coccinea var. faginata" OR "Nectria dealbata" OR "Nectria dematiosa" OR "Nectria episphaeria" OR "Nectria flavoviridis" OR "Nectria fuckeliana" OR "Nectria galligena" OR "Nectria mammoidea" OR "Nectria mammoidea var. rugulosa" OR "Nectria modesta" OR "Nectria nigrescens" OR "Nectria ochroleuca" OR "Nectria pallidula" OR "Nectria pseudotrichia" OR "Nectria purtonii" OR "Nectria ralfsii" OR "Nectria veuillotiana" OR "Nectria viridescens" OR "Nectria vulpina" OR "Nemania atropurpurea" OR "Nemania chestersii" OR "Nemania quadrata" OR "Nemania serpens" OR "Nematoloma sublateritium" OR "Neobulgaria pura" OR "Neonectria ditissima" OR "Neonectria punicea" OR "Niesslia pulchriseta" OR "Nigrospora sp." OR "Nitschkia brevispina" OR "Nitschkia cupularis" OR "Nodulisporium sp." OR "Nummularia repanda" OR "Nummularia succenturiata" OR "Odontia acerina" OR "Odontia hydnoides" OR "Odontia subcrinale" OR "Oidium sp." OR "Oligoporus tephroleucus" OR "Oncopodium aceris" OR "Ophiocordyceps clavulata" OR "Ophiostoma piceae" OR "Ophiostoma piliferum" OR "Ophiostoma roboris" OR "Orbilia inflatula" OR "Orbilia luteorubella" OR "Otthia spiraeae" OR "Oudemansiella mucida" OR "Oxyporus populinus" OR "Pachyella clypeata" OR "Panus laevis" OR "Panus rudis" OR "Papularia arundinis" OR "Papularia sp." OR "Parmelia glabratula" OR "Parmelia subargentifera" OR "Parmelia subrudecta" OR "Patellaria cylindrospora" OR "Patellariopsis clavispora" OR "Penicillium sp." OR "Peniophora carnosa" OR "Peniophora cinerea" OR "Peniophora decorticans" OR "Peniophora gracillima" OR "Peniophora heterocystidia" OR "Peniophora hydnoides" OR "Peniophora parasitica" OR "Peniophora velutina" OR "Peniophora violaceolivida" OR "Peniophora viticola" OR "Perenniporia fissiliformis" OR "Periconia pycnospora" OR "Peroneutypa heteracantha" OR "Pestalotia aceris" OR "Pestalotia sp." OR "Pestalotiopsis aceris" OR "Pestalotiopsis paraguariensis" OR "Pezicula acericola" OR "Pezicula acerina" OR "Pezicula aesculea" OR "Pezicula carnea" OR "Pezicula sp." OR "Pezicula subcarnea" OR "Peziza cognata" OR "Peziza paulopuncta" OR "Peziza repanda" OR "Peziza simulata" OR "Peziza vinosa" OR "Phaeodiaporthe appendiculata" OR "Phaeoisaria sparsa" OR "Phaeomoniella sp." OR "Phaeosphaeriopsis sp." OR "Phaeostalagmus altissimus" OR "Phaeostalagmus cyclosporus" OR "Phanerochaete carnosa" OR "Phanerochaete chrysorhiza" OR "Phanerochaete ericina" OR "Phanerochaete filamentosa" OR "Phanerochaete laevis" OR "Phanerochaete rhodella" OR "Phanerochaete sordida" OR "Phanerochaete velutina" OR "Phellinidium fragrans" OR "Phellinus ferruginosus" OR "Phellinus fragrans" OR "Phellinus igniarius" OR "Phellinus macgregorii" OR "Phellinus melleoporus" OR "Phellinus parmastoi" OR "Phellinus robustus" OR "Phialocephala canadensis" OR "Phialocephala fusca" OR "Phialophora americana" OR "Phialophora sp." OR "Phialophora verrucosa" OR "Phlebia floridensis" OR "Phlebia radiata" OR "Phlebia setulosa" OR "Pholiota albocrenulata" OR "Pholiota sp." OR "Phoma consorta" OR "Phoma pezizoides" OR "Phoma sp." OR "Phomopsis acerina" OR "Phomopsis aceris-palmatus" OR "Phomopsis lebiseyi" OR "Phragmotrichum rivoclarinum" OR "Phyllactinia guttata" OR "Phyllactinia suffulta" OR "Phyllosticta acericola" OR "Phyllosticta aceris" OR "Phyllosticta capitalensis" OR "Phyllosticta minima" OR "Phyllosticta minutissima" OR "Phyllosticta negundinis" OR "Phyllosticta platanoides" OR "Phyllosticta platanoidis" OR "Phyllosticta sp." OR "Physalospora malorum" OR "Physcia caesia" OR "Physcia dubia" OR "Phytophthora

	cactorum" OR "Phytophthora cambivora" OR "Phytophthora cinnamomi" OR "Phytophthora citricola" OR "Phytophthora infestans" OR "Phytophthora sp." OR "Pilidium acerinum" OR "Plagiostoma barriae" OR "Plagiostoma inclinatum" OR "Plagiostoma petiolophilum" OR "Plagiostoma pseudobavaricum" OR "Plagiostoma sp." OR "Platystomum compressum var. pseudomacrostomum" OR "Pleomassaria acericola" OR "Pleospora papillata" OR "Pleurophoma pleurospora" OR "Pleurophragmium parvisporum" OR "Pleurotellus hypnophilus" OR "Pleurothecium recurvatum" OR "Pleurotus cornucopiae var. citrinopileatus" OR "Pleurotus ostreatus" OR "Pleurotus salmoneostramineus" OR "Pleurotus serotinus" OR "Pleurotus strigosus" OR "Pleurotus ulmarius" OR "Plicaturopsis crispa" OR "Polyporus admirabilis" OR "Polyporus adustus" OR "Polyporus biformis" OR "Polyporus conchifer" OR "Polyporus cuticularis" OR "Polyporus delectans" OR "Polyporus ectypus" OR "Polyporus floriformis" OR "Polyporus frondosus" OR "Polyporus gilvus" OR "Polyporus glomeratus" OR "Polyporus hispidus" OR "Polyporus lentus" OR "Polyporus litschaueri" OR "Polyporus mori" OR "Polyporus nidulans" OR "Polyporus picipes" OR "Polyporus pinsitus" OR "Polyporus planellus" OR "Polyporus robiniophilus" OR "Polyporus spraguei" OR "Polyporus squamosus" OR "Polyporus tulipiferae" OR "Polyporus umbellatus" OR "Polyporus varius" OR "Polyporus versicolor" OR "Poria ambigua" OR "Poria attenuata" OR "Poria aurea" OR "Poria cinerascens" OR "Poria cocos" OR "Poria elongata" OR "Poria eupora" OR "Poria fimbriatella" OR "Poria fraxinea" OR "Poria isabellina" OR "Poria lurida" OR "Poria mollusca" OR "Poria pulchella" OR "Poria punctata" OR "Poria subacida" OR "Poria tomentocincta" OR "Poria unita" OR "Poria versipora" OR "Propolis lobata" OR "Propolomyces versicolor" OR "Prosthecium innesii" OR "Prosthecium platanoidis" OR "Protoventuria vancouverensis" OR "Pseudobasidiospora caroliniana" OR "Pseudodiplodia corticis" OR "Pseudospiropes longipilus" OR "Pseudospiropes nodosus" OR "Pseudospiropes simplex" OR "Pseudotomentella flavovirens" OR "Pseudotomentella griseopergamacea" OR "Pseudovalsa fusca" OR "Pseudovalsa minima" OR "Ptychogaster cubensis" OR "Pycnoporellus fulgens" OR "Pycnoporus cinnabarinus" OR "Pycnoporus sanguineus" OR "Pyrenopeziza nervicola" OR "Pyrenopeziza petiolaris" OR "Pythium debaryanum" OR "Resinicium bicolor" OR "Rhamphoria bevanii" OR "Rhizoctonia aurantiaca" OR "Rhizoctonia solani" OR "Rhodotorula sp." OR "Rhytisma acerinum" OR "Rhytisma punctatum" OR "Rigidoporus nigrescens" OR "Rosellinia aquila" OR "Rosellinia cainii" OR "Rosellinia corticium" OR "Rosellinia evansii" OR "Rosellinia medullaris" OR "Rosellinia megalocarpa" OR "Rosellinia necatrix" OR "Russula salmoneolutea" OR "Rutstroemia luteovirescens" OR "Rutstroemia sp." OR "Rutstroemia sydowiana" OR "Sarcoscypha coccinea" OR "Sarcoscypha occidentalis" OR "Sawadaea bicornis" OR "Sawadaea polyfida var. japonica" OR "Sawadaea sp." OR "Sawadaea tulasnei" OR "Sawadaia bicornis" OR "Schizophyllum commune" OR "Schizothyrium aceris" OR "Schizoxylon compositum" OR "Schizoxylum cinereum" OR "Scoleconectria atkinsonii" OR "Scopuloides rimosa" OR "Scytinostroma protrusum subsp. septentrionale" OR "Sebacina epigaea" OR "Sebacina incrustans" OR "Sebacina molybdea" OR "Seimatosporium lichenicola" OR "Septobasidium castaneum" OR "Septobasidium pseudopedicellatum" OR "Septomyxa tulasnei" OR "Septonema breviusculum" OR "Septoria acerina" OR "Septoria aceris" OR "Septoria apatela" OR "Septoria epicotylea" OR "Septoria negundinis" OR "Septoria seminalis var. platanoidis" OR "Septoria sp." OR "Septosporium velutinum" OR "Skeletocutis perennis" OR "Sordaria lutea" OR "Spadicoides atra" OR "Spadicoides bina" OR "Spadicoides obovata" OR "Spegazzinia parkeri" OR "Sphaerella alarum" OR "Sphaeria atriella" OR "Sphaeria caminata" OR "Sphaeria fulvotecta" OR "Sphaeria monilispora" OR "Sphaeria vetusta" OR "Sphaeronaema acerinum" OR "Sphaeropsis grandinea" OR "Sphaeropsis sp." OR "Sphaerostilbe flammea" OR "Sphaerotheca fuliginea" OR "Splanchnonema pupula" OR "Spongipellis delectans" OR "Spongipellis spumeus" OR "Sporidesmiella brachysporioides" OR "Sporidesmiella hyalosperma var. hyalosperma" OR "Sporidesmium altum" OR "Sporidesmium folliculatum" OR "Sporidesmium hormiscioides" OR "Sporidesmium hysterioideum" OR "Sporidesmium leptosporum" OR "Sporidesmium moriforme" OR "Sporidesmium varians" OR "Sporonema pallidum" OR "Stachybotrys chartarum" OR "Stachycoremium parvulum" OR "Steccherinum ochraceum" OR "Steccherinum peckii" OR "Steccherinum septentrionale" OR "Steccherinum setulosum" OR "Steccherinum tenue" OR "Steganosporium ovatum" OR "Stegonsporium pyriforme" OR "Stereum complicatum" OR "Stereum fuscum" OR "Stereum gausapatum" OR "Stereum hirsutum" OR "Stereum lilacinofuscum" OR "Stereum murrayi" OR "Stereum ostrea" OR "Stictis radiata" OR "Stigmatomassaria

	pupula" OR "Stigmina robusta" OR "Stilbum giganteum" OR "Streptomyces sp." OR "Strickeria obducens" OR "Stromatocyphella aceris" OR "Strossmayeria bakeriana" OR "Strossmayeria basitricha" OR "Taeniolella breviuscula" OR "Taphrina sacchari" OR "Taphrina sp." OR "Teichospora nigrobrunnea" OR "Thanatephorus terrigenus" OR "Thelephora sp." OR "Thelonectria gongylodes" OR "Thelonectria nodosa" OR "Thyridaria minima" OR "Thyridaria rubronotata" OR "Thyridium stilbostomum" OR "Thyronectria pyrrhochlora" OR "Thyronectria virens" OR "Tilletiopsis lilacina" OR "Tilletiopsis minor var. flava" OR "Tomentella angulospora" OR "Tomentella atrorubra" OR "Tomentella bicolor" OR "Tomentella botryoides" OR "Tomentella bresadolae" OR "Tomentella bryophila" OR "Tomentella calcicola" OR "Tomentella chlorina" OR "Tomentella cinerascens" OR "Tomentella coerulea" OR "Tomentella crinalis" OR "Tomentella epigaea" OR "Tomentella ferruginea" OR "Tomentella fibrosa" OR "Tomentella fuscoferruginosa" OR "Tomentella lateritia" OR "Tomentella microspora" OR "Tomentella neobourdotii" OR "Tomentella ochracea" OR "Tomentella olivascens" OR "Tomentella pilosa" OR "Tomentella punicea" OR "Tomentella ramosissima" OR "Tomentella ruttneri" OR "Tomentella subcinerascens" OR "Tomentella sublilacina" OR "Tomentella subvinosa" OR "Tomentella terrestris" OR "Tomentella umbrinospora" OR "Tomentella violaceofusca" OR "Tomentella viridescens" OR "Tomentella viridis" OR "Tomentella viridula" OR "Trametes cinnabarina var. sanguinea" OR "Trametes elegans" OR "Trametes hirsuta" OR "Trametes malicola" OR "Trametes trogii" OR "Trametes unicolor" OR "Trechispora farinacea" OR "Trematosphaeria pertusa" OR "Tremella foliacea" OR "Tremella lutescens" OR "Triblidium caliciiforme" OR "Trichocladium canadense" OR "Trichocladium sp." OR "Trichoderma sp." OR "Trichodiscus virescentulus" OR "Trichothecium sp." OR "Tripospermum acerinum" OR "Trisulcosporium acerinum" OR "Tubakia dryina" OR "Tubercularia granulata" OR "Tubercularia smaragdina" OR "Tubercularia vulgaris" OR "Tubulicrinis glebulosus" OR "Tulasnella pruinosa" OR "Tulasnella violea" OR "Tympanis acericola" OR "Tympanis acerina" OR "Tympanis bicolor" OR "Tympanis truncatula" OR "Typhula intermedia" OR "Typhula phacorrhiza" OR "Tyromyces balsameus" OR "Tyromyces chioneus" OR "Tyromyces fissilis" OR "Tyromyces fumidiceps" OR "Tyromyces galactinus" OR "Tyromyces immitis" OR "Tyromyces spumeus" OR "Tyromyces stipticus" OR "Tyromyces undosus" OR "Uncinula aceris" OR "Uncinula bicornis" OR "Uncinula circinata" OR "Uncinula nankinensis" OR "Unguiculariopsis ilicincola" OR "Valsa ambiens" OR "Valsa ambiens subsp. ambiens" OR "Valsa ambiens subsp. leucostomoides" OR "Valsa ceratosperma" OR "Valsa magnispora" OR "Valsa myinda" OR "Valsa pauperata" OR "Valsa pseudoplatani" OR "Valsa sordida" OR "Valsaria exasperans" OR "Velutarina rufo-olivacea" OR "Venturia acerina" OR "Vermicularia ochrochaeta" OR "Verticillium albo-atrum" OR "Verticillium dahliae" OR "Verticillium nigra" OR "Verticillium sp." OR "Vesiculomyces citrinus" OR "Vibrissea truncorum" OR "Volvariella bombycina" OR "Vuilleminia comedens" OR "Wardomyces hughesii" OR "Xenasma alboglaucum" OR "Xenasma praeteritum" OR "Xenasma rallum" OR "Xenasma rimicola" OR "Xenasma tulasnelloideum" OR "Xenostigmina zilleri" OR "Xylaria acuta" OR "Xylaria cornu-damae" OR "Xylaria cubensis" OR "Xylaria longipes" OR "Xylaria polymorpha" OR "Xylaria warburgii" OR "Zygodesmus granulosus" OR "Zygodesmus limonisporus" OR "Biscogniauxia capnodes" OR "Botryosphaeria parva" OR "Pestalotiopsis sp." OR "Drepanosiphum platanoidis" OR "Periphyllus californiensis" OR "Phloeophagosoma dilutum" OR "Stenoscelis hylastoides" OR "Lopharia spadicea" OR "Stegonsporium pyriforme" OR "Hyphoderma obtusum" OR "Pleurotus ostreatus" OR "Chondrostereum purpureum" OR "Codinaea glauconigra" OR "Costantinella terrestris" OR "Fomes connatus" OR "Ganoderma lucidum" OR "Hypoxylon deustum" OR "Hypoxylon howeanum" OR "Laeticorticium roseocarneum" OR "Menispora glauconigra" OR "Menispora tortuosa" OR "Nectria pithoides" OR "Omphalotus olearius" OR "Ophionectria cerea" OR "Peniophora decorticans" OR "Plectania coccinea" OR "Polyporus brumalis" OR "Polyporus dichrous" OR "Polyporus" OR "Polyporus glomeratus" OR "Spadicoides atra" OR "Stegonsporium pyriforme" OR "Vararia investiens" OR "Massaria pupula" OR "Metasphaeria sepincola" OR "Septogloeum hercynicum" OR "Trichia scabra" OR "Cylindrocladium pacificum" OR "Verticillium nigrescens" OR "Agaricus" OR "Botryosphaeria quercuum sensu" OR "Calonectria kyotensis" OR "Descolea" OR "Eutypa" OR "Gymnopus sp." OR "Inocybe geophila" OR "Lopharia cinerascens" OR "Verticillium" OR "Dendrothele acerina" OR "Dacrymyces capitatus" OR "Dacrymyces stillatus" OR "Diatrypaceae" OR "Exidia nucleata" OR "Lycoperdon" OR "Phloeospora aceris" OR "Rhytisma acerinum" OR "Suillus grevillei"

	OR "Pseudomonas syringae pv. aceris" OR "Verticillium intertextum" OR "Aporpium caryae" OR "Cryptodiaporthe myinda" OR "Diatrypella frostii" OR "Helicoma viride" OR "Hypocrea gelatinosa" OR "Polyporus albellus" OR "Polyporus" OR "Polyporus fumidiceps" OR "Polyporus galactinus" OR "Poria elongata" OR "Poria pannocincta" OR "Cecidomyia ocellaris" OR "Dasyneura communis" OR "Rhabdophaga rileyana" OR "Perrisia tympani" OR "Aceria ryderi" OR "Aculops longispinosus" OR "Cnestus mutilatus" OR "Monarthrum mali" OR "Euwallacea fornicatus sensu lato" OR "Hypothenemus eruditus" OR "Megaplatypus mutatus" OR "Platypus koryoensis" OR "Xylosandrus compactus" OR "Longidorus biformis" OR "Longidorus breviannulatus" OR "Longidorus crassus" OR "Longidorus diadecturus" OR "Longidorus paralongicaudatus" OR "Longidorus paravineacola" OR "Xiphinema brevicolle" OR "Xiphinema simile" OR "Nanidorus minor" OR "Paratrichodorus teres")

Appendix C – Plant taxa reported to be present in the nurseries of *Acer campestre*

Table C.1: Plant taxa reported in the Dossier Section 6.0 to be present in the nurseries of *Acer campestre*

Number	Plant taxa	Number	Plant taxa
1	*Abelia*	292	*Lavatera*
2	*Abies alba*	293	*Leucanthemum*
3	*Abies concolor*	294	*Leucothoe*
4	*Abies fraseri*	295	*Leycesteria*
5	*Abies grandis*	296	*Leymus*
6	*Abies koreana*	297	*Liatris*
7	*Abies nobilis*	298	*Ligularia*
8	*Abies nordmanniana*	299	*Ligustrum*
9	*Abies procera*	300	*Ligustrum ovalifolium*
10	*Acacia*	301	*Ligustrum ovalifolium* 'Aureum'
11	*Acanthus*	302	*Ligustrum vulgare*
12	*Acer*	303	*Liquidambar*
13	*Acer campestre*	304	*Liquidambar styr.* 'Slender Silhouette'
14	*Acer campestre* 'Elsrijk'	305	*Liquidambar styraciflua*
15	*Acer campestre fastigiata*	306	*Liquidambar styraciflua* 'Lane Roberts'
16	*Acer campestre* 'Streetwise'	307	*Liquidambar styraciflua* 'Worplesdon'
17	*Acer capillipes*	308	*Liriodendron tulipifera*
18	*Acer cappodocicum* 'Rubrum'	309	*Liriope*
19	*Acer davidii*	310	*Lithodora*
20	*Acer davidii* 'George Forrest'	311	*Lobelia*
21	*Acer griseum*	312	*Lonicera*
22	*Acer lobelii*	313	*Lonicera nitida*
23	*Acer macrocarpa*	314	*Lonicera periclymenum*
24	*Acer palmatum*	315	*Lupinus*
25	*Acer palmatum* 'Atropurpureum'	316	*Luzula*
26	*Acer palmatum* 'Red Wings'	317	*Lysimachia*
27	*Acer pensylvanicum*	318	*Magnolia*
28	*Acer platanoides*	319	*Magnolia* 'Galaxy'
29	*Acer platanoides* 'Columnare'	320	*Magnolia grandiflora* 'Ferruginea'
30	*Acer platanoides* 'Crimson King'	321	*Magnolia kobus*
31	*Acer platanoides* 'Crimson Sentry'	322	*Mahonia*
32	*Acer platanoides* 'Deborah'	323	*Malus*
33	*Acer platanoides* 'Emerald Queen'	324	*Malus* 'Adirondack'
34	*Acer platanoides* 'Globosum'	325	*Malus* 'Comtesse de Paris'
35	*Acer platanoides* 'Perfect Upright'	326	*Malus* 'Evereste'
36	*Acer platanoides* 'Princeton Gold'	327	*Malus* 'Freja'
37	*Acer pseudoplatanus*	328	*Malus hupehensis*
38	*Acer pseudoplatanus* 'Erectum'	329	*Malus* 'Mokum'
39	*Acer pseudoplatanus purpurea*	330	*Malus sylvestris*
40	*Acer rubrum*	331	*Malus trilobata*
41	*Acer rubrum* 'Karpick'	332	*Malus tschonoskii*
42	*Acer rubrum* 'October Glory'	333	*Matteuccia*
43	*Acer tataricum* subsp. *ginnala*	334	*Maytenus boaria*
44	*Acer* × *freemanii* 'Armstrong'	335	*Meconopsis*
45	*Acer* × *freemanii* 'Autumn Blaze'	336	*Metasequoia glyptostroboides*

Number	Plant taxa	Number	Plant taxa
46	*Achillea*	337	*Miscanthus*
47	*Acorus*	338	*Molinia*
48	*Actaea*	339	*Monarda*
49	*Aesculus hippocastanum* 'Baumannii'	340	*Myrtus*
50	*Aesculus indica*	341	*Nandina*
51	*Aesculus* × *carnea* 'Briotii'	342	*Nemesia*
52	*Agapanthus*	343	*Nepeta*
53	*Agastache*	344	*Nothofagus antarctica*
54	*Ajuga*	345	*Nothofagus*
55	*Akebia*	346	*Nyssa sylvatica*
56	*Alchemilla*	347	*Olea europea*
57	*Allium*	348	*Olearia*
58	*Alnus*	349	*Ophiopogon*
59	*Alnus cordata*	350	*Osmanthus*
60	*Alnus glutinosa*	351	*Osmunda*
61	*Alnus glutinosa* 'Laciniata'	352	*Ostrya carpinifolia*
62	*Alnus incana*	353	*Pachysandra*
63	*Alnus incana* 'Aurea'	354	*Pachystegia*
64	*Alnus rubra*	355	*Paeonia*
65	*Alnus spaethii*	356	*Panicum*
66	*Alstroemeria*	357	*Parrotia persica* 'Vanessa'
67	*Amelanchier*	358	*Paulownia tomentosa*
68	*Amelanchier canadensis*	359	*Pennisetum*
69	*Amelanchier grandiflora* 'Ballerina'	360	*Penstemon*
70	*Amelanchier lamarckii*	361	*Perovskia*
71	*Amelanchier lamarckii* 'Robin Hill'	362	*Persicaria*
72	*Ammonophylla*	363	*Philadelphus*
73	*Anemanthele*	364	*Phlomis*
74	*Anemone*	365	*Phlox*
75	*Aquilegia*	366	*Phormium*
76	*Araucaria araucana*	367	*Photinia*
77	*Arbutus*	368	*Photinia* × *fraseri* 'Red Robin'
78	*Arbutus unedo*	369	*Phygelius*
79	*Armeria*	370	*Physocarpus*
80	*Artemisia*	371	*Physostegia*
81	*Arum*	372	*Picea abies*
82	*Aruncus*	373	*Picea omorika*
83	*Asplenium*	374	*Picea orientalis*
84	*Astelia*	375	*Picea ormorika*
85	*Aster*	376	*Picea pungens glauca*
86	*Astilbe*	377	*Picea sitchensis*
87	*Astrantia*	378	*Pinus*
88	*Athyrium*	379	*Pinus nigra*
89	*Aucuba*	380	*Pinus nigra* var. *austriaca*
90	*Baptisia*	381	*Pinus peuce*
91	*Berberis*	382	*Pinus pinaster*
92	*Berberis darwinii*	383	*Pinus pungens glauca*
93	*Berberis thunbergii*	384	*Pinus radiata*
94	*Berberis thunbergii* f. *atropurpurea*	385	*Pinus sylvestris*
95	*Bergenia*	386	*Pittosporum*

Number	Plant taxa	Number	Plant taxa
96	*Betula*	387	*Platanus orientalis digitalis*
97	*Betula albosinensis* 'Fascination'	388	*Platanus* × *hispanica louisalead*
98	*Betula albosinensis* 'Hillier'	389	*Platanus*
99	*Betula albosinensis* 'Red Panda'	390	*Polemonium*
100	*Betula* 'Edinburgh'	391	*Polygonatum*
101	*Betula ermanii*	392	*Polypodium*
102	*Betula lenta*	393	*Polystichum*
103	*Betula nigra*	394	*Populus*
104	*Betula papyrifera* var. *kenaica*	395	*Populus nigra* 'Italica'
105	*Betula pendula*	396	*Populus nigra*
106	*Betula pendula* 'Dalecarlica'	397	*Populus tremula*
107	*Betula pendula fastigiata* 'Obelisk'	398	*Potentilla*
108	*Betula pendula* 'Zwitsers Glory'	399	*Primula*
109	*Betula pubescens*	400	*Prunus*
110	*Betula utilis* 'Jermyns'	401	*Prunus* 'Accolade'
111	*Betula utilis* var. *jacquemontii*	402	*Prunus* 'Amanogawa'
112	*Blechnum*	403	*Prunus avium*
113	*Brachyglottis*	404	*Prunus avium* 'Landscape Bloom'
114	*Brunnera*	405	*Prunus avium* 'Plena'
115	*Buddleja*	406	*Prunus campanulata*
116	*Buxus*	407	*Prunus cera*
117	*Buxus sempervirens*	408	*Prunus cerasifera*
118	*Calamagrostis*	409	*Prunus cerasifera* 'Nigra'
119	*Calluna*	410	*Prunus cerasifera* 'Pissardii'
120	*Campanula*	411	*Prunus* 'Ichiyo'
121	*Carex*	412	*Prunus* 'Kanzan'
122	*Carpinus*	413	*Prunus* 'Kursar'
123	*Carpinus betulus*	414	*Prunus laurocerasus* 'Rotund'
124	*Carpinus betulus* 'Cube Head'	415	*Prunus laurocerasus*
125	*Carpinus betulus* 'Pleached'	416	*Prunus laurocerasus* 'Magnoliifolia'
126	*Carpinus betulus* 'Fastigiata'	417	*Prunus* 'Litigiosa'
127	*Carpinus betulus* 'Lucas'	418	*Prunus* lusitanica
128	*Carpinus betulus* 'Streetwise'	419	*Prunus maackii* 'Amber Beauty'
129	*Caryopteris*	420	*Prunus* 'Mount Fuji' (Shirotae)
130	*Castanea*	421	*Prunus padus*
131	*Castanea sativa*	422	*Prunus padus* 'Select'
132	*Castanea sativa* 'Anny's Summer Red'	423	*Prunus* 'Pandora'
133	*Catalpa bignoniodes*	424	*Prunus sargentii*
134	*Ceanothus*	425	*Prunus sargentii* 'Rancho'
135	*Cedrus atlantica* 'Glauca'	426	*Prunus serrula*
136	*Cedrus atlantica*	427	*Prunus* 'Shirofugen'
137	*Cedrus deodara*	428	*Prunus* 'Snow Goose'
138	*Cedrus libani*	429	*Prunus spinosa*
139	*Celtis australis*	430	*Prunus* 'Spire' ('hillieri Spire')
140	*Centaurea*	431	*Prunus* 'Sunset Boulevard'
141	*Centranthus*	432	*Prunus* 'Tai-haku'
142	*Ceratostigma*	433	*Prunus* × *schmittii*
143	*Cercidiphyllum japonicum*	434	*Prunus* × *sub*. 'Autumnalis Rosea'
144	*Cercis canadensis*	435	*Prunus* × *subhirtella* 'Autumnalis'
145	*Cercis silaquastrum*	436	*Prunus yedoensis*

Number	Plant taxa	Number	Plant taxa
146	*Chaenomeles*	437	*Pseudotsuga menziesii*
147	*Chamaecyparis*	438	*Pterocarya stenoptera* 'Fern Leaf'
148	*Chamaecyparis lawsoniana*	439	*Pulmonaria*
149	*Choisya*	440	*Pyracantha*
150	*Cistus*	441	*Pyrus*
151	*Clematis*	442	*Pyrus calleryana* 'Chanticleer'
152	*Convolvulus*	443	*Pyrus calleryana* 'Red Spire'
153	*Coprosma*	444	*Pyrus communis*
154	*Coreopsis*	445	*Quercus*
155	*Cornus*	446	*Quercus castaneifolia* 'Green Spire'
156	*Cornus kousa* var. *chinensis*	447	*Quercus cerris*
157	*Cornus sanguinea*	448	*Quercus frainetto* 'Hungarian Crown'
158	*Cortaderia*	449	*Quercus ilex*
159	*Corydalis*	450	*Quercus palustris*
160	*Corylus*	451	*Quercus palustris* 'Green Pillar'
161	*Corylus avellana*	452	*Quercus petraea*
162	*Corylus colurna*	453	*Quercus robur*
163	*Cosmos*	454	*Quercus robur* 'Fastigiata Koster'
164	*Cotinus*	455	*Quercus rubra*
165	*Cotoneaster*	456	*Quercus* × *bimundorum* 'Crimson Spire'
166	*Cotoneaster bullatus*	457	*Rhamnus*
167	*Cotoneaster franchettii*	458	*Rhamnus cathartica*
168	*Cotoneaster horizontalis*	459	*Rhamnus frangula*
169	*Cotoneaster lacteus*	460	*Rhus*
170	*Cotoneaster simonsii*	461	*Ribes*
171	*Crataegus*	462	*Robinia* 'Casque Rouge/Bessoniana'
172	*Crataegus laevigata* 'Pauls Scarlet'	463	*Robinia pseudoacacia*
173	*Crataegus lavallei* 'Carreri'	464	*Robinia*
174	*Crataegus monogyna*	465	*Rosa*
175	*Crataegus persimilis* 'Prunifolia'	466	*Rosa arvensis*
176	*Crocosmia*	467	*Rosa canina*
177	*Cryptomeria japonica*	468	*Rosa rubiginosa*
178	*Cupressocyparis*	469	*Rosa rugosa*
179	*Cupressocyparis leylandii*	470	*Rosa rugosa* 'Alba'
180	*Cupressus*	471	*Rosa rugosa rubra*
181	*Cupressus macrocarpa*	472	*Rosa spinosissima*
182	*Cynoglossum*	473	*Rosmarinus*
183	*Cytisus*	474	*Rudbeckia*
184	*Dahlia*	475	*Salix*
185	*Daphne*	476	*Salix alba*
186	*Davidia involucrata*	477	*Salix alba* 'Britzensis'
187	*Delosperma*	478	*Salix aurita*
188	*Delphinium*	479	*Salix babylonica pendula*
189	*Deschampsia*	480	*Salix capraea*
190	*Deutzia*	481	*Salix cinerea*
191	*Dicentra*	482	*Salix pentandra*
192	*Diervilla*	483	*Salix viminalis*
193	*Digitalis*	484	*Salvia*
194	*Doronicum*	485	*Sambucus*
195	*Dryopteris*	486	*Sambucus nigra*

Number	Plant taxa	Number	Plant taxa
196	*Echinacea*	487	*Sanguisorba*
197	*Echinops*	488	*Santolina*
198	*Elaeagnus*	489	*Sarcococca confusa*
199	*Epimedium*	490	*Scabiosa*
200	*Eremurus*	491	*Schizostylis*
201	*Erigeron*	492	*Sedum*
202	*Eriophorum*	493	*Senecio*
203	*Eriostemon*	494	*Sequoia sempervirens*
204	*Eryngium*	495	*Sequoiadendron giganteum*
205	*Erysimum*	496	*Sesleria*
206	*Escallonia*	497	*Sorbaria*
207	*Eucalyptus*	498	*Sorbus*
208	*Eucalyptus glaucescens*	499	*Sorbus aria*
209	*Eucalyptus gunnii*	500	*Sorbus aria* 'Majestica'
210	*Euonymus*	501	*Sorbus arnoldiana* 'Golden Wonder'
211	*Euonymus europaeus*	502	*Sorbus aucuparia*
212	*Euonymus europaeus* 'Red Cascade'	503	*Sorbus aucuparia* 'Aspleniifolia'
213	*Euonymus japonicus* 'Bravo'	504	*Sorbus aucuparia* 'Cardinal Royal'
214	*Euphorbia*	505	*Sorbus aucuparia* 'Sheerwater Seedling'
215	*Exochorda*	506	*Sorbus aucuparia* 'Streetwise'
216	*Fagus*	507	*Sorbus* 'Autumn Spire'
217	*Fagus aspelenifolia*	508	*Sorbus commixta* 'Embley'
218	*Fagus sylvatica*	509	*Sorbus commixta* 'Olympic Flame'
219	*Fagus sylvatica* 'Atropurpurea'	510	*Sorbus* 'Glowing Pink'
220	*Fagus sylvatica* 'Dawyck'	511	*Sorbus* 'Hemsleyi John Bond'
221	*Fagus sylvatica* 'Dawyck Gold'	512	*Sorbus intermedia*
222	*Fagus sylvatica* 'Dawyck Purple'	513	*Sorbus intermedia* 'Browers'
223	*Fagus sylvatica* 'Purpurea'	514	*Sorbus* 'John Mitchell'
224	*Fargesia*	515	*Sorbus* 'Sunshine'
225	*Fatsia*	516	*Sorbus torminalis*
226	*Festuca*	517	*Sorbus* × *thuringiaca* 'Fastigiata'
227	*Filipendula*	518	*Spiraea*
228	*Foeniculum*	519	*Stachys*
229	*Forsythia*	520	*Stachyurus*
230	*Fraxinus angustifolia*	521	*Stewartia pseudocamellia*
231	*Fraxinus americana*	522	*Stipa*
232	Fruit Trees	523	*Symphoricarpos*
233	*Fuchsia*	524	*Symphytum*
234	*Galium*	525	*Syringa*
235	*Garrya*	526	*Taxodium dist.* Nutans
236	*Gaultheria procumbens*	527	*Taxodium distichum*
237	*Gaultheria shallon*	528	*Taxus*
238	*Gaura*	529	*Taxus baccata*
239	*Genista*	530	*Tellima*
240	*Geranium*	531	*Thalictrum*
241	*Geum*	532	*Thuja*
242	*Ginkgo biloba*	533	*Thuja plicata*
243	*Ginkgo biloba* 'Globosum'	534	*Thuja plicata* 'Fastigiata'
244	*Ginkgo biloba* 'Saratoga'	535	*Thymus*
245	*Gleditsia triacanthos* 'Skyline'	536	*Tiarella*

Number	Plant taxa	Number	Plant taxa
246	*Griselinia*	537	*Tilia*
247	*Hakonechloa*	538	*Tilia cordata*
248	*Halesia carolina*	539	*Tilia cordata* 'Corzam'
249	*Halimium*	540	*Tilia cordata* 'Greenspire'
250	*Hebe*	541	*Tilia cordata* 'Streetwise'
251	*Hedera*	542	*Tilia cordata* 'Winter Orange'
252	*Helenium*	543	*Tilia* 'Harold Hillier'
253	*Helichrysum*	544	*Tilia henryana*
254	*Helleborus*	545	*Tilia oliveri*
255	*Hemerocallis*	546	*Tilia petolaris* 'Chelsea Sentinel'
256	*Heuchera*	547	*Tilia platanoides*
257	*Heucherella*	548	*Tilia platyphyllos*
258	*Hippophae*	549	*Tilia platyphyllos* 'Aurea'
259	*Hippophae rhamnoides*	550	*Tilia platyphyllos* 'Princes Street'
260	*Hippophae salicifolia* 'Streetwise'	551	*Tilia platyphyllos* 'Streetwise'
261	*Hosta*	552	*Tilia tomentosa* 'Brabant'
262	*Houttuynia*	553	*Tilia* × *euchlora*
263	*Hydrangea*	554	*Tilia* × *europaea* 'Pallida'
264	*Hypericum*	555	*Trachelospermum*
265	*Iberis*	556	*Trachycarpus fortunei*
266	*Ilex*	557	*Tradescantia*
267	*Ilex aquifolium*	558	*Tricyrtis*
268	*Ilex aquifolium* 'Marijo'	559	*Trollius*
269	*Ilex crenata*	560	*Tsuga heterophylla*
270	*Ilex* × *altaclarensis* 'James G. Esson'	561	*Ulex*
271	*Ilex* × *altaclerensis* 'Golden King'	562	*Ulex europaeus*
272	*Ilex* × *koehneana* 'Chestnut Leaf'	563	*Ulmus*
273	*Imperata*	564	*Ulmus* 'Columnella'
274	*Iris*	565	*Ulmus* 'Fiorente'
275	*Jasminum*	566	*Ulmus glabra*
276	*Juglans nigra*	567	*Ulmus* 'New Horizon'
277	*Juglans regia*	568	*Ulmus* 'Rebona'
278	*Juniperus*	569	*Ulmus* 'San Zenobi'
279	*Juniperus communis*	570	*Uncinia*
280	*Knautia*	571	*Verbena*
281	*Kniphofia*	572	*Veronica*
282	*Koelreuteria paniculata*	573	*Viburnum*
283	*Laburnum*	574	*Viburnum lantana*
284	*Laburnum anagyroides*	575	*Viburnum opulus*
285	*Lamium*	576	*Vinca*
286	*Larix*	577	*Weigela*
287	*Larix decidua*	578	*Wisteria sinensis*
288	*Larix kaempferi*	579	*Cupressocyparis leylandii*
289	*Larix* × *decidua*	580	*Yucca*
290	*Larix* × *eurolepsis*	581	*Yucca filamentosa*
291	*Lavandula*	582	*Zelkova serrata* 'Green Vase'

Appendix D – Water used for irrigation

All mains water used meets the UK standard Water Supply (Water quality) regulation 2016 and the WHO/EU potable water standards, (Drinking water Directive (98/83/EC and the revised Drinking Water Directive 2020/2184) which includes a total freedom from both human and plant pathogens (Article 2-(7)). All mains water conducting pipework fully complies with the UK Water Supply (Water Fittings) regulations of 1999 and the amendments of 2019. Irrigation water used is not stored in any open tanks where air borne contamination could take place and is entirely isolated from any outside exposure (Dossier Section 3.0).

Bore hole water supply: in some cases, where the underlying geology permits, nurseries can draw water directly from bore holes drilled into underground aquafers. The water that fills these aquafers is naturally filtered through the layers of rock (e.g. limestone) over long periods of time, many millennia in some cases. The water from such supplies is generally of such high quality that it is fit for human consumption with little to no further processing and is often bottled and sold as mineral water (Dossier Section 3.0).

Rainwater or freshwater watercourse supply: some nurseries contributing to this application for both environmental and efficiency reasons use a combination of rain capture systems or abstract directly from available watercourses. All water is passed through a sand filtration system to remove contaminants and is contained in storage tanks prior to use. One nursery that operates this approach is currently in the process of installing additional nanobubble technology to treat the water (Dossier Section 3.0).

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

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

N	Pest name	EPPO Code	Group	Present in the UK	Present in the EU	*Acer campestre* confirmed as a host (reference)	Pest can be associated with the commodity	Impact	Justification for inclusion in this list
1	*Anthocoptes transitionalis*	–	Mites	Yes	Restricted (Hungary)	*Acer campestre* (Amrine and Stasny, 1994)	Yes	No data	Uncertainty about impact.
2	*Aureobasidium apocryptum*	–	Fungi	Yes	Restricted (Germany)	*Acer* (Farr and Rossman, online)	Yes	No data	Uncertainty about impact.
3	*Cinereomyces lindbladii*	CINELI	Fungi	Yes	No	*Acer* (Farr and Rossman, online)	Uncertain	No data	Uncertainty about impact and about association with the commodities.
4	*Helicobasidium longisporum*	HLCBCO	Fungi	Yes	Restricted (France, the Netherlands)	*Acer campestre* (Farr and Rossman, online)	Yes	No data	Uncertainty about impact.
5	*Phomopsis lebiseyi*	–	Fungi	Yes	Restricted (Portugal)	*Acer* (Farr and Rossman, online)	Yes	No data	Uncertainty about impact.
6	*Phyllactinia marissallii*	–	Fungi	Yes	Restricted (Belgium)	*Acer campestre* (Farr and Rossman, online)	Yes	No data	Uncertainty about impact.
7	*Phyllosticta aceris*	–	Fungi	Yes	Restricted (Czechia, Poland, Slovakia)	*Acer, A. campestre* (Farr and Rossman, online)	Yes	No data	Uncertainty about impact.
8	*Phyllosticta campestris*	–	Fungi	Yes	Restricted (Poland)	*Acer campestre* (Farr and Rossman, online)	Yes	No data	Uncertainty about impact.
9	*Rhizoctonia terrigena*		Fungi	Yes	Restricted (Denmark)	*Acer* (Farr and Rossman, online)	Yes	No data	Uncertainty about impact.
10	*Septomyxa tulasnei*	–	Fungi	Yes	Restricted (Poland)	*Acer* (Farr and Rossman, online)	Yes	No data	Uncertainty about impact.

Appendix F – Excel file with the pest list of *Acer campestre*

Appendix F can be found in the online version of this output (in the 'Supporting information section'): https://efsa.onlinelibrary.wiley.com/doi/10.2903/j.efsa.2023.8071#support-informationsection