

# Pest categorisation of *Eulecanium excrescens*

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## Abstract

Following the commodity risk assessments of *Acer* spp., *Malus* spp. and *Prunus* spp. plants for planting from the United Kingdom (UK), in which *Eulecanium excrescens* (Ferris) (Hemiptera: Coccidae) was identified as a pest of possible concern, the European Commission requested the EFSA Panel on Plant Health to conduct a pest categorisation of *E. excrescens* for the territory of the European Union (EU). *E. excrescens*, commonly known as excrescent or wisteria scale, is a polyphagous pest, primarily feeding on deciduous orchard and ornamental trees. It is present in the USA, China (Sichuan) and in the UK. It is not present in the EU. *E. excrescens* can be found on leaves and woody parts of the host plants. The pest completes one generation per year and overwinters on twigs as nymphs. *E. excrescens* is reported as harmful in Oregon (USA) on hazelnut, and in China on fruit trees, without details on the magnitude of yield and quality losses. In the UK, serious damage was reported on wisteria plants in 2001, but since then there have been no further reports of damage. The magnitude of impact in the EU is therefore uncertain. Phytosanitary measures are available to reduce the likelihood of entry. All criteria assessed by EFSA for consideration as a potential quarantine pest are met.

## KEYWORDS

Coccidae, excrescent scale, pest risk, plant health, plant pest, quarantine, wisteria scale

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# 1 | INTRODUCTION

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

### 1.1.1 | Background

The new Plant Health Regulation (EU) 2016/2031, on the protective measures against pests of plants, is applying from 14 December 2019. Conditions are laid down in this legislation in order for pests to qualify for listing as Union quarantine pests, protected zone quarantine pests or Union regulated non-quarantine pests. The lists of the EU regulated pests together with the associated import or internal movement requirements of commodities are included in Commission Implementing Regulation (EU) 2019/2072. Additionally, as stipulated in the Commission Implementing Regulation 2018/2019, certain commodities are provisionally prohibited to enter in the EU (high risk plants, HRP). EFSA is performing the risk assessment of the dossiers submitted by exporting to the EU countries of the HRP commodities, as stipulated in Commission Implementing Regulation 2018/2018. Furthermore, EFSA has evaluated a number of requests from exporting to the EU countries for derogations from specific EU import requirements.

In line with the principles of the new plant health law, the European Commission with the Member States are discussing monthly the reports of the interceptions and the outbreaks of pests notified by the Member States. Notifications of an imminent danger from pests that may fulfil the conditions for inclusion in the list of the Union quarantine pest are included. Furthermore, EFSA has been performing horizon scanning of media and literature.

As a follow-up of the above-mentioned activities (reporting of interceptions and outbreaks, HRP, derogation requests and horizon scanning), a number of pests of concern have been identified. EFSA is requested to provide scientific opinions for these pests, in view of their potential inclusion by the risk manager in the lists of Commission Implementing Regulation (EU) 2019/2072 and the inclusion of specific import requirements for relevant host commodities, when deemed necessary by the risk manager.

### 1.1.2 | Terms of Reference

EFSA is requested, pursuant to Article 29(1) of Regulation (EC) No 178/2002, to provide scientific opinions in the field of plant health.

EFSA is requested to deliver 53 pest categorisations for the pests listed in Annex 1A, 1B, 1D and 1E (for more details see mandate M-2021-00027 on the [Open.EFSA](#) portal). Additionally, EFSA is requested to perform pest categorisations for the pests so far not regulated in the EU, identified as pests potentially associated with a commodity in the commodity risk assessments of the HRP dossiers (Annex 1C; for more details see mandate M-2021-00027 on the [Open.EFSA](#) portal). Such pest categorisations are needed in the case where there are not available risk assessments for the EU.

When the pests of Annex 1A are qualifying as potential Union quarantine pests, EFSA should proceed to phase 2 risk assessment. The opinions should address entry pathways, spread, establishment, impact and include a risk reduction options analysis.

Additionally, EFSA is requested to develop further the quantitative methodology currently followed for risk assessment, in order to have the possibility to deliver an express risk assessment methodology. Such methodological development should take into account the EFSA Plant Health Panel Guidance on quantitative pest risk assessment and the experience obtained during its implementation for the Union candidate priority pests and for the likelihood of pest freedom at entry for the commodity risk assessment of High Risk Plants.

## 1.2 | Interpretation of the Terms of Reference

*Eulecanium excrescens* is one of a number of pests relevant to Annex 1C of the Terms of Reference (ToR) to be subject to pest categorisation to determine whether it fulfils the criteria of a potential Union quarantine pest for the area of the EU excluding Ceuta, Melilla and the outermost regions of Member States referred to in Article 355(1) of the Treaty on the Functioning of the European Union (TFEU), other than Madeira and the Azores, and so inform EU decision making as to its appropriateness for potential inclusion in the lists of pests of Commission Implementing Regulation (EU) 2019/2072. If a pest fulfils the criteria to be potentially listed as a Union quarantine pest, risk reduction options will be identified.

## 1.3 | Additional information

This pest categorisation was initiated following the commodity risk assessments of *Acer campestre*, *A. palmatum*, *A. platanoides*, *A. pseudoplatanus* (EFSA PLH Panel, 2023a, 2023b, 2023c, 2023d), *Malus domestica*, *M. sylvestris* (EFSA PLH Panel, 2023e, 2023f), *Prunus avium* and *P. spinosa* (EFSA PLH Panel, 2024a, 2024b), plants from the United Kingdom in which *E. excrescens*

was identified as a relevant pest of possible concern for the EU, not yet regulated, which could potentially enter the EU on these plants.

## 2 | DATA AND METHODOLOGIES

### 2.1 | Data

#### 2.1.1 | Literature search

A systematic literature search on *E. excrescens* was conducted at the beginning of the pest categorisation (23/7/2024) in the ISI Web of Science and Elsevier SCOPUS bibliographic databases. The literature search string was constructed using as search terms the main scientific name, common names and other scientific names associated with the pest (for more details see Appendix D). All the relevant papers were reviewed, and additional information was obtained from experts, as well as from citations within the references, grey literature and other sources online.

#### 2.1.2 | Database search

Pest information, on host(s) and distribution, was extracted from the references collected in the systematic literature search mentioned above (Section 2.1.1). The CABI Database (CABI, [online](#)) and the EPPO Global Database (EPPO, [online](#)) were used to integrate the information retrieved through the data extraction.

Data about the import of commodity types that could potentially provide a pathway for the pest to enter the EU and about the areas of hosts grown in the EU were obtained from EUROSTAT (Statistical Office of the European Union).

The EUROPHYT (EUROPHYT, [online](#)) and TRACES databases (TRACES-NT, [online](#)) were consulted for pest-specific notifications on interceptions and outbreaks. EUROPHYT is a web-based network run by the Directorate General for Health and Food Safety (DG SANTÉ) of the European Commission as a subproject of PHYSAN (Phyto-Sanitary Controls) specifically concerned with plant health information. TRACES is the European Commission's multilingual online platform for sanitary and phytosanitary certification required for the importation of animals, animal products, food and feed of non-animal origin and plants into the European Union, and the intra-EU trade and EU exports of animals and certain animal products. Up until May 2020, the EUROPHYT database managed notifications of interceptions of plants or plant products that do not comply with EU legislation, as well as notifications of plant pests detected in the territory of the Member States and the phytosanitary measures taken to eradicate or avoid their spread. The recording of interceptions switched from EUROPHYT to TRACES in May 2020.

GenBank was searched to determine whether it contained any nucleotide sequences for *E. excrescens* which could be used as reference material for molecular diagnosis ([www.ncbi.nlm.nih.gov/genbank/](http://www.ncbi.nlm.nih.gov/genbank/); Sayers et al., 2024).

### 2.2 | Methodologies

The Panel performed the pest categorisation for *E. excrescens*, following guiding principles and steps presented in the EFSA guidance on quantitative pest risk assessment (EFSA PLH Panel et al., 2018), the EFSA guidance on the use of the weight of evidence approach in scientific assessments (EFSA Scientific Committee et al., 2017) and the International Standards for Phytosanitary Measures No. 11 (FAO, 2013).

The criteria to be considered when categorising a pest as a potential Union quarantine pest (QP) are given in Regulation (EU) 2016/2031 Article 3 and Annex I, Section 1 of the Regulation. Table 1 presents the pest categorisation criteria (Regulation (EU) 2016/2031) on which the Panel bases its conclusions. In judging whether a criterion is met the Panel uses its best professional judgement (EFSA Scientific Committee et al., 2017) by integrating a range of evidence from a variety of sources (as presented above in Section 2.1) to reach an informed conclusion as to whether a criterion is satisfied.

The Panel's conclusions are formulated respecting its remit and particularly regarding the principle of separation between risk assessment and risk management (EFSA founding regulation (EU) No 178/2002). Therefore, instead of determining whether the pest is likely to have an unacceptable impact, deemed to be a risk management decision, the Panel will present a summary of the observed impacts in the areas where the pest occurs and make a judgement about potential impacts in the EU. Whilst the Panel may quote impacts reported from areas where the pest occurs in monetary terms, the Panel will seek to express potential EU impacts in terms of yield and quality losses and not in monetary terms, in agreement with the EFSA guidance on quantitative pest risk assessment (EFSA PLH Panel et al., 2018). Article 3 (d) of Regulation (EU) 2016/2031 refers to unacceptable social impact as a criterion for quarantine pest status. Assessing social impact is outside the remit of the Panel.

**TABLE 1** Pest categorisation criteria under evaluation, as derived from Regulation (EU) 2016/2031 on protective measures against pests of plants (the number of the relevant sections of the pest categorisation is shown in brackets in the first column).

| Criterion of pest categorisation                                                     | Criterion in regulation (EU) 2016/2031 regarding union quarantine pest (article 3)                                                                                                                                        |
|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Identity of the pest (Section 3.1)                                                   | Is the identity of the pest clearly defined, or has it been shown to produce consistent symptoms and to be transmissible?                                                                                                 |
| Absence/presence of the pest in the EU territory (Section 3.2)                       | Is the pest present in the EU territory?<br>If present, is the pest in a limited part of the EU or is it scarce, irregular, isolated or present infrequently? If so, the pest is considered to be not widely distributed. |
| Pest potential for entry, establishment and spread in the EU territory (Section 3.4) | Is the pest able to enter into, become established in, and spread within, the EU territory?<br>If yes, briefly list the pathways for entry and spread.                                                                    |
| Potential for consequences in the EU territory (Section 3.5)                         | Would the pests' introduction have an economic or environmental impact on the EU territory?                                                                                                                               |
| Available measures (Section 3.6)                                                     | Are there measures available to prevent pest entry, establishment, spread or impacts?                                                                                                                                     |
| Conclusion of pest categorisation (Section 4)                                        | A statement as to whether (1) all criteria assessed by EFSA above for consideration as a potential quarantine pest were met and (2) if not, which one(s) were not met.                                                    |

### 3 | PEST CATEGORISATION

#### 3.1 | Identity and biology of the pest

##### 3.1.1 | Identity and taxonomy

*Is the identity of the pest clearly defined using current methods, or has it been shown to produce consistent symptoms and/or to be transmissible?*

**Yes**, the identity of the pest is clearly defined, and *Eulecanium excrescens* (Ferris, 1920) is the accepted name.

*E. excrescens* is an insect within the order Hemiptera, suborder Sternorrhyncha, family Coccidae, which was first described by Ferris in 1920 on English walnut (*Juglans regia*) in Palo Alto, California (Ferris, 1920). It is commonly known as excrescent scale or wisteria scale. Synonym of *E. excrescens* is *Lecanium excrescens* (García Morales et al., 2016).

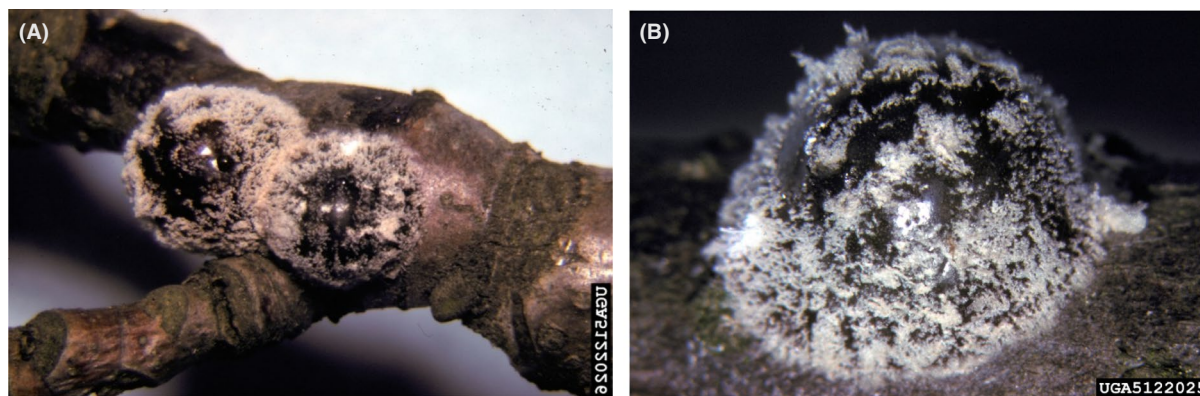
The EPPO code<sup>1</sup> (EPPO, 2019; Griessinger & Roy, 2015) for this species is: EULCEX (EPPO, online).

##### 3.1.2 | Biology of the pest

*E. excrescens* is a polyphagous insect of Asian origin (Kosztarab, 1996 as cited in Malumphy, 2005). Studies on its biology are limited, and therefore, many aspects of the species are not known in detail. Information has been extracted mainly from the literature published after its introduction in the UK in 2001.

*E. excrescens* is univoltine and its lifecycle includes egg, three nymphal instars and adult (Figure 1) (Malumphy, 2005). Probably it reproduces parthenogenetically as no male nymphs or adults have been found in a large number of samples examined in the UK (Malumphy, 2005). In the UK, where its lifecycle has been studied, the nymphs overwinter and reach maturity in late spring. Eggs are laid under the female body in May (approximately 2000 eggs per female) and first instar nymphs appear in late May–June (RHS, online; Malumphy, 2005). The nymphs feed on leaves and in autumn, before leaf fall, they move from the leaves to the woody parts of the host plants (Malumphy, 2005) where they remain sedentary (RHS, online).

<sup>1</sup>An EPPO code, formerly known as a Bayer code, is a unique identifier linked to the name of a plant or plant pest important in agriculture and plant protection. Codes are based on genus and species names. However, if a scientific name is changed the EPPO code remains the same. This provides a harmonised system to facilitate the management of plant and pest names in computerised databases, as well as data exchange between IT systems (EPPO, 2019; Griessinger & Roy, 2015).



**FIGURE 1** (A, B) Wisteria scale (*Eulecanium excrescens*) (United States National Collection of Scale Insects Photographs, USDA Agricultural Research Service, [Bugwood.org](https://bugwood.org), licensed under a [Creative Commons Attribution-Noncommercial 3.0 License](https://creativecommons.org/licenses/by-nc/3.0/)).

### 3.1.3 | Host range/species affected

*E. excrescens* is polyphagous, primarily feeding on deciduous orchard and ornamental trees. Economically important host plants are apple, almond, apricot, cherry and peach. In the UK, it has been recorded on several plant species, including plum (*Prunus domestica*) and peach (*P. persica*) (Malumphy C., Fera Science Ltd., email of 20 February 2025), but most findings (> 85%) were on *Wisteria* (Salisbury et al., 2010). Recently, a large population was recorded on *Gleditsia* trees (Malumphy C., Fera Science Ltd., email of 20 February 2025). The full host list is presented in detail in Appendix A.

### 3.1.4 | Intraspecific diversity

To the best of the Panel's knowledge, no information on intraspecific diversity is reported for this species.

### 3.1.5 | Detection and identification of the pest

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

**Yes**, there are methods available for the detection and morphological identification of *E. excrescens*.

## Symptoms

*E. excrescens* is a phloem-sap feeding insect which can weaken the host plant and cause leaf loss (MacLeod & Matthews, 2005). When heavy infestations occur, stems can become thickly encrusted with scales and host plants may lack vigour and die back (RHS, [online](https://www.rhs.org.uk/pests-and-diseases/wisteria/wisteria-scale)). The pest also excretes honeydew promoting growth of sooty mould. This can lead to reduced photosynthesis rate and deteriorate the aesthetic quality of plants (MacLeod & Matthews, 2005; Salisbury et al., 2010).

## Detection

Visual examination of plants is an effective way for the detection of *E. excrescens* due to the large size (up to 13 mm long and 8–10 mm high) of adult female scales (Ferris, 1920). All developmental stages of *E. excrescens* occur on the bark of the host plant. The first- and second-nymphal instars can be found on the undersides of foliage (Malumphy, 2005).

## Identification

The identification of *E. excrescens* requires microscopic examination of slide-mounted adults and verification of the presence of key morphological characteristics.

Detailed morphological descriptions, illustrations and keys of all developmental stages of *E. excrescens* can be found in Ferris (1920). Teneral adult females are required for identification. Illustrations and diagnostic keys are provided by Gill (1988) and Kosztarab (1996) (as cited in Malumphy, 2005).

No molecular identification methods have been reported in the available literature and no nucleotide sequences of any gene are included in GenBank.

Description

Eggs are 0.5 mm long and pinkish to orange (Alford, 2014).  
The first instar nymphs are orange, while the second and third instar nymphs are brown with distinct waxy patches (Alford, 2014).  
Adult females are globular, dark brown to blackish, often covered in a grey powdery wax (Alford, 2014; Salisbury et al., 2010). More details are given in Gill (1988) and Kosztarab (1996) (as cited in Malumphy, 2005).

3.2 | Pest distribution

3.2.1 | Pest distribution outside the EU

*E. excrescens* is of Asian origin (Kosztarab, 1996 as cited in Malumphy, 2005) with limited distribution in the world (Figure 2). It is present in certain parts of the United States and in Sichuan (China). In the UK, it was first detected in London in 2001 (MacLeod & Matthews, 2005). Between December 2003 and July 2010, 28 verifiable records of *E. excrescens* were reported indicating that the scale has been spreading in South-East England (Salisbury et al., 2010). The pest has been found at numerous sites in London affecting mainly host plants in private domestic gardens and not in commercial sites. In 2024, *E. excrescens* was also reported in the west of England (Malumphy C., Fera Science Ltd., email of 20 February 2025). In Australia, there is a requirement for importing hazelnut nursery stock from Bhutan to be inspected and found free of *E. excrescens* (Micor, online). However, there is no reported record of it in Bhutan.

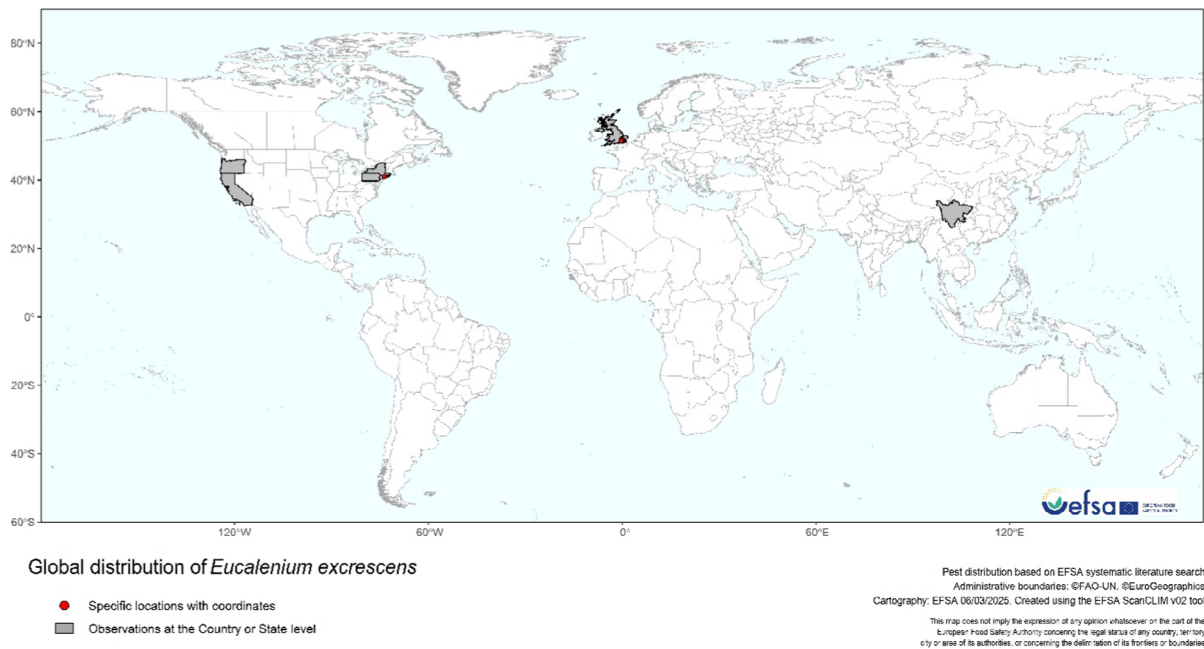


FIGURE 2 Global distribution of *Eulecanium excrescens* (Source: EFSA systematic literature search and other sources; for details see Appendix B).

3.2.2 | Pest distribution in the EU

Is the pest present in the EU territory? If present, is the pest in a limited part of the EU or is it scarce, irregular, isolated or present infrequently? If so, the pest is considered to be not widely distributed.

No, *E. excrescens* is not known to be present in the EU territory.

3.3 | Regulatory status

3.3.1 | Legislation addressing the pest

There is no specific legislation addressing *E. excrescens*, and the pest is not listed in Annex II of Commission Implementing Regulation (EU) 2019/2072, an implementing act of Regulation (EU) 2016/2031, or in any emergency plant health legislation.

### 3.3.2 | Legislation addressing the hosts

EU phytosanitary legislation prohibits several *E. excrescens* hosts from entering the EU territory (Table 2 and text below Table 2).

**TABLE 2** List of plants, plant products and other objects that are *Eulecanium excrescens* hosts whose introduction into the Union from certain third countries is prohibited (Source: Commission Implementing Regulation (EU) 2019/2072, Annex VI).

| List of plants, plant products and other objects whose introduction into the union from certain third countries is prohibited                                  |               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description                                                                                                                                                    | CN code       | Third country, group of third countries or specific area of third country                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 8. Plants for planting of [...] <i>Malus</i> Mill., <i>Prunus</i> L., <i>Pyrus</i> L. and [...] other than dormant plants free from leaves, flowers and fruits | ex 0602 10 90 | Third countries other than 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 (Severo- Zapadny 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 (1)                                                                                                                                          |
|                                                                                                                                                                | ex 0602 20 20 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                                                                                                                                                                | ex 0602 20 80 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                                                                                                                                                                | ex 0602 40 00 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                                                                                                                                                                | ex 0602 90 41 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                                                                                                                                                                | ex 0602 90 45 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                                                                                                                                                                | ex 0602 90 46 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                                                                                                                                                                | ex 0602 90 47 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                                                                                                                                                                | ex 0602 90 48 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                                                                                                                                                                | ex 0602 90 50 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                                                                                                                                                                | ex 0602 90 70 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                                                                                                                                                                | ex 0602 90 91 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| 9. Plants for planting of [...] <i>Malus</i> Mill., <i>Prunus</i> L. and <i>Pyrus</i> L. and their hybrids, [...], other than seeds                            | ex 0602 10 90 | Third countries other than Albania, Algeria, Andorra, Armenia, Australia, Azerbaijan, Belarus, Bosnia and Herzegovina, Canada, Canary Islands, Egypt, Faeroe Islands, Georgia, Iceland, Israel, Jordan, Lebanon, Libya, Liechtenstein, Moldova, Monaco, Montenegro, Morocco, New Zealand, 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, Syria, Tunisia, Türkiye, Ukraine, the United Kingdom (1) and United States other than Hawaii |
|                                                                                                                                                                | ex 0602 20 20 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                                                                                                                                                                | ex 0602 90 30 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                                                                                                                                                                | ex 0602 90 41 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
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|                                                                                                                                                                |               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

Although certain host genera are prohibited from entering the EU, some are permitted from the UK and US (see Table 2) where *E. excrescens* occurs.

*Acer* L., *Corylus* L., *Juglans* L., *Malus* Mill., *Prunus* L., *Ulmus* L. plants other than seeds, in vitro material or naturally or artificially dwarfed woody plants, are listed in Commission Implementing Regulation (EU) 2018/2019 as high-risk plants for planting and their import into the Union is prohibited pending risk assessment (EU 2018/2019).

Derogations are in place since June and July 2023 (EU 2023/1203, EU 2023/1511, EU 2023/1535), allowing the import of specific commodities of *Acer* spp., *Malus domestica* and *M. sylvestris* from the UK into the EU, following the commodity risk assessments performed by EFSA (EFSA PLH Panel, 2023a, 2023b, 2023c, 2023d, 2023e).

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

#### 3.4.1 | Entry

Is the pest able to enter into the EU territory? If yes, identify and list the pathways.

**Yes**, the pest could enter the EU territory. Possible pathways of entry are plants for planting and cut branches of host plants.

Comment on plants for planting as a pathway.

Plants for planting provide the main pathway to enter the EU.

Possible pathways of entry are plants for planting and cut branches (Table 3).

TABLE 3 Potential pathways for *Eulecanium excrescens* into the EU.

| Pathways<br>(e.g. host/intended use/source) | Life stage      | Prohibitions (Annex VI) within commission implementing Regulation 2019/2072                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|---------------------------------------------|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Plants for planting                         | All life stages | Plants for planting that are hosts of <i>E. excrescens</i> and are prohibited from being imported from third countries (Regulation 2019/2072, Annex VI) are listed in Table 2. Plants for planting from third countries require a phytosanitary certificate (Regulation 2019/2072, Annex XI, Part A)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Cut branches                                | All life stages | Foliage, branches and other parts of plants of <i>Prunus</i> spp., without flowers or flower buds, being goods of a kind suitable for bouquets or for ornamental purposes, fresh, from certain third countries require a phytosanitary certificate (Regulation 2019/2072, Annex XI, Part A)<br>Foliage, branches and other parts of plants of <i>Malus</i> Mill. and <i>Pyrus</i> L. of <i>E. excrescens</i> , without flowers or flower buds and grasses, mosses and lichens, being goods of a kind suitable for bouquets or for ornamental purposes, fresh, dried, dyed, bleached, impregnated or otherwise prepared: – Fresh: ex 0604 20 90, from third countries other than Switzerland require a phytosanitary certificate for their introduction into a protected zone from certain third countries of origin or dispatch (Regulation 2019/2072, Annex XII, Part C) |

Notifications of interceptions of harmful organisms began to be compiled in EUROPHYT in May 1994 and in TRACES in May 2020. As of 22 January 2025, there were no records of interception of *E. excrescens* in the EUROPHYT and TRACES databases (EUROPHYT/TRACES-NT, [online](#)).

3.4.2 | Establishment

Is the pest able to become established in the EU territory?

**Yes**, the pest is able to become established in the EU territory. Establishment could occur in most EU Member States, based on climate suitability and host availability.

Climatic mapping is the principal method for identifying areas that could provide suitable conditions for the establishment of a pest taking key abiotic factors into account (Baker, 2002). The approach used in EFSA pest categorisations is based on the Köppen–Geiger climate classification (version of Kottek et al., 2006 and Rubel et al., 2017) which identifies potentially suitable areas based on the climate types present in Europe. Availability of hosts is considered in Section 3.4.2.1. Climatic factors are considered in Section 3.4.2.2.

3.4.2.1 | EU distribution of main host plants

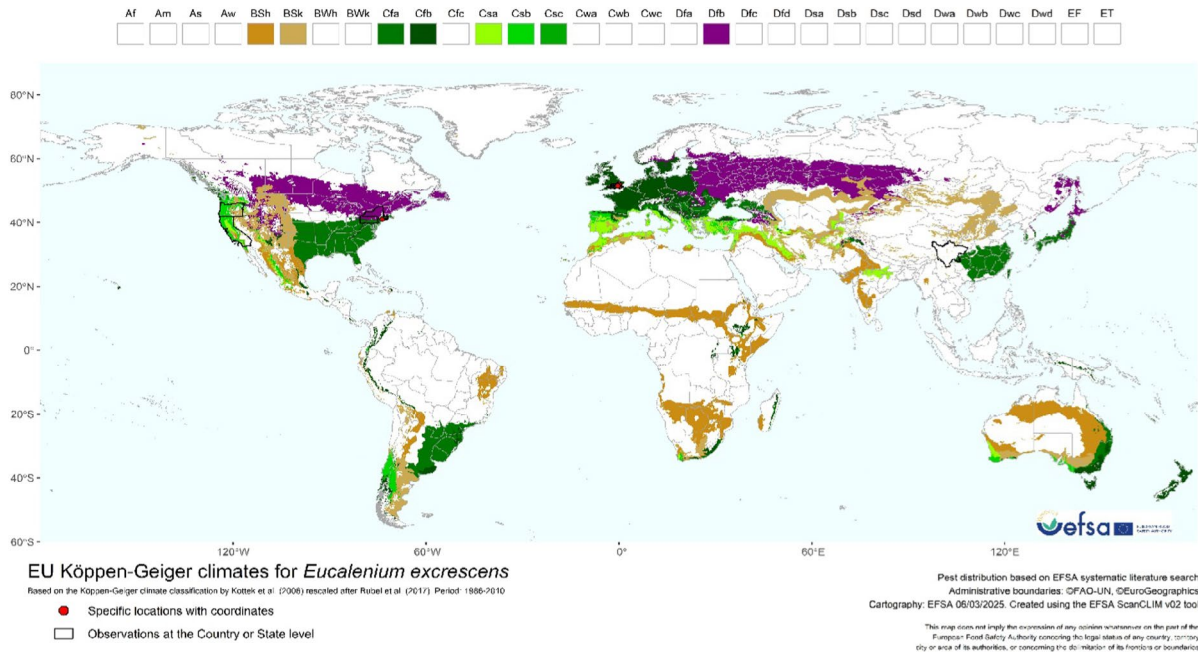
Many genera of *E. excrescens* host plants are present or are grown widely across the EU (Appendices C.1–C.8). Among others, almond, apple, apricot, pear, plum, sycamore trees etc. and ornamental plants. The harvested area of some of the hosts in the EU between 2019 and 2023 is shown in Table 4.

TABLE 4 Harvested area (1000 ha) of some of the host plants of *Eulecanium excrescens* in the EU. Source Eurostat (accessed on 17 January 2025).

| Harvested area (1000 ha) |       |        |        |        |        |        |
|--------------------------|-------|--------|--------|--------|--------|--------|
| Crops                    | Code  | 2019   | 2020   | 2021   | 2022   | 2023   |
| Almond                   | F4300 | 809.56 | 853.83 | 881.06 | 905.33 | 917.34 |
| Apple                    | F1110 | 491.08 | 489.19 | 492.56 | 478.01 | 471.88 |
| Apricot                  | F1230 | 73.22  | 76.13  | 73.48  | 72.09  | 70.43  |
| Hazelnut                 | F4200 | 110.39 | 116.33 | 119.75 | 123.64 | 128.56 |
| Peach                    | F1210 | 144.78 | 138.31 | 133.06 | 129.40 | 124.01 |
| Pear                     | F1120 | 110.66 | 108.29 | 106.96 | 103.10 | 100.53 |
| Plum                     | F1250 | 154.51 | 160.38 | 157.68 | 156.63 | 157.06 |
| Walnut                   | F4100 | 87.62  | 99.21  | 97.00  | 102.46 | 103.36 |

3.4.2.2 | Climatic conditions affecting establishment

*E. excrescens* occurs in the United States, China (Sichuan) and the UK (Figure 2). Figure 3 shows the world distribution of selected Köppen–Geiger climate types (Kottek et al., 2006) that occur in the EU, and which occur in countries where *E. excrescens* has been reported. Its current distribution suggests that the largest part of the EU has climate types suitable to its establishment. Dfc was removed from the figure due to its marginal appearance in the area of pest distribution (appears only in some pixels in New York State). The biology of the scale is little studied and no temperature thresholds for development have been reported.



**FIGURE 3** World distribution of the Köppen–Geiger climate types that occur in the EU and in countries where *Eulecanium excrescens* occurs (red dots represent specific coordinate locations where *E. excrescens* was reported).

3.4.3 | Spread

Describe how the pest would be able to spread within the EU territory following establishment?

First instar nymphs may disperse over short distances by crawling, wind, rainfall and as occasional hitchhikers on humans and animals.

All stages may be moved over long distances in trade of infested plant material, specifically plants for planting and cut branches.

Comment on plants for planting as a mechanism of spread.

The trade of infested plants for planting is the main pathway of *E. excrescens* spread within the EU territory.

Natural dispersal is likely to be slow. However, there is some uncertainty about the natural dispersal rate because first instar nymphs may be passively carried in air currents (Salisbury et al., 2010). Such aerial dispersal has been shown in several coccid species (Washburn & Fankie, 1985; Barras et al., 1994; as cited in Salisbury et al., 2010). In addition, the organism may also spread by animals, humans and machinery (Stephens & Aylor, 1978; as cited in Salisbury et al., 2010). Infested plants for planting and other plant material are the main spread pathways of *E. excrescens* (Salisbury et al., 2010).

### 3.5 | Impacts

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

**Yes**, *Eulecanium excrescens* has been reported to have impact on fruit trees in China and on hazelnut trees in Oregon, USA without specific data about the magnitude of yield and quality losses due to the insect. Apart from serious damage on wisteria plants in 2001, it did not have further severe economic or environmental impact in the UK.

In 2001, in the UK, *E. excrescens* caused serious damage on wisteria plants around London and posed a potential environmental/economic threat (Malumphy, 2005; Salisbury et al., 2010). The insect feeds on phloem sap and this can directly weaken the plants. The scale also excretes excess plant sap as honeydew, which can promote the growth of sooty mould, having the secondary effect of reducing photosynthesis and the aesthetic quality of plants. Infestations on wisteria can affect the aesthetic appearance of buildings covered with this plant. Heavy infestations can cause die back. High levels of parasitism by Chalcidoidea and entomopathogenic fungi attacking populations of *E. excrescens* in London have been recorded, providing some control (Malumphy C., Fera Science Ltd., email of 20 February 2025; EFSA PLH Panel, 2024c). The impact on commercial crops is less clear. Mature, well established and healthy plants are able to tolerate small populations and are not likely to be killed by the pest (MacLeod & Matthews, 2005; RHS, online). Apart from the serious damage on wisteria plants around London (large populations on individual wisteria plants have caused defoliation and die back), no severe impacts have been reported in the UK (Malumphy C., Fera Science Ltd., email of 20 February 2025).

In China, *E. excrescens* was reported as a pest of apple, pear and peach trees, causing damage (Deng, 1985), but no further details are provided, as it has been reported only in Sichuan and the available literature is limited. In California, the scale is not considered a pest as it is rarely found (Gill, 1988 as cited in Salisbury et al., 2010). In Oregon, it is included in the list of pests causing severe damage on hazelnut (i.e. *Corylus avellana*) (Murray & Jepson, 2018). Heavy infestations can kill twigs of hazelnut trees. No data were found on the pest's status and impact in other US States. In an old record in the US, Smith (1944) reported that *E. excrescens* and other scales were not injurious to large trees but sometimes to nursery stocks and young sycamore trees.

Although *E. excrescens* is considered an important pest for hazelnut in the USA, its introduction in the UK has not caused serious damage (apart from damage on wisteria plants in 2001 in London). Therefore, there is uncertainty about the magnitude of economic and environmental impact that would result from an introduction of *E. excrescens* in the EU.

### 3.6 | Available measures and their limitations

*Are there measures available to prevent pest entry, establishment, spread or impacts such that the risk becomes mitigated?*

**Yes**, there are phytosanitary measures that prohibit several plant genera as plants for planting from third countries (Section 3.3.2), and requirements for a phytosanitary certificate for other species to be imported into the EU territory (Section 3.4.1). There are also additional measures (Section 3.6.1) to eliminate the likelihood of *E. excrescens* entry, establishment and spread within the EU.

#### 3.6.1 | Identification of potential additional measures

Phytosanitary measures (prohibitions) are currently applied to some host plants for planting (see Section 3.3.2).

Additional potential risk reduction options and supporting measures are shown in Sections 3.6.1.1 and 3.6.1.2.

## 3.6.1.1 | Additional potential risk reduction options

Potential additional control measures are listed in Table 5.

**TABLE 5** Selected control measures (a full list is available in EFSA PLH Panel et al., 2018) for pest entry/establishment/spread/impact in relation to currently unregulated hosts and pathways. Control measures are measures that have a direct effect on pest abundance.

| Control measure/risk reduction option<br>(blue underline = Zenodo doc, blue = WIP) | RRO summary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Risk element targeted (entry/establishment/spread/impact) |
|------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|
| Require pest freedom                                                               | As a pest with low mobility, a risk reduction option could be to source plants from a pest free area, or place of production or production site                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Entry/spread                                              |
| <u>Growing plants in isolation</u>                                                 | Description of possible exclusion conditions that could be implemented to isolate the crop from pests and if applicable relevant vectors, e.g. a dedicated structure such as glass or plastic greenhouses<br>Growing plants in insect proof place of production or in a place with complete physical isolation, when feasible, could be an effective measure to mitigate the likelihood of entry and spread of <i>E. excrescens</i>                                                                                                                                                                                            | Entry (reduce contamination/infestation)/spread           |
| Managed growing conditions                                                         | Used to mitigate likelihood of infestation at origin. Plants collected directly from natural habitats, have been grown, held and trained for at least two consecutive years prior to dispatch in officially registered nurseries, which are subject to an officially supervised control regime                                                                                                                                                                                                                                                                                                                                 | Entry (reduce contamination/infestation)/spread           |
| <u>Roguing and pruning</u>                                                         | Roguing is defined as the removal of infested plants and/or uninfested host plants in a delimited area, whereas pruning is defined as the removal of infested plant parts only without affecting the viability of the plant<br>According to MacLeod and Matthews (2005), pruning of debris can be included in the management options of the pest. However, if the tree is extensively infested, over-pruning cannot be a viable option                                                                                                                                                                                         | Entry/spread/impact                                       |
| Biological control and behavioural manipulation                                    | In the UK, the parasitoid <i>Coccophagus obscurus</i> Westwood (Hymenoptera: Aphelinidae) was found parasitising on <i>E. excrescens</i> at low levels (Malumphy, 2005). Also, high levels of parasitism by some unidentified Chalcidoidea species and infestation by an entomopathogenic fungus were observed (Malumphy C., Fera Science Ltd., confirmed this by email on 20 February 2025)<br>In China, natural enemies of <i>E. excrescens</i> include the beetle, <i>Anthribus niveovariegatus</i> (Roelofs) (Coleoptera: Anthribidae) and an unidentified entomopathogenic fungus (Deng, 1985)                            | Entry/impact                                              |
| Chemical treatments on crops including reproductive material                       | According to MacLeod and Matthews (2005), the application of fatty acids could be used against <i>E. excrescens</i> , but no further details are provided                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Entry/establishment/impact                                |
| <u>Chemical treatments on consignments or during processing</u>                    | Use of chemical compounds that may be applied to plants or to plant products after harvest, during process or packaging operations and storage<br>The treatments addressed in this risk mitigation measure are:<br>a. fumigation<br>b. spraying/dipping pesticides<br>c. surface disinfectants<br>d. process additives<br>e. protective compounds<br>Chemical compounds that may be applied to plants or to plant products after harvest, during process or packaging operations and storage could mitigate the likelihood of infestation of pests susceptible to chemical treatment                                           | Entry/spread                                              |
| <u>Physical treatments on consignments or during processing</u>                    | This risk mitigation measure deals with the following categories of physical treatments: irradiation/ionisation; mechanical cleaning (brushing, washing); sorting and grading, and; removal of plant parts (e.g. debarking wood). This risk mitigation measure does not address: heat and cold treatments, or roguing and pruning<br>Brushing with a soft brush or water pressure when applicable could be an effective way of removing <i>Eulecanium</i> spp. in general. On large trees and on large areas this measure is not considered applicable (UMass Extension Landscape, Nursery and Urban Forestry Program, online) | Entry/spread                                              |
| <u>Cleaning and disinfection of facilities, tools and machinery</u>                | The physical and chemical cleaning and disinfection of facilities, tools, machinery, transport means, facilities and other accessories (e.g. boxes, pots, pallets, palox, supports, hand tools). The treatments addressed in this risk mitigation measure are washing, sweeping and fumigation                                                                                                                                                                                                                                                                                                                                 | Entry/spread                                              |

(Continues)

TABLE 5 (Continued)

| Control measure/risk reduction option<br>(blue underline = Zenodo doc, blue = WIP) | RRO summary                                                                                                                                                                                                                                                                                                               | Risk element targeted (entry/establishment/spread/impact) |
|------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|
| <b>Waste management</b>                                                            | This measure covers treatment of the waste (deep burial, composting, incineration, chipping, production of bio-energy...) in authorised facilities and official restriction on the movement of waste<br>According to MacLeod and Matthews (2005), burning of debris can be included in the management options of the pest | Establishment/spread                                      |

### 3.6.1.2 | Additional supporting measures

Potential additional supporting measures are listed in Table 6.

**TABLE 6** Selected supporting measures (a full list is available in EFSA PLH Panel et al., 2018) in relation to currently unregulated hosts and pathways. Supporting measures are organisational measures or procedures supporting the choice of appropriate risk reduction options that do not directly affect pest abundance.

| Supporting measure<br>(blue underline = Zenodo doc, blue = WIP)    | Summary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Risk element targeted (entry/establishment/spread/impact) |
|--------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|
| <b>Inspection and trapping</b>                                     | ISPM 5 (FAO, 2023) defines inspection as the official visual examination of plants, plant products or other regulated articles to determine if pests are present or to determine compliance with phytosanitary regulations<br>Inspection can be an effective way of detecting any scales. In spring, mature females are rounded and swollen and produce honeydew which can be accompanied by sooty mould. These can be visible on leaves, branches or any other surfaces of the plant. Crawlers might be visible among the veins of the leaves; however magnification might be needed to spot them. Moreover, during fall, nymphs could be visible via magnification on the twigs. This can facilitate the planning of dormant oil application in spring (UMass Extension Landscape, Nursery and Urban Forestry Program, online) | Entry/establishment/spread                                |
| <b>Laboratory testing</b>                                          | Examination, other than visual, to determine if pests are present using official diagnostic protocols. Diagnostic protocols describe the minimum requirements for reliable diagnosis of regulated pests                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Entry/spread                                              |
| <b>Sampling</b>                                                    | According to ISPM 31 (FAO, 2008), it is usually not feasible to inspect entire consignments, so phytosanitary inspection is performed mainly on samples obtained from a consignment. It is noted that the sampling concepts presented in this standard may also apply to other phytosanitary procedures, notably selection of units for testing<br>For inspection, testing and/or surveillance purposes the sample may be taken according to a statistically based or a non-statistical sampling methodology                                                                                                                                                                                                                                                                                                                     | Entry/spread                                              |
| <b>Phytosanitary certificate and plant passport</b>                | According to ISPM 5 (FAO, 2023) a phytosanitary certificate and a plant passport are official paper documents or their official electronic equivalents, consistent with the model certificates of the IPPC, attesting that a consignment meets phytosanitary import requirements<br>a. export certificate (import)<br>b. plant passport (EU internal trade)                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Entry/spread                                              |
| <b>Certified and approved premises</b>                             | Mandatory/voluntary certification/approval of premises is a process including a set of procedures and of actions implemented by producers, conditioners and traders contributing to ensure the phytosanitary compliance of consignments. It can be a part of a larger system maintained by the NPPO in order to guarantee the fulfilment of plant health requirements of plants and plant products intended for trade. Key property of certified or approved premises is the traceability of activities and tasks (and their components) inherent the pursued phytosanitary objective. Traceability aims to provide access to all trustful pieces of information that may help to prove the compliance of consignments with phytosanitary requirements of importing countries                                                    | Entry/spread                                              |
| <b>Certification of reproductive material (voluntary/official)</b> | Plants come from within an approved propagation scheme and are certified pest free (level of infestation) following testing; Used to mitigate against pests that are included in a certification scheme                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Entry/spread                                              |
| <b>Delimitation of Buffer zones</b>                                | ISPM 5 (FAO, 2023) defines a buffer zone as 'an area surrounding or adjacent to an area officially delimited for phytosanitary purposes in order to minimise the probability of spread of the target pest into or out of the delimited area, and subject to phytosanitary or other control measures, if appropriate'. The objectives for delimiting a buffer zone can be to prevent spread from the outbreak area and to maintain a pest free production place (PFPP), site (PFPS) or area (PFA)                                                                                                                                                                                                                                                                                                                                 | Spread                                                    |
| <b>Surveillance</b>                                                | Surveillance to guarantee that plants and produce originate from a Pest Free Area could be an option                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Entry/spread                                              |

3.6.1.3 | Biological or technical factors limiting the effectiveness of measures

- Limited effectiveness of insecticides due to the presence of hard cover over the insects.
- Control with chemical treatments is uncertain.
- Low initial infestations or young developmental stages (crawlers) might be overlooked.

3.7 | Uncertainty

No key uncertainties have been identified in the assessment.

4 | CONCLUSIONS

*E. excrescens* satisfies all criteria assessed by EFSA for consideration as a potential quarantine pest. Table 7 provides a summary of the PLH Panel conclusions.

**TABLE 7** The Panel's conclusions on the pest categorisation criteria defined in Regulation (EU) 2016/2031 on protective measures against pests of plants (the number of the relevant sections of the pest categorisation is shown in brackets in the first column).

| Criterion of pest categorisation                                                  | Panel's conclusions against criterion in regulation (EU) 2016/2031 regarding union quarantine pest                                                                                                                                                                                                                                                                     | Key uncertainties |
|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|
| Identity of the pest (Section 3.1)                                                | The identity of the pest is clearly defined and <i>Eulecanium excrescens</i> (Ferris, 1920) is the accepted name                                                                                                                                                                                                                                                       | None              |
| Absence/presence of the pest in the EU (Section 3.2)                              | <i>Eulecanium excrescens</i> is not known to be present in the EU territory                                                                                                                                                                                                                                                                                            | None              |
| Pest potential for entry, establishment and spread in the EU (Section 3.4)        | <i>Eulecanium excrescens</i> is able to enter into, become established and spread in the EU territory<br>The main pathways are plants for planting and cut branches                                                                                                                                                                                                    | None              |
| Potential for consequences in the EU (Section 3.5)                                | <i>Eulecanium excrescens</i> has been reported to have impact on fruit trees in China and on hazelnut trees in Oregon, USA, without specific data about the magnitude of yield and quality losses due to the insect. Apart from one report of serious damage on wisteria plants in 2001, it did not have any further severe economic or environmental impact in the UK | None              |
| Available measures (Section 3.6)                                                  | There are measures available to prevent the entry, establishment and spread of <i>E. excrescens</i> within the EU                                                                                                                                                                                                                                                      | None              |
| Conclusion (Section 4)                                                            | All criteria assessed by EFSA for consideration as a potential quarantine pest are met                                                                                                                                                                                                                                                                                 |                   |
| Aspects of assessment to focus on/ scenarios to address in future if appropriate: |                                                                                                                                                                                                                                                                                                                                                                        |                   |

ABBREVIATIONS

|      |                                                          |
|------|----------------------------------------------------------|
| EPPO | European and Mediterranean Plant Protection Organization |
| FAO  | Food and Agriculture Organization                        |
| IPPC | International Plant Protection Convention                |
| ISPM | International Standards for Phytosanitary Measures       |
| MS   | Member State                                             |
| PFA  | pest free production area                                |
| PFPP | pest free production place                               |
| PFPS | pest free production site                                |
| PLH  | EFSA Panel on Plant Health                               |
| PPPs | plant protection products                                |
| PZ   | Protected Zone                                           |
| RRO  | risk reduction option                                    |
| TFEU | Treaty on the Functioning of the European Union          |
| ToR  | Terms of Reference                                       |

GLOSSARY

|                         |                                                                                                              |
|-------------------------|--------------------------------------------------------------------------------------------------------------|
| Containment (of a pest) | Application of phytosanitary measures in and around an infested area to prevent spread of a pest (FAO, 2023) |
| Control (of a pest)     | Suppression, containment or eradication of a pest population (FAO, 2023)                                     |

|                             |                                                                                                                                                                                                                                                            |
|-----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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, 2023)                                                                                                             |
| Eradication (of a pest)     | Application of phytosanitary measures to eliminate a pest from an area (FAO, 2023)                                                                                                                                                                         |
| Establishment (of a pest)   | Perpetuation, for the foreseeable future, of a pest within an area after entry (FAO, 2023)                                                                                                                                                                 |
| Greenhouse                  | A walk-in, static, closed place of crop production with a usually translucent outer shell, which allows controlled exchange of material and energy with the surroundings and prevents release of plant protection products (PPPs) into the environment.    |
| Hitchhiker                  | An organism sheltering or transported accidentally via inanimate pathways including with machinery, shipping containers and vehicles; such organisms are also known as contaminating pests or stowaways (Toy & Newfield, 2010).                            |
| 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, 2023)                                                                                                                                                                                             |
| Pathway                     | Any means that allows the entry or spread of a pest (FAO, 2023)                                                                                                                                                                                            |
| 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, 2023)                                              |
| 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, 2023)                                                                        |
| Risk reduction option (RRO) | A measure acting on pest introduction and/or pest spread and/or the magnitude of the biological impact of the pest should the pest be present. A RRO may become a phytosanitary measure, action or procedure according to the decision of the risk manager |
| Spread (of a pest)          | Expansion of the geographical distribution of a pest within an area (FAO, 2023)                                                                                                                                                                            |

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## REQUESTOR

European Commission

## QUESTION NUMBER

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## APPENDIX A

*Eulecanium excrescens* host plants/species affected

Source: Literature.

| Host status      | Host name                          | Plant family | Common name                             | Reference                                                                   |
|------------------|------------------------------------|--------------|-----------------------------------------|-----------------------------------------------------------------------------|
| Cultivated hosts | <i>Acer</i> sp.                    | Sapindaceae  | –                                       | Malumphy (2005)                                                             |
|                  | <i>Acer pseudoplatanus</i> L.      | Sapindaceae  | Common sycamore                         | Essig (1958); Gill (1988) (as cited in Salisbury et al., 2010)              |
|                  | <i>Ceanothus</i> sp.               | Rhamnaceae   | –                                       | Salisbury et al. (2010)                                                     |
|                  | <i>Corylus avellana</i>            | Corylaceae   | Common hazelnut                         | AliNiazee (1981); Murray and Jepson (2018)                                  |
|                  | <i>Gleditsia</i> sp.               | Fabaceae     | –                                       | Malumphy C., Fera Science Ltd., confirmed this by email on 20 February 2025 |
|                  | <i>Juglans regia</i>               | Juglandaceae | Common walnut                           | Malumphy (2005)                                                             |
|                  | <i>Malus</i> spp.                  | Rosaceae     | Apple                                   | Malumphy (2005)                                                             |
|                  | <i>Parthenocissus quinquefolia</i> | Vitaceae     | Virginia creeper                        | Salisbury et al. (2010)                                                     |
|                  | <i>Parthenocissus tricuspidata</i> | Vitaceae     | Japanese ivy                            | Salisbury et al. (2010)                                                     |
|                  | <i>Platanus</i> spp.               | Platanaceae  | Sycamore                                | Smith (1944)                                                                |
|                  | <i>Podranea ricasoliana</i>        | Bignoniaceae | Port St-Johns creeper, Zimbabwe creeper | Salisbury et al. (2010)                                                     |
|                  | <i>Prunus</i> spp.                 | Rosaceae     | –                                       | Salisbury et al. (2010)                                                     |
|                  | <i>Prunus armeniaca</i>            | Rosaceae     | Apricot                                 | Essig (1958); Gill (1988) (as cited in Salisbury et al., 2010)              |
|                  | <i>Prunus avium</i>                | Rosaceae     | Cherry                                  | Essig (1958); Gill (1988) (as cited in Salisbury et al., 2010)              |
|                  | <i>Prunus domestica</i>            | Rosaceae     | European plum                           | Deng (1985)                                                                 |
|                  | <i>Prunus dulcis</i>               | Rosaceae     | Almond                                  | Essig (1958); Gill (1988) (as cited in Salisbury et al., 2010)              |
|                  | <i>Prunus persica</i>              | Rosaceae     | Peach                                   | Essig (1958); Gill (1988) (as cited in Salisbury et al., 2010)              |
|                  | <i>Pyrus</i> spp.                  | Rosaceae     | –                                       | Essig (1958); Gill (1988) (as cited in Salisbury et al., 2010)              |
|                  | <i>Pyrus communis</i>              | Rosaceae     | Pear                                    | Malumphy (2005)                                                             |
|                  | <i>Ulmus</i> spp.                  | Ulmaceae     | –                                       | Malumphy (2005)                                                             |
|                  | <i>Wisteria</i> spp.               | Fabaceae     | –                                       | Malumphy (2005)                                                             |
|                  | <i>Wisteria sinensis</i>           | Fabaceae     | Purple wisteria                         | Salisbury et al. (2010)                                                     |
|                  | <i>Zelkova serrata</i>             | Ulmaceae     | Japanese zelkova                        | Salisbury et al. (2010)                                                     |

APPENDIX B

Distribution of *Eulecanium excrescens*

Distribution records are based on literature.

| Region        | Country        | Sub-national (e.g. state) | Status              | References                                                                  |
|---------------|----------------|---------------------------|---------------------|-----------------------------------------------------------------------------|
| North America | USA            | California                | Present, no details | Ferris (1920); Gill (1988) (as cited in Salisbury et al., 2010)             |
|               |                | Connecticut               | Present, no details | Newstead (1913); Felt (1933); Kosztarab (1996) (as cited in Malumphy, 2005) |
|               |                | New York                  | Present, no details | Kosztarab (1996) (as cited in Malumphy, 2005)                               |
|               |                | Oregon                    | Present, no details | AliNiazee (1981); Murray and Jepson (2018)                                  |
|               |                | Pennsylvania              | Present, no details | Kosztarab (1996) (as cited in Malumphy, 2005)                               |
| Other Europe  | United Kingdom | Bath                      | Present, no details | Malumphy C., Fera Science Ltd., confirmed this by email on 20 February 2025 |
|               |                | Bristol                   | Present, no details | Malumphy C., Fera Science Ltd., confirmed this by email on 20 February 2025 |
|               |                | Buckinghamshire           | Present, no details | Malumphy C., Fera Science Ltd., confirmed this by email on 20 February 2025 |
|               |                | Essex                     | Present, no details | Salisbury et al. (2010)                                                     |
|               |                | Gloucestershire           | Present, no details | Malumphy C., Fera Science Ltd., confirmed this by email on 20 February 2025 |
|               |                | Greater London            | Present, no details | Salisbury et al. (2010)                                                     |
|               |                | Hampshire                 | Present, no details | Malumphy C., Fera Science Ltd., confirmed this by email on 20 February 2025 |
|               |                | Isle of Wight             | Present, no details | Malumphy C., Fera Science Ltd., confirmed this by email on 20 February 2025 |
|               |                | Kent                      | Present, no details | Salisbury et al. (2010)                                                     |
|               |                | Oxfordshire               | Present, no details | Malumphy C., Fera Science Ltd., confirmed this by email on 20 February 2025 |
|               |                | Somerset                  | Present, no details | Malumphy C., Fera Science Ltd., confirmed this by email on 20 February 2025 |
|               |                | Surrey                    | Present, no details | Salisbury et al. (2010)                                                     |
|               |                | Sussex                    | Present, no details | Malumphy C., Fera Science Ltd., confirmed this by email on 20 February 2025 |
| Asia          | China          | Sichuan                   | Present, no details | Deng (1985)                                                                 |

## APPENDIX C

EU cultivation/harvested/production area of *Eulecanium excrescens* hosts (in 1000 ha)

## C.1 | EU CULTIVATION/HARVESTED/PRODUCTION AREA OF ALMONDS (IN 1000 HA) (SOURCE: EUROSTAT ACCESSED ON 17 JANUARY 2025)

| Almonds  | 2019   | 2020   | 2021   | 2022   | 2023   |
|----------|--------|--------|--------|--------|--------|
| EU       | 809.56 | 853.83 | 881.06 | 905.33 | 917.34 |
| Bulgaria | 1.01   | 0.93   | 1.28   | 1.51   | 1.08   |
| Greece   | 15.13  | 23.71  | 17.66  | 18.44  | 18.68  |
| Spain    | 687.23 | 718.54 | 744.47 | 761.66 | 765.54 |
| France   | 1.18   | 2.11   | 2.21   | 2.21   | 2.33   |
| Croatia  | 0.62   | 0.81   | 0.81   | 1.04   | 1.07   |
| Italy    | 52.04  | 52.65  | 53.72  | 53.89  | 54.10  |
| Cyprus   | 2.71   | 2.38   | 2.12   | 2.25   | 2.40   |
| Hungary  | 0.31   | 0.35   | 0.39   | 0.42   | 0.43   |
| Portugal | 49.35  | 52.34  | 58.40  | 63.88  | 71.69  |
| Slovenia | 0.00   | 0.01   | 0.01   | 0.02   | 0.02   |

## C.2 | EU CULTIVATION/HARVESTED/PRODUCTION AREA OF APPLES (IN 1000 HA) (SOURCE: EUROSTAT ACCESSED ON 17 JANUARY 2025)

| Apples      | 2019   | 2020   | 2021   | 2022   | 2023   |
|-------------|--------|--------|--------|--------|--------|
| EU          | 491.08 | 489.19 | 492.56 | 478.01 | 471.88 |
| Belgium     | 5.79   | 5.48   | 5.35   | 5.23   | 4.90   |
| Bulgaria    | 4.14   | 3.56   | 3.78   | 3.72   | 3.56   |
| Czechia     | 7.32   | 7.19   | 7.11   | 7.01   | 6.45   |
| Denmark     | 1.39   | 1.38   | 1.40   | 1.41   | 1.45   |
| Germany     | 33.98  | 33.98  | 33.98  | 33.11  | 33.11  |
| Estonia     | 0.57   | 0.62   | 0.73   | 0.71   | 0.75   |
| Ireland     | 0.71   | 0.71   | 0.71   | 0.71   | 0.71   |
| Greece      | 9.82   | 14.38  | 10.28  | 10.65  | 9.75   |
| Spain       | 29.64  | 29.49  | 29.45  | 29.25  | 28.41  |
| France      | 50.37  | 54.71  | 54.21  | 54.02  | 53.80  |
| Croatia     | 4.95   | 4.36   | 4.39   | 3.65   | 3.65   |
| Italy       | 55.00  | 54.91  | 54.47  | 53.73  | 54.08  |
| Cyprus      | 0.37   | 0.41   | 0.41   | 0.43   | 0.40   |
| Latvia      | 3.44   | 3.50   | 3.20   | 3.06   | 3.30   |
| Lithuania   | 10.18  | 10.50  | 10.18  | 9.88   | 9.03   |
| Luxembourg  | 0.27   | 0.08   | 0.10   | 0.10   | 0.10   |
| Hungary     | 30.97  | 25.97  | 25.02  | 23.82  | 22.79  |
| Netherlands | 6.42   | 6.20   | 5.97   | 5.90   | 5.50   |
| Austria     | 6.59   | 6.43   | 6.35   | 6.30   | 6.25   |
| Poland      | 155.62 | 152.60 | 161.90 | 151.90 | 150.00 |
| Portugal    | 14.31  | 14.31  | 13.92  | 13.73  | 13.94  |
| Romania     | 52.74  | 52.34  | 53.82  | 54.07  | 54.29  |
| Slovenia    | 2.27   | 2.16   | 2.09   | 2.03   | 2.00   |
| Slovakia    | 2.06   | 1.80   | 1.64   | 1.54   | 1.54   |
| Finland     | 0.65   | 0.67   | 0.62   | 0.62   | 0.66   |
| Sweden      | 1.52   | 1.44   | 1.46   | 1.45   | 1.45   |

### C.3 | EU CULTIVATION/HARVESTED/PRODUCTION AREA OF APRICOTS (IN 1000 HA) (SOURCE: EUROSTAT ACCESSED ON 17 JANUARY 2025)

| Apricots | 2019  | 2020  | 2021  | 2022  | 2023  |
|----------|-------|-------|-------|-------|-------|
| EU       | 73.22 | 76.13 | 73.48 | 72.09 | 70.43 |
| Bulgaria | 2.91  | 1.84  | 3.06  | 3.05  | 2.20  |
| Czechia  | 1.15  | 1.17  | 1.12  | 1.11  | 1.00  |
| Germany  | 0.23  | 0.23  | 0.23  | 0.29  | 0.29  |
| Greece   | 8.35  | 12.24 | 8.96  | 9.36  | 9.50  |
| Spain    | 20.24 | 19.78 | 19.44 | 18.43 | 18.01 |
| France   | 12.28 | 12.08 | 11.88 | 11.36 | 11.12 |
| Croatia  | 0.26  | 0.29  | 0.31  | 0.31  | 0.31  |
| Italy    | 17.91 | 17.81 | 17.74 | 17.45 | 17.36 |
| Cyprus   | 0.18  | 0.20  | 0.21  | 0.23  | 0.20  |
| Hungary  | 4.99  | 5.94  | 6.05  | 5.82  | 5.58  |
| Austria  | 0.82  | 0.83  | 0.86  | 0.86  | 0.87  |
| Poland   | 1.06  | 0.90  | 0.90  | 1.00  | 1.10  |
| Portugal | 0.54  | 0.52  | 0.53  | 0.60  | 0.59  |
| Romania  | 2.04  | 2.03  | 1.92  | 1.96  | 2.03  |
| Slovenia | 0.08  | 0.09  | 0.09  | 0.09  | 0.09  |
| Slovakia | 0.18  | 0.20  | 0.19  | 0.19  | 0.18  |

### C.4 | EU CULTIVATION/HARVESTED/PRODUCTION AREA OF HAZELNUTS (IN 1000 HA) (SOURCE: EUROSTAT ACCESSED ON 17 JANUARY 2025)

| Hazelnuts | 2019   | 2020   | 2021   | 2022   | 2023   |
|-----------|--------|--------|--------|--------|--------|
| EU        | 110.39 | 116.33 | 119.75 | 123.64 | 128.56 |
| Belgium   | 0.01   | 0.01   | 0.03   | 0.06   | 0.06   |
| Bulgaria  | 1.27   | 1.34   | 1.56   | 1.53   | 1.72   |
| Germany   | 0.00   | 0.00   | 0.00   | 0.52   | 0.52   |
| Greece    | 0.52   | 0.59   | 0.75   | 0.72   | 0.75   |
| Spain     | 13.02  | 13.07  | 13.11  | 12.66  | 12.47  |
| France    | 5.19   | 7.43   | 7.51   | 7.56   | 7.92   |
| Croatia   | 5.53   | 6.54   | 6.71   | 8.24   | 8.70   |
| Italy     | 79.35  | 80.28  | 82.59  | 84.43  | 87.50  |
| Cyprus    | 0.02   | 0.03   | 0.03   | 0.03   | 0.03   |
| Lithuania | 0.00   | 0.00   | 0.18   | 0.20   | 0.30   |
| Hungary   | 0.37   | 0.43   | 0.48   | 0.51   | 0.54   |
| Poland    | 3.75   | 5.40   | 5.40   | 5.60   | 5.60   |
| Portugal  | 0.32   | 0.32   | 0.41   | 0.55   | 0.70   |
| Romania   | 0.89   | 0.71   | 0.82   | 0.84   | 1.54   |
| Slovenia  | 0.15   | 0.17   | 0.19   | 0.20   | 0.21   |

### C.5 | EU CULTIVATION/HARVESTED/PRODUCTION AREA OF PEACHES (IN 1000 HA) (SOURCE: EUROSTAT ACCESSED ON 17 JANUARY 2025)

| Peaches  | 2019   | 2020   | 2021   | 2022   | 2023   |
|----------|--------|--------|--------|--------|--------|
| EU       | 144.78 | 138.31 | 133.06 | 129.40 | 124.01 |
| Bulgaria | 3.02   | 2.70   | 2.57   | 2.46   | 1.43   |
| Czechia  | 0.34   | 0.34   | 0.32   | 0.28   | 0.25   |
| Germany  | 0.11   | 0.11   | 0.11   | 0.11   | 0.11   |
| Greece   | 33.61  | 32.94  | 30.48  | 29.95  | 28.88  |
| Spain    | 47.94  | 44.42  | 43.55  | 41.61  | 40.19  |
| France   | 4.65   | 5.99   | 6.05   | 5.91   | 5.74   |

(Continued)

| Peaches  | 2019  | 2020  | 2021  | 2022  | 2023  |
|----------|-------|-------|-------|-------|-------|
| Croatia  | 0.68  | 0.61  | 0.62  | 0.49  | 0.39  |
| Italy    | 41.93 | 41.04 | 39.44 | 39.13 | 37.95 |
| Cyprus   | 0.22  | 0.23  | 0.24  | 0.25  | 0.24  |
| Hungary  | 4.79  | 3.89  | 3.86  | 3.61  | 3.48  |
| Austria  | 0.18  | 0.18  | 0.18  | 0.18  | 0.17  |
| Poland   | 2.15  | 0.80  | 1.00  | 0.80  | 0.60  |
| Portugal | 2.87  | 2.88  | 2.86  | 2.91  | 2.88  |
| Romania  | 1.72  | 1.62  | 1.27  | 1.22  | 1.21  |
| Slovenia | 0.25  | 0.25  | 0.24  | 0.23  | 0.22  |
| Slovakia | 0.35  | 0.31  | 0.28  | 0.27  | 0.26  |

#### C.6 | EU CULTIVATION/HARVESTED/PRODUCTION AREA OF PEARS (IN 1000 HA) (SOURCE: EUROSTAT ACCESSED ON 17 JANUARY 2025)

| Pears       | 2019   | 2020   | 2021   | 2022   | 2023   |
|-------------|--------|--------|--------|--------|--------|
| EU          | 110.66 | 108.29 | 106.96 | 103.10 | 100.53 |
| Belgium     | 10.37  | 10.66  | 10.45  | 10.57  | 10.63  |
| Bulgaria    | 0.70   | 0.50   | 0.55   | 0.58   | 0.47   |
| Czechia     | 0.80   | 0.83   | 0.80   | 0.80   | 0.79   |
| Denmark     | 0.30   | 0.30   | 0.30   | 0.29   | 0.30   |
| Germany     | 2.14   | 2.14   | 2.14   | 2.07   | 2.07   |
| Greece      | 4.34   | 5.42   | 4.37   | 4.35   | 4.09   |
| Spain       | 20.62  | 20.22  | 20.02  | 19.11  | 18.46  |
| France      | 5.25   | 5.90   | 5.89   | 5.91   | 6.08   |
| Croatia     | 0.86   | 0.73   | 0.75   | 0.60   | 0.59   |
| Italy       | 28.71  | 26.60  | 26.79  | 24.52  | 23.03  |
| Cyprus      | 0.06   | 0.07   | 0.08   | 0.08   | 0.07   |
| Latvia      | 0.20   | 0.20   | 0.20   | 0.22   | 0.20   |
| Lithuania   | 0.82   | 0.85   | 0.85   | 0.84   | 0.75   |
| Luxembourg  | 0.02   | 0.01   | 0.01   | 0.01   | 0.01   |
| Hungary     | 2.81   | 2.62   | 2.74   | 2.48   | 2.40   |
| Netherlands | 10.09  | 10.00  | 10.07  | 10.10  | 9.86   |
| Austria     | 0.50   | 0.54   | 0.55   | 0.57   | 0.60   |
| Poland      | 7.22   | 5.80   | 5.60   | 5.50   | 5.60   |
| Portugal    | 11.33  | 11.33  | 11.16  | 10.85  | 10.83  |
| Romania     | 3.08   | 3.09   | 3.17   | 3.20   | 3.23   |
| Slovenia    | 0.21   | 0.22   | 0.23   | 0.22   | 0.21   |
| Slovakia    | 0.11   | 0.10   | 0.09   | 0.10   | 0.11   |
| Finland     | 0.04   | 0.05   | 0.05   | 0.05   | 0.03   |
| Sweden      | 0.10   | 0.11   | 0.11   | 0.12   | 0.13   |

#### C.7 | EU CULTIVATION/HARVESTED/PRODUCTION AREA OF PLUMS (IN 1000 HA) (SOURCE: EUROSTAT ACCESSED ON 17 JANUARY 2025)

| Plums    | 2019   | 2020   | 2021   | 2022   | 2023   |
|----------|--------|--------|--------|--------|--------|
| EU       | 154.51 | 160.38 | 157.68 | 156.63 | 157.06 |
| Belgium  | 0.04   | 0.04   | 0.05   | 0.05   | 0.06   |
| Bulgaria | 8.02   | 8.57   | 9.28   | 9.40   | 9.26   |
| Czechia  | 1.88   | 1.89   | 1.94   | 1.92   | 1.88   |
| Denmark  | 0.08   | 0.09   | 0.10   | 0.11   | 0.10   |
| Germany  | 4.83   | 4.84   | 4.85   | 4.79   | 4.77   |

(Continues)

(Continued)

| Plums       | 2019  | 2020  | 2021  | 2022  | 2023  |
|-------------|-------|-------|-------|-------|-------|
| Estonia     | 0.02  | 0.02  | 0.02  | 0.02  | 0.02  |
| Greece      | 2.18  | 2.44  | 2.15  | 2.15  | 2.03  |
| Spain       | 14.85 | 14.41 | 13.69 | 13.25 | 12.64 |
| France      | 14.83 | 15.70 | 15.70 | 15.09 | 15.11 |
| Croatia     | 4.46  | 3.39  | 3.49  | 3.56  | 3.87  |
| Italy       | 11.94 | 11.89 | 11.98 | 12.04 | 11.92 |
| Cyprus      | 0.38  | 0.43  | 0.43  | 0.42  | 0.40  |
| Latvia      | 0.06  | 0.10  | 0.10  | 0.07  | 0.10  |
| Lithuania   | 0.74  | 0.75  | 0.74  | 0.73  | 0.54  |
| Luxembourg  | 0.04  | 0.04  | 0.04  | 0.03  | 0.03  |
| Hungary     | 7.96  | 7.06  | 7.00  | 7.00  | 6.93  |
| Netherlands | 0.28  | 0.27  | 0.26  | 0.26  | 0.26  |
| Austria     | 0.20  | 0.21  | 0.21  | 0.21  | 0.21  |
| Poland      | 13.63 | 18.70 | 16.50 | 16.50 | 16.90 |
| Portugal    | 1.83  | 1.83  | 1.75  | 1.64  | 1.63  |
| Romania     | 65.58 | 67.01 | 66.73 | 66.71 | 67.74 |
| Slovenia    | 0.05  | 0.06  | 0.06  | 0.07  | 0.07  |
| Slovakia    | 0.61  | 0.59  | 0.58  | 0.59  | 0.58  |
| Sweden      | 0.04  | 0.04  | 0.04  | 0.05  | 0.04  |

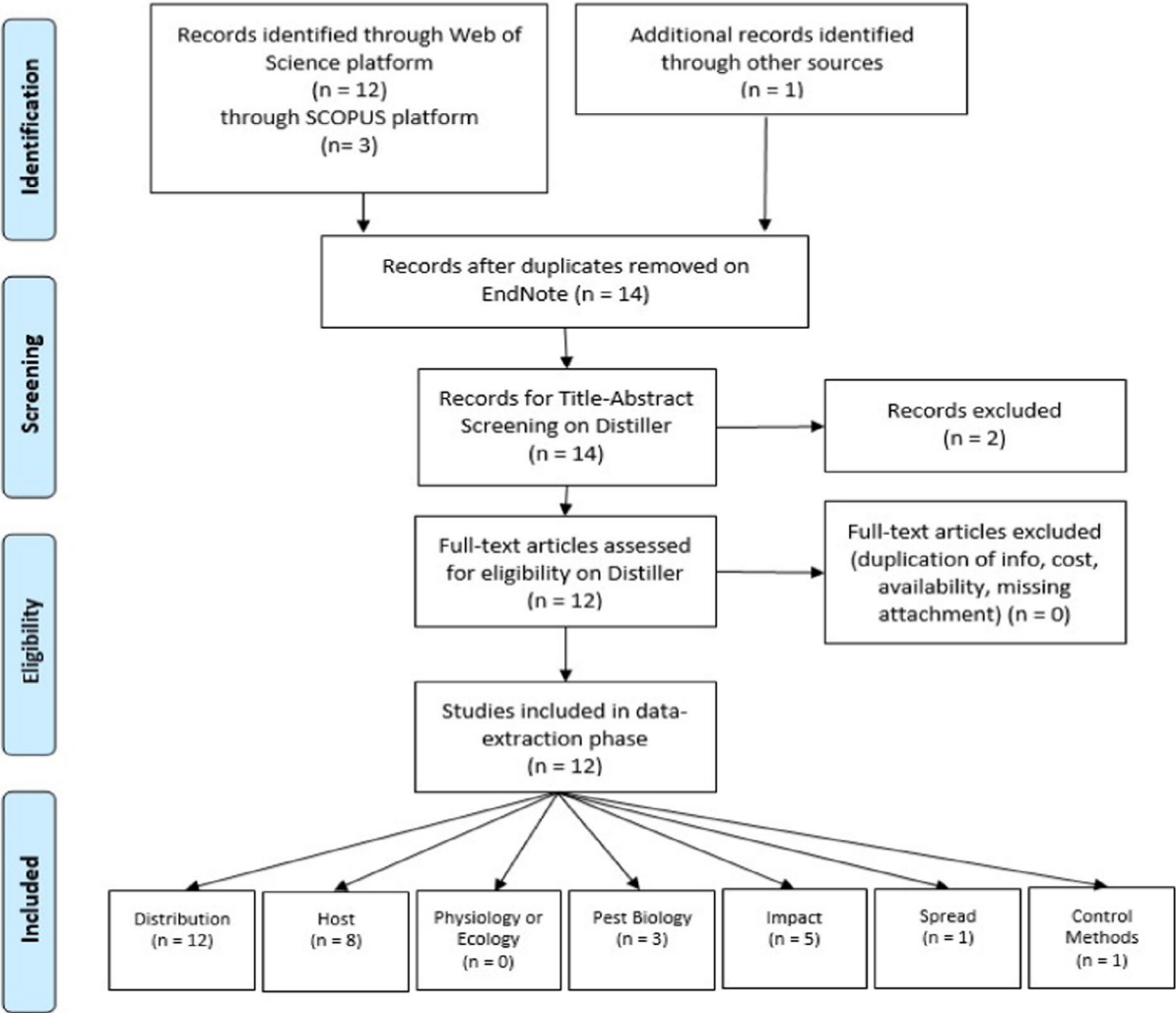
#### C.8 | EU CULTIVATION/HARVESTED/PRODUCTION AREA OF WALNUTS (IN 1000 HA) (SOURCE: EUROSTAT ACCESSED ON 17 JANUARY 2025)

| Walnuts    | 2019  | 2020  | 2021  | 2022   | 2023   |
|------------|-------|-------|-------|--------|--------|
| EU         | 87.62 | 99.21 | 97.00 | 102.46 | 103.36 |
| Belgium    | 0.10  | 0.10  | 0.14  | 0.16   | 0.16   |
| Bulgaria   | 6.36  | 7.10  | 8.07  | 8.33   | 7.51   |
| Czechia    | 0.13  | 0.16  | 0.13  | 0.14   | 0.13   |
| Germany    | 0.29  | 0.29  | 0.29  | 0.73   | 0.73   |
| Greece     | 14.82 | 20.27 | 16.58 | 17.10  | 16.74  |
| Spain      | 11.44 | 12.29 | 12.78 | 12.71  | 13.23  |
| France     | 25.88 | 27.18 | 26.85 | 26.90  | 26.87  |
| Croatia    | 7.21  | 8.11  | 8.42  | 8.91   | 8.65   |
| Italy      | 4.67  | 4.93  | 5.39  | 5.44   | 6.13   |
| Cyprus     | 0.21  | 0.22  | 0.22  | 0.24   | 0.24   |
| Lithuania  | 0.00  | 0.00  | 0.27  | 0.30   | 0.46   |
| Luxembourg | 0.01  | 0.01  | 0.01  | 0.01   | 0.01   |
| Hungary    | 6.00  | 6.40  | 6.44  | 7.82   | 7.96   |
| Austria    | 0.17  | 0.18  | 0.19  | 0.19   | 0.19   |
| Poland     | 2.27  | 3.00  | 2.70  | 3.40   | 3.30   |
| Portugal   | 5.37  | 5.40  | 5.61  | 5.49   | 5.60   |
| Romania    | 1.62  | 1.91  | 2.40  | 2.83   | 3.59   |
| Slovenia   | 0.44  | 0.48  | 0.52  | 0.56   | 0.60   |
| Slovakia   | 0.63  | 1.17  | 0.00  | 1.19   | 1.26   |

APPENDIX D

Prisma 2009 Flow Diagram

Name of the Pest: *Eulecanium excrescens*  
Date of the search: 23 July 2024  
Approved Literature Search String: ("*Eulecanium excrescens*" OR "*Lecanium excrescens*")



From: Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. *PLoS Med* 6(7): e1000097. doi:10.1371/journal.pmed1000097

For more information, visit [www.prisma-statement.org](http://www.prisma-statement.org).