SCIENTIFIC OPINION

EFSA Journal

ADOPTED: 21 October 2021

doi: 10.2903/j.efsa.2021.6927

Pest categorisation of *Oligonychus mangiferus*

EFSA Panel on Plant Health (PLH),
Claude Bragard, Francesco Di Serio, Paolo Gonthier, Josep Anton Jaques Miret, Annemarie Fejer Justesen, Christer Sven Magnusson, Panagiotis Milonas, Juan A Navas-Cortes, Stephen Parnell, Roel Potting, Philippe Lucien Reignault, Hans-Hermann Thulke, Wopke Van der Werf, Antonio Vicent Civera, Jonathan Yuen, Lucia Zappalà, Jean-Claude Gregoire, Chris Malumphy, Ewelina Czwienczek, Virag Kertesz, Andrea Maiorano and Alan MacLeod

Abstract

The EFSA Panel on Plant Health performed a pest categorisation of the mango red spider mite, *Oligonychus mangiferus* (Rahman and Sapra, 1940) (Acari: Prostigmata: Tetranychidae), for the territory of the EU. This species is not included in the EU Commission Implementing Regulation 2019/2072. The polyphagous mite feeds on more than 50 host plants including tropical fruits such as mangoes and avocados and temperate fruits such as pears, peaches, pomegranates and grapes. It occurs in Africa, Asia, Oceania and South America. *O. mangiferus* is multivoltine and can develop throughout the year as long as temperatures are above 12°C. The species produces dense webs on the above-ground parts of their host plants, where all stages of development (egg, larva, nymph and adult) can be found. This species is considered a pest of mango, grapevine, lychee and pomegranate, mostly in areas with hotter climates than those occurring in the EU. Potential entry pathways for *O. mangiferus* include plants for planting with foliage, fruit and cut flowers. Plants for planting of a few hosts (i.e. *Pinus*, *Prunus*, *Pyrus*, *Rosa*, *Vitis* and Arecaceae) are banned from entering into the EU from countries where *O. mangiferus* is known to occur and can be considered as closed entry pathways. However, other plants for planting, as well as the fruit and the cut flowers pathways remain open. There are no EU records of interception. Should *O. mangiferus* enter the EU, the ample availability of hosts and the climatic conditions in the EU would most probably allow this species to successfully establish and spread, at least in southern MSs, where economic impact in different fruit production (e.g. pomegranate, mango and grape) is anticipated. *O. mangiferus* satisfies the criteria that are within the remit of EFSA to assess for this species to be regarded as a potential Union quarantine pest.

Keywords: Mango red spider mite, Tetranychidae, Prostigmata, pest risk, plant health, plant pest, quarantine

Requestor: European Commission

Question number: EFSA-Q-2021-00379

Correspondence: alpha@efsa.europa.eu

Panel members: Claude Bragard, Francesco Di Serio, Paolo Gonthier, Josep Anton Jaques Miret, Annemarie Fejer Justesen, Alan MacLeod, Christer Sven Magnusson, Panagiotis Milonas, Juan A Navas-Cortes, Stephen Parnell, Roel Potting, Philippe L Reignault, Hans-Hermann Thulke, Wopke Van der Werf, Antonio Vicent Civera, Jonathan Yuen and Lucia Zappalà.

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

Acknowledgements: EFSA wishes to acknowledge the contribution of Caterina Campese and Oresteia Sfyra to this opinion.

Suggested citation: EFSA PLH Panel (EFSA Panel on Plant Health), Bragard C, Di Serio F, Gonthier P, Jaques Miret JA, Justesen AF, Magnusson CS, Milonas P, Navas-Cortes JA, Parnell S, Potting R, Reignault PL, Thulke H-H, Van der Werf W, Vicent Civera A, Yuen J, Zappalà L, Gregoire J-C, Malumphy C, Czwienczek E, Kertesz V, Maiorano A and MacLeod A, 2021. Scientific Opinion on the pest categorisation of *Oligonychus mangiferus*. EFSA Journal 2021;19(11):6927, 22 pp. https://doi.org/10.2903/j.efsa.2021.6927

ISSN: 1831-4732

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

Table of contents

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

Oligonychus mangiferus is one of a number of pests listed in Annex C to 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 European Commission 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 for relevant host commodities will be identified.

1.3. Additional information

This pest categorisation was initiated following the commodity risk assessment of *Ficus carica* plants from Israel performed by EFSA (EFSA PLH Panel, 2021), in which *O. mangiferus* was identified as a relevant non-regulated EU pest which could potentially enter the EU on *F. carica.*

2. Data and methodologies

2.1. Data

2.1.1. Literature search

A literature search on *O. mangiferus* was conducted at the beginning of the categorisation in the ISI Web of Science bibliographic database, using the scientific name of the pest as search term. Papers relevant for the pest categorisation were reviewed, and further references and information were obtained from experts, as well as from citations within the references and grey literature.

2.1.2. Database search

Pest information, on host(s) and distribution, was retrieved from the European and Mediterranean Plant Protection Organization (EPPO) Global Database (EPPO, online), the CABI databases and scientific literature databases as referred above in Section 2.1.1.

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

The Europhyt and TRACES databases 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 Interceptions to TRACES in May 2020.

2.2. Methodologies

The Panel performed the pest categorisation for *O. mangiferus,* following guiding principles and steps presented in the EFSA guidance on quantitative pest risk assessment (EFSA PLH Panel, 2018), the EFSA guidance on the use of the weight of evidence approach in scientific assessments (EFSA Scientific Committee, 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 to this Regulation. Table 1 presents the Regulation (EU) 2016/2031 pest categorisation criteria on which the Panel bases its conclusions. In judging whether a criterion is met the Panel uses its best professional judgement (EFSA Scientific Committee, 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 or not a criterion is satisfied.

The Panel's conclusions are formulated respecting its remit and particularly with regard to the principle of separation between risk assessment and risk management (EFSA founding regulation (EU) No 178/2002); therefore, instead of determining whether the pest is likely to have an unacceptable impact, 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 likely 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, 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 defined in Regulation (EU) 2016/2031 on protective measures against pests of plants (the number of the relevant sections of the pest categorisation is shown in brackets in the first column)

Criterion of pest categorisation	Criterion in Regulation (EU) 2016/2031 regarding Union quarantine pest (article 3)
Identity of the pest (Section 3.1)	Is the identity of the pest established, 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? If present, is the pest widely distributed within the EU? Describe the pest distribution briefly
Regulatory status (Section 3.3)	If the pest is present in the EU but not widely distributed in the risk assessment area, it should be under official control or expected to be under official control in the near future.
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? If yes, briefly list the pathways
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 the entry into the EU such that the likelihood of introduction becomes mitigated?
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 established, or has it been shown to produce consistent symptoms and/or to be transmissible?

Yes. The identity of *O. mangiferus* is established.

Oligonychus mangiferus (Rahman and Sapra, 1940) (Acari: Prostigmata: Tetranychidae) is a spider mite originally described from specimens collected on *Mangifera indica* (mangoes) in Pakistan. Junior synonyms include *Paratetranychus insularis* McGregor, 1950, *Paratetranychus terminalis* Sayed, 1940, and *Oligonychus terminalis* (Sayed, 1946) (Migeon and Dorkeld, 2021).

The EPPO code[1] for this species is: OLIGMA (EPPO, online).

3.1.2. Biology of the pest

According to Beard (2018) and Gerson and Applebaum (2015), *O. mangiferus* feed mostly on the upper surfaces of the leaves of their hosts, where this spider mite spins delicate silk threads in which dust may accumulate. The mite population usually increases to a high density during the dry season (Lin, 2013) with infestations reaching a peak during late summer (Beard, 2018). This species prefers leaves at the upper levels of the canopy in mango (Rahman and Sapra, 1940; Jeppson et al., 1975; Gerson, 1986) and grapevine (Gupta, 1976) plants.

Lin (2013) estimated lower development thresholds of *O. mangiferus* at 12.5°C and 12.4°C for females and males, respectively. Above these temperatures, 185.9 and 175.7 DD are required by

[1] 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 (Griessinger and Roy, 2015; EPPO, 2019).

females and males, respectively, to complete development (Lin, 2013). Thus, one generation can be completed on mango in 27.4–48.1 days at constant conditions of 31°C/65%RH and 15°C/75%RH, respectively (Abou-Awad et al., 2011). Fu et al. (2002) and Lin (2013) report shorter generation times at both higher and lower temperatures: 9.2 and 13.2 days at 32 and 33°C, and 29.1 and up to 47 days at 16°C and 17°C. Based on these data, Lin (2013) estimated that *O. mangiferus* could complete 26 generations per year on mangoes in Taiwan. However, this figure dropped to 14–20 in Egypt on the same host (Zaher et al., 1982; Abou-Awad et al., 2011). Highest fecundity of 46.43 eggs per female was registered at 31°C and 65% RH (Abou-Awad et al., 2011). Lin (2013) obtained highest daily fecundity at 29°C with 3.2 eggs per female. Reproduction is by arrhenotoky (unfertilised eggs develop into haploid males and fertilised eggs into diploid females), the sex ratio being about 1:4 males to females. The highest intrinsic rates of increase (r_m; day^{-1}) estimated by Lin (2013), Fu et al. (2002) and Abou-Awad et al. (2011) were 0.182, 0.396 and 0.125 day, at 29, 28 and 31°C, respectively.

There is uncertainty about the overwintering stage of this mite on deciduous host plants in temperate climates. EFSA PLH Panel (2021) assumed that the life history of this mite would be similar to that of other closely related spider mites, like *Oligonychus perditus* Pritchard & Baker (EFSA PLH Panel, 2017), which overwinters on bark as egg or adult.

3.1.3. Host range

According to Migeon and Dorkeld (2021), *O. mangiferus* can feed on 54 hosts in 21 botanical families (see Appendix A) including relevant host plants occurring in the EU either as a fruit crop (e.g. *Cydonia* sp., *Eriobotrya japonica*, *Ficus carica*, *Prunus persica*, *Pyrus communis*, *Vitis vinifera*) or as ornamental and/or wild plants (e.g. *Bauhinia* spp., *Cotoneaster* sp., *Cupressus sempervirens, Eucalyptus* spp., *Lagerstroemia* spp., *Melia azedarach*, *Pinus* spp., *Rosa* spp.), as well as other plants not widely cultivated in the EU but traded with third countries (e.g. *Annona* spp., *Mangifera indica*, *Musa* spp., *Persea americana*).

3.1.4. Intraspecific diversity

There are no reports of intraspecific variation for *O. mangiferus*.

3.1.5. Detection and identification of the pest

Are detection and identification methods available for the pest?

Yes, there are detection and identification methods for *O. mangiferus.*

Symptoms

The infested plant parts are covered with a dense web and become yellow first and then brownish on mango and lychee. Heavy feeding on mango causes a drying of the leaves followed by premature leaf drop (Rahman and Sapra, 1940; Jeppson et al., 1975; Gupta, 1976; Beard, 2018).

Identification/Description (for full description, see NAPPO, 2014, or Beard, 2018)

Females within the *Oligonychus ununguis* group, which includes *O. mangiferus*, look alike and share many common features. As a consequence, identification is based on male morphology, specifically the morphology of the aedeagus, which is a unique identifying character for Tetranychidae. Male aedeagus of *O. mangiferus* follows a strong ventral (slightly acute) bent; the ventral bend or extension then gradually tapers into a blunt point, which may be slightly bent apically.

3.2. Pest distribution

3.2.1. Pest distribution outside the EU

Figure 1 shows the reported global distribution of *O. mangiferus* based on Beard (2018), CABI (2021) and Migeon and Dorkeld (2021). *O. mangiferus* occurs in Australia (including Western Australia, DPI-Western Australia, 2014; Australian Government-Biosecurity Australia, 2005), Brazil (no details about subnational records), Chile, China (no details about subnational records), Egypt, El Salvador, Hawaii, India (states of Karnataka, Punjab and West Bengal), Iran, Israel, Mauritius, Mozambique, Myanmar, Pakistan, Peru, Reunion, Singapore, South Africa, Taiwan, Thailand and Yemen.

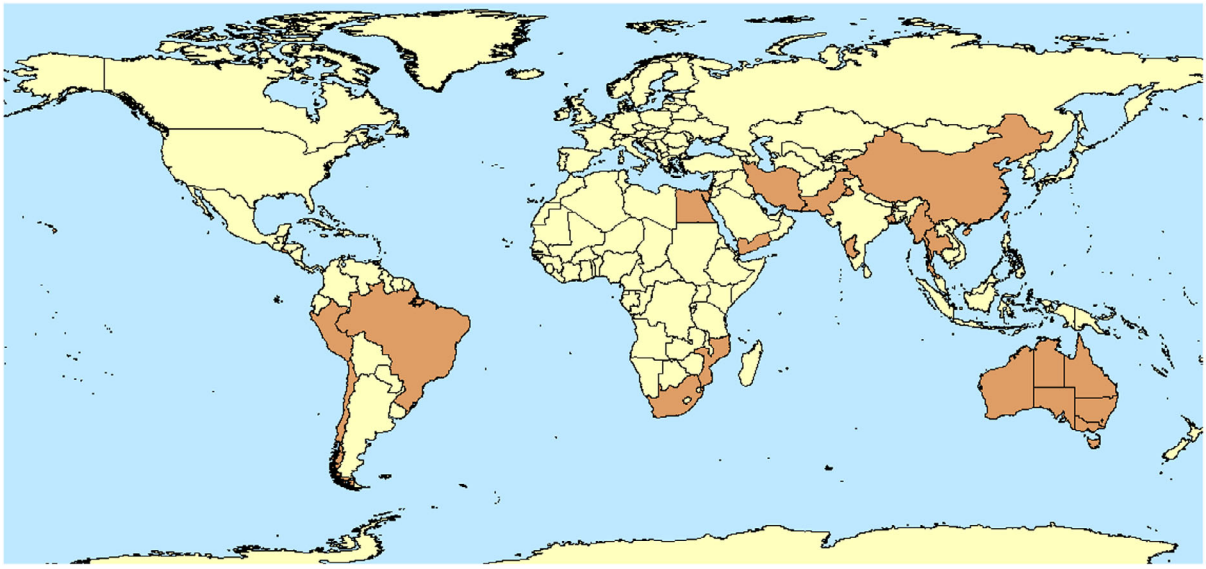

Figure 1: Global distribution of *Oligonychus mangiferus* (Source: literature and CABI accessed on 11.8.2021)

3.2.2. Pest distribution in the EU

Is the pest present in the EU territory? If present, is the pest widely distributed within the EU?
No. *O. mangiferus* is not known to occur in the EU.

3.3. Regulatory status

3.3.1. Commission Implementing Regulation 2019/2072

O. mangiferus is not listed in Annex II of Commission Implementing Regulation (EU) 2019/2072, an implementing act of Regulation (EU) 2016/2031.

3.3.2. Hosts of *O. mangiferus* that are prohibited from entering the Union from third countries

As specified in Annex VI of 2019/2072, some plants, which are also *O. mangiferus* host plants (see Section 3.1.3), are prohibited from entering the EU as plants for planting, or have specific conditions applied. Host plants that are prohibited include *Cydonia*, *Malus*, *Pinus*, *Prunus*, *Pyrus*, *Rosa*, *Vitis and Phoenix* sp. (Table 2).

Table 2: List of plants, plant products and other objects that are *Oligonychus mangiferus* 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**
1.	Plants of (. . .) *Pinus* L., (. . .) other than fruit and seeds	ex 0602 20 20 ex 0602 20 80 ex 0602 90 41 ex 0602 90 45 ex 0602 90 46 ex 0602 90 47 ex 0602 90 50 ex 0602 90 70 ex 0602 90 99 ex 0604 20 20 ex 0604 20 40	Third countries other than [. . .] Exclusions do not affect any country where *O. mangiferus* is known to occur. Therefore, countries where *O. mangiferus* is known to occur are included in the prohibition.
8.	Plants for planting of (. . .) *Cydonia* Mill., (. . .) *Prunus* L., *Pyrus* L. and *Rosa* L., other than dormant plants free from leaves, flowers and fruits	ex 0602 10 90 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 ex 0602 90 99	Third countries other than [. . .] Exclusions do not affect any country where *O. mangiferus* is known to occur. Therefore, countries where *O. mangiferus* is known to occur are included in the prohibition.
9.	Plants for planting of *Cydonia* Mill., (. . .) *Prunus* L. and *Pyrus* L. and their hybrids (. . .) other than seeds	ex 0602 10 90 ex 0602 20 20 ex 0602 90 30 ex 0602 90 41 ex 0602 90 45 ex 0602 90 46 ex 0602 90 48 ex 0602 90 50 ex 0602 90 70 ex 0602 90 91 ex 0602 90 99	Third countries other than [. . .] Exclusions include Hawaii, where *O. mangiferus* is known to occur. Therefore, imports of these commodities from Hawaii offer a pathway.
10.	Plants of *Vitis* L., other than fruits	0602 10 10 0602 20 10 ex 0604 20 90 ex 1404 90 00	Third countries other than Switzerland
13.	Plants of *Phoenix* sp. other than fruit and seeds	ex 0602 20 20 ex 0602 20 80 ex 0602 90 41 ex 0602 90 45 ex 0602 90 46 ex 0602 90 47 ex 0602 90 50 ex 0602 90 70 ex 0602 90 99 ex 0604 20 90 ex 1404 90 00	Algeria, Morocco

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.

Comment on plants for planting as a pathway.

Yes, *O. mangiferus* could enter the EU territory. The main pathways are plants for planting, fruit, and cut flowers.

Colonies of *O. mangiferus* usually develop on leaves. Therefore, any stage, either sessile (i.e. egg) or mobile (i.e. larva, nymph and adult), of *O. mangiferus* could be carried by plants for planting with leaves. However, as wandering individuals can be found anywhere on the above-ground parts of the plant, motiles could be found on flowers and fruit as well. As a consequence, *O. mangiferus* could move in international trade on plants for planting, fruit and cut flowers. Indeed, the fruit pathway for table grapes from Chile and the plants for planting pathway for *F. carica* from Israel were considered as possible by the Australian Government-Biosecurity Australia (2005) and EFSA PLH Panel (2021), respectively. The import into the EU of some plants for planting from countries where *O. mangiferus* is known to occur is prohibited (Annex VII of Commission Implementing Regulation (EU) 2019/2072, 1., 8., 9., 10. and 13.). Moreover, some known hosts of *O. mangiferus* which are listed in Commission Implementing Regulation (EU) 2018/2019 as 'High risk plants, plant products and other objects' (i.e. plants for planting of *F. carica*) are subjected to specific risk assessments. Nevertheless, the import of fruit and cut flowers from third countries where *O. mangiferus* is known to occur is permitted and regulated (Annexes VII and XI; see Table 3). Moreover, *Musa* L. fruits (bananas, including plantains, fresh or dried) are included in the list of plants, plant products and other objects for which phytosanitary certificates are not required for their introduction into the Union territory (Annex XI, Part C).

In the period 2016–2020 almost 14 106 t of fresh grapes (CN code 080610; Figure 2), more than 7 106 t of guavas, mangoes and mangosteens (CN code 080450; Figure 3), and about 106 t of other edible fruit (CN code 08109075), which includes pomegranates among others (Figure 4), were imported into the EU from countries where *O. mangiferus* is known to occur (Figure 1). From these, South Africa ranked as the main exporter of fresh grapes to the EU (49.1% of total), as Brazil did for mangoes (89.9%), and Israel for other fruit (43.1%). A search of interceptions in Europhyt and TRACES databases did not reveal any interception of *O. mangiferus* for the period January 1994 to July 2021 (accessed on 9.8.2021). It should be kept in mind that this polyphagous species, which is native to SE Asia, can now be found in almost every continent, with the exception of the Poles, Europe and North America (see Section 3.2). To sum up, although *O. mangiferus* has never been intercepted in the EU, plants for planting, fruit and cut flowers are potential entry pathways for this spider mite into the EU (Table 3).

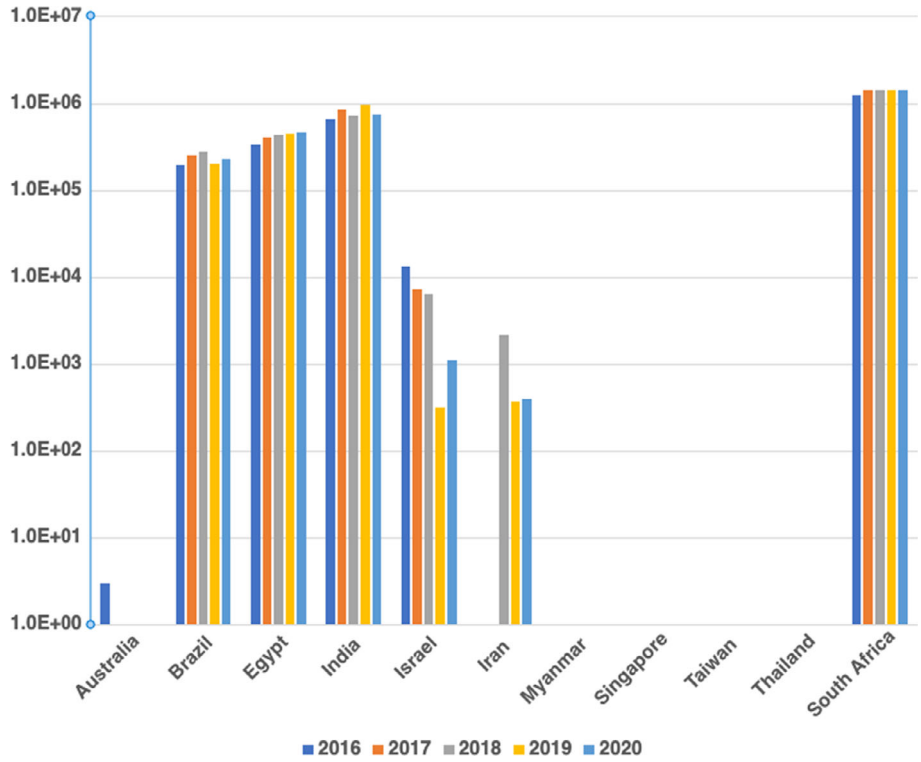

Figure 2: Total amount of fresh grapes (CN code 080610) imported (× 1,000 tons) into the EU (27) from countries where *Oligonychus mangiferus* is known to occur

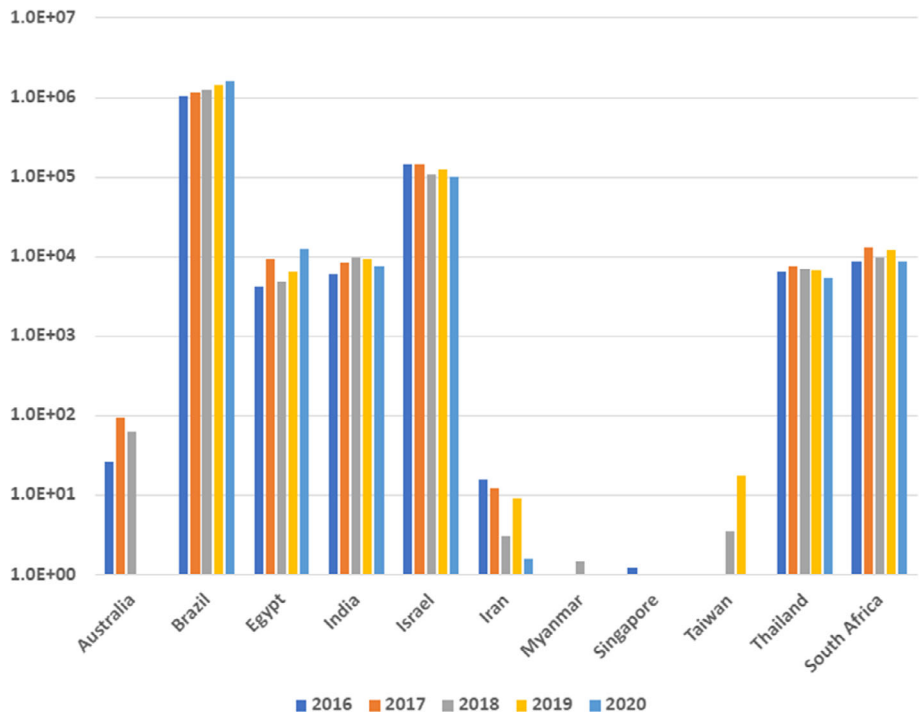

Figure 3: Total amount of guavas, mangoes and mangosteens (CN code 080450) imported (× 1,000 tons) into the EU (27) from countries where *Oligonychus mangiferus* is known to occur. Mangoes are a host for this spider mite

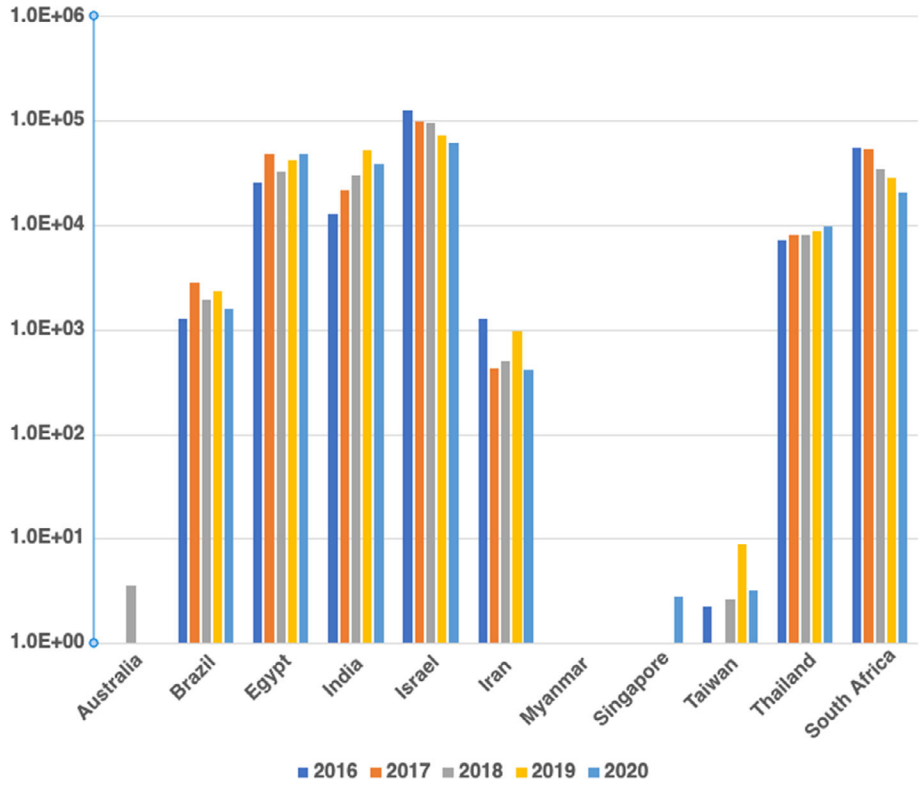

Figure 4: Total amount of other fruit (CN code 08109075) imported (× 1,000 tons) into the EU (27) from countries where *Oligonychus mangiferus* is known to occur. Pomegranates, which are included in this category, are a host for this spider mite

Table 3: Potential pathways for *Oligonychus mangiferus* into the EU 27

Pathways	Life stage	Relevant mitigations [e.g. prohibitions (Annex VI), special requirements (Annex VII) or phytosanitary certificates (Annex XI) within Implementing Regulation 2019/2072]
Plants for planting	Any stage (egg, larva, nymph, chrysalis and adult)	Annex VI (1., 8., 9., 10.) prohibits the introduction of plants of *Cydonia*, *Malus*, *Pinus, Prunus*, *Pyrus*, *Rosa* and *Vitis* from countries where *O. mangiferus* is known to occur. However, plants of *Cydonia* Mill., (…) *Prunus* L. and *Pyrus* L. and their hybrids (…) can be imported from Hawaii (Annex VI 9.) and current prohibitions for *Phoenix* sp. Annex VI, 13. do not include any country where *O. mangiferus* is known to occur.
Fruits	Motile stages (larva, nymph, and adult)	A phytosanitary certificate is required to import fresh fruits into the EU (2019/2072, Annex XI, Part A) unless exempt by being listed in 2019/2072 Annex XI, Part C. *Musa* L. fruits, which are *O. mangiferus* hosts are listed in Annex XI, Part C; hence, their introduction does not require a phytosanitary certificate. No specific requirements are set for other fruits known to be hosts of *O. mangiferus*. As a proportion of imported consignments but not all are liable to be physically inspected, this requirement does not preclude the entry of *O. mangiferus* on fruit.
Flowers	Motile stages (larva, nymph and adult)	A phytosanitary certificate is required to import cut flowers into the EU (2019/2072, Annex XI, Part B). However, no specific requirements are set for *O. mangiferus*. As a proportion of imported consignments but not all are liable to be physically inspected, this requirement does not preclude the entry of *O. mangiferus* on fruit.

3.4.2. Establishment

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

Yes, *O. mangiferus* would most probably be able to establish in the EU. It could establish in most of the EU, with Scandinavian and Baltic EU MSs being mostly unsuitable and warmer southern MSs mostly suitable.

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 et al., 2000). 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

As noted above (Section 3.4.1) and in Appendix A, O. *mangiferus* is a polyphagous mite species feeding on 54 hosts in 21 botanical families. In the EU, some hosts are restricted to the warmer southern MSs (e.g. avocados, mangoes, pomegranates), whilst others occur more widely (e.g. grapes, pears, peaches, plums, roses). Hosts are grown both in commercial production and also in home-gardens and some occur in the wild (pine trees, roses) Table 4 shows the harvested area of some key hosts cultivated in the EU 27 in recent years. Appendix B provides production statistics for individual member states.

Table 4: Harvested area of some *Oligonychus mangiferus* hosts in EU 27, 2016–2020 (thousand ha). Source EUROSTAT (accessed 25/4/2021)

Crop	Code	2016	2017	2018	2019	2020
Avocados	F2300	12.24	12.72	13.22	15.52	17.29
Grapes	W1000	3,136.04	3,134.93	3,137.17	3,160.68	NA
Plums	F1250	152.79	153.88	153.43	154.48	NA
Pears	F1120	115.76	114.84	114.84	111.84	108.93

3.4.2.2. Climatic conditions affecting establishment

O. mangiferus is known to occur in countries where BSh (hot semi-arid), BSk (cold semi-arid), Cfa (humid sub-tropical), Cfb (oceanic), Cfc (oceanic-subpolar), Csa (hot-summer Mediterranean), Csb (warm-summer Mediterranean), Csc (cold-summer Mediterranean), Dfb (humid-continental) and Dfc (subarctic) climate types also occurring in the EU can be found. We assume that the subarctic climate, though, is not suitable for the developing of this mite. As a consequence, climatic conditions would not limit the ability of *O. mangiferus* to establish in the EU, with Scandinavian and Baltic EU MSs being mostly unsuitable and warmer southern MSs mostly suitable (Figure 5).

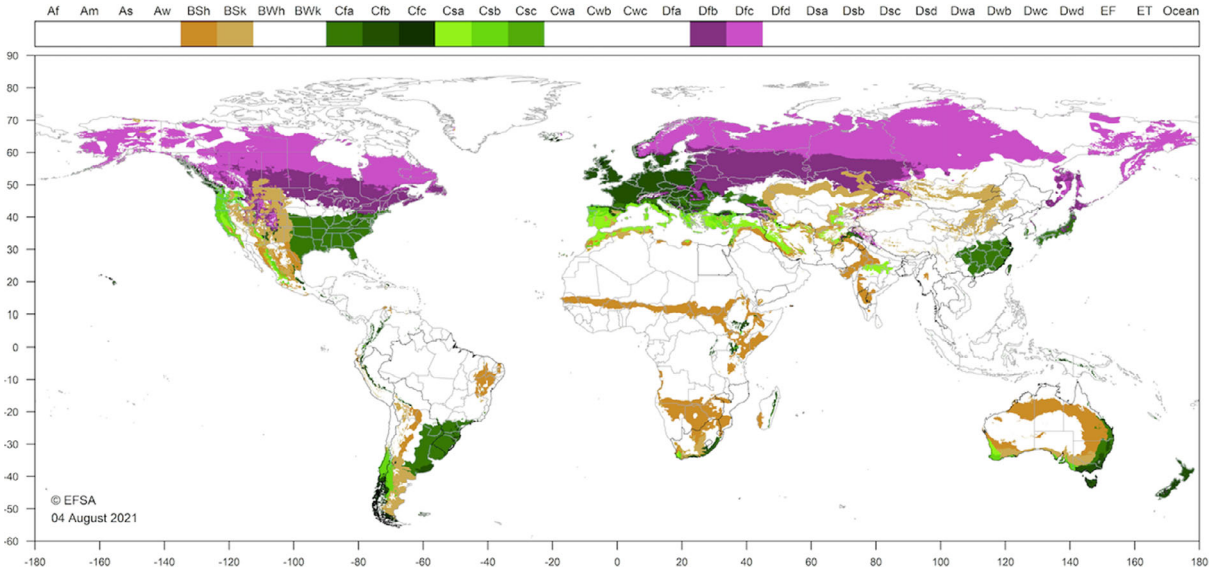

Figure 5: Occurrence of BSh, BSk, Cfa, Cfb, Cfc, Csa, Csb, Csc, Dfb and Dfc climate types in the World

3.4.3. Spread

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

Spider mites cannot fly. Spread would be mostly passive, with air currents (i.e. when ballooning) and human-assisted movement of either infested plants, fruit, flowers, or tools/gear being the most important spread mechanisms.

Comment on plants for planting as a mechanism of spread

Plants for planting could be the main mechanism of spread for *O. mangiferus*.

3.5. Impacts

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

Yes, the introduction of *O. mangiferus* would most probably have an economic impact on the EU territory.

According to Lin (2013), *O. mangiferus* has long been the key pest of mango in Taiwan and is primarily controlled by miticides. Mango farmers often incur great expense in controlling this spider mite every year. According to Beard (2018), it is also an important pest of mango and grapevines, and an occasional pest on lychee, in India. Moreover, *O. mangiferus* is recorded as the second most important pest of pomegranate in Egypt. Heavy feeding on mango causes a drying of the leaves followed by premature leaf drop. Lack of evidence for impacts on temperate crops in cooler areas of Australia, Chile, South Africa adds uncertainty to the impact that this species could cause in the EU.

3.6. Available measures and their limitations

Are there measures available to prevent the entry into the EU such that the risk becomes mitigated?

Yes, some plants for planting from third countries are banned from entering into the EU (see sections 3.3.2 and 3.4.1). Fruit and other commodities require a phytosanitary certificate (see section 3.4.1) and could be further sourced from areas free of *O. mangiferus* (see section 3.6.1).

3.6.1. Identification of potential additional measures

Phytosanitary measures are currently applied to some plants for planting (see Section 3.3 for prohibitions). Therefore, this entry pathway can be considered as partly closed. However, current regulations applied to the fruit and cut flowers pathways (see Section 3.4.1) do not specifically consider *O. mangiferus*. As these pathways are currently not prohibited for import, potential additional measures are listed in Table 5.

Table 5: Selected control measures (a full list is available in EFSA PLH Panel, 2018) for pest entry in relation to currently unregulated hosts and pathways

Special requirements summary (with hyperlink to information sheet if available)	Potential control measure summary
Pest freedom	Used to mitigate likelihood of infestation by specified pest at origin, hence to mitigate entry. Imports of susceptible commodities could be sourced from *O. mangiferus*-free *countries/areas.*
Certification of reproductive material (voluntary/official)	Used to mitigate pests that are included in a certification scheme.
Chemical treatments on crops including reproductive material	Used to mitigate likelihood of infestation of pests susceptible to chemical treatments. Famers usually apply acaricides against *O. mangiferus* to reduce their densities in the field.
Inspections	Used to mitigate likelihood of infestation by specified pest at origin.

Special requirements summary (with hyperlink to information sheet if available)	Potential control measure summary
Chemical treatments on consignments or during processing	Used to mitigate likelihood of infestation of pests susceptible to chemical treatments. Acaricidal treatments could be applied, for instance, at the packinghouse on susceptible commodities.
Physical treatments on consignments or during processing	Used to mitigate likelihood of infestation of pests susceptible to physical treatments. Brushing and washing can decrease mite density in fruit.
Timing of planting and harvesting and timing of export to EU	Used to mitigate likelihood of entry of pests associated with particular phenological stages of host. Because *O. mangiferus* lives mostly on leaves, dormant plants for planting without leaves could decrease the likelihood of infestation, although they still provide a relevant entry pathway. Moreover, they could increase the efficacy of other treatments either physical (i.e. washing) or chemical (i.e. pesticides).
Phytosanitary certificate and plant passport	Used to attest which of the above requirements have been applied.

3.6.1.1. Biological or technical factors limiting the effectiveness of measures to prevent the entry (and spread when applicable) of the pest

This is a minute species which may be difficult to detect via visual examination when infestation is low/incipient.

3.7. Uncertainty

The main uncertainties refer to the lack of information (1) about the overwintering stage of this mite on deciduous host plants in temperate climates (see Section 3.1.2) and (2) about the impact on crops in temperate climates (see Section 3.5). These uncertainties, though, do not affect the conclusion of this categorisation.

4. Conclusions

O. mangiferus satisfies the criteria that are within the remit of EFSA to assess for this species to be regarded as a potential Union quarantine pest. There are no uncertainties affecting the conclusions of this categorisation. Table 6 shows the summary of the PLH Panel conclusions.

Table 6: The Panel's conclusions on the pest categorisation criteria defined in Regulation (EU) 2016/2031 on protective measures against pests of plants (the number of the relevant sections of the pest categorisation is shown in brackets in the first column)

Criterion of pest categorisation	Panel's conclusions against criterion in Regulation (EU) 2016/2031 regarding Union quarantine pest	Key uncertainties
Identity of the pest (Section 3.1)	The identity of *O. mangiferus* has been properly established.	
Absence/presence of the pest in the EU (Section 3.2)	*O. mangiferus* is not known to occur in the EU territory.	
Regulatory status (Section 3.3)	*O. mangiferus* is currently not regulated in the EU.	
Pest potential for entry, establishment and spread in the EU (Section 3.4)	*O. mangiferus* could enter into, establish in, and spread within the EU territory. Main entry pathways are: • Plants for planting (those of *Pinus*, *Prunus*, *Pyrus*, *Vitis* and Arecaeae are regulated and closed) • Fruit (regulated: open) • Cut flowers (regulated: open)	

Criterion of pest categorisation	Panel's conclusions against criterion in Regulation (EU) 2016/2031 regarding Union quarantine pest	Key uncertainties
Potential for consequences in the EU (Section 3.5)	Should *O. mangiferus* be introduced into the EU, an economic impact would most likely follow	Impacts reported for mango, grapevine, lychee, and pomegranate mostly in areas with hotter climates than those occurring in the EU.
Available measures (Section 3.6)	There are measures to prevent the entry, establishment and spread of *O. mangiferus* within the EU territory, such as sourcing plants from pest free areas.	
Conclusion (Section 4)	*O. mangiferus* fulfils all criteria assessed by EFSA above for consideration as a quarantine pest.	
Aspects of assessment to focus on/scenarios to address in future if appropriate:		

References

Abou-Awad BA, Al-Azzazy MM and Afia SI, 2011. Effect of temperature and relative humidity on the rate of development, fecundity and life table parameters of the red spider mite Oligonychus mangiferus (Rahman and Sapra)(Acari: Tetranychidae). Archives of Phytopathology and Plant Protection, 44, 1862–1866.

Australian Government-Biosecurity Australia, 2005. Revised Draft Import Risk Analysis Report for Table Grapes from Chile. Part B. 100 pp.

Baker RHA, Sansford CE, Jarvis CH, Cannon RJ, MacLeod A and Walters KF, 2000. The role of climatic mapping in predicting the potential geographical distribution of non-indigenous pests under current and future climates. Agriculture, Ecosystems and Environment, 82, 57–71.

Beard JJ, 2018. Spider mites of Australia (including key exotic southeast Asia exotic pest species) - Factsheet *Oligonychus mangiferus*. Available online: https://keys.lucidcentral.org/keys/v3/spider_mites_australia/key/spider_mites_of_australia/Media/Html/entities/Oligonychus_mangiferus_Rahman__Sapra_1940.htm [Accessed: 28 July 2021].

CABI CPC, 2021. Crop Protection Compendium. CAB International, UK. Available online: http://www.cabi.org/cpc [Accessed: 29 June 2021].

DPI-Western Australia, 2014. Spider mite pests of Western Australian plants. Available online: https://www.agric.wa.gov.au/plant-biosecurity/spider-mite-pests-western-australian-plants [Accessed: 24 September 2021].

EFSA PLH Panel (EFSA Panel on Plant Health), Jeger M, Bragard C, Caffier D, Candresse T, Chatzivassiliou E, Dehnen-Schmutz K, Gilioli G, Jaques Miret JA, MacLeod A, Navajas Navarro M, Niere B, Parnell S, Potting R, Rafoss T, Rossi V, Urek G, Van Bruggen A, Van der Werf W, West J, Winter S, Kertesz V, Aukhojee M and Gregoire J-C, 2017. Scientific Opinion on the pest categorisation of Oligonychus perditus. EFSA Journal 2017;15(11):5075, 20 pp. https://doi.org/10.2903/j.efsa.2017.5075

EFSA PLH Panel (EFSA Panel on Plant Health), Jeger M, Bragard C, Caffier D, Candresse T, Chatzivassiliou E, Dehnen-Schmutz K, Gregoire J-C, Jaques Miret JA, MacLeod A, Navajas Navarro M, Niere B, Parnell S, Potting R, Rafoss T, Rossi V, Urek G, Van Bruggen A, Van Der Werf W, West J, Winter S, Hart A, Schans J, Schrader G, Suffert M, Kertesz V, Kozelska S, Mannino MR, Mosbach-Schulz O, Pautasso M, Stancanelli G, Tramontini S, Vos S and Gilioli G, 2018. Guidance on quantitative pest risk assessment. EFSA Journal 2018;16(8):5350, 86 pp. https://doi.org/10.2903/j.efsa.2018.5350

EFSA PLH Panel (EFSA Panel on Plant Health), Bragard C, Dehnen-Schmutz K, Di Serio F, Jacques M-A, Jaques Miret JA, Justesen AF, MacLeod A, Magnusson CS, Milonas P, Navas-Cortes JA, Parnell S, Potting R, Reignault PL, Thulke H-H, van der Werf W, Civera AV, Yuen J, Zappalà L, Battisti A, Mas H, Rigling D, Mosbach-Schulz O and Gonthier P, 2021. Scientifc Opinion on the commodity risk assessment of *Ficus carica* plants from Israel. EFSA Journal 2021;19(1):6353, 249 pp. https://doi.org/10.2903/j.efsa.2021.6353

EFSA Scientific Committee, Hardy A, Benford D, Halldorsson T, Jeger MJ, Knutsen HK, More S, Naegeli H, Noteborn H, Ockleford C, Ricci A, Rychen G, Schlatter JR, Silano V, Solecki R, Turck D, Benfenati E, Chaudhry QM, Craig P, Frampton G, Greiner M, Hart A, Hogstrand C, Lambre C, Luttik R, Makowski D, Siani A, Wahlstroem H, Aguilera J, Dorne J-L, Fernandez Dumont A, Hempen M, Valtueña Martinez S, Martino L, Smeraldi C, Terron A, Georgiadis N and Younes M, 2017. Scientific Opinion on the guidance on the use of the weight of evidence approach in scientific assessments. EFSA Journal 2017;15(8):4971, 69 pp. https://doi.org/10.2903/j.efsa.2017.4971

EPPO (European and Mediterranean Plant Protection Organization), online. EPPO Global Database. Available online: https://gd.eppo.int [Accessed: 29 July 2021].
FAO (Food and Agriculture Organization of the United Nations), 2013. ISPM (International Standards for Phytosanitary Measures) 11—Pest risk analysis for quarantine pests. FAO, Rome, 36 pp. Available online: https://www.ippc.int/sites/default/files/documents/20140512/ispm_11_2013_en_2014-04-30_201405121523-494.65%20KB.pdf
FAO (Food and Agriculture Organization of the United Nations), 2018. International Standards for Phytosanitary Measures. ISPM 5 Glossary of phytosanitary terms. Revised version adopted CPM 13, April 2018. FAO, Rome. Available online: https://www.ippc.int/en/publications/621/
Fu Y, Zhang F, Peng Z, Liu K and Jin Q, 2002. The effects of temperature on the development and reproduction of Tetranychus piercei McGregor (Acari: Tetranychidae) in banana. Systematic and Applied Acarology, 7, 69–76.
Gerson U, 1986. The spider mite *Oligonychus mangiferus* found on mangoes in Israel. Phytoparasitica, 14, 2.
Gerson U and Applebaum S, 2015. Plant Pests of the Middle East. Olygonychus mangiferae Rahman and Sapra. Available online: www.agri.huji.ac.ac.il/mepests/pest/Oligonychus_mangiferus/ [Accessed: 4 August 2021].
Griessinger D and Roy A-S, 2015. EPPO codes: a brief description. Available online: https://www.eppo.int/media/uploaded_images/RESOURCES/eppo_databases/A4_EPPO_Codes_2018.pdf
Gupta SK, 1976. Contribution to our knowledge of tetranychid mites (Acarina) with descriptions of three new species from India. Oriental Insects, 10, 327–351.
Jeppson L, Keifer H and Baker E, 1975. Mites Injurious to Economic Plants. University of California Press, Berkeley, USA. 614 pp.
Lin MY, 2013. Temperature-dependent life history of Oligonychus mangiferus (Acari: Tetranychidae) on Mangifera indica. Experimental and Applied Acarology, 61, 403–413.
Migeon A and Dorkeld F, 2021. Spider Mites Web: A Comprehensive Database for the Tetranychidae. Available online: http://www1.montpellier.inra.fr/CBGP/spmweb [Accessed: 29 June 2021].
NAPPO (North American Plant Protection Organization), 2014. Morphological Identification of Spider Mites (Tetranychidae) Affecting Imported Fruits. NAPPO diagnostic protocol. 34 pp. Available online: https://www.nappo.org/application/files/3515/8322/7229/DP_03_Tetranychidae-e.pdf
Rahman KA and Sapra AN, 1940. Mites of the family Tetranychidae from Lyallpur with descriptions of four new species. Proceedings of the Indian Academy of Sciences, Series B, 11, 177–196.
Zaher MA, Gomaa EA and El-Enany MA, 1982. Spider mites of Egypt (Acari: Tetranychidae). International Journal of Acarology, 8, 91–114.

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
PLH	EFSA Panel on Plant Health
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, 2018).
Control (of a pest)	Suppression, containment or eradication of a pest population (FAO, 2018).
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, 2018).
Eradication (of a pest)	Application of phytosanitary measures to eliminate a pest from an area (FAO, 2018).
Establishment (of a pest)	Perpetuation, for the foreseeable future, of a pest within an area after entry (FAO, 2018).
Greenhouse	A walk-in, static, closed place of crop production with a usually translucent outer shell, which allows controlled exchange of material and energy with the surroundings and prevents release of plant protection products (PPPs) into the environment.
Impact (of a pest)	The impact of the pest on the crop output and quality and on the environment in the occupied spatial units.
Introduction (of a pest)	The entry of a pest resulting in its establishment (FAO, 2018).

Pathway	Any means that allows the entry or spread of a pest (FAO, 2018).
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, 2018).
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, 2018).
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, 2018).

Appendix A – Hosts of *Oligonychus mangiferus* according to Migeon and Dorkeld (2021)

Family	Host(s)
Anacardiaceae	*Mangifera indica*
Annonaceae	*Annona macroprophyllata* *Annona* sp. *Annona squamosa*
Apocynaceae	*Plumeria rubra*
Arecaceae (= Palmae)	*Acanthophoenix* sp. *Arecaceae* sp.
Calophyllaceae	*Calophyllum inophyllum*
Combretaceae	*Combretum erythrophyllum* *Combretum indicum* *Terminalia catappa* *Terminalia* sp.
Cupressaceae	*Cupressus sempervirens* *Platycladus orientalis*
Euphorbiaceae	*Acalypha wilkesiana* *Ricinus communis*
Lauraceae	*Litsea chinensis* *Persea americana*
Leguminosae	*Bauhinia acuminata* *Cassia fistula* *Delonix* sp.
Lythraceae	*Lagerstroemia indica* *Lagerstromia thorelii* *Punica granatum*
Meliaceae	*Melia azedarach* *Trichilia emetica*
Moraceae	*Artocarpus integer* *Ficus carica* *Ficus* sp.
Musaceae	*Musa* sp. *Musa* × *paradisiaca*
Myrtaceae	*Eucalyptus camaldulensis* *Eugenia* sp. *Psidium guajava* *Syzygium cumini* *Syzygium jambos* *Syzygium samarangense*
Pinaceae	*Pinus* sp.
Rosaceae	*Cotoneaster* sp. *Cydonia* sp. *Eriobotrya japonica* *Prunus persica* *Pyrus communis* *Rosa cymosa* *Rosa gallica* *Rosa hybrida* *Rosa indica* *Rosa* sp. *Rubus allegheniensis*
Rubiaceae	*Gardenia jasminoides*
Sapindaceae	*Dimocarpus longan* *Litchi chinensis*
Simaroubaceae	*Ailanthus altissima*
Vitaceae	*Vitis vinifera*

Appendix B – Distribution of *Oligonychus mangiferus*

Distribution records based on different sources are presented in the table below.

Region	Country	Sub-national (e.g. State)	Status	Reference
North America			No records, presumed absent	
Central America	El Salvador		Present	Beard (2018)
Caribbean			No records, presumed absent	
South America	Brazil		Present, no details about subnational distribution	CABI, CPC
	Chile		Present	Beard (2018)
	Peru		Present	Beard (2018)
Europe			No records, presumed absent	
Africa	Egypt		Present	CABI, CPC
	France	Reunion	Present	CABI, CPC
	Mauritius		Present	Beard (2018)
	Mozambique		Present	Beard (2018)
	South Africa		Present	CABI, CPC
Asia	China		Present, no details about subnational distribution	CABI, CPC
	India	Karnataka	Present	CABI, CPC
		Punjab	Present	CABI, CPC
		West Bengal	Present	CABI, CPC
	Iran		Present	CABI, CPC
	Israel		Present	CABI, CPC
	Myanmar		Present	CABI, CPC
	Pakistan		Present	Beard (2018)
	Singapore		Present	CABI, CPC
	Taiwan		Present	CABI, CPC
	Thailand		Present	CABI, CPC
	Yemen		Present	Beard (2018)
Oceania	Australia		Present	Australian Government- Biosecurity Australia (2005), DPI-Western Australia (2014)
	USA	Hawaii	Present	Beard (2018)

Appendix C – EU 27 and member state cultivation/harvested/production area of some *Oligonychus mangiferus* selected hosts (thousands ha)

Eurostat data accessed on 27/4/2021

Pears (F1200)	2016	2017	2018	2019	2020
EU 27	115.76	114.84	114.84	111.84	108.93
Belgium	9.69	10.02	10.15	10.37	10.66
Bulgaria	0.41	0.45	0.57	0.7	0.6
Czechia	0.74	0.71	0.75	0.8	0.83
Denmark	0.3	0.3	0.29	0.3	0.3
Germany	1.93	2.14	2.14	2.14	2.14
Estonia	0	0	0	0	0
Ireland	0	0	0	0	0
Greece	4.08	4.07	4.41	4.34	4.34
Spain	22.55	21.89	21.33	20.62	20.22
France	5.3	5.25	5.24	5.25	5.61
Croatia	0.93	0.71	0.8	0.86	0.72
Italy	32.29	31.73	31.34	28.71	25.75
Cyprus	0.07	0.07	0.06	0.06	0.06
Latvia	0.2	0.2	0.2	0.2	0.2
Lithuania	0.8	0.82	0.82	0.82	0.85
Luxembourg	0.02	0.02	0.02	0.02	0.02
Hungary	2.87	2.9	2.84	2.81	2.6
Malta	0	0	0	0	0
Netherlands	9.4	9.7	10	10.09	10
Austria	0.46	0.46	0.49	0.5	0.54
Poland	7.49	7.26	7.3	7.22	7.39
Portugal	12.62	12.56	12.5	12.5	12.5
Romania	3.15	3.12	3.1	3.08	3.1
Slovenia	0.2	0.2	0.21	0.21	0.23
Slovakia	0.11	0.11	0.12	0.11	0.1
Finland	0.04	0.04	0.05	0.04	0.05
Sweden	0.12	0.12	0.11	0.1	0.13

Plums (F1250)	2016	2017	2018	2019	2020
EU 27	152.79	153.88	153.43	154.48	:
Belgium	0.03	0.03	0.03	0.04	0.04
Bulgaria	6.71	6.82	7.36	8.02	:
Czechia	1.88	1.76	1.82	1.88	1.89
Denmark	0.06	0.06	0.07	0.08	0.09
Germany	4.35	4.83	4.82	4.83	4.84
Estonia	0	0.02	0.02	0.02	0.02
Ireland	0	0	0	0	0
Greece	2.6	2.06	2.2	2.18	2.18
Spain	15.28	15.2	14.64	14.85	14.41
France	14.81	15.06	14.97	14.83	14.83
Croatia	4.83	4.36	4.28	4.46	4
Italy	11.57	11.68	11.72	11.94	11.89
Cyprus	0.45	0.38	0.37	0.38	0.39
Latvia	0.1	0.1	0.1	0.06	0.1
Lithuania	0.73	0.73	0.72	0.74	0.75
Luxembourg	0.04	0.04	0.04	0.04	0.04

Plums (F1250)	2016	2017	2018	2019	2020
Hungary	7.98	7.94	7.92	7.96	6.9
Malta	0	0	0	0	0
Netherlands	0.25	0.26	0.26	0.28	0.27
Austria	0.18	0.19	0.2	0.2	0.21
Poland	13.39	13.31	13.48	13.63	13.68
Portugal	1.8	1.78	1.8	1.8	1.8
Romania	65.11	66.68	65.91	65.58	66.5
Slovenia	0.04	0.04	0.05	0.05	0.06
Slovakia	0.58	0.52	0.61	0.61	0.59
Finland	0	0	0	0	0
Sweden	0.04	0.04	0.04	0.04	0.04
Grapes (W1000)	**2016**	**2017**	**2018**	**2019**	**2020**
EU 27	3,136.04	3,134.93	3,137.17	3,160.68	:
Belgium	0.24	0.24	0.3	0.38	0.49
Bulgaria	36.55	34.11	34.11	30.05	:
Czechia	15.8	15.81	15.94	16.08	16.14
Denmark	0	0	0	0	0
Germany	:	:	:	:	:
Estonia	0	0	0	0	0
Ireland	0	0	0	0	0
Greece	98.09	101.75	100.34	101.85	101.85
Spain	935.11	937.76	939.92	936.89	931.96
France	751.69	750.46	750.62	755.47	758.86
Croatia	23.4	21.9	20.51	19.82	20.63
Italy	673.76	670.09	675.82	697.91	703.9
Cyprus	6.07	5.93	6.67	6.67	6.79
Latvia	0	0	0	0	0
Lithuania	0	0	0	0	0
Luxembourg	1.26	1.26	1.25	1.24	1.24
Hungary	68.12	67.08	66.06	64.92	62.9
Malta	0.68	0.68	0.42	0.42	0.42
Netherlands	0.14	0.16	0.17	0.16	0.17
Austria	46.49	48.05	48.65	48.72	48.06
Poland	0.62	0.67	0.73	0.74	0.76
Portugal	179.05	178.84	178.78	178.78	178.78
Romania	174.17	175.32	172.8	176.34	176.76
Slovenia	15.84	15.86	15.65	15.57	15.29
Slovakia	8.71	8.47	8.01	7.92	7.73
Finland	0	0	0	0	0
Sweden	0.05	0.04	0.05	0.05	0.06