Commodity risk assessment of *Juglans regia* plants from Moldova


**Abstract**

The European Commission requested the EFSA Panel on Plant Health to prepare and deliver risk assessments for commodities listed in Commission Implementing Regulation (EU) 2018/2019 as ‘High risk plants, plant products and other objects’. Taking into account the available scientific information, including the technical information provided by the applicant country, this Scientific Opinion covers the plant health risks posed by the following commodities: dormant, free of leaves grafted plants and rootstocks of *Juglans regia* imported from Moldova. A list of pests potentially associated with the commodities was compiled. The relevance of any pest was assessed based on evidence following defined criteria. None of the pests in the list fulfilled all relevant criteria and therefore none were selected for further evaluation. As a result, risk mitigation measures proposed in the technical dossier from Moldova were listed, but not further evaluated.

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**Keywords:** *Juglans regia*, walnut, plants for planting, grafted plants, rootstocks, European Union

**Requestor:** European Commission

**Question number:** EFSA-Q-2020-00532

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

Acknowledgments: EFSA Panel on Plant Health wishes to thank Svetla Kozelska for the support during the whole process of the opinion development and to acknowledge the important contribution of the trainee Alzbeta Mikulova, who provided an essential contribution to the literature search, the compilation of the pest list and the pest datasheets and drafting and reviewing the opinion.


ISSN: 1831-4732

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

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

1.1.1. **Background**

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

1.1.2. **Terms of Reference**

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

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

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

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

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

1.2. **Interpretation of the Terms of Reference**

The EFSA Panel on Plant Health (hereafter referred to as ‘the Panel’) was requested to conduct a commodity risk assessment of *Juglans regia* from Moldova following the Guidance on commodity risk assessment for the evaluation of high-risk plant dossiers (EFSA PLH Panel, 2019).

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

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

Annex VII of the same Regulation, in certain cases (e.g. point 32) makes reference to the following countries that are excluded from the obligation to comply with specific import requirements for those non-European populations, or isolates, or species: Albania, Andorra, Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Canary Islands, Faeroe Islands, Georgia, Iceland, Liechtenstein, Moldova, Monaco,

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Montenegro, North Macedonia, Norway, Russia (only the following parts: Central Federal District (Tsentralny federalny okrug), Northwestern Federal District (SeveroZapadny federalny okrug), Southern Federal District (Yuzhny federalny okrug), North Caucasian Federal District (Severo-Kavkazsky federalny okrug) and Volga Federal District (Privolzhsky federalny okrug), San Marino, Serbia, Switzerland, Turkey, Ukraine and United Kingdom (except Northern Ireland⁴). Those countries are historically linked to the reference to ‘non-European countries’ existing in the previous legal framework, Directive 2000/29/EC. Consequently, for those countries, any pests identified, which are listed as non-European species in Annex II of Implementing Regulation (EU) 2019/2072 should be investigated as any other non-regulated pest.

Pests listed as ‘Regulated Non-Quarantine Pest’ (RNQP) in Annex IV of the Commission Implementing Regulation (EU) 2019/2072, and deregulated pests (i.e. pest that were listed as quarantine pests in the Council Directive 2000/29/EC and were deregulated by Commission Implementing Regulation (EU) 2019/2072) were not considered for further evaluation.

In its evaluation the Panel:

- Checked whether the provided information in the technical dossier (hereafter referred to as ‘the Dossier’) provided by the applicant [Agentia Nationala Pentru Siguranta Alimentor (ANSA), National Food Safety Agency of the Republic of Moldova] was sufficient to conduct a commodity risk assessment. When necessary, additional information was requested to the applicant.
- Selected the relevant Union quarantine pests and protected zone quarantine pests (as specified in Commission Implementing Regulation (EU) 2019/2072⁵, hereafter referred to as ‘EU quarantine pests’) and other relevant pests present in Moldova and associated with the commodity.
- Did not assess the effectiveness of measures for Union quarantine pests for which specific measures are in place for the import of the commodity from Moldova in Commission Implementing Regulation (EU) 2019/2072 and/or in the relevant legislative texts for emergency measures and if the specific country is in the scope of those emergency measures. The assessment was restricted to whether or not the applicant country implements those measures.
- Assessed the effectiveness of the measures described in the Dossier for those Union quarantine pests for which no specific measures are in place for the importation of the commodity from Moldova and other relevant pests present in Moldova and associated with the commodity.

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

2. Data and methodologies

2.1. Data provided by ANSA

The Panel considered all the data and information provided by ANSA of Moldova in July 2020, including the additional information provided on 18 January 2021 and clarification provided on 3 February 2021, after EFSA’s request. The Dossier is managed by EFSA.

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

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

The data and supporting information provided by ANSA formed the basis of the commodity risk assessment. The below overview shows the sources of information used by ANSA to compile the Dossier as specified in the Dossier Section 2.

7) http://pomicol.wordpress.com
8) https://www.weatheronline.co.uk/reports/climate/Moldova.htm
9) https://en.wikipedia.org/wiki/Codling_moth
10) http://www.agroatlas.ru/ru/content/pests/Quadraspisotus pernicio sus/index.html
11) https://ru.wikipedia.org/wiki/Archipsrosana
12) https://en.wikipedia.org/wiki/Archipsrosana
13) https://agrobaseapp.com/austtrallakisease/vvalnut-blight
16) https://ru.wikipedia.org/wiki/Archipsrosana
17) https://agrobaseapp.com/austtrallakisease/vvalnut-blight
18) https://www.rno.skiskyrnitosti-orechovych-listovi
20) http://www.legis.md
22) http://www.pesticide.mdregister-cautarei
24) https://gd.eppo.int/
25) https://www.eppo.int/RESOURCES/eppo standards

2.2. Literature searches performed by EFSA

The following searches were combined: (i) a general search to identify pests of *Juglans regia* in different databases and (ii) a general search to identify pests associated with *Juglans* as a genus. The general searches were run between 6 August and 1 September 2020 using the databases indicated in Table 2. No language, date or document type restrictions were applied in the search strategy.

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

As for Web of Science, the literature search was performed using a specific, ad hoc established search string (see Appendix A). The string was run in 'All Databases' with no range limits for time or language filters.
Finally, the pest list that was assessed included all the pests associated with *J. regia* and all EU quarantine pests associated with *Juglans* as genus.

### Table 2: Databases used by EFSA for the compilation of the pest list associated with *Juglans* and *Juglans regia*

<table>
<thead>
<tr>
<th>Database</th>
<th>Platform / Link</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aphids on World Plants</td>
<td><a href="http://www.aphidonworldsplants.info/C_HOSTS_AAIntro.htm">http://www.aphidonworldsplants.info/C_HOSTS_AAIntro.htm</a></td>
</tr>
<tr>
<td>CABI Crop Protection Compendium</td>
<td><a href="https://www.cabi.org/cpc/">https://www.cabi.org/cpc/</a></td>
</tr>
<tr>
<td>Database of Insects and Their Food Plants</td>
<td><a href="http://www.brc.ac.uk/dbif/hosts.aspx">http://www.brc.ac.uk/dbif/hosts.aspx</a></td>
</tr>
<tr>
<td>Database of the World's Lepidopteran Hostplants</td>
<td><a href="https://www.nhm.ac.uk/our-science/data/hostplants/search/indexdsn/">https://www.nhm.ac.uk/our-science/data/hostplants/search/indexdsn/</a></td>
</tr>
<tr>
<td>EPPO Global Database</td>
<td><a href="https://gd.eppo.int/">https://gd.eppo.int/</a></td>
</tr>
<tr>
<td>Leaf-miners</td>
<td><a href="http://www.leafmines.co.uk/html/plants.htm">http://www.leafmines.co.uk/html/plants.htm</a></td>
</tr>
<tr>
<td>New Zealand Fungi</td>
<td><a href="https://nzfungi2.landcareresearch.co.nz/default.aspx?NavControl=search&amp;selected=NameSearch">https://nzfungi2.landcareresearch.co.nz/default.aspx?NavControl=search&amp;selected=NameSearch</a></td>
</tr>
<tr>
<td>Plant Viruses Online</td>
<td><a href="http://bio-mirror.im.ac.cn/mirrors/pvo/vide/famindex.htm">http://bio-mirror.im.ac.cn/mirrors/pvo/vide/famindex.htm</a></td>
</tr>
<tr>
<td>Scalenet</td>
<td><a href="http://scalenet.info/associates/">http://scalenet.info/associates/</a></td>
</tr>
<tr>
<td>USDA ARS Fungi Database</td>
<td>[<a href="https://nt.ars-grin.gov/fungal">https://nt.ars-grin.gov/fungal</a> databases/fungushost/fungushost.cfm](<a href="https://nt.ars-grin.gov/fungal">https://nt.ars-grin.gov/fungal</a> databases/fungushost/fungushost.cfm)</td>
</tr>
<tr>
<td>Web of Science: All Databases (Web of Science Core Collection, CABI: CAB Abstracts, BIOSIS Citation Index, Chinese Science Citation Database, Current Contents Connect, Data Citation Index, FSTA, KCI-Korean Journal Database, Russian Science Citation Index, MEDLINE, SciELO Citation Index, Zoological Record)</td>
<td>Web of Science <a href="https://www.webofknowledge.com">https://www.webofknowledge.com</a></td>
</tr>
</tbody>
</table>

Additional searches, limited to retrieve documents, were run when developing the Opinion. The available scientific information, including previous EFSA opinions on the relevant pests and diseases and the relevant literature and legislation [e.g. Regulation (EU) 2016/2031; Commission Implementing Regulations (EU) 2018/2019; (EU) 2018/20186, (EU) 2019/2072] were taken into account.

#### 2.3. Methodology

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

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

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impact in the EU. After the first step, all the relevant pests that may need risk mitigation measures were identified.

In the second step, if applicable, the overall efficacy of the proposed risk mitigation measures for each pest was evaluated. A conclusion on the pest freedom status of the commodity for each of the relevant pests, if any, was achieved and uncertainties were identified. Pest freedom was assessed by estimating the number of infested/infected units out of 10,000 exported units. Further details on the methodology used to estimate the likelihood of pest freedom are provided in Section 2.3.3.

2.3.1. Commodity data

Based on the information provided by ANSA the characteristics of the commodity were summarised.

2.3.2. Identification of pests potentially associated with the commodity

To evaluate the pest risk associated with the importation of J. regia from Moldova, a pest list was compiled. The pest list is a compilation of all identified plant pests associated with J. regia based on information provided in the Dossier Sections 1.0 and 4.0 and on searches performed by the Panel. In addition, all EU quarantine pests associated with any species of Juglans were added to the list.

The scientific names of the host plants (i.e. Juglans regia and Juglans) were used when searching in the EPPO Global Database and CABI Crop Protection Compendium. The same strategy was applied to the other databases excluding EUROPHYT, TRACES-NT and Web of Science.

EUROPHYT was investigated by searching for the interceptions associated with J. regia commodities imported from Moldova from 1995 to May 2020 and TRACES-NT from May 2020 to January 2021 respectively.

The search strategy used for Web of Science Databases was designed combining English common names for pests and diseases, terms describing symptoms caused by the pests on the host plants, and the scientific and English common names of the commodity and excluding pests that were identified using searches in other databases. The established search string is detailed in Appendix A and was run on 6 August 2020.

The titles and abstracts of the scientific papers retrieved were screened and the pests associated with J. regia were included in the pest list.

The compiled pest list (see Microsoft Excel® file in Appendix B) includes all identified agents associated with J. regia, potentially including predators and parasitoids of insects and not harmful microorganisms, and all quarantine pests that use Juglans as host. The pest list was eventually further compiled with other relevant information (e.g. EPPO Codes, taxonomic information, categorisation, distribution) useful for the selection of the pests relevant for the purposes of this opinion.

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

Pests for which limited information was available on one or more criteria used to identify them as relevant for this Opinion, if any, are specified in Section 4.4.

2.3.3. Listing and evaluation of risk mitigation measures

The proposed risk mitigation measures were listed.

As the Panel did not identify any relevant pest for this Opinion (see Sections 4.1, 4.2 and 4.5), the proposed risk mitigation measures were not further evaluated and for the same reason Expert Knowledge Elicitation on pest freedom was not performed.

3. Commodity data

3.1. Description of the commodity

According to the Dossier Section 1.0 the commodity to be exported to the EU are Juglans regia (common name: walnut; family: Juglandaceae) plants for planting that can be classified as ‘cuttings/seedlings (scion and rootstock) grown in soil, plants with roots washed with water’. Two different commodities are planned: grafted walnut plants and walnut rootstocks.

Depending on the nursery, the grafted walnut trees intended for export are 1 year old (the time from grafting until uprooting is 8 months) or 2 years old (the time from grafting until uprooting is 20 months). The 1-year-old grafted trees at the time of export range in height, measured from the graft point, from 0.3 to 1.5 m, depending on the variety vigour. The diameter at the base of the tree, measured roughly 10 cm above the first lateral roots ranges from 1.5 to 3 cm. The 2-year-old walnut trees varied in height from 1.5 to 2.5 m, possibly depending on the variety vigour. The diameter of these trees, measured at 10 cm above the graft union, ranged from 2.5 to 3.5 cm. The age of rootstocks at the time of export is not specified in the Dossier.

The intended total annual export volume to the EU is estimated to be between 40 – 75,000 grafted walnut trees and between 100 and 150,000 walnut rootstocks (Dossier Section 3.0). In the importing country, both commodities are used to establish fruit production plantations (Dossier Section 1.0).

The nurseries currently intend to export Regular or CAC (Conformitas Agraria Communitatis) material. However, in the future some nurseries plan to develop a production of certified trees (Dossier Section 3.0).

3.2. Description of the production areas

Dossier Section 3.0 specifies the following three nurseries that intend to export *J. regia* plants for planting from Moldova to the EU:

1) SRL Pepeniera Pomicola Voinesti in Hincești District (coordinates: 46.668056, 28.306193),
2) SRL Gospodarul, Rediu in Fălești District (coordinates: 47.509926, 27.601773),
3) SRL Agronuts in Telenești District (coordinates: 47.733873, 28.510438).

All three nurseries grow exclusively *Juglans* species and the last two nurseries strictly specialised in *J. regia*. In all three nurseries the commodity is grown in open fields. The nurseries produce the plant material for the local market as well as for export to the EU and other countries. The production is adapted to comply with EU standards and regulations. All three nurseries intend to export grafted walnut trees to the EU and one nursery (SRL Pepeniera Pomicola Voinesti in Hincești District) intends also to export walnut rootstock to the EU. The sizes of the three nurseries are comparable, the grafted walnut trees intended for export to the EU occupy in the nurseries on average an area between 0.3 and 1 hectare. Walnut rootstocks produced for export to the EU grow on an area ranging from 1 to 1.5 hectares (Dossier Section 3.0).

In the surrounding areas of the nurseries, windbreaks consisting of either walnut trees or *Gleditsia* spp. hedgerows are used. In one case the *Gleditsia* spp. hedgerow also surrounds an adjacent walnut orchard belonging to the nursery (Dossier Section 3.0).

Based on the global Köppen-Geiger climate zone classification (Kottek et al., 2006), the climate of the production areas of Moldova is classified as warm-summer humid continental (Dfb) [main climate D (continental); no dry season (f); warm summer (b)] (Dossier Section 1.0).

3.3. Production and handling processes

3.3.1. Growing conditions

In the three nurseries, plantation density of the grafted walnut plants ranges from 3 to 5 plants/m² and for walnut rootstocks from 8 to 11 plants/m².

In the first nursery (SRL Pepeniera Pomicola Voinesti in Hincești District), most of the fields are irrigated. The rootstock parcels are irrigated from the beginning of July until the end of August by a sprinkler system every 20–30 days from the last irrigation or rainfall. The fields where the one-year old grafted walnut trees are produced are prepared as raised beds covered with plastic mulch with drip line running under the mulch. The irrigation takes place from the end of April until the beginning of September once every week. The mother plants are irrigated by microdrippers running along the tree rows. These trees are irrigated every 12–14 days. The irrigation water is pumped directly from the Prut River and before application is filtered by a sand filter and a disk filter. This river’s water is known for its good irrigation qualities and is not treated further.

In the second nursery (SRL Gospodarul, Rediu in Fălești District), none of the production parcels are irrigated.

In the third nursery (SRL Agronuts in Telenești District), the production fields are irrigated by dripping lines. The grafted walnuts are irrigated between March and September, with a frequency that
depends on rainfall and temperature, but on average 3–5 times/month. The water source is a pond that depends on rain and snow and springs. Before irrigation the water is filtered but is not treated.

In general, all nurseries and the surrounding fields are kept free of weeds all the time. Because walnuts are sensitive to herbicides, mechanic methods of controlling weeds are applied (Dossier Section 3.0).

3.3.2. Source of planting material

According to the Dossier Section 3.0, the planting material, both rootstocks and scions, is produced within each nursery.

3.3.3. Production cycle

Seeds for production of rootstocks and scions are obtained from mother plants grown in the nurseries. Grafting of 1-year-old rootstocks is performed from February throughout to the end of March. The nurseries use the ‘Cadillac’, the ‘whip & tongue’ or the ‘omega’ grafting systems. The rootstock used is common walnut (*J. regia*). The grafting point presents a certain vulnerability to infection. To reduce the risk of infection, both rootstocks and scions are washed before grafting with pressurized tap water or disinfected with a hydrogen peroxide solution or with a 5% solution of calcium hypochlorite. After stratification, the callused grafted plants go through a phase of acclimatization before being planted in the nursery fields (Dossier Section 3.0).

3.3.4. Pest monitoring during production

Biological and phytosanitary visual control of the plants during the vegetation period is carried out by the inspectors of the territorial units of the National Agency for Food Safety (hereinafter ANSA).

Mother plants for production of rootstocks and scions are subjected to at least three field inspections, which focus on:

- the origin of the material used for the establishment;
- observance of technology and physiological condition of plants;
- phytosanitary status of plants;
- virus testing;
- the absence of harmful organisms, including quarantine organisms.

In the nursery fields, at least three inspections are carried out during the vegetation period, which verify:

- the origin of the material used for the establishment in the field and of the graft branches;
- authenticity and biological purity;
- observance of technology and physiological condition of plants;
- phytosanitary status and virus testing;
- marking rootstocks, varieties, rows on plots and their registration in the Nursery Register.

In the process of producing the material of the category ‘Ordinary’, which is expected to be exported to the EU (referred in the Section 3.1 as ‘Regular’), the same inspections are carried out in the field and after harvesting the grafted plants, except for the collection of samples for testing for viruses in the laboratory (Dossier Section 3.0).

3.3.5. Harvest and post-harvest processes and export procedure

Dossier Section 3.0 provides the following details on general harvest and post-harvest processes and export procedures.

Removal of the trees is carried out when their vegetative tops go into dormancy. Removal, sorting and transport of the trees are allowed at times when the air temperature is not below -3°C. If leaves have not fallen by the beginning of the tree removal, manual defoliation is carried out. In large proportions, defoliation is carried out by spraying with chemical defoliants solutions approximately 25–30 days before removing the trees. The trees are removed with the VPN-2 suspended plough. A vibrator is mounted on the VPN-2 plough, which ensures that the soil layer loosens with roots, thus making it easier to remove the trees. After pruning the roots with a plough to a depth of 30–35 cm, the trees are removed manually. The vibration system enables the excess soil to be shaken off the roots.
Sorting trees is done by people who are fully aware of the provisions of the morphological and growth standards as described in ‘Government Decision no. 415/2013 for the approval of the Norm of production, control, certification and marketing of fruit propagating and planting material, fruit propagating and planting material’ and who can visually distribute them on first, second and non-standard quality categories. During sorting, attention is drawn to the physiological and phytosanitary condition of the trees, especially the root system, which could not be verified in the field controls. As the trees are sorted of each special quality category on the pomological varieties, trees are tied in packages of 10 pieces each. Two labels are attached to each package: one closer to the package and another on the axis of a tree. The label indicates the pomological name of the variety and rootstock.

Certification of the planting material follows after packing and is performed by ANSA specialists from the territory according to the regulation in force and the transport to the place for storage. Certification consists of verifying the origin of the propagating material produced within the certification schemes and ensures the traceability of this material at all production stages. By monitoring the production of the material, from the establishment of the mother plantations to the dispatch of the grafted trees from the nursery, this certification brings additional guarantees on the authenticity and varietal purity, and the phytosanitary and physiological condition of the certified trees.

The general harvest and post-harvest processes also indicate a storage step after uprooting. However, based on information provided by the three nurseries intending to export to the EU, that storage step is not applied. Further information on the storage step is given in Dossier Section 3.0.

The roots are washed with pressurised water before export. During marketing and transport of the planting material, special attention is paid to avoid its dehydration, especially of the roots, which are more sensitive to wilting. Before loading the trees into trucks, the rear edge of the body is opened and is secured well at an angle of 45°. Wet straw is laid on the base of the body, and the sides are lined with mats or other materials to protect the trees from damage. The trees, starting from the last board, are placed inside, at an inclined position, opposite to the direction of movement of the transport, as a rule, with the roots staggered in two stages to increase the load. Wet straw is placed between the roots of each row of trees (bundles). The body is covered with a waterproof cloth and tied with string so that the trees are not traumatised and dehydrated. Every 3–4 h the trees are wetted. If the trees are shipped over long distances, it is recommended that they are transported in refrigerated containers. Brought to the intended place and until planting, the planting material is kept in the same way as after it was removed from the nursery, especially watered abundantly. Delivery, transportation, other works with walnut trees in the open air are not recommended to be performed at a temperature lower than +3°C.

Completion of the phytosanitary certificate for export/re-export is carried out in accordance with the operational procedure based on ISPM 12: Phytosanitary certificates.

### 3.4. Phytosanitary surveillance and monitoring system in Moldova

The Dossier Section 1.0 states that in accordance with the provisions of ISPM-6 (Guidelines for surveillance), ANSA implements programmes for the surveillance and monitoring of organisms harmful to plants and plant products:

- **general surveillance**: a process for collection of information on pests in Moldova;
- **specific surveillance**: collection of information on harmful organisms in the area during the plant vegetation period. The data relate to specific types of damage to plants and species by harmful organism. Including surveys to determine the specific characteristics of pest populations or the presence/absence of pests in the area.

The monitoring plan for organisms harmful to plants and plant products is reviewed annually. All samples taken under the monitoring plan are examined in the phytosanitary laboratory, in accordance with EPPO PM7 diagnostic protocols (EPPO Standards – PM7 Diagnostics). The phytosanitary laboratory has international accreditation under ISO:17025 Testing and calibration laboratories.

Phytosanitary inspectors within the local sub-sections are responsible for phytosanitary surveillance:

- Permanent monitoring during the vegetation period involves systematic and continuous observation and research into the development of pests, diseases and weeds affecting plants according to their development stage, by:
  1. phenological observations of crops (phenological stages, pests (development stages)) and diseases;
2) numerical evidence of the density of pest populations and disease development, by tracing, periodic control and surveys. The range of species on a particular crop is identified, various methods are used according to the biology and ecology of the species within the biocenoses;

3) records of the biology of harmful organisms, successions of stages and generations;

4) identification of useful fauna (parasites and predators);

5) agrotechnical and hydro-meteorological information;

6) production and distribution to agricultural holdings and local authorities of warning bulletins on the combating of harmful species, drawn up on the basis of the following criteria:
   - phenological – relationship between the appearance of a pest and the development;
   - stage of the host plant;
   - biological – establishing the ideal time to apply treatments according to certain aspects of the life cycle of the species in question;
   - ecological – establishing warning time limits according to certain aspects of the harmful organism’s development cycle, such as: effective temperature, certain thermal constants, length of the cycle and development stages.

7) full, characteristic and qualitative determination of the pest population and plant diseases;

8) measures for the assessment, documentation and communication of phytosanitary risk associated with the spread of harmful organisms;

9) inspection and control over the performance by landowners and tenants, irrespective of their subordination or type of ownership, of plant protection measures and outbreak eradication.

All data, in accordance with the approved methodological indicators, are recorded by inspectors in the context of phytosanitary monitoring, field registries: tracing and field register: phenological observations. On a weekly basis, information for generalisation and evaluation is submitted for operational processing.

Pheromone traps are also used for phytosanitary monitoring, these are placed for farmers to implement the monitoring and self-control plan.

Furthermore, during the phytosanitary inspection before export, samples of plant production are taken for laboratory examinations.

4. **Identification of pests potentially associated with the commodity**

The compiled pest list (see Microsoft Excel® file in Appendix B) including all agents associated with *J. regia* and all EU quarantine pests associated with *Juglans* yielded 696 pests. This list also included 27 RNQPs and 3 deregulated pests that were subsequently excluded from the evaluation as indicated in Section 1.2.

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

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

Twenty-six EU quarantine pests that are reported in the compiled pest list were evaluated (Table 3).

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

1) the pest is present in Moldova;

2) *Juglans regia* or other species in the genus *Juglans* are hosts of the pest;

3) one or more life stages of pest can be associated with the specified commodity.

Out of the 26 EU quarantine pests evaluated, 25 were not present in Moldova. One (*Thaumetopoea processionea*) is present in Moldova, but it is not associated with the commodity. Therefore, no pest was selected for further evaluation.
### Table 3: Overview of the evaluation of the 26 EU quarantine pest species known to use *Juglans regia* or *Juglans* as a host plant for their relevance for this Opinion

<table>
<thead>
<tr>
<th>N</th>
<th>Pest name according to EU legislation(a)</th>
<th>EPPO Code</th>
<th>Group</th>
<th>Pest present in Moldova</th>
<th><em>Juglans regia/Juglans</em> confirmed as a host (reference)</th>
<th>Pest can be associated with commodity(b)</th>
<th>Pest relevant for the Opinion</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Anastrepha fraterculus</td>
<td>ANSTFR</td>
<td>Insects</td>
<td>No</td>
<td>Yes (CABI, online)</td>
<td>Not evaluated</td>
<td>No</td>
</tr>
<tr>
<td>2</td>
<td>Anastrepha ludens</td>
<td>ANSTLU</td>
<td>Insects</td>
<td>No</td>
<td>Yes (EPPO, online)</td>
<td>Not evaluated</td>
<td>No</td>
</tr>
<tr>
<td>3</td>
<td>Anoplophora chinensis</td>
<td>ANOLCN</td>
<td>Insects</td>
<td>No</td>
<td>Yes, as <em>Juglans</em> (EPPO, online)</td>
<td>Not evaluated</td>
<td>No</td>
</tr>
<tr>
<td>4</td>
<td>Aromia bungii</td>
<td>AROMBU</td>
<td>Insects</td>
<td>No</td>
<td>Yes (CABI, online; EPPO, online)</td>
<td>Not evaluated</td>
<td>No</td>
</tr>
<tr>
<td>5</td>
<td>Bactrocera tryoni</td>
<td>DACUTR</td>
<td>Insects</td>
<td>No</td>
<td>Yes (CABI, online)</td>
<td>Not evaluated</td>
<td>No</td>
</tr>
<tr>
<td>6</td>
<td>Cnestus mutilatus</td>
<td>XYLSMU</td>
<td>Insects</td>
<td>No</td>
<td>Yes, as Scolytidae non-European (EPPO, 2020)</td>
<td>Not evaluated</td>
<td>No</td>
</tr>
<tr>
<td>7</td>
<td>Euwallacea fornicatus</td>
<td>EUWAWH, EUWAKU</td>
<td>Insects</td>
<td>No</td>
<td>Yes, as <em>Juglans</em> (EPPO, online)</td>
<td>Not evaluated</td>
<td>No</td>
</tr>
<tr>
<td>8</td>
<td>Euwallacea validus</td>
<td>XYLBA</td>
<td>Insects</td>
<td>No</td>
<td>Yes, as <em>Juglans</em> (EPPO, 2020)</td>
<td>Not evaluated</td>
<td>No</td>
</tr>
<tr>
<td>9</td>
<td>Geosmithia morbida</td>
<td>GEOHMO</td>
<td>Fungi</td>
<td>No</td>
<td>Yes (CABI, online; EPPO, online; Farr and Rossman, online)</td>
<td>Not evaluated</td>
<td>No</td>
</tr>
<tr>
<td>10</td>
<td>Gymnosporangium libocedri</td>
<td>GYMNL1</td>
<td>Fungi</td>
<td>No</td>
<td>Yes, as <em>Juglans</em> (Farr and Rossman, online)</td>
<td>Not evaluated</td>
<td>No</td>
</tr>
<tr>
<td>11</td>
<td>Hypothenemus erectus</td>
<td>HYOTER</td>
<td>Insects</td>
<td>No</td>
<td>Yes (Wen-tian, 2001)</td>
<td>Not evaluated</td>
<td>No</td>
</tr>
<tr>
<td>12</td>
<td>Lopholeucaspis japonica</td>
<td>LOPLJA</td>
<td>Insects</td>
<td>No</td>
<td>Yes (Garcia Morales et al., online)</td>
<td>Not evaluated</td>
<td>No</td>
</tr>
<tr>
<td>13</td>
<td>Monarthrum mali</td>
<td>MNTHMA</td>
<td>Insects</td>
<td>No</td>
<td>Yes (EPPO, 2020)</td>
<td>Not evaluated</td>
<td>No</td>
</tr>
<tr>
<td>14</td>
<td>Oemona hirta</td>
<td>OEMOHI</td>
<td>Insects</td>
<td>No</td>
<td>Yes, as <em>Juglans</em> (EPPO, online)</td>
<td>Not evaluated</td>
<td>No</td>
</tr>
<tr>
<td>15</td>
<td>Phymatotrichopsis omnivora (synonyms: Phymatotrichum omnivorum, Phymatotrichopsis omnivore)</td>
<td>PHMPOM</td>
<td>Fungi</td>
<td>No</td>
<td>Yes (CABI, online; Farr and Rossman, online)</td>
<td>Not evaluated</td>
<td>No</td>
</tr>
</tbody>
</table>
### Pest name according to EU legislation(a) EPPO Code Group Pest present in Moldova Juglans regia/Juglans confirmed as a host (reference) Pest can be associated with commodity(b) Pest relevant for the Opinion

<table>
<thead>
<tr>
<th>N</th>
<th>Pest name according to EU legislation</th>
<th>EPPO Code</th>
<th>Group</th>
<th>Pest present in Moldova</th>
<th>Juglans regia/Juglans confirmed as a host (reference)</th>
<th>Pest can be associated with commodity(b)</th>
<th>Pest relevant for the Opinion</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td><em>Pityophthorus juglandis</em></td>
<td>PITOJU</td>
<td>Insects</td>
<td>No</td>
<td>Yes (CABI, online; EPPO, online)</td>
<td>Not evaluated</td>
<td>No</td>
</tr>
<tr>
<td>17</td>
<td><em>Popillia japonica</em></td>
<td>POPIJA</td>
<td>Insects</td>
<td>No</td>
<td>Yes, as <em>Juglans</em> (EPPO, online)</td>
<td>Not evaluated</td>
<td>No</td>
</tr>
<tr>
<td>18</td>
<td><em>Rhagoletis suavis</em></td>
<td>RHAGSU</td>
<td>Insects</td>
<td>No</td>
<td>Yes (EPPO, online)</td>
<td>Not evaluated</td>
<td>No</td>
</tr>
<tr>
<td>19</td>
<td><em>Scolytus nitidus</em> as Scolytidae non-European</td>
<td>-</td>
<td>Insects</td>
<td>No</td>
<td>Yes (Sharma et al., 2012)</td>
<td>Not evaluated</td>
<td>No</td>
</tr>
<tr>
<td>20</td>
<td><em>Spodoptera frugiperda</em></td>
<td>LAPHFR</td>
<td>Insects</td>
<td>No</td>
<td>Yes (EPPO, online)</td>
<td>Not evaluated</td>
<td>No</td>
</tr>
<tr>
<td>21</td>
<td><em>Thaumatotibia leucotreta</em></td>
<td>ARGPLE</td>
<td>Insects</td>
<td>No</td>
<td>Yes (EPPO, online)</td>
<td>Not evaluated</td>
<td>No</td>
</tr>
<tr>
<td>22</td>
<td><em>Thaumetopoea processionea</em></td>
<td>THAUPR</td>
<td>Insects</td>
<td>Yes</td>
<td>Yes (Robinson et al., online)</td>
<td>No(c)</td>
<td>No</td>
</tr>
<tr>
<td>23</td>
<td><em>Xiphinema americanum senssu stricto</em></td>
<td>XIPHAA</td>
<td>Nematodes</td>
<td>No</td>
<td>Yes (CABI, online)</td>
<td>Not evaluated</td>
<td>No</td>
</tr>
<tr>
<td>24</td>
<td><em>Xiphinema rivesi</em> (non-EU populations)</td>
<td>XIPHRI</td>
<td>Nematodes</td>
<td>No</td>
<td>Yes, as <em>Juglans</em> (Ferris, online)</td>
<td>Not evaluated</td>
<td>No</td>
</tr>
<tr>
<td>25</td>
<td><em>Xyleborinus artestriatus</em> as Scolytidae non-European</td>
<td>XYBIAR</td>
<td>Insects</td>
<td>No</td>
<td>Yes (EPPO, 2020)</td>
<td>Not evaluated</td>
<td>No</td>
</tr>
<tr>
<td>26</td>
<td><em>Xylella fastidiosa</em></td>
<td>XYLEFA</td>
<td>Bacteria</td>
<td>No</td>
<td>Yes (EPPO, online)</td>
<td>Not evaluated</td>
<td>No</td>
</tr>
</tbody>
</table>

(b): The question if the pest can be associated with the commodity is evaluated only if the questions on the presence in Moldova were answered with ‘yes’.
(c): The pest it is not associated with the commodity because there is no oviposition on small plants of walnut.
4.2. Selection of other relevant pests (not regulated in the EU) associated with the commodity

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

1) the pest is present in Moldova;
2) the pest is (i) absent or (ii) has a limited distribution in the EU and phytosanitary measures are in place in at least one of the relevant EU MS or all evidence of introduction is recent (no older than 5 years);
3) *Juglans regia* is a host of the pest;
4) one or more life stages of the pest can be associated with the specified commodity;
5) the pest may have an impact in the EU.

Based on the information collected, 640 non-regulated potential pests known to be associated with *J. regia* were evaluated for their relevance to this Opinion. Pests were excluded from further evaluation when at least one of the conditions listed above (1–5) was not met. Details can be found in the Appendix B (Microsoft Excel® file). None of the pests not regulated in the EU was selected for further evaluation because none of them met all selection criteria. It is worth noting that many pests largely distributed in Europe have not been reported in Moldova.

4.3. Overview of interceptions

Data on the interception of harmful organisms on plants of *J. regia* can provide information on some of the organisms that can be present on *J. regia* despite the measures taken.

According to EUROPHYT online (accessed on 1 September 2020) and TRACES-NT online (accessed on 5 February 2021), there were no interceptions of plants for planting of *J. regia* from Moldova destined to the EU Member States due to presence of harmful organisms between 1995 and January 2021.

4.4. List of potential pests not further assessed

The Panel did not find any pest that, while meeting most of the criteria to be considered as relevant for the Opinion, showed uncertainty in the remaining criteria.

4.5. Summary of pests selected for further evaluation

After a thorough analysis of the Dossier on *J. regia* submitted by ANSA of the Republic of Moldova and after evaluation of the compiled pest list, the Panel did not identify any pest relevant for this Opinion.

5. Risk mitigation measures

As the Panel did not identify any relevant pest for this opinion, the proposed risk mitigation measures were not further evaluated and, for the same reason, Expert Knowledge Elicitation on pest freedom was not performed. However, an overview of the risk mitigation measures, as described in the Dossier Section 1.0, is reported in the following section.

5.1. Risk mitigation measures proposed

The Dossier Section 1.0 contains information on the proposed mitigation measures related to the plant of interest (*J. regia*), and are reported as follows:

In the process of cultivating plants, and the import, export, storage, transport, marketing and use of plants, plant products and related goods subject to phytosanitary quarantine rules, natural and legal persons, regardless of the type of ownership or legal form of organisation, are obliged to:
a) carry out systematic research into sowing and planting, and monitor plant production for the timely detection of quarantine pests;
b) implement phytosanitary measures with a view to preventing the appearance and spread of pests;
c) keep premises where plants, plant products and related goods subject to phytosanitary quarantine rules are stored and processed in an appropriate phytosanitary condition;
d) meet the requirements on the import, storage, transport, marketing and use of plant protection products to prevent the entry of contamination into the environment and agricultural production;
e) at the request of specialists from the phytosanitary control body, provide the necessary information on the phytosanitary condition of agricultural land, the protection measures taken and the application of protective products to plants and the storage and marketing of plant protection products;
f) create the conditions to enable staff of the phytosanitary control body to apply the provisions of the law unhindered;
g) comply with the rules on protected areas, endangered areas and phytosanitary quarantine;
h) immediately inform the phytosanitary control body, within 7 calendar days, of the unusual presence of pests, symptoms or any other anomaly in plant development. Failure to comply with the legal provisions incurs disciplinary measures and administrative, civil and criminal (including material) liability, in accordance with the legislation in force.

Infringements are identified and sanctioned in accordance with the Contravention Code. In accordance with the Contravention Code the following actions include penalties:

a) infringement of the rules on the production, recording, storage and/or transport of plants, plant products and plant protection products;
b) marketing, import, export, transport of plants and plant products without the accompanying documents required by legislation;
c) import and/or marketing of plant protection products without licence;
d) production, import, marketing, publicising, repackaging and use of plant protection products not subject to research testing experimentation, approval and certification by the State, or those whose use-by-dates has expired or have been removed from the State Register of plant protection products and fertilisers permitted for use in the Republic of Moldova;
e) infringement of the rules on the implementation of measures to control pests or failure to implement such measures such as to cause the mass appearance and spread of those pests;
f) introduction into the country of plants, plant products and related goods subject to phytosanitary quarantine rules whose introduction is prohibited;
g) collection of plants, plant products and related goods subject to phytosanitary quarantine rules from points of entry without phytosanitary import/export documents;
h) obstruction of the phytosanitary control body in the exercise of its duties relating to control of compliance with phytosanitary rules and standards by importers, exporters, marketers, producers, owners and/or keepers of storage facilities, dispatch centres and any other persons involved in the production and movement of plants, plant products, plant protection products and related goods subject to phytosanitary quarantine rules;
i) prevention of staff of the phytosanitary control body from performing their duties;
j) failure to provide the written information requested by staff of the phytosanitary control body within the deadline set by them;
k) refusal to allow access to staff of the phytosanitary control body to the premises of railway stations, ports and river jetties, civil aviation airports, merchant fleet vessels, civilian aircraft, passenger and freight wagons, automobiles, the premises of agricultural producers, nurseries, orchards and vineyards, plant product stores, the premises of scientific research institutes and other locations, and access to related assets subject to phytosanitary regulations, where phytosanitary checks are required to be carried out.

The imposition of administrative or criminal penalties is subject to the civil liability of persons responsible for damage with regard to other countries, the State and the authorities of central and local public administrations.
Furthermore, to monitor the spread of plant and plant product pests, maintain the Republic of Moldova’s phytosanitary status and prevent the entry of quarantine plant pests, the phytosanitary control body (ANSA) adopts the plant pest monitoring plan on an annual basis.

Based on international standards drawn up and approved by the International Plant Protection Convention, ISPM 04: Requirements for the establishment of pest-free zones, ISPM 06: Surveillance, ISPM 08: Establishment of area pest status, ISPM 10: Requirements for the establishment of pest-free production locations and consignments have been drawn up and approved and are applied by producers, Special Procedure (PS/FS-MSD-05/01): Establishing and/or maintaining the status of ‘plant pest-free production location and or area’.

During the vegetation period, inspectors of ANSA’s local sub-sections perform the following:

- diagnosis, forecast and monitoring of pests, alerting agricultural producers and natural and legal persons to their occurrence and development;
- organisation of the forecasting and warning system;
- production and dissemination of warning notices;
- surveys to determine the area of spread of diseases and pests in terms of their density, frequency and intensity of attack, the damage caused and mortality caused by entomophagy or environmental conditions;
- determination of whether treatments are appropriate, depending on the economic threshold of the damage;
- reporting any observations on changes to the biology of pests, with a view to the launch of specialist studies;
- drawing up and providing technical documentation and instructions on harmful organisms (diseases, pests, weeds) and recommendations for controlling them;
- taking samples for official control by laboratory assessment of plants, plant products and related goods subject to phytosanitary quarantine rules, imported, exported and marketed, in specialised accredited laboratories;
- production and publishing of monthly and annual forecasts on the spread of the main pests and diseases among agricultural plants, participation in the drawing up of instructions and recommendations in the field of plant protection and health. Furthermore, at the request of the phytosanitary control body of the importing country, additional treatments are carried out on shipments intended for export.

With the information provided by ANSA (Dossier Sections 1.0), the Panel summarised the risk mitigation measures (see Table 4) that are proposed in the nurseries producing the commodity to be exported to the EU.

### Table 4: Overview of proposed risk mitigation measures for *J. regia* plants designated for export to the EU from Moldova

<table>
<thead>
<tr>
<th>N</th>
<th>Risk mitigation measure</th>
<th>Implementation in Moldova</th>
</tr>
</thead>
</table>
| 1 | Pesticide treatment     | Details of pesticide treatments are described in Table E1 in the Dossier Section 1.0.  
The measures are specific against following pests:  
*Panonychus ulmi*  
*Cydia pomonella*  
*Quadraspidiotus perniciosus*  
*Hyphantria cunea*  
*Tetranychus viennensis*  
*Lepidosaphes ulmi*  
*Lymnantria dispar*  
*Archips rosana*  
*Xanthomonas campestris pv. juglandis*  
*Gnomonia juglandis* |
6. Conclusions

After a thorough analysis of the Dossier on *J. regia* submitted by ANSA of the Republic of Moldova and after evaluation of the compiled pest list, the Panel did not identify any pest relevant for this opinion. Therefore, the proposed risk mitigation measures were not further evaluated and for the same reason Expert Knowledge Elicitation on pest freedom was not performed.

References

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


**Glossary**

**Control (of a pest)** Suppression, containment or eradication of a pest population (FAO, 1995, 2017).

**Entry (of a pest)** Movement of a pest into an area where it is not yet present, or present but not widely distributed and being officially controlled (FAO, 2017).

**Establishment (of a pest)** Perpetuation, for the foreseeable future, of a pest within an area after entry (FAO, 2017).

**Impact (of a pest)** The impact of the pest on the crop output and quality and on the environment in the occupied spatial units.

**Introduction (of a pest)*** The entry of a pest resulting in its establishment (FAO, 2017).

**Measures**

- **Control (of a pest)** is defined in ISPM 5 (FAO, 2017) as ‘Suppression, containment or eradication of a pest population’ (FAO, 1995). Control measures are measures that have a direct effect on pest abundance. Supporting measures are organisational measures or procedures supporting the choice of appropriate Risk Reduction Options that do not directly affect pest abundance.

- **Pathway** Any means that allows the entry or spread of a pest (FAO, 2017).

- **Phytosanitary measures** Any legislation, regulation or official procedure having the purpose to prevent the introduction or spread of quarantine pests, or to limit the economic impact of regulated non-quarantine pests (FAO, 2017).

- **Protected zones (PZ)** A Protected zone is an area recognised at EU level to be free from a harmful organism, which is established in one or more other parts of the Union.

- **Quarantine pest** A pest of potential economic importance to the area endangered thereby and not yet present there, or present but not widely distributed and being officially controlled (FAO, 2017).

- **Regulated non-quarantine pest** A non-quarantine pest whose presence in plants for planting affects the intended use of those plants with an economically unacceptable impact and which is therefore regulated within the territory of the importing contracting party (FAO, 2017).

- **Risk mitigation measure** A measure acting on pest introduction and/or pest spread and/or the magnitude of the biological impact of the pest should the pest be present. A risk mitigation measure may become a phytosanitary measure, action or procedure according to the decision of the risk manager.

- **Spread (of a pest)** Expansion of the geographical distribution of a pest within an area (FAO, 2017).

**Abbreviations**

- **ANSIA** Agentia Nationala Pentru Siguranta Alimentor, National Food Safety Agency of the Republic of Moldova
- **CABI** Centre for Agriculture and Bioscience International
- **CAC** Conformitas Agraria Communitatis
- **EPPO** European and Mediterranean Plant Protection Organization
- **FAO** Food and Agriculture Organization
- **ISPM** International Standards for Phytosanitary Measures
- **PLH** Plant Health
- **RNQP** Regulated Non-Quarantine Pest
Appendix A – Web of Science All Databases Search String

In the table below the search string used in Web of Science is reported. In total, 513 papers were retrieved. Titles and abstracts were screened, and 117 pests were added to the list of pests (see Appendix B).

<table>
<thead>
<tr>
<th>Web of Science All Databases</th>
<th>TOPIC:</th>
<th>AND</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(Juglans regia) OR &quot;common walnut&quot; OR &quot;Juglans duclouxiana&quot; OR &quot;Juglans fallax&quot; OR &quot;Juglans kamaonica&quot; OR &quot;Juglans orientis&quot; OR &quot;Juglans sinensis&quot;)</td>
<td></td>
</tr>
<tr>
<td></td>
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<td>(winged seeds$ OR metabolites OR <em>tannins OR climate OR &quot;maple syrup&quot; OR syrup OR mycorrhiz$ OR &quot;carbon loss&quot; OR pollut$ OR weather OR propert$ OR probes OR spectr$ OR antioxidant$ OR transformation OR DNA OR DNA OR &quot;Secondary plant metabolites$ OR metabol$ OR &quot;Phenolic compounds&quot; OR Quality OR Abiotic OR Storage OR Pollen</em> OR fertili* OR Mulching OR Nutrient* OR Pruning OR drought OR &quot;human virus&quot; OR &quot;animal disease&quot;* OR &quot;plant extracts&quot; OR immunological OR &quot;purified fraction&quot; OR &quot;traditional medicine&quot; OR medicine OR mammal* OR bird* OR &quot;human disease&quot;* OR biomarker$ OR &quot;health education&quot; OR bat$ OR &quot;seedling$ survival&quot; OR &quot;anthropogenic disturbance&quot; OR &quot;cold resistance&quot; OR &quot;salt stress&quot; OR salinity OR &quot;ace$ method&quot; OR &quot;adaptive cognitive emotion regulation&quot; OR nitrogen OR hygiene OR &quot;cognitive functions&quot; OR fossil$ OR &quot;toxicity OR Miocene OR postglacial OR &quot;weed control OR landscape&quot;)</td>
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Commodity risk assessment of *Juglans regia* plants from Moldova

ulianishchevii∗ OR “Cyphellipsis anomalā” OR “Cytospora albiceps” OR “Cytospora atrocirrhata” OR “Cytospora californica” OR “Cytospora chrysosperma” OR “Cytospora cincta” OR “Cytospora gigalocus” OR “Cytospora gigasporea” OR “Cytospora joaquinquensis” OR “Cytospora juglandicola” OR “Cytospora juglandina” OR “Cytospora juglandis” OR “Cytospora leucosperma” OR “Cytospora nivea” OR “Cytospora plurivora” OR “Cytospora suckulus” OR “Cytospora sp.” OR “Dactylonecridia torresensis” OR “Daedalea ambigua” OR “Daedalea confarqua” OR “Daedalea quercina” OR “Daldinia concentrica” OR “Daldinia stellighii” OR “Dasyphis rhuse” OR “Datana anguissi” OR “Datana drenelli” OR “Datana internegra” OR “Datana intergerra” OR “Dematophora necatrix” OR “Dendrophoma juglandina” OR “Dendrophora albobadia” OR “Dendrosporum lobatum” OR “Diaporte juglandina” OR “Diaporte amygdalii” OR “Diaporte bicincta” OR “Diaporte biguttulata” OR “Diaporte cotoneastri” OR “Diaporte eres” OR “Diaporte foeniculina” OR “Diaporte juglandica” OR “Diaporte juglandis” OR “Diaporte medusa” OR “Diaporte medusa var. viburni” OR “Diaporte neothecola” OR “Diaporte rhusica” OR “Diaporte rostrata” OR “Diaporte shennonjiensis” OR “Diaporte spiculosa” OR “Diaporte tibetensis” OR “Diaspidiotus aesculi” OR “Diaspidiotus ancylius” OR “Diaspidiotus juglansregiae” OR “Diaspidiotus osborni” OR “Diaspidiotus ostreaeformis” OR “Diaspidiotus zonatus” OR “Diatrype albopruinosa” OR “Diatrypella eutypaeformis” OR “Diatrypella favacea” OR “Diatrypella sp.” OR “Dichomera juglandis” OR “Dichomieris sparselia” OR “Dictyosporum solani” OR “Diplocladiella scalaroides” OR “Diploida juglandina” OR “Diploida juglandis” OR “Diploida mutilla” OR “Diploida seriata” OR “Diploida sp.” OR “Discosia arctoears var. juglandis” OR “Dioscophaearia fagi” OR “Dithiorella gregaria” OR “Dithiorella iberica” OR “Dithiorella juglandis” OR “Dithiorella omnivora” OR “Dithiorella sp.” OR “Dryococetes himalayensis” OR “Eacles ducalis” OR “Eacles imperialis” OR “Eacles oslari” OR “Eacles penelope” OR “Ectopsis crepuscularia” OR “Ectopsis excursaria” OR “Efingia applanata” OR “Elisoea randii” OR “Ennomos subsignaria” OR “Eutetranychus uncatus” OR “Ephestia kuehniella” OR “Ephestia parastella” OR “Epidiaspis leperi” OR “Epidiaspis leperi” OR “Epinotia timidella” OR “Erannis tilaria” OR “Eriophyes erineus” OR “Eriophyes tristriatus” OR “Eriophyes tristriatus” OR “Erschoviella musculana” OR “Erschoviella musculana” OR “Erwinia nigriufluens” OR “Erysiphe juglandis” OR “Erysiphe juglandis-nigræ” OR “Erysiphe polygoni” OR “Eulecanium caryae” OR “Eulecanium ciliatum” OR “Eulecanium excrescens” OR “Eulecanium giganteum” OR “Eulecanium kustoevii” OR “Eulecanium kunoense” OR “Eulecanium kuwanai” OR “Eulecanium rugulosum” OR “Eulecanium tilæ” OR “Eulecanium tiliae” OR “Euproctis celebensis” OR “Euproctis chrysochlorae” OR “Eurhizococcus brasilensis” OR “Eutetranychus orientalis” OR “Eutypa lata” OR “Eutypa ludaunida” OR “Eutypella dissepta” OR “Eutypella juglandina” OR “Eutypella juglandicola” OR “Eutypella leprosa” OR “Eutypella stellulata” OR “Euzophera batangensis” OR “Euzophera bigella” OR “Euzophera bigella” OR “Euzophera bigella” OR “Euzophera bigella” OR “Euzophera bigella” OR “Euzophera osseatealla” OR “Euzophera semifuneralis” OR “Exosporina fawcettii” OR “Exosporium stylobatum” OR “Exosporium tilæ” OR “Exosporium tiliae” OR “Favulous squamosus” OR “Ferrisia gillii” OR “Fomes conchatus” OR “Fomes everhartii” OR “Fomes fassciant” OR “Fomes fomentarius” OR “Fomes fomentarius” OR “Fomes ignianus” OR “Fomes marginatus” OR “Fomes scroposus” OR “Fomes ulmarius” OR “Fomtitops pinicola” OR “Funalia hispida” OR “Fusarium avencenum” OR “Fusarium incarnatum” OR “Fusarium incarnatum” OR “Fusarium latentium” OR “Fusarium oxysporum” OR “Fusarium oxysporum” OR “Fusarium parildoosseum” OR “Fusarium sambucinum” OR “Fusarium semitectum” OR “Fusarium semitectum var. majus” OR “Fusarium solani” OR “Fusarium sp.” OR “Fuscohora cryptacanthia” OR “Fusciadium effusum” OR “Fuscoscicum amygdali” OR “Fuscoscicum dimidatum” OR “Fuscooccus juglandinum” OR “Fuscooccus juglandis” OR “Ganoderma applanatum” OR “Ganoderma lipsense” OR “Garella musculana” OR “Gastroina depressa” OR “Geosmithia flavæ” OR “Geosmithia lavendula” OR “Geosmithia morbida” OR “Geosmithia morbida” OR “Geosmithia morbida” OR “Geosmithia pitterilli” OR “Geosmithia sp.” OR “Gibberella baccata” OR “Glomastix masseii” OR “Gloeocystidiellum lactescens” OR “Gloeosporium epicarp” OR “Gloeosporium epicarpii” OR “Gloeosporium frutigenum” OR “Gloeosporium sp.” OR “Glorerella cingulata” OR “Glioniopsis curvata” OR “Glioniopsis curvata ” OR “Gnomonia caryae” OR “Gnomonia ischnostyla” OR “Gnomonia juglandis” OR “Gnomonia leptostyla” OR “Gnomonia nervisequa” OR “Gnomonia sp.” OR “Grapholitha funebrana” OR “Gretchena bolliana” OR “Gretchena concitriciana” OR “Grifola frondosa” OR “Grifola frondosa” OR “Grifola frondosa” OR “Grifola frondosa” OR “Grifola frondosa” OR “Grifola 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Commodity risk assessment of *Juglans regia* plants from Moldova

“Grovesinia pyramidalis” OR “Grovesinia pyramidalis” OR “Guignardia endophylica” OR “Guignardia juglandis” OR “Gymnosporangium libocedri” OR “Haematococcus haematococca” OR “Hagapteryx mirabilior” OR “Haploe reversa” OR “Helianthus ciliaris” OR “Helicobasidium brevisonii” OR “Helicobasidium mompa” OR “Helicobasidium tanakae” OR “Helicoma morganii” OR “Helicoma tenuifillum” OR “Helicomyces bellus” OR “Helicotylenchus digonicus” OR “Helicotylenchus dihyastera” OR “Helicotylenchus erythrinae” OR “Helicotylenchus mirolobus” OR “Helicotylenchus sp.” OR “Heliothyris haemorrhoidalis” OR “Helminthosporium hispanicum” OR “Helminthosporium juglandinum” OR “Helminthosporium microsorum” OR “Helminthosporium sp.” OR “Helminthosporium velutinum” OR “Hemiberlesia lataniae” OR “Hemiberlesia lataniae” OR “Hemiberlesia neodiffinis” OR “Hemiberlesia rapax” OR “Hemicerinomeoides chitwoodii” OR “Hemicerinomeoides sp.” OR “Hemicycliophora koreana” OR “Hendersonia biseptata” OR “Hendersonia juglandina” OR “Hendersonula toruloidea” OR “Hericium erinaceus” OR “Heterocampa guttivitta” OR “Heteroderida mediterranea” OR “Heteroderida sp.” OR “Homona coffearia” OR “Howardia biulavis” OR “Hyalophora cecropia” OR “Hyleisia nigricans” OR “Hylesinus crenatus” OR “Hymenochaete rubiginosa” OR “Hymenoscyphus fructigenus” OR “Hypena madefactualis” OR “Hypena sordidula” OR “Hyphantria cunea” OR “Hyphantria cunea” OR “Hyphodonta arguta” OR “Hyphodonta sputhulata” OR “Hypochne fumigenum” OR “Hypocreap subpachybasioides” OR “Hypoxylon mediterraneum” OR “Hypoxylon multifforme” OR “Hypoxylon quadratum” OR “Hypoxylon rubiginosum” OR “Hysterographum mori” OR “Ilyonectria linolendri” OR “Ilyonectria robusta” OR “Inonotus hispidus” OR “Inonotus hispidus” OR “Irpex lacteus” OR “Jobellisia rhynchostoma” OR “Juglanconis appendiculata” OR “Juglanconis juglandina” OR “Juglanconis oblonga” OR “Kirschsteiniothelia aethiops” OR “Lachnodochium juglandis” OR “Laeticorticium canfieldii” OR “Laeticorticium roseum” OR “Laetiporus sulphureus” OR “Lasiochilus trifolii” OR “Lasiodiplodia citrico” OR “Lasiodiplodia iranensis” OR “Lasiodiplodia pseudotheobromae” OR “Lecanidion atratum” OR “Lecanidion prosopidis” OR “Leiopus nebulosus” OR “Lemonniera terrestris” OR “Lentinellus ursinus” OR “Leperisinus varius” OR “Lepidosaphes beckii” OR “Lepidosaphes conchiformis” OR “Lepidosaphes conchyformis” OR “Lepidosaphes malicola” OR “Lepidosaphes salicina” OR “Lepidosaphes ulmi” OR “Lepidosaphes ulmi” OR “Lepidosaphes yanagicola” OR “Leptosphaeria depressa” OR “Leptosphaeria leucoplaeca” OR “Leptosphaeria petiolaris” OR “Leucodiaphorthe juglandis” OR “Lochmaeus manteo” OR “Longidorus juglandicola” OR “Longidorus juglans” OR “Longidorus sp.” OR “Lophocampa carvae” OR “Lopholeucaspis japonica” OR “Lucanus cervus” OR “Lycia graecariaus” OR “Lyctus bruneus” OR “Lymantria dispar” OR “Lymantria juglandis” OR “Lymantria mathura” OR “Lymantria obscura” OR “Lymantria obscura” OR “Machimia tentoriferella” OR “Malacosoma disstria” OR “Malacosoma parallel” OR “Marasmius candidus” OR “Marssonia calfornica” OR “Marssonia juglandis” OR “Marssonidella juglandis” OR “Marssonina californica” OR “Marssonina juglandis” OR “Marssonina japanica” OR “Marssonina sp.” OR “Megaplatypus mutatus” OR “Melanaspis inopinata” OR “Melanaspis obscura” OR “Melanaspis tenebricosa” OR “Melanconis carthusiana” OR “Melanconis juglandis” OR “Melanconis juglandis” OR “Melanconium juglandinum” OR “Melanconium oblongum” OR “Melanconium sp.” OR “Melanopsamma pomiformis” OR “Meliodogyne arenaria” OR “Meliodogyne hapla” OR “Meliodogyne incognita” OR “Meliodogyne javanica” OR “Meliodogyne partityla” OR “Meliodogyne sp.” OR “Merlinius brevidens” OR “Merulius rufus” OR “Mesocrinome rusticium” OR “Mesocrinome teres” OR “Mesocrinome xenoplas” OR “Microleipsis sp.” OR “Microleipsis juglandis” OR “Microleipsis alni” OR “Microleipsis hialayensis” OR “Microleipsis juglandis” OR “Microleipsis juglandis var. juglandis” OR “Microleipsis juglandis-nigræ” OR “Microleipsis penicillata” OR “Microleipsis yamadae” OR “Microleipsis yatagan” OR “Microstroma brachysporum” OR “Microstroma juglandis” OR “Microstroma juglandis” OR “Microstroma juglandis” OR “Monoderma flavens” OR “Monoderma fluctuata” OR “Monoderma juglandis” OR “Montagnula obtusa” OR “Mycena excisa” OR “Mycena luteopallens” OR “Mycena speirea” OR “Mycosphaerella juglandis” OR “Mycosphaerella saccardoa” OR “Mycosphaerella woronowii” OR “Myxosporium juglandinum” OR “Myzus persicae” OR “Naemospora microsora” OR “Naemospora sp.” OR “Nathrius brevipennis” OR “Nattrassia mangiferæ” OR “Naupactus xanthographus” OR “Nectria cinnabarinà” OR “Nectria cinnabarina” OR “Nectria coccinea” OR “Nectria ditissima” OR “Nectria galligena” OR “Nectria haematococca” OR “Nectria pseudotrichia” OR “Nectria punicea”
Commodity risk assessment of *Juglans regia* plants from Moldova
Commodity risk assessment of *Juglans regia* plants from Moldova

**Plum pox virus** OR **Poculum firmum** OR **Poculum juglandis** OR **Poculum nucicola** OR **Polygonum aviculare** OR **Polyergus admirabilis** OR **Polyergus adustus** OR **Polyergus biformis** OR **Polyergus cinnabarinus** OR **Polyergus delectans** OR **Polyergus fumosogriseus** OR **Polyergus gilvus** OR **Polyergus hirsutus** OR **Polyergus hispidus** OR **Polyergus nidulans** OR **Polyergus sp.** OR **Polyergus spumeus** OR **Polyergus squamosus** OR **Polyergus sulphureus** OR **Polyergus versicolor** OR **Polystictus unicolor** OR **Popillia japonica** OR **Poria ambiguа** OR **Poria apacheriensis** OR **Poria medulla-panis** OR **Poria pulchella** OR **Poria punctata** OR **Poria purpurea** OR **Poria rancia** OR **Poria reticulata** OR **Poria rhodella** OR **Poria tenuis var. pulchella** OR **Poria tenuis var. tenuis** OR **Poria tulipiferae** OR **Poria versipora** OR **Porodisculus pendulus** OR **Porotheleum fimbriatum** OR **Pratylenchus brachyrhynchus** OR **Pratylenchus coffeae** OR **Pratylenchus neglectus** OR **Pratylenchus penetrans** OR **Pratylenchus pratensis** OR **Pratylenchus sp.** OR **Pratylenchus thornei** OR **Pratylenchus thornei** OR **Pratylenchus vulnus** OR **Pratylenchus vulnus** OR **Prochoerodes forficaria** OR **Psaphida electilis** OR **Pseudaulacaspis pentagona** OR **Pseudaulacaspis pentagona** OR **Pseudocercospora juglandicola** OR **Pseudocercospora pterocaryaee** OR **Pseudocercospora regalis** OR **Pseudococcus calceariae** OR **Pseudococcus dispers** OR **Pseudococcus longispinus** OR **Pseudococcus meridionalis** OR **Pseudococcus viburni** OR **Pseudococcus viburni** OR **Pseudomonas syringae pv. syringae** OR **Pulvinaria juglandii** OR **Pulvinaria regalis** OR **Pulvinaria vitis** OR **Pycnoporus sanguineus** OR **Pythium debaryanum** OR **Pythium oligandrum** OR **Pythium sp.** OR **Pythium ultimum** OR **Quadraspidiotus zonatus** OR **Ramularia sp.** OR **Retithrips syriacus** OR **Rhabdospora juglandis** OR **Rhamphion mordax** OR **Rha goletis completa** OR **Rha goletis suavis** OR **Rhzobium radiobacter** OR **Rhzobium rhigonenes** OR **Rhizoctonia solani** OR **Rhizoctonia sp.** OR **Rhizopus stolonifer** OR **Rhodinia newara** OR **Rhopodococcus turanicus** OR **Rosellinia aquila** OR **Rosellinia necatrix** OR **Rosellinia necatrix** OR **Rosellinia sp.** OR **Rosellinia thelena** OR **Sabulodes aegrotata** OR **Sabulodes caberata** OR **Samia cynthia** OR **Saperda scalaris** OR **Saperda scalaris** OR **Sarcinella heterospora** OR **Sarcocysta occidentalis** OR **Saturnia Indica** OR **Saturnia pavonia** OR **Saturnia pavonia** OR **Saturnia pyri** OR **Saturnia pyri** OR **Saturnia calanus** OR **Schizophyllum commune** OR **Schizotetranychus smirnovi** OR **Schizoxylon alboatrum** OR **Schizoxylon insigne** OR **Schizura concinna** OR **Schizura leptinoides** OR **Sclerotium rolfsii** OR **Sclerotium rolfsii** OR **Sclerotium rolfsii** OR **Scutellonema sp.** OR **Septobasidium bogoriense** OR **Septobasidium tanakae** OR **Septogloeum juglandis** OR **Septoria epicarpii** OR **Septoria juglandis** OR **Septoria letendreae** OR **Septoria nigromaculans** OR **Septoria sp.** OR **Sheathospora cornuta** OR **Sirococcus clavigignenti-juglandacearum** OR **Sirococcus clavigignenti-juglandacearum** OR **Sparganothis directana** OR **Sphaceloma sp.** OR **Sphaceloma sp.** OR **Sphaeronaema infuscans** OR **Sphaeronaema japonicum** OR **Sphaeropsis druparum** OR **Sphaeropsis juglandis** OR **Sphaerulina juglandis** OR **Sphingonota ocellata** OR **Spilosoma virginica** OR **Spongipellis lits-cages** OR **Spongipellis litschaueri** OR **Stachybotrys alternaria** OR **Stachybotrys chartarum** OR **Stachybotrys kampalensis** OR **Staurus fagi** OR **Stecherium ochraceum** OR **Stegosporium purpureum** OR **Stenella trisepata** OR **Stereu fasciatum** OR **Stereu hirsutum** OR **Stereu sp.** OR **Stictis stellata** OR **Stigmatolemma poriforme** OR **Stigmella flosflectella** OR **Stigmella juglandifoliella** OR **Stigmella longisaccata** OR **Stigmella microtheriella** OR **Stomaphis juglandis** OR **Stomaphis mordvilkoii** OR **Stomaphis wojciechowskii** OR **Strangalia aurulenta** OR **Suturarapis archangelskyyae** OR **Synanthedon vespiiformis** OR **Synanthedon vespiiformis** OR **Takashia japonica** OR **Taphrochus bicolor** OR **Teichospora juglandis** OR **Teleiospis brevivalva** OR **Tetramorium grassii** OR **Tetramorium desertorum** OR **Tetramorius ludeni** OR **Tetranychus pacificus** OR **Tetranychus turkestanii** OR **Tetranychus urticae** OR **Tetranychus horridus** OR **Tetranychus castaneum** OR **Thaumatomibbia leucotreta** OR **Thaumatomibbia leucotreta** OR **Thaumetopoea processionea** OR **Tomentella chlorina** OR **Tomentella ferruginea** OR **Tomentella sublilacina** OR **Tomentella viridescens** OR **Tomentella viridis** OR **Trametes dickinsii** OR **Trametes gallica** OR **Trametes hirsuta** OR **Trametes versicolor** OR **Trechispora sphaerocystis** OR **Trematosphaeria communis** OR **Tremelloclepte japonica** OR **Tremex fusicornis** OR **Tribolium castaneum** OR **Trichocidium canadense** OR **Trichoderma sp.** OR **Trichodorus** OR **Trichodorus
Commodity risk assessment of Juglans regia plants from Moldova

porosus” OR “Trichodoros sp.” OR “Trichothecium roseum” OR “Trichothecium sp.” OR “Trirachys sartus” OR “Trogoderma granarium” OR “Tubercularia sp.” OR “Tubercularia vulgaris” OR “Turanocyctys namanganensis” OR “Tylenchorhynchus acutus” OR “Tylenchorhynchus capitatus” OR “Tylenchorhynchus clarus” OR “Tylenchorhynchus claytoni” OR “Tylenchorhynchus sp.” OR “Tylolaimophorus rotundicauda” OR “Valsa ambiens” OR “Valsa ambiens subsp. Ambiens” OR “Valsa ceratophora” OR “Valsa ceratosperma” OR “Valsa juglandicola” OR “Valsa juglandina” OR “Valsa sordida” OR “Vararia effusata” OR “Verticillum sp.” OR “Volutella fructi” OR “Volutella fruit” OR “Vuilleminia cystidiata” OR “Xanthochrous hispidus” OR “Xanthomonas arboricola pv. Juglandis” OR “Xanthomonas arboricola pv. juglandis” OR “Xanthomonas juglandis” OR “Xestobium rufovillosum” OR “Xiphinema americanum” OR “Xiphinema americanum” OR “Xiphinema index” OR “Xiphinema pachtaicum” OR “Xiphinema rivesi” OR “Xiphinema sp.” OR “Xyleborinus saxesenii” OR “Xyleborus dispar” OR “Xyleborus dispar” OR “Xylella fastidiosa” OR “Xylella fastidiosa subsp. fastidiosa” OR “Xylosandrus germanus” OR “Xylosandrus germanus” OR “Xylosandrus namanganensis” OR “Zeuzera coffeae” OR “Zeuzera pyrina” OR “Zeuzera pyrina”
Appendix B – Excel file with the pest list of *Juglans regia*

Appendix B can be found in the online version of this output (in the ‘Supporting information’ section): https://efsa.onlinelibrary.wiley.com/doi/10.2903/j.efsa.2021.6570#support-information-section