

ADOPTED: 25 September 2019

doi: 10.2903/j.efsa.2019.5856

Pest categorisation of non-EU *Acleris* spp.

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Abstract

The Panel on Plant Health performed a pest categorisation of non-EU *Acleris* spp. *Acleris* is a well-defined insect genus in the family Tortricidae (Insecta: Lepidoptera). Species can be identified using taxonomic keys based on adult morphology and genitalia. The genus includes 261 species attacking conifers and non-conifer plants in many areas in the world, among which 40 species are present in the EU. The non-EU species are collectively listed in Annex IAI of Council Directive 2000/29/EC as *Acleris* spp. (non-European). Some species are important defoliators in North America, mainly on conifers but also on several broadleaf trees. Females lay eggs on the leaves or on the bark. The larvae bind together with silk the leaves upon which they feed. Pupation occurs in leaves attached with silk or in the soil. Some species are univoltine; others are bivoltine or multivoltine. Flight capacity is not documented, but outbreak expansion suggests that the adults can probably fly long distances. The main pathways for entry are host plants for planting with or without soil, cut branches, fruits of host plants (including cones), round wood with bark and bark. The presence of host plants and suitable EU climate would allow the establishment of the known non-EU harmful species. In the literature, nine non-EU *Acleris* species are reported as pests on various host plants, namely *A. gloverana*, *A. variana*, *A. minuta*, *A. nishidai*, *A. issikij*, *A. semipurpurana*, *A. robinsoniana*, *A. senescens* and *A. nivisellana*. These non-EU *Acleris* spp. satisfy all the criteria to be considered as Union quarantine pests. Concerning the other 212 non-EU *Acleris* species, there is scarce information on host plants, pests status and climatic suitability. Measures are in place to prevent the introduction of non-EU *Acleris* spp. through the pathways described in the document. As non-EU *Acleris* spp. are not present in the EU and plants for planting are not the major pathway for spread, non-EU *Acleris* spp. do not meet the criteria to be considered as regulated non-quarantine pests.

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Keywords: Budworms, European Union, pest risk, plant health, plant pest, quarantine, Tortricidae

Requestor: European Commission

Question Number: EFSA-Q-2018-00794

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Suggested citation: EFSA Panel on Plant Health (PLH), Bragard C, Dehnen-Schmutz K, Di Serio F, Gonthier P, Jacques M-A, Jaques Miret JA, Justesen AF, MacLeod A, Magnusson CS, Navas-Cortes JA, Parnell S, Potting R, Reignault PL, Thulke H-H, Van der Werf W, Civera AV, Yuen J, Zappalà L, Grégoire J-C, Kertész V and Milonas P, 2019. Scientific Opinion on the pest categorisation of non-EU *Acleris* spp. *EFSA Journal* 2019;17(10):5856, 37 pp. <https://doi.org/10.2903/j.efsa.2019.5856>

ISSN: 1831-4732

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1. Introduction

1.1. Background and Terms of Reference as provided by the requestor

1.1.1. Background

Council Directive 2000/29/EC¹ on protective measures against the introduction into the Community of organisms harmful to plants or plant products and against their spread within the Community establishes the present European Union plant health regime. The Directive lays down the phytosanitary provisions and the control checks to be carried out at the place of origin on plants and plant products destined for the Union or to be moved within the Union. In the Directive's 2000/29/EC annexes, the list of harmful organisms (pests) whose introduction into or spread within the Union is prohibited, is detailed together with specific requirements for import or internal movement.

Following the evaluation of the plant health regime, the new basic plant health law, Regulation (EU) 2016/2031² on protective measures against pests of plants, was adopted on 26 October 2016 and will apply from 14 December 2019 onwards, repealing Directive 2000/29/EC. In line with the principles of the above mentioned legislation and the follow-up work of the secondary legislation for the listing of EU regulated pests, EFSA is requested to provide pest categorisations of the harmful organisms included in the annexes of Directive 2000/29/EC, in the cases where recent pest risk assessment/pest categorisation is not available.

1.1.2. Terms of Reference

EFSA is requested, pursuant to Article 22(5.b) and Article 29(1) of Regulation (EC) No 178/2002,³ to provide scientific opinion in the field of plant health.

EFSA is requested to prepare and deliver a pest categorisation (step 1 analysis) for each of the regulated pests included in the appendices of the annex to this mandate. The methodology and template of pest categorisation have already been developed in past mandates for the organisms listed in Annex II Part A Section II of Directive 2000/29/EC. The same methodology and outcome is expected for this work as well.

The list of the harmful organisms included in the annex to this mandate comprises 133 harmful organisms or groups. A pest categorisation is expected for these 133 pests or groups and the delivery of the work would be stepwise at regular intervals through the year as detailed below. First priority covers the harmful organisms included in Appendix 1, comprising pests from Annex II Part A Section I and Annex II Part B of Directive 2000/29/EC. The delivery of all pest categorisations for the pests included in Appendix 1 is June 2018. The second priority is the pests included in Appendix 2, comprising the group of *Cicadellidae* (non-EU) known to be vector of Pierce's disease (caused by *Xylella fastidiosa*), the group of *Tephritidae* (non-EU), the group of potato viruses and virus-like organisms, the group of viruses and virus-like organisms of *Cydonia* Mill., *Fragaria* L., *Malus* Mill., *Prunus* L., *Pyrus* L., *Ribes* L., *Rubus* L. and *Vitis* L., and the group of *Margarodes* (non-EU species). The delivery of all pest categorisations for the pests included in Appendix 2 is end 2019. The pests included in Appendix 3 cover pests of Annex I part A section I and all pest categorisations should be delivered by end 2020.

For the above-mentioned groups, each covering a large number of pests, the pest categorisation will be performed for the group and not the individual harmful organisms listed under "such as" notation in the Annexes of the Directive 2000/29/EC. The criteria to be taken particularly under consideration for these cases, is the analysis of host pest combination, investigation of pathways, the damages occurring and the relevant impact.

Finally, as indicated in the text above, all references to 'non-European' should be avoided and replaced by 'non-EU' and refer to all territories with exception of the Union territories as defined in Article 1 point 3 of Regulation (EU) 2016/2031.

¹ Council Directive 2000/29/EC of 8 May 2000 on protective measures against the introduction into the Community of organisms harmful to plants or plant products and against their spread within the Community. OJ L 169/1, 10.7.2000, p. 1–112.

² Regulation (EU) 2016/2031 of the European Parliament of the Council of 26 October 2016 on protective measures against pests of plants. OJ L 317, 23.11.2016, p. 4–104.

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

1.1.2.1. Terms of Reference: Appendix 1

List of harmful organisms for which pest categorisation is requested. The list below follows the annexes of Directive 2000/29/EC.

Annex IIAI

(a) Insects, mites and nematodes, at all stages of their development

<i>Aleurocanthus</i> spp.	<i>Numonia pyrivorella</i> (Matsumura)
<i>Anthonomus bisignifer</i> (Schenkling)	<i>Oligonychus perditus</i> Pritchard and Baker
<i>Anthonomus signatus</i> (Say)	<i>Pissodes</i> spp. (non-EU)
<i>Aschistonyx eppoi</i> Inouye	<i>Scirtothrips aurantii</i> Faure
<i>Carposina niponensis</i> Walsingham	<i>Scirtothrips citri</i> (Moultex)
<i>Enarmonia packardi</i> (Zeller)	<i>Scolytidae</i> spp. (non-EU)
<i>Enarmonia prunivora</i> Walsh	<i>Scrobipalopsis solanivora</i> Povolny
<i>Grapholita inopinata</i> Heinrich	<i>Tachypterellus quadrigibbus</i> Say
<i>Hishomonus phycitis</i>	<i>Toxoptera citricida</i> Kirk.
<i>Leucaspis japonica</i> Ckll.	<i>Unaspis citri</i> Comstock
<i>Listronotus bonariensis</i> (Kuschel)	

(b) Bacteria

Citrus variegated chlorosis	<i>Xanthomonas campestris</i> pv. <i>oryzae</i> (Ishiyama)
<i>Erwinia stewartii</i> (Smith) Dye	Dye and pv. <i>oryzicola</i> (Fang, et al.) Dye

(c) Fungi

<i>Alternaria alternata</i> (Fr.) Keissler (non-EU pathogenic isolates)	<i>Elsinoe</i> spp. Bitanc. and Jenk. Mendes
<i>Anisogramma anomala</i> (Peck) E. Müller	<i>Fusarium oxysporum</i> f. sp. <i>albedinis</i> (Kilian and Maire) Gordon
<i>Apiosporina morbosus</i> (Schwein.) v. Arx	<i>Guignardia piricola</i> (Nosa) Yamamoto
<i>Ceratocystis virescens</i> (Davidson) Moreau	<i>Puccinia pittieriana</i> Hennings
<i>Cercoseptoria pini-densiflorae</i> (Hori and Nambu) Deighton	<i>Stegophora ulmea</i> (Schweinitz: Fries) Sydow & Sydow
<i>Cercospora angolensis</i> Carv. and Mendes	<i>Venturia nashicola</i> Tanaka and Yamamoto

(d) Virus and virus-like organisms

Beet curly top virus (non-EU isolates)	Citrus tristeza virus (non-EU isolates)
Black raspberry latent virus	Leprosis
Blight and blight-like	Little cherry pathogen (non- EU isolates)
Cadang-Cadang viroid	Naturally spreading psorosis
Palm lethal yellowing mycoplasma	Tatter leaf virus
Satsuma dwarf virus	Witches' broom (MLO)

Annex IIB

(a) Insect mites and nematodes, at all stages of their development

<i>Anthonomus grandis</i> (Boh.)	<i>Ips cembrae</i> Heer
<i>Cephalcia lariciphila</i> (Klug)	<i>Ips duplicatus</i> Sahlberg
<i>Dendroctonus micans</i> Kugelán	<i>Ips sexdentatus</i> Börner
<i>Gilpinia hercyniae</i> (Hartig)	<i>Ips typographus</i> Heer
<i>Gonipterus scutellatus</i> Gyll.	<i>Sternochetus mangiferae</i> Fabricius
<i>Ips amitinus</i> Eichhof	

(b) Bacteria

Curtobacterium flaccumfaciens pv. *flaccumfaciens*
(Hedges) Collins and Jones

(c) Fungi

Glomerella gossypii Edgerton

Hypoxyton mammatum (Wahl.) J. Miller

Gremmeniella abietina (Lag.) Morelet

1.1.2.2. Terms of Reference: Appendix 2

List of harmful organisms for which pest categorisation is requested per group. The list below follows the categorisation included in the annexes of Directive 2000/29/EC.

Annex IAI**(a) Insects, mites and nematodes, at all stages of their development**

Group of Cicadellidae (non-EU) known to be vector of Pierce's disease (caused by *Xylella fastidiosa*), such as:

- | | |
|--|---|
| 1) <i>Carneocephala fulgida</i> Nottingham | 3) <i>Graphocephala atropunctata</i> (Signoret) |
| 2) <i>Draeculacephala minerva</i> Ball | |

Group of Tephritidae (non-EU) such as:

- | | |
|--|---|
| 1) <i>Anastrepha fraterculus</i> (Wiedemann) | 12) <i>Pardalaspis cyanescens</i> Bezzi |
| 2) <i>Anastrepha ludens</i> (Loew) | 13) <i>Pardalaspis quinaria</i> Bezzi |
| 3) <i>Anastrepha obliqua</i> Macquart | 14) <i>Pterandrus rosa</i> (Karsch) |
| 4) <i>Anastrepha suspensa</i> (Loew) | 15) <i>Rhacochlaena japonica</i> Ito |
| 5) <i>Dacus ciliatus</i> Loew | 16) <i>Rhagoletis completa</i> Cresson |
| 6) <i>Dacus curcurbitae</i> Coquillett | 17) <i>Rhagoletis fausta</i> (Osten-Sacken) |
| 7) <i>Dacus dorsalis</i> Hendel | 18) <i>Rhagoletis indifferens</i> Curran |
| 8) <i>Dacus tryoni</i> (Froggatt) | 19) <i>Rhagoletis mendax</i> Curran |
| 9) <i>Dacus tsuneonis</i> Miyake | 20) <i>Rhagoletis pomonella</i> Walsh |
| 10) <i>Dacus zonatus</i> Saund. | 21) <i>Rhagoletis suavis</i> (Loew) |
| 11) <i>Epochra canadensis</i> (Loew) | |

(c) Viruses and virus-like organisms

Group of potato viruses and virus-like organisms such as:

- | | |
|----------------------------------|--|
| 1) Andean potato latent virus | 4) Potato black ringspot virus |
| 2) Andean potato mottle virus | 5) Potato virus T |
| 3) Arracacha virus B, oca strain | 6) non-EU isolates of potato viruses A, M, S, V, X and Y (including Yo, Yn and Yc) and Potato leafroll virus |

Group of viruses and virus-like organisms of *Cydonia* Mill., *Fragaria* L., *Malus* Mill., *Prunus* L., *Pyrus* L., *Ribes* L., *Rubus* L. and *Vitis* L., such as:

- | | |
|--------------------------------------|--|
| 1) Blueberry leaf mottle virus | 8) Peach yellows mycoplasma |
| 2) Cherry rasp leaf virus (American) | 9) Plum line pattern virus (American) |
| 3) Peach mosaic virus (American) | 10) Raspberry leaf curl virus (American) |
| 4) Peach phony rickettsia | 11) Strawberry witches' broom mycoplasma |
| 5) Peach rosette mosaic virus | 12) Non-EU viruses and virus-like organisms of <i>Cydonia</i> Mill., <i>Fragaria</i> L., <i>Malus</i> Mill., <i>Prunus</i> L., <i>Pyrus</i> L., <i>Ribes</i> L., <i>Rubus</i> L. and <i>Vitis</i> L. |
| 6) Peach rosette mycoplasma | |
| 7) Peach X-disease mycoplasma | |

Annex IIAI

(a) Insects, mites and nematodes, at all stages of their development

Group of *Margarodes* (non-EU species) such as:

- 1) *Margarodes vitis* (Phillipi)
- 2) *Margarodes vredendalensis* de Klerk
- 3) *Margarodes prieskaensis* Jakubski

1.1.2.3. Terms of Reference: Appendix 3

List of harmful organisms for which pest categorisation is requested. The list below follows the annexes of Directive 2000/29/EC.

Annex IAI

(a) Insects, mites and nematodes, at all stages of their development

<i>Acleris</i> spp. (non-EU)	<i>Longidorus diadecturus</i> Eveleigh and Allen
<i>Amauromyza maculosa</i> (Malloch)	<i>Monochamus</i> spp. (non-EU)
<i>Anomala orientalis</i> Waterhouse	<i>Myndus crudus</i> Van Duzee
<i>Arrhenodes minutus</i> Drury	<i>Nacobbus aberrans</i> (Thorne) Thorne and Allen
<i>Choristoneura</i> spp. (non-EU)	<i>Naupactus leucoloma</i> Boheman
<i>Conotrachelus nenuphar</i> (Herbst)	<i>Premnotrypes</i> spp. (non-EU)
<i>Dendrolimus sibiricus</i> Tschetverikov	<i>Pseudopityophthorus minutissimus</i> (Zimmermann)
<i>Diabrotica barberi</i> Smith and Lawrence	<i>Pseudopityophthorus pruinosus</i> (Eichhoff)
<i>Diabrotica undecimpunctata howardi</i> Barber	<i>Scaphoideus luteolus</i> (Van Duzee)
<i>Diabrotica undecimpunctata undecimpunctata</i> Mannerheim	<i>Spodoptera eridania</i> (Cramer)
<i>Diabrotica virgifera zea</i> Krysan & Smith	<i>Spodoptera frugiperda</i> (Smith)
<i>Diaphorina citri</i> Kuway	<i>Spodoptera litura</i> (Fabricius)
<i>Heliothis zea</i> (Boddie)	<i>Thrips palmi</i> Karny
<i>Hirschmanniella</i> spp., other than <i>Hirschmanniella gracilis</i> (de Man) Luc and Goodey	<i>Xiphinema americanum</i> Cobb sensu lato (non-EU populations)
<i>Liriomyza sativae</i> Blanchard	<i>Xiphinema californicum</i> Lamberti and Bleve-Zacheo

(b) Fungi

<i>Ceratocystis fagacearum</i> (Bretz) Hunt	<i>Guignardia loricata</i> (Saw.) Yamamoto and Ito
<i>Chrysomyxa arctostaphyli</i> Dietel	<i>Gymnosporangium</i> spp. (non-EU)
<i>Cronartium</i> spp. (non-EU)	<i>Inonotus weirii</i> (Murril) Kotlaba and Pouzar
<i>Endocronartium</i> spp. (non-EU)	<i>Melampsora farlowii</i> (Arthur) Davis
<i>Mycosphaerella larici-leptolepis</i> Ito et al.	<i>Septoria lycopersici</i> Speg. var. <i>malagutii</i> Ciccarone and Boerema
<i>Mycosphaerella populorum</i> G. E. Thompson	<i>Trechispora brinkmannii</i> (Bresad.) Rogers
<i>Thecaphora solani</i> Barrus	
<i>Phoma andina</i> Turkensteen	
<i>Phyllosticta solitaria</i> Ell. and Ev.	

(c) Viruses and virus-like organisms

Tobacco ringspot virus	Pepper mild tigré virus
Tomato ringspot virus	Squash leaf curl virus
Bean golden mosaic virus	Euphorbia mosaic virus
Cowpea mild mottle virus	Florida tomato virus
Lettuce infectious yellows virus	

(d) Parasitic plants

Arceuthobium spp. (non-EU)

Annex I A II

(a) Insects, mites and nematodes, at all stages of their development

Meloidogyne fallax Karssen

Rhizoecus hibisci Kawai and Takagi

Popillia japonica Newman

(b) Bacteria

Clavibacter michiganensis (Smith) Davis et al. ssp. *sepedonicus* (Spieckermann and Kotthoff) Davis et al.

Ralstonia solanacearum (Smith) Yabuuchi et al.

(c) Fungi

Melampsora medusae Thümen

Synchytrium endobioticum (Schilbersky) Percival

Annex I B

(a) Insects, mites and nematodes, at all stages of their development

Leptinotarsa decemlineata Say

Liriomyza bryoniae (Kaltenbach)

(b) Viruses and virus-like organisms

Beet necrotic yellow vein virus

1.2. Interpretation of the Terms of Reference

Acleris spp. (non-European Union (EU)) are listed in the Appendices to the Terms of Reference (ToR) to be subject to pest categorisation to determine whether they fulfil the criteria of quarantine pests or those of regulated non-quarantine pests for the area of the EU excluding Ceuta, Melilla and the outermost regions of Member States (MSs) referred to in Article 355(1) of the Treaty on the Functioning of the European Union (TFEU), other than Madeira and the Azores.

2. Data and methodologies

2.1. Data

2.1.1. Literature search

A literature search on *Acleris* spp. was conducted at the beginning of the categorisation in the ISI Web of Science bibliographic database, using the scientific name of the genus as search term. Relevant papers 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) and relevant publications.

The Europhyt database was 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 and is a subproject of PHYSAN (Phyto-Sanitary Controls) specifically concerned with plant health information. The Europhyt database manages 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 MS and the phytosanitary measures taken to eradicate or avoid their spread.

2.2. Methodologies

The Panel performed the pest categorisation for *Acleris* spp., following guiding principles and steps presented in the EFSA guidance on quantitative pest risk assessment (EFSA PLH Panel, 2018) and in the International Standard for Phytosanitary Measures No 11 (FAO, 2013) and No 21 (FAO, 2004).

This work was initiated following an evaluation of the EU plant health regime. Therefore, to facilitate the decision-making process, in the conclusions of the pest categorisation, the Panel addresses explicitly each criterion for a Union quarantine pest and for a Union regulated non-quarantine pest (RNQP) in accordance with Regulation (EU) 2016/2031 on protective measures against pests of plants, and includes additional information required in accordance with the specific ToR received by the European Commission. In addition, for each conclusion, the Panel provides a short description of its associated uncertainty.

Table 1 presents the Regulation (EU) 2016/2031 pest categorisation criteria on which the Panel bases its conclusions. All relevant criteria have to be met for the pest to potentially qualify either as a quarantine pest or as a RNQP. If one of the criteria is not met, the pest will not qualify. A pest that does not qualify as a quarantine pest may still qualify as a RNQP that needs to be addressed in the opinion. For the pests regulated in the protected zones only, the scope of the categorisation is the territory of the protected zone; thus, the criteria refer to the protected zone instead of the EU territory.

It should be noted that 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, the Panel will present a summary of the observed pest impacts. Economic impacts are expressed in terms of yield and quality losses and not in monetary terms, whereas addressing social impacts 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	Criterion in Regulation (EU) 2016/2031 regarding protected zone quarantine pest (articles 32–35)	Criterion in Regulation (EU) 2016/2031 regarding Union regulated non-quarantine pest
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?	Is the identity of the pest established, or has it been shown to produce consistent symptoms and to be transmissible?	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!	Is the pest present in the EU territory? If not, it cannot be a protected zone quarantine organism	Is the pest present in the EU territory? If not, it cannot be a RNQP. (A regulated non-quarantine pest must be present in the risk assessment area)
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	The protected zone system aligns with the pest-free area system under the International Plant Protection Convention (IPPC) The pest satisfies the IPPC definition of a quarantine pest that is not present in the risk assessment area (i.e. protected zone)	Is the pest regulated as a quarantine pest? If currently regulated as a quarantine pest, are there grounds to consider its status could be revoked?

Criterion of pest categorisation	Criterion in Regulation (EU) 2016/2031 regarding Union quarantine pest	Criterion in Regulation (EU) 2016/2031 regarding protected zone quarantine pest (articles 32–35)	Criterion in Regulation (EU) 2016/2031 regarding Union regulated non-quarantine pest
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!	Is the pest able to enter into, become established in, and spread within, the protected zone areas? Is entry by natural spread from EU areas where the pest is present possible?	Is spread mainly via specific plants for planting, rather than via natural spread or via movement of plant products or other objects? Clearly state if plants for planting is the main pathway!
Potential for consequences in the EU territory (Section 3.5)	Would the pests' introduction have an economic or environmental impact on the EU territory?	Would the pests' introduction have an economic or environmental impact on the protected zone areas?	Does the presence of the pest on plants for planting have an economic impact as regards the intended use of those plants for planting?
Available measures (Section 3.6)	Are there measures available to prevent the entry into, establishment within or spread of the pest within the EU such that the risk becomes mitigated?	Are there measures available to prevent the entry into, establishment within or spread of the pest within the protected zone areas such that the risk becomes mitigated? Is it possible to eradicate the pest in a restricted area within 24 months (or a period longer than 24 months where the biology of the organism so justifies) after the presence of the pest was confirmed in the protected zone?	Are there measures available to prevent pest presence on plants for planting such that the risk 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	A statement as to whether (1) all criteria assessed by EFSA above for consideration as potential protected zone quarantine pest were met, and (2) if not, which one(s) were not met	A statement as to whether (1) all criteria assessed by EFSA above for consideration as a potential RNQP were met, and (2) if not, which one(s) were not met

The Panel will not indicate in its conclusions of the pest categorisation whether to continue the risk assessment process, but following the agreed two-step approach, will continue only if requested by the risk managers. However, during the categorisation process, experts may identify key elements and knowledge gaps that could contribute significant uncertainty to a future assessment of risk. It would be useful to identify and highlight such gaps so that potential future requests can specifically target the major elements of uncertainty, perhaps suggesting specific scenarios to examine.

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 to be transmissible?

Yes, the identity of the non-EU *Acleris* species is well established. The different species can be identified using taxonomic keys based on adult morphology and their genitalia.

Acleris Hübner is an insect genus in the family Tortricidae (Insecta: Lepidoptera, Subfamily: Tortricinae, Tribe: Tortricini). It includes 261 species distributed in all around the world (Razowski et al., 2010; Gilligan and Epstein, 2012; Gilligan et al., 2018). The different species can be identified using taxonomic keys based on adult morphology and the genitalia of both sexes.

Although the species *Acleris gloverana* is mentioned under this name in most of the literature (Brown, 2006), it is referred to as *Acleris gloveranus* in the Tortricid.net database (Brown et al., 2008). The bases for this discrepancy have not been found in the literature. For the purpose of this opinion, we use the name *A. gloverana*.

3.1.2. Biology of the pest

The genus *Acleris* includes 221 non-EU species (Appendix A). They primarily feed on leaves. The biology of the species known as major pests, which has been used as a criterion to identify those species subjected to this categorisation, is summarised here. Unless specified otherwise, much of the information in this section has been drawn from Gilligan and Epstein (2012).

The non-EU *Acleris* include two major defoliators of conifers that occur in North America, *A. variana* and *A. gloverana* also known as eastern and western blackheaded budworm, respectively (Nealis and Turnquist, 2010; Johns et al., 2016). Both species complete one generation per year. Adults appear in mid-summer till early September and lay eggs in the underside of the needles at the upper part of the host plants. Eggs overwinter and hatch in next spring. Larvae feed initially in the buds and later on the needles which are folded or tied together with silk. Pupation occurs in a sheath made of needles attached with silk.

Acleris minuta attacks various deciduous hosts in the families Rosaceae, Myricaceae, Ericaceae and Salicaceae. It completes two to three generations per year depending on latitude. Adults of the first and second generation are orange or yellow and are present in June and August. Adults of the third generation are grey and are present in October. It overwinters as adult. Eggs are laid singly on bark in the spring or on leaves in the summer. Eggs hatch in 7–10 days and first instar larvae feed on the underside of leaves. Later instars web together leaves to create a shelter or fold single leaves where they feed and then pupate (Weatherby, 1982).

Acleris semipurpurana attacks mainly oak trees. It completes one generation per year and eggs are the overwintering stage. In Spring, young larvae feed in buds and later use silk to tie sections of leaves together and feed inside the folds. The fully grown larvae are whitish to light green. The pale head capsule has black bars on the sides. Usually in May, the mature larvae spin down to the ground and pupate in the soil litter. Pupation lasts from 1 to 2 weeks. Adults emerge and mate, and eggs are deposited individually on the bark of second-year branches. Only one generation per year has been reported (USDA, 1979).

Other species such as *Acleris robinsoniana*, *Acleris senescens* and *Acleris nivisellana* attack several deciduous plants among which the Rosaceae. They complete one or two generations per year.

Acleris nishidai is known only from the mountains of central Costa Rica. It feeds on *Rubus* spp. (Rosaceae). Larvae may be relatively abundant on cultivated blackberry, and are responsible for heavy damage. *A. nishidai* is therefore considered as a pest in Costa Rica (Brown and Nishida, 2008).

Acleris issikii has two generations per year with adults on wing from June to July and again from September to October. Larvae feed on *Salix integra*, *Populus nigra* and *Populus sieboldii*.



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Figure 1: *Acleris gloverana* male. The wingspan is about 20 mm. (Todd M. Gilligan and Marc E. Epstein, TortAI: Tortricids of Agricultural Importance, USDA APHIS PPQ, Bugwood.org)



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Figure 2: *Acleris gloverana* late instar larva (size 10–15 mm) (Tom Gray, Canadian Forest Service, Bugwood.org)



Figure 3: Damage on *Abies balsamea* by *Acleris variana* larvae. (Rick West, Canadian Forest Service, Bugwood.org)

3.1.3. Intraspecific diversity

No intraspecific diversity has been reported.

3.1.4. Detection and identification of the pest

Are detection and identification methods available for the pest?

Yes, the pest can be detected and identified visually. For some species, pheromones have been identified and could be used for detection.

For all non-EU *Acleris* species, detailed description of the adults and male and female genitalia is available for identification. For several species including those which have been reported as pests, online identification keys based on adult morphological characters are available. For several species, molecular tools have been developed for their identification (Obraztsov, 1963; Razowski et al., 2010; Gilligan and Epstein, 2012).

Detection of non-EU *Acleris* species is based on the presence of larval feeding damage, which is typical of a leafroller insect. Feeding larvae or damaged leaves could be detected visually by the presence of silk used to tie or fold infested leaves. In addition, for several *Acleris* species (e.g. *A. gloverana*, *A. minuta* and *A. variana*), the pheromone has been identified and could be used for detection with pheromone traps (Gries et al., 1994; Gray et al., 1996; Nealis et al., 2010; Pherobase 2019).

3.2. Pest distribution

3.2.1. Pest distribution outside the EU

In Appendix A, information about the distribution of all non-EU *Acleris* can be found based on Gilligan and Epstein (2012) and the EPPO Global Database (EPPO, online). For the non-EU *Acleris* that are reported as pests, distribution data are summarized in Table 2. The distribution of two major pests, *A. gloverana* and *A. variana*, are presented in Figures 4 and 5.

Table 2: Geographic distribution of nine non-EU *Acleris* species reported as pests

Species	Distribution	Reference
<i>A. gloverana</i> (<i>A. gloveranus</i>)	Alaska and northwestern Canada south to northern California and east to western Montana	Gilligan and Epstein (2012)
<i>A. issikii</i>	Japan, North Korea, South Korea, China, East Russia	Oku (1957), Byun and Yan (2004)
<i>A. minuta</i>	Widely distributed in eastern North America. No record was found for Sweden or any European countries; in particular, the pest is not included in the Fauna Europaea database (de Jong et al., 2014, accessed on 24 September 2019)	Gilligan and Epstein (2012), EPPO (2015)
<i>A. nishidai</i>	Costa Rica	Brown and Nishida (2008)
<i>A. nivisellana</i>	Northeastern United States across southern Canada to British Columbia and south to California. In the United States, it is found mainly north of the 40th parallel	Gilligan and Epstein (2012)
<i>A. robinsoniana</i>	Northeastern United States across southern Canada to British Columbia and south to California	Gilligan and Epstein (2012)
<i>A. semipurpurana</i>	USA, Ohio	Gilligan and Epstein (2012)
<i>A. senescens</i>	Pacific Coast of North America from British Columbia south to California	Gilligan and Epstein (2012)
<i>A. variana</i>	Eastern Canada and Northeastern United States	Gilligan and Epstein (2012)

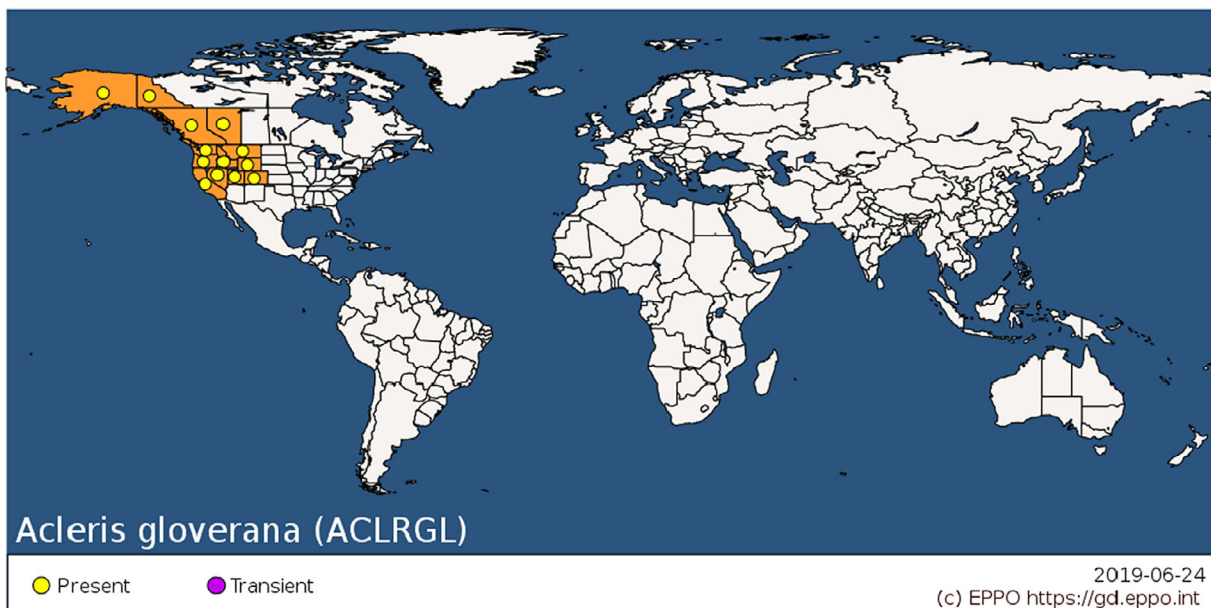


Figure 4: Global distribution map for *Acleris gloverana* (extracted from the EPPO Global Database accessed on 24 June 2019)

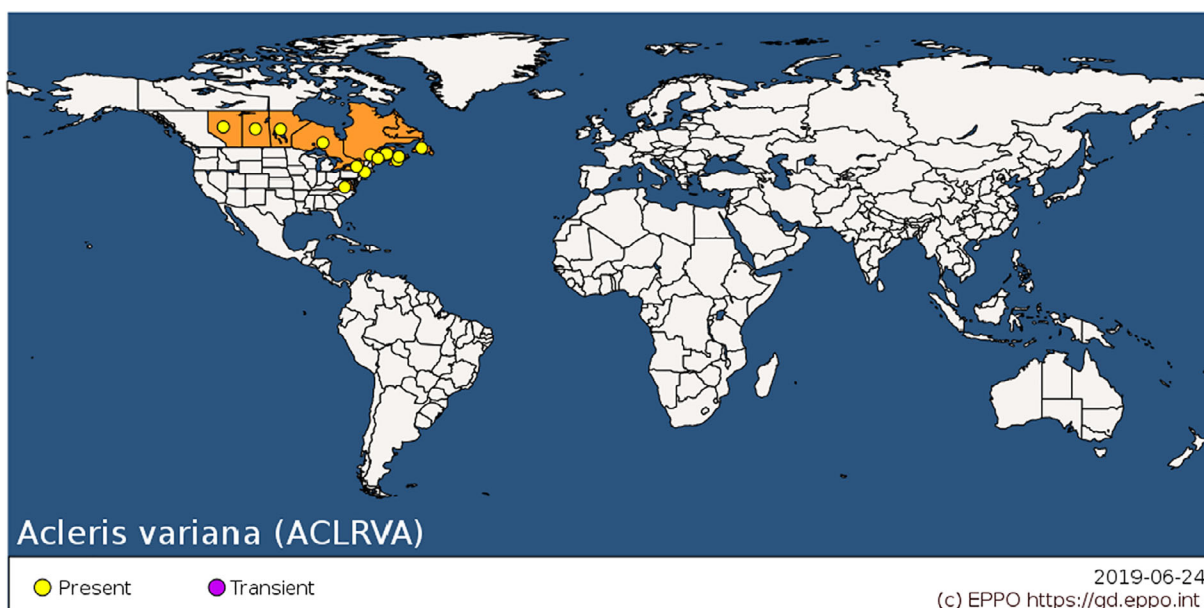


Figure 5: Global distribution map for *Acleris variana* (extracted from the EPPO Global Database accessed on 24 June 2019)

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, non-EU species of the genus *Acleris* are not present in the EU territory.

For a list of *Acleris* species present in the EU, please see Appendix B.

3.3. Regulatory status

3.3.1. Council Directive 2000/29/EC

Acleris species are listed in Council Directive 2000/29/EC. Details are presented in Table 3.

Table 3: *Acleris* spp. in Council Directive 2000/29/EC

Annex I, Part A	Harmful organisms whose introduction into, and spread within, all member states shall be banned
Section I	Harmful organisms not known to occur in any part of the community and relevant for the entire community
(a)	Insects, mites and nematodes, at all stages of their development
	Species
1.	<i>Acleris</i> spp. (non-European)

3.3.2. Legislation addressing the hosts of *Acleris* spp

Acleris spp. (non-European) are listed on Annex IAI, which indicates that they are regulated for all plant genera and commodities. Some host plants used by *Acleris* spp. are listed in the import prohibitions of Annex III or specific requirements in Annex IV of Council Directive 2000/29/EC (see Section 3.4.2).

3.4. Entry, establishment and spread in the EU

3.4.1. Host range

The nine species considered as potential pests attack a range of host plant families that include Betulaceae; Cupressaceae; Ericaceae; Fagaceae; Myricaceae; Pinaceae, Rosaceae and Salicaceae (Brown et al., 2008), and the following species or genera:

Abies spp.; *Alnus* spp.; *Betula* spp.; *Calluna* sp.; *Crataegus* spp.; *Kalmia* sp.; *Larix* spp.; *Malus* sp.; *Myrica gale*; *Physocarpus malvaceus*; *Picea* spp.; *Pinus* spp.; *Populus* spp.; *Prunus* spp.; *Pseudotsuga menziesii*; *Pyrus* sp.; *Quercus* spp.; *Rosa* spp.; *Rubus* spp.; *Salix* spp.; *Sorbus* spp.; *Thuja plicata*; *Tsuga* spp.; *Vaccinium* spp. (Brown et al., 2008).

A more complete list of host plants is provided in Appendix A.

3.4.2. Entry

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

Yes, non-EU *Acleris* are able to enter as eggs or pupae on plants for planting belonging to one of the families listed in section 3.4.1. and as eggs on the bark of round wood with bark of host plants. *A. semipurpurana* also pupates in the soil and therefore could travel with potted plants.

The main pathways of entry are:

- Plants for planting (including seeds) of the host plants, with or without soil
- Cut branches of host plants
- Fruits (including cones of conifers) of host plants
- Round wood with bark of host plants
- Bark of host plants

For the pathways listed above, the following prohibitions (Annex III) or special requirements (Annex IV) are in place:

Plants for planting

- Plants of *Abies*, *Larix*, *Picea*, *Pinus*, *Pseudotsuga*, *Tsuga*, and plants with leaves of *Quercus*, other than fruit and seeds – prohibited from non-European countries (Annex IIIAI 1 and 2.)
- Plants with leaves (other than fruit and seeds) of *Populus* – prohibited from North American countries (Annex IIIAI 3.)
- Plants for planting of *Crataegus*, *Malus*, *Prunus*, *Pyrus*, *Rosa* other than dormant plants free from leaves, flowers and fruit – prohibited from non-European countries (Annex IIIAI 9.)
- Plants for planting of *Malus*, *Prunus*, *Pyrus* other than seeds – prohibited from non-European countries, other than Mediterranean countries, Australia, New Zealand, Canada, the continental states of the USA (Annex IIIAI 18.)
- Plants of conifers other than fruit and seeds – special requirements in relation to other pests (Annex IVAI 8.1., 8.2.)
- Plants of *Abies*, *Larix*, *Picea*, *Pinus*, *Pseudotsuga*, *Tsuga*, *Quercus* – special requirements in relation to other pests (Annex IVAI 9., 10., 11.01., 11.1., 11.2.)
- Plants of *Betula*, *Populus* – special requirements in relation to other pests (Annex IVAI 11.5., 13.1., 13.2.)
- Plants of *Crataegus*, *Malus*, *Prunus*, *Pyrus*, *Rubus* – special requirements in relation to other pests (Annex IVAI 14.1., 17., 19.1., 19.2., 20., 22.1., 22.2., 23.1., 23.2., 24.)

Wood

- Wood of conifers – special requirements in relation to other pests (Annex IVAI 1.1., 1.3., 1.5., 1.6.)
- Wood of *Quercus*, *Populus* – special requirements (Annex IVAI 3., 6.)
- Wood of *Betula* – special requirements in relation to other pests (Annex IVAI 4.1., 4.3.)
- Wood of *Crataegus*, *Malus*, *Prunus*, *Pyrus* – special requirements in relation to other pests (Annex IVAI 7.4.)

Bark

- Isolated bark of *Quercus* – prohibited from North American countries (Annex IIIAI 6.)
- Isolated bark of *Populus* – prohibited from countries of the American continent (Annex IIIAI 8.)
- Isolated bark of conifers – special requirements (Annex IVAI 7.3.)

For all other identified pathways (e.g. fruits and cut branches of host plants, dormant *Populus* plants from North America, dormant plants of *Malus* from Mediterranean countries, Australia, New Zealand, Canada, the continental states of the USA, etc.) no import requirements are currently specified.

Between 1994 and May 2019, there was one record of interception of *Acleris* sp. in the Europhyt database, on a consignment of *Cassia fistula* (Fabaceae) plants from Vietnam.

3.4.3. Establishment

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

Yes, many of the host plants of the non-EU *Acleris* spp. are present in the EU, and climatic conditions are locally favourable for pest establishment.

3.4.3.1. EU distribution of main host plants

The two main pest species *A. gloverana* and *A. variana* feed on various coniferous hosts (*Abies*, *Picea*, *Pinus*, etc.). These are distributed throughout the EU territory (Figure 6). Apart from conifers several other plant species (see Section 3.4.1) that are present throughout EU are known hosts for non-EU *Acleris* spp. Therefore, available hosts are present throughout the EU.

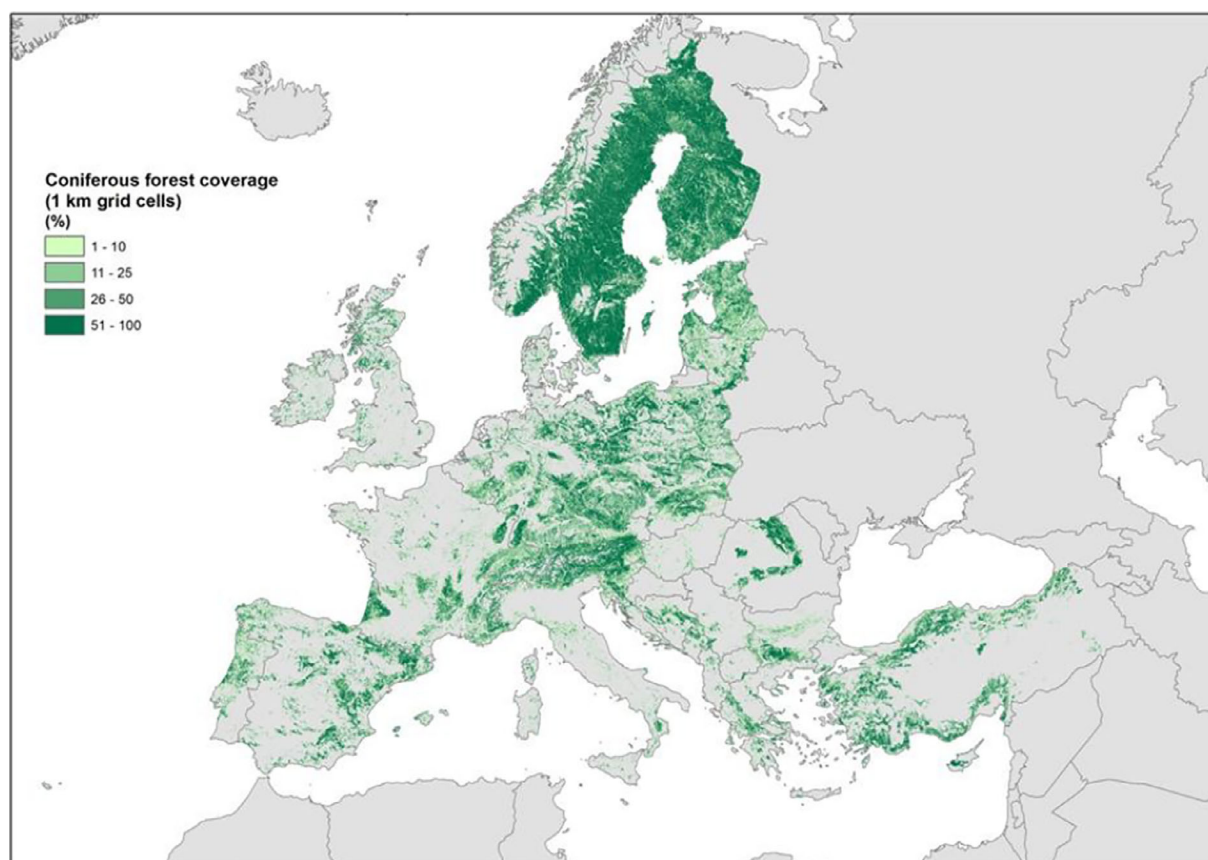


Figure 6: The cover percentage of coniferous forests in Europe with a range of values from 0 to 100 at 1 km resolution (source: Corine Land Cover year 2012 version 18.5 by European Environment Agency)

3.4.3.2. Climatic conditions affecting establishment

Non-EU *Acleris* spp. have a broad distribution in North America and Asia. Climatic categories based on Köppen–Geiger climate classification can be found in these areas that are also present in EU. For instance, Köppen–Geiger climate types Bsk, Cfa, Csa and Dfb which occur in North America also occur in EU. Moreover, the two blackheaded budworm species, *A. gloverana* and *A. variana*, occur in North America with Cfb and Dfb climatic classes that are also found in EU with Cfb being more prevalent in EU than Dfb (MacLeod and Korycinska 2019) suggesting that most of EU is more climatic suitable for *A. gloverana* than for *A. variana*.

3.4.4. Spread

Is the pest able to spread within the EU territory following establishment?

Yes, the pest can fly and can also be transported as eggs or pupae on plants for planting and other commodities (see section 3.4.2)

RNQPs: Is spread mainly via specific plants for planting, rather than via natural spread or via movement of plant products or other objects?

No, the spread is also due to flight and transportation on other commodities than plants for planting.

The literature does not provide any direct information on flight. However, outbreak expansion provides an indirect measure of flight. During the period 1957–1987, the maximal size of an *A. gloverana* outbreak was 27,530 ha, and the maximal size of an *A. variana* outbreak was 115,789 ha (Mattson et al., 1991), suggesting a flight capacity of tens of kilometres, and probably more when the insects are carried by the wind. For comparison, although *Acleris* spp. adults are two or three times smaller than *Choristoneura* spp. adults, *C. fumiferana* could fly a distance of 20 km with a maximum recorded distance of 450 km using prevailing winds (Anderson and Sturtevant, 2011).

In *A. gloverana* at least, the larvae do not disperse by ballooning (Shepherd and Gray, 2001).

3.5. Impacts

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

Yes, there are some non-EU *Acleris* species that are destructive defoliators and pests in their native area

RNQPs: Does the presence of the pest on plants for planting have an economic impact, as regards the intended use of those plants for planting?

Yes, the presence of the pest on plants for planting has an economic impact on its intended use

In the literature, nine non-EU *Acleris* species are reported as pests on various host plants. The eastern and western blackheaded budworm species, *A. gloverana* and *A. variana*, are known destructive pests on coniferous plants in North America with extensive outbreaks occurring in areas of 90,000 ha (Gries et al., 1994; Nealis et al., 2004, Nealis and Turnquist, 2010). Mattson et al. (1991) report an outbreak of *A. gloverana* that expanded over 170,000 ha of *Tsuga heterophylla* in British Columbia between 1996 and 2001. Nearly 70% mortality was observed by Wood and Garbutt (1990) during a survey of young *T. heterophylla* defoliated by *A. gloverana* in the 1970s in British Columbia. *A. minuta* has been reported as significant pest on various host plants, including cultivated ones such as *Malus* sp., *Prunus* sp., *Pyrus* sp. (Gilligan and Epstein, 2012). *Acleris nishidai* is reported as an important pest on *Rubus* sp. in Costa Rica (Brown and Nishida, 2008) and *A. issikii* is reported as a pest on *Salix miyabeana* from Japan (Nakamura and Ohgushi, 2004). *Acleris semipurpurana* is reported as a pest on *Quercus* sp. causing significant tree mortality in the Appalachian region (USDA, 1979). *A. robinsoniana*, *A. senescens* and *A. nivisellana* are also reported as pests (Gilligan and Epstein, 2012).

3.6. Availability and limits of mitigation measures

Are there measures available to prevent the entry into, establishment within or spread of the pest within the EU such that the risk becomes mitigated?

Yes, see sections 3.3 and 3.6.1

RNQPs: Are there measures available to prevent pest presence on plants for planting such that the risk becomes mitigated?

Yes, plants for planting from pest free areas and grown in isolation would mitigate the risk in case the pest entered the EU.

3.6.1. Identification of additional measures

Phytosanitary measures are currently applied to coniferous plants and to several other host plants (see Sections 3.3 and 3.4.2).

3.6.1.1. Additional control measures

Potential additional control measures are listed in Table 4.

Table 4: Selected control measures (a full list is available in EFSA PLH Panel, 2018) for pest entry/establishment/spread/impact in relation to currently unregulated hosts and pathways. Control measures are measures that have a direct effect on pest abundance

Information sheet title (with hyperlink to information sheet if available)	Control measure summary	Risk component (entry/establishment/spread/impact)
Growing plants in isolation	Description of possible exclusion conditions that could be implemented to isolate the crop from pests and if applicable relevant vectors. E.g. a dedicated structure such as glass or plastic greenhouses	Entry/spread
Chemical treatments on consignments or during processing	Use of chemical compounds that may be applied to plants or to plant products after harvest, during process or packaging operations and storage The treatments addressed in this information sheet are: a) fumigation; b) spraying/dipping pesticides; c) surface disinfectants; d) process additives; e) protective compounds	Entry/spread
Roguing and pruning	Roguing is defined as the removal of infested plants and/or uninfested host plants in a delimited area, whereas pruning is defined as the removal of infested plant parts only, without affecting the viability of the plant	Establishment/spread
Chemical treatments on crops including reproductive material	Application of insecticides on nurseries for plants for planting may be considered to reduce the presence of the pest	Entry/spread
Post-entry quarantine and other restrictions of movement in the importing country	This information sheet covers post-entry quarantine of relevant commodities; temporal, spatial and end-use restrictions in the importing country for import of relevant commodities; prohibition of import of relevant commodities into the domestic country Relevant commodities are plants, plant parts and other materials that may carry pests, either as infection, infestation or contamination	Entry/spread

3.6.1.2. Additional supporting measures

Potential additional supporting measures are listed in Table 5.

Table 5: Selected supporting measures (a full list is available in EFSA PLH Panel, 2018) in relation to currently unregulated hosts and pathways. Supporting measures are organisational measures or procedures supporting the choice of appropriate risk reduction options that do not directly affect pest abundance

Information sheet title (with hyperlink to information sheet if available)	Supporting measure summary	Risk component (entry/establishment/spread/impact)
Inspection and trapping	Inspection is defined as the official visual examination of plants, plant products or other regulated articles to determine if pests are present or to determine compliance with phytosanitary regulations (ISPM 5) The effectiveness of sampling and subsequent inspection to detect pests may be enhanced by including trapping and luring techniques	Entry

Information sheet title (with hyperlink to information sheet if available)	Supporting measure summary	Risk component (entry/establishment/spread/impact)
Laboratory testing	Examination, other than visual, to determine if pests are present using official diagnostic protocols. Diagnostic protocols describe the minimum requirements for reliable diagnosis of regulated pests	Entry
Certified and approved premises	Mandatory/voluntary certification/approval of premises is a process including a set of procedures and of actions implemented by producers, conditioners and traders contributing to ensure the phytosanitary compliance of consignments. It can be a part of a larger system maintained by a National Plant Protection Organization in order to guarantee the fulfilment of plant health requirements of plants and plant products intended for trade. Key property of certified or approved premises is the traceability of activities and tasks (and their components) inherent the pursued phytosanitary objective. Traceability aims to provide access to all trustful pieces of information that may help to prove the compliance of consignments with phytosanitary requirements of importing countries	Entry
Delimitation of buffer zones	ISPM 5 defines a buffer zone as 'an area surrounding or adjacent to an area officially delimited for phytosanitary purposes in order to minimise the probability of spread of the target pest into or out of the delimited area, and subject to phytosanitary or other control measures, if appropriate' (ISPM 5). The objectives for delimiting a buffer zone can be to prevent spread from the outbreak area and to maintain a pest-free production place, site or area	Entry/spread
Sampling	According to ISPM 31, it is usually not feasible to inspect entire consignments, so phytosanitary inspection is performed mainly on samples obtained from a consignment. It is noted that the sampling concepts presented in this standard may also apply to other phytosanitary procedures, notably selection of units for testing For inspection, testing and/or surveillance purposes the sample may be taken according to a statistically based or a non-statistical sampling methodology	Entry
Phytosanitary certificate and plant passport	An official paper document or its official electronic equivalent, consistent with the model certificates of the IPPC, attesting that a consignment meets phytosanitary import requirements (ISPM 5) a) export certificate (import) b) plant passport (EU internal trade)	Entry
Surveillance	Pheromone traps and visual inspection	Entry/establishment/spread

3.6.1.3. Biological or technical factors limiting the effectiveness of measures to prevent the entry, establishment and spread of the pest

- Eggs on the leaves or the bark, or pupae in the foliage or the soil, can pass inspection unnoticed.
- The adults probably fly long distance.

3.7. Uncertainty

- The host range of many non-EU *Acleris* spp. is not known
- The impact of many non-EU *Acleris* spp. is not known

4. Conclusions

From the group of 221 non-EU *Acleris* species, nine non-EU species (*A. gloverana*, *A. variana*, *A. minuta*, *A. nishidai*, *A. issikii*, *A. semipurpurana*, *A. robinsoniana*, *A. senescens* and *A. nivisellana*) are consistently reported as pests on various host plants, and meet all criteria assessed by EFSA above for consideration as potential quarantine pests. All non-EU *Acleris* spp. do not meet all criteria assessed by EFSA above for consideration as potential regulated non-quarantine pests as they are not present in the EU.

Table 6 provides a summary of the conclusions of each part of this pest categorisation for the nine species listed above.

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	Panel's conclusions against criterion in Regulation (EU) 2016/2031 regarding Union regulated non-quarantine pest	Key uncertainties
Identity of the pests (Section 3.1)	<i>Acleris</i> is a clearly defined insect genus (Lepidoptera: Tortricidae) and detailed morphological descriptions are available for species identification	<i>Acleris</i> is a clearly defined insect genus (Lepidoptera: Tortricidae) and detailed morphological descriptions are available for species identification	
Absence/presence of the pest in the EU territory (Section 3.2)	Non-EU <i>Acleris</i> spp. are not known to be present in the EU	Non-EU <i>Acleris</i> spp. are not known to be present in the EU	
Regulatory status (Section 3.3)	Non-EU <i>Acleris</i> spp. are listed on Annex IAI of Council Directive 2000/29/EC as <i>Acleris</i> spp (Non-European)	Non-EU <i>Acleris</i> spp. are listed on Annex IAI of Council Directive 2000/29/EC as <i>Acleris</i> spp (Non-European). There are no grounds to consider its status could be revoked	
Pest potential for entry, establishment and spread in the EU territory (Section 3.4)	Non-EU <i>Acleris</i> spp. are able to enter into the EU through plants for planting with soil attached, cut branches, fruits, round wood and bark. Establishment is possible as host plants are available and climatic conditions similar to their native range do occur in the EU. Active dispersal by flight is the main means for spread	Non-EU <i>Acleris</i> spp. mainly spread by active dispersal through adult flight over long distances. Plants for planting are not considered as the main pathway of spread	Dispersal abilities for several species are not known

Criterion of pest categorisation	Panel's conclusions against criterion in Regulation (EU) 2016/2031 regarding Union quarantine pest	Panel's conclusions against criterion in Regulation (EU) 2016/2031 regarding Union regulated non-quarantine pest	Key uncertainties
Potential for consequences in the EU territory (Section 3.5)	There are nine species of non-EU <i>Acleris</i> (<i>A. gloverana</i> , <i>A. variana</i> , <i>A. minuta</i> , <i>A. nishidai</i> , <i>A. issikii</i> , <i>A. semipurpurana</i> , <i>A. robinsoniana</i> , <i>A. senescens</i> and <i>A. nivisellana</i>) that are known as pests in their native area. The introduction of these species could cause economic impact on several forest plants and other crops in the EU. For the remaining 212 species, the potential impact is unknown	The presence of non-EU <i>Acleris</i> on plants for planting would have an economic impact on its intended use	The host plants and potential damaging ability of several species is not known
Available measures (Section 3.6)	There are measures available to prevent entry, establishment and spread of non-EU <i>Acleris</i> spp. in the EU which are described in Council Directive 2000/29/EC and in Section 3.6	There are measures available to prevent pest presence on plants for planting (e.g. plants for planting from pest-free areas and grown in isolation) that could mitigate the risk in case the pest entered the EU	
Conclusion on pest categorisation (Section 4)	Nine non-EU <i>Acleris</i> species, reported as pests on various host plants (<i>A. gloverana</i> , <i>A. variana</i> , <i>A. minuta</i> , <i>A. nishidai</i> , <i>A. issikii</i> , <i>A. semipurpurana</i> , <i>A. robinsoniana</i> , <i>A. senescens</i> and <i>A. nivisellana</i>) meet all criteria assessed by EFSA above for consideration as potential quarantine pests	Non-EU <i>Acleris</i> spp. do not meet all criteria assessed by EFSA above for consideration as potential regulated non-quarantine pests, as they are not present in the EU	
Aspects of assessment to focus on/scenarios to address in future if appropriate	Scarce information on host plants, pests status and climatic suitability of the other 212 non-EU <i>Acleris</i> species		

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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
PZ	Protected Zone
RNQP	regulated non-quarantine pest
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, 1995, 2017)
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)
Eradication (of a pest)	Application of phytosanitary measures to eliminate a pest from an area (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 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, 2017)

Appendix A – List of *Acleris* spp. (221 species) reported outside the EU with information on their host plants

	Species name (species known as pests are in bold)	Occurrence ^(a) (based on Brown et al., 2008)	Host species	Host family	Region/continent
1	<i>A. aenigmata</i>	USA	<i>Hypericum perforatum</i> ; <i>Prunus emarginata</i>	Clusiaceae; Rosaceae	North America
2	<i>A. aestuosa</i>	Japan	<i>Fagus crenata</i>	Fagaceae	Asia
3	<i>A. affinata</i>	China	<i>Quercus acutissima</i> ; <i>Quercus cerris</i> ; <i>Quercus dentata</i> ; <i>Quercus glauca</i> ; <i>Quercus serrata</i> ; <i>Quercus variabilis</i> ; <i>Zelkova schneideriana</i>	Fagaceae; Ulmaceae	Asia
4	<i>A. albicomana</i>	USA	<i>Gaylussacia sp.</i> ; <i>Vaccinium sp.</i> ; <i>Quercus sp.</i> ; <i>Rosa californica</i> ; <i>Rosa sp.</i> ; <i>Rosa californica</i> ; <i>Rosa gymnocarpa</i>	Ericaceae; Fagaceae; Rosaceae	North America
5	<i>A. albinvia</i>	USA			
6	<i>A. albiscapulana</i>	Russia			
7	<i>A. albopterana</i>	China			
8	<i>A. alnivora</i>	Japan	<i>Alnus hirsuta</i> ; <i>Alnus japonica var. rufa</i>	Betulaceae	Asia
9	<i>A. amurensis</i>	Russia	<i>Populus tremula</i>	Salicaceae	Asia
10	<i>A. arcuata</i>	Japan			
11	<i>A. argyrograpta</i>	Vietnam			
12	<i>A. askoldana</i>	Russia	<i>Abelia spathulata</i> ; <i>Deutzia scabra</i> ; <i>Deutzia sp.</i>	Caprifoliaceae; Hydrangeaceae (also Saxifragaceae)	Asia
13	<i>A. atayalicana</i>	Taiwan			
14	<i>A. atomophora</i>	Nepal			
15	<i>A. auricaput</i>	Taiwan			
16	<i>A. aurichalcana</i>	Russia	<i>Tilia japonica</i> ; <i>Tilia tuan</i>	Tiliaceae	Asia
17	<i>A. avicularia</i>	Guatemala			
18	<i>A. bacurana</i>	Libya			
19	<i>A. baleina</i>	Ethiopia			
20	<i>A. bengalica</i>	India, Bengal			
21	<i>A. bicolor</i>	Japan	<i>Viburnum burejaeticum</i> ; <i>Populus sp.</i>	Caprifoliaceae; Salicaceae	Asia
22	<i>A. blanda</i>	Japan			
23	<i>A. bowmanana</i>	Canada	<i>Myrica gale</i> ; <i>Picea engelmannii</i> ; <i>Picea glauca</i> ; <i>Aronia melanocarpa</i> ; <i>Aronia melanocarpa</i> ; <i>Spiraea sp.</i> ; <i>Rubus sp.</i>	Myricaceae; Pinaceae; Rosaceae	North America

	Species name (species known as pests are in bold)	Occurrence^(a) (based on Brown et al., 2008)	Host species	Host family	Region/continent
24	<i>A. braunana</i>	Canada	<i>Alnus incana</i> ; <i>Alnus rubra</i> ; <i>Alnus sp.</i> ; <i>Betula papyrifera</i> ; <i>Betula sp.</i>	Betulaceae	North America
25	<i>A. britannia</i>	Canada	<i>Potentilla sp.</i> ; <i>Rosa sp.</i> ; <i>Rubus occidentalis</i> ; <i>Rubus parviflorus</i> ; <i>Rubus parviflorus</i> ; <i>Rubus ursinus</i>	Rosaceae	North America
26	<i>A. bununa</i>	Taiwan			
27	<i>A. busckana</i>	Canada	<i>Spiraea alba</i> ; <i>Spiraea sp.</i>	Rosaceae	North America
28	<i>A. caerulescens</i>	Japan	<i>Pterocarya rhoifolia</i>	Juglandaceae	Asia
29	<i>A. caliginosana</i>	North America	<i>Alnus incana</i> ; <i>Alnus incana subsp. tenuifolia</i> ; <i>Alnus rubra</i> ; <i>Betula papyrifera</i>	Betulaceae	North America
30	<i>A. cameroonana</i>	Cameroon			
31	<i>A. capizziana</i>	USA			
32	<i>A. caucasica</i>	Georgia			
33	<i>A. celiana</i>	USA	<i>Betula nana</i> ; <i>Betula papyrifera</i> ; <i>Betula sp.</i> ; <i>Prunus virginiana</i> ; <i>Salix sp.</i>	Betulaceae; Rosaceae; Salicaceae	North America
34	<i>A. cervinana</i>	USA	<i>Alnus sp.</i> ; <i>Betula alleghaniensis</i> ; <i>Corylus sp.</i>	Betulaceae	North America
35	<i>A. chalybeana</i>	USA	<i>Acer rubrum</i> ; <i>Acer saccharinum</i> ; <i>Acer sp.</i> ; <i>Acer spicatum</i> ; <i>Betula papyrifera</i> ; <i>Betula sp.</i> ; <i>Corylus sp.</i> ; <i>Fagus sp.</i> ; <i>Quercus rubra</i>	Aceraceae; Betulaceae; Fagaceae	North America
36	<i>A. chionocentra</i>	India			
37	<i>A. chloroma</i>	Uganda			
38	<i>A. clarkei</i>	USA			
39	<i>A. comandrana</i>	USA	<i>Comandra sp.</i> ; <i>Comandra sp.</i>	Santalaceae	North America
40	<i>A. compsoptila</i>	India			
41	<i>A. conchyloides</i>	China	<i>Quercus mongolica</i>	Fagaceae	Asia
42	<i>A. coniferarum</i>	Kazakhstan	<i>Picea sp.</i>	Pinaceae	Asia
43	<i>A. cornana</i>	Canada	<i>Alnus incana</i> ; <i>Cornus canadensis</i> ; <i>Cornus racemosa</i> ; <i>Cornus sericea</i> ; <i>Cornus sericea</i> ; <i>Cornus sp.</i>	Betulaceae; Cornaceae	North America
44	<i>A. crassa</i>	Japan			
45	<i>A. crataegi</i>	Russia			
46	<i>A. cribellata</i>	Russia			

	Species name (species known as pests are in bold)	Occurrence^(a) (based on Brown et al., 2008)	Host species	Host family	Region/continent
47	<i>A. curvalana</i>	USA	<i>Gaylussacia baccata</i> ; <i>Gaylussacia sp.</i> ; <i>Vaccinium angustifolium</i> ; <i>Vaccinium pallidum</i> ; <i>Vaccinium sp.</i> ; <i>Quercus sp.</i> ; <i>Rosa sp.</i>	Ericaceae; Fagaceae; Rosaceae	North America
48	<i>A. dealbata</i>	Japan	<i>Salix sp.</i>	Salicaceae	Asia
49	<i>A. decolorata</i>	India			
50	<i>A. delicata</i>	Japan			
51	<i>A. delicatana</i>	Russia	<i>Carpinus japonica</i> ; <i>Corylus sieboldiana var. mandshurica</i> ; <i>Quercus cerris</i> ; <i>Quercus sp.</i>	Betulaceae; Fagaceae	Asia
52	<i>A. dentata</i>	Japan			
53	<i>A. denticulosa</i>	Nepal			
54	<i>A. diadecta</i>	North Vietnam			
55	<i>A. diaphora</i>	North Vietnam			
56	<i>A. dispar</i>	China			
57	<i>A. dryochyta</i>	China			
58	<i>A. duoloba</i>	North Vietnam			
59	<i>A. duracina</i>	China			
60	<i>A. elaearcha</i>	India			
61	<i>A. elegans</i>	Japan			
62	<i>A. emera</i>	Bolivia			
63	<i>A. enitescens</i>	India	<i>Rubus microphyllus</i> ; <i>Rubus sp.</i>	Rosaceae	Asia
64	<i>A. expressa</i>	Japan	<i>Fraxinus mandshurica</i>	Oleaceae	Asia
65	<i>A. exsucana</i>	Russia	<i>Viburnum opulus var. sargentii</i> ; <i>Deutzia scabra</i>	Caprifoliaceae; Hydrangeaceae	Asia
66	<i>A. extensana</i>	Sri Lanka	<i>Malus sp.</i> ; <i>Malus sylvestris</i> ; <i>Pyrus sp.</i> ; <i>Rosa sp.</i>	Rosaceae	Asia
67	<i>A. extranea</i>	China			
68	<i>A. ferox</i>	China			
69	<i>A. ferrumixtana</i>	Scandinavia			
70	<i>A. filipjevi</i>	Russia			
71	<i>A. fistularis</i>	Nepal			
72	<i>A. flavivittana</i>	USA	<i>Malus pumila</i> ; <i>Prunus pensylvanica</i>	Rosaceae	North America
73	<i>A. flavopterana</i>	China			
74	<i>A. foliana</i>	USA	<i>Cercocarpus betuloides</i> ; <i>Cercocarpus ledifolius</i> ; <i>Cercocarpus montanus</i> ; <i>Cercocarpus montanus</i> ; <i>Cercocarpus sp.</i>	Rosaceae	North America

	Species name (species known as pests are in bold)	Occurrence ^(a) (based on Brown et al., 2008)	Host species	Host family	Region/continent
75	<i>A. forbesana</i>	Canada	<i>Cornus californica</i> ; <i>Cornus sericea</i> subsp. <i>occidentalis</i> ; <i>Cornus</i> <i>sericea</i> subsp. <i>Stolonifera</i> ; <i>Cornus</i> sp.	Cornaceae	North America
76	<i>A. formosae</i>	Taiwan			
77	<i>A. fragariana</i>	USA	<i>Aronia melanocarpa</i> ; <i>Fragaria</i> sp.; <i>Fragaria</i> <i>virginiana</i> ; <i>Myrica gale</i> ; <i>Pouteria</i> sp.; <i>Prunus</i> sp.; <i>Rosa</i> sp.; <i>Rubus</i> sp.	Myricaceae; Sapotaceae	North America
78	<i>A. fuscopterana</i>	China			
79	<i>A. fuscopunctata</i>	China			
80	<i>A. fuscotogata</i>	Japan	<i>Quercus serrata</i> ;	Fagaceae	Asia
81	<i>A. ganeshia</i>	Nepal			
82	<i>A. gatesclarkei</i>	Taiwan			
83	<i>A. gibbopterana</i>	China			
84	<i>A. glaucomis</i>	India			
85	<i>A. gloverana</i> (<i>A. gloveranus</i>)	USA	<i>Abies balsamea</i> ; <i>Abies</i> <i>concolor</i> ; <i>Abies</i> <i>magnifica</i> ; <i>Abies</i> sp.; <i>Larix</i> sp.; <i>Picea</i> <i>sitchensis</i> ; <i>Picea</i> sp.; <i>Pseudotsuga</i> sp.; <i>Pseudotsuga</i> <i>menziesii</i> ; <i>Tsuga</i> <i>heterophylla</i> ; <i>Tsuga</i> sp.	Pinaceae	North America
86	<i>A. gobica</i>	Mongolia			
87	<i>A. gothena</i>	Nepal			
88	<i>A. griseopterana</i>	China			
89	<i>A. hapalactis</i>	India			
90	<i>A. harena</i>	Ethiopia			
91	<i>A. helvolaris</i>	China			
92	<i>A. hispidana</i>	Russia	<i>Quercus mongolica</i>	Fagaceae	Asia
93	<i>A. hohuanshana</i>	Taiwan			
94	<i>A. hokkaidana</i>	Japan			
95	<i>A. hudsoniana</i>	Canada	<i>Alnus</i> sp.; <i>Betula</i> <i>papyrifera</i> ; <i>Picea</i> <i>glauca</i> ; <i>Populus</i> <i>balsamifera</i> ; <i>Populus</i> <i>tremuloides</i> ; <i>Salix</i> sp.	Betulaceae; Pinaceae; Salicaceae	North America
96	<i>A. idonea</i>	Mongolia			
97	<i>A. imitatrix</i>	China			
98	<i>A. inana</i>	USA	<i>Alnus</i> sp.; <i>Betula</i> sp.; <i>Corylus</i> sp.	Betulaceae	North America
99	<i>A. incognita</i>	USA			
100	<i>A. indignana</i>	Russia			
101	<i>A. issikii</i>	Japan	<i>Populus nigra</i> ; <i>Populus</i> <i>sieboldii</i> ; <i>Salix integra</i>	Salicaceae	Asia

	Species name (species known as pests are in bold)	Occurrence^(a) (based on Brown et al., 2008)	Host species	Host family	Region/continent
102	<i>A. japonica</i>	Japan	<i>Zelkova serrata</i>	Ulmaceae	Asia
103	<i>A. kearfottana</i>	Canada	<i>Hamamelis sp.</i> ; <i>Myrica gale</i> ; <i>Myrica sp.</i> ; <i>Comptonia peregrina</i>	Hamamelidaceae; Myricaceae; Myrtaceae	North America
104	<i>A. keiferi</i>	USA	<i>Fragaria sp.</i> ; <i>Rosa californica</i> ; <i>Rubus ursinus</i>	Rosaceae	North America
105	<i>A. kerincina</i>	West Sumatra			
106	<i>A. kinangopana</i>	Kenya			
107	<i>A. klotsi</i>	USA			
108	<i>A. kodamai</i>	Japan	<i>Pinus koraiensis</i>	Pinaceae	Asia
109	<i>A. kuznetzovi</i>	Russia			
110	<i>A. leechi</i>	Japan	<i>Quercus acutissima</i> ; <i>Quercus variabilis</i>	Fagaceae	Asia
111	<i>A. leucophracta</i>	China			
112	<i>A. longipalpana</i>	Russia			
113	<i>A. loxoscia</i>	Sri Lanka			
114	<i>A. lucipara</i>	India			
115	<i>A. lucipeta</i>	India			
116	<i>A. luoyingensis</i>	Taiwan			
117	<i>A. lutescentis</i>	China			
118	<i>A. macdunnoughi</i>	USA	<i>Rubus sp.</i> ; <i>Salix sp.</i> ; <i>Spiraea alba</i> ; <i>Vaccinium sp.</i>	Ericaceae; Rosaceae; Salicaceae	North America
119	<i>A. macropterana</i>	China			
120	<i>A. maculidorsana</i>	USA	<i>Chamaedaphne calyculata</i> ; <i>Hypericum perforatum</i> ; <i>Hypericum perforatum</i> ; <i>Hypericum sp.</i> ; <i>Kalmia sp.</i> ; <i>Vaccinium sp.</i>	Clusiaceae; Ericaceae	North America
121	<i>A. maculopterana</i>	China			
122	<i>A. malagassana</i>	Madagascar			
123	<i>A. matthewsi</i>	Peru			
124	<i>A. maximana</i>	Canada	<i>Malus pumila</i> ; <i>Malus sp.</i> ; <i>Populus balsamifera</i> ; <i>Populus fremontii</i> ; <i>Populus sp.</i> ; <i>Populus tremula L.</i> ; <i>Populus tremuloides</i> ; <i>Prunus emarginata</i> ; <i>Salix sp.</i>	Rosaceae; Salicaceae	North America
125	<i>A. medea</i>	Nepal			
126	<i>A. micropterana</i>	China			

	Species name (species known as pests are in bold)	Occurrence ^(a) (based on Brown et al., 2008)	Host species	Host family	Region/continent
127	A. minuta	USA	<i>Calluna sp.</i> ; <i>Kalmia angustifolia</i> ; <i>Kalmia sp.</i> ; <i>Malus pumila</i> ; <i>Malus sp.</i> ; <i>Myrica gale</i> ; <i>Prunus sp.</i> ; <i>Pyrus sp.</i> ; <i>Salix sp.</i> ; <i>Vaccinium macrocarpon</i> ; <i>Vaccinium sp.</i>	Ericaceae; Myricaceae; Rosaceae; Salicaceae	North America
128	<i>A. monagma</i>	Nepal			
129	<i>A. mundana</i>	Russia			
130	<i>A. nakajimai</i>	Taiwan			
131	<i>A. napaea</i>	India, European Russia			
132	<i>A. nectaritis</i>	India			
133	<i>A. negundana</i>	USA	<i>Acer sp.</i> ; <i>Acer negundo</i>	Aceraceae	North America
134	<i>A. nigriradix</i>	Russia			
135	<i>A. nigrolinea</i>	Canada, Ontario			
136	<i>A. nigropterana</i>	China			
137	A. nishidai	Costa Rica	<i>Rubus eriocarpus</i> , <i>R. vulcanicola</i> , <i>R. praecipuus</i> ; <i>Rubus</i> spp.	Rosaceae	
138	A. nivisellana	USA	<i>Crataegus sp.</i> ; <i>Malus pumila</i> ; <i>Malus sp.</i> ; <i>Physocarpus malvaceus</i> ; <i>Prunus pensylvanica</i> ; <i>Sorbus scopulina</i> ; <i>Sorbus sp.</i>	Rosaceae	North America
139	<i>A. obligatoria</i>	South Korea			
140	<i>A. ochropicta</i>	China			
141	<i>A. ochropterana</i>	China			
142	<i>A. okanagana</i>	Canada			
143	<i>A. ophthalmicana</i>	Japan			
144	<i>A. orphnocycla</i>	China	<i>Chamaedaphne calyculata</i> (L.) Moench; <i>Chamaedaphne calyculata</i> (L.) Moench; <i>Malus pumila</i> Mill.; <i>Malus sp.</i> ; <i>Prunus pumila</i> L.; <i>Rosa sp.</i>	Ericaceae; Rosaceae	Asia; North America
145	<i>A. osthelderi</i>	Syria			
146	<i>A. oxycoccana</i>	USA			
147	<i>A. pallidorbis</i>	Nepal			
148	<i>A. paracinderella</i>	USA	<i>Betula sp.</i> ; <i>Prunus dumosa</i> ; <i>Prunus fremontii</i> ; <i>Prunus virginiana</i>	Betulaceae; Rosaceae	North America
149	<i>A. paradiseana</i>	Japan	<i>Malus pumila</i> ; <i>Sorbus sambucifolia</i>	Rosaceae	Asia

	Species name (species known as pests are in bold)	Occurrence ^(a) (based on Brown et al., 2008)	Host species	Host family	Region/continent
150	<i>A. perfundana</i>	Russia, Asia	<i>Quercus mongolica</i> ; <i>Quercus serrata</i> ; <i>Zelkova schneideriana</i> ; <i>Zelkova serrata</i>	Fagaceae; Ulmaceae	Non-EU Europe; Asia
151	<i>A. phalera</i>	Russia			
152	<i>A. phanero crypta</i>	Madagascar			
153	<i>A. phantastica</i>	Japan			
154	<i>A. phyllosocia</i>	Vietnam			
155	<i>A. placata</i>	India			
156	<i>A. placidana</i>	USA			
157	<i>A. placidus</i>	Japan			
158	<i>A. platynotana</i>	Japan	<i>Ilex pedunculosa</i> ; <i>Lyonia ovalifolia</i> ; <i>Quercus glauca</i> ; <i>Rhododendron kaempferi</i> ; <i>Rhododendron molle</i>	Aquifoliaceae; Ericaceae; Fagaceae	Asia
159	<i>A. porphyrocentra</i>	China			
160	<i>A. potosiana</i>	Mexico			
161	<i>A. praeterita</i>	South Korea			
162	<i>A. proximana</i>	China			
163	<i>A. ptychogrammos</i>	USA	<i>Cornus sericea</i>	Cornaceae	North America
164	<i>A. pulchella</i>	Japan			
165	<i>A. pulcherrima</i>	Taiwan			
166	<i>A. quadridentana</i>	China			
167	<i>A. rantaizana</i>	Taiwan			
168	<i>A. razowskii</i>	Japan			
169	<i>A. reclusa</i>	China			
170	<i>A. retrusa</i>	Mexico	<i>Rubus sp.</i>	Rosaceae	North America
171	<i>A. robinsoniana</i>	USA	<i>Populus tremuloides</i> ; <i>Rosa californica</i>	Rosaceae; Salicaceae	North America
172	<i>A. rosella</i>	China	<i>Rosa acicularis var. taquetii</i>	Rosaceae	Asia
173	<i>A. roxana</i>	Japan			
174	<i>A. rubi</i>	South Africa	<i>Rubus rigidus</i>	Rosaceae	Africa
175	<i>A. rubrivorella</i>	Kazakhstan			
176	<i>A. ruwenzorica</i>	Uganda, Congo			
177	<i>A. sagarmathae</i>	Nepal			
178	<i>A. sagmatias</i>	Sri Lanka			
179	<i>A. salicicola</i>	Russia			
180	<i>A. santacrucis</i>	USA			
181	<i>A. schisma</i>	Thailand			
182	<i>A. semiannula</i>	USA	<i>Acer rubrum</i> ; <i>Acer saccharinum</i> ; <i>Acer sp.</i> ; <i>Quercus alba</i>	Aceraceae; Fagaceae	North America

	Species name (species known as pests are in bold)	Occurrence ^(a) (based on Brown et al., 2008)	Host species	Host family	Region/continent
183	A. semipurpurana	USA	<i>Quercus alba</i> ; <i>Quercus coccinea</i> ; <i>Quercus palustris</i> ; <i>Quercus rubra</i> ; <i>Quercus</i> sp.; <i>Quercus velutina</i> ; <i>Rosa</i> sp.	Fagaceae; Rosaceae	North America
184	<i>A. semitexta</i>	India			
185	A. senescens	Canada	<i>Alnus rubra</i> ; <i>Betula</i> sp.; <i>Malus</i> sp.; <i>Populus tremuloides</i> ; <i>Prunus virginiana</i> ; <i>Salix hookeriana</i> ; <i>Salix lasiolepis</i> ; <i>Salix</i> sp.	Betulaceae; Rosaceae; Salicaceae	North America
186	<i>A. similis</i>	Russia			
187	<i>A. simpliciana</i>	USA			
188	<i>A. sinica</i>	China			
189	<i>A. sinuoptera</i>	China			
190	<i>A. sinuosaria</i>	China			
191	<i>A. sordidata</i>	Afghanistan			
192	<i>A. stachi</i>	Central Asia			
193	<i>A. stadiana</i>	Canada	<i>Alnus</i> sp.; <i>Betula alleghaniensis</i> ; <i>Betula papyrifera</i> ; <i>Betula populifolia</i> ; <i>Betula</i> sp.	Betulaceae	North America
194	<i>A. stibiana</i>	Russia			
195	<i>A. strigifera</i>	Russia			
196	<i>A. submaccana</i>	Russia	<i>Alnus japonica</i> var. <i>rufa</i> ; <i>Alnus maximowiczii</i> ; <i>Betula platyphylla</i> ; <i>Betula</i> sp.; <i>Duchesnea indica</i> ; <i>Populus</i> sp.; <i>Rhododendron sinsii</i> ; <i>Ribes</i> sp.; <i>Salix koreensis</i> ; <i>Vaccinium vitis-idaea</i> ; <i>Viburnum dilatatum</i>	Betulaceae; Caprifoliaceae; Ericaceae; Grossulariaceae (or Saxifragaceae); Rosaceae; Salicaceae	Asia
197	<i>A. subnivana</i>	Canada	<i>Vernonia</i> sp.; <i>Quercus rubra</i> ; <i>Quercus</i> sp.	Asteraceae; Fagaceae	North America
198	<i>A. auriga</i>	Western New Guinea			
199	<i>A. supernova</i>	Ecuador			
200	<i>A. tabida</i>	China			
201	<i>A. taiwana</i>	Taiwan			
202	<i>A. takeuchii</i>	Japan			
203	<i>A. thiana</i>	China			
204	<i>A. thomasi</i>	India			
205	<i>A. thylactis</i>	Kenya			
206	<i>A. tibetica</i>	Tibet			
207	<i>A. tigricolor</i>	Japan	<i>Sorbus alnifolia</i>	Rosaceae	Asia
208	<i>A. tremewani</i>	Myanmar			

	Species name (species known as pests are in bold)	Occurrence ^(a) (based on Brown et al., 2008)	Host species	Host family	Region/continent
209	<i>A. trujilloana</i>	Venezuela			
210	<i>A. tsuifengana</i>	Taiwan			
211	<i>A. tungurahuae</i>	Ecuador			
212	<i>A. tunicatana</i>	Japan			
213	<i>A. ulmicola</i>	China	<i>Hemiptelea davidii</i> ; <i>Ulmus davidiana</i> ; <i>Ulmus davidiana</i> var. <i>japonica</i> ; <i>Ulmus</i> <i>pumilla</i> ; <i>Ulmus</i> sp.	Ulmaceae	Asia
214	<i>A. uniformis</i>	Russia			
215	<i>A. variana</i>	USA	<i>Abies alba</i> ; <i>Abies</i> <i>amabilis</i> ; <i>Abies</i> <i>balsamea</i> ; <i>Abies</i> <i>grandis</i> ; <i>Abies</i> <i>lasiocarpa</i> ; <i>Abies</i> sp.; <i>Larix occidentalis</i> ; <i>Larix</i> sp.; <i>Picea abies</i> ; <i>Picea engelmannii</i> ; <i>Picea engelmannii</i> ; <i>Picea glauca</i> ; <i>Picea</i> <i>mariana</i> ; <i>Picea</i> <i>pungens</i> ; <i>Picea</i> <i>rubens</i> ; <i>Picea</i> <i>sitchensis</i> ; <i>Picea</i> sp.; <i>Pinus contorta</i> ; <i>Populus balsamifera</i> ; <i>Pseudotsuga</i> <i>menziesii</i> ; <i>Pseudotsuga</i> <i>menziesii</i> ; <i>Pseudotsuga</i> sp.; <i>Thuja plicata</i> ; <i>Tsuga</i> <i>canadensis</i> ; <i>Tsuga</i> <i>heterophylla</i> ; <i>Tsuga</i> <i>mertensiana</i>	Cupressaceae; Pinaceae; Salicaceae	North America
216	<i>A. venatana</i>	Taiwan			
217	<i>A. yasudai</i>	Japan	<i>Enkianthus</i> <i>campanulatus</i> ; <i>Enkianthus</i> <i>campanulatus</i> var. <i>sikokianus</i>	Ericaceae	Asia
218	<i>A. yasutoshii</i>	Taiwan			
219	<i>A. youngana</i>	Canada			
220	<i>A. zeta</i>	China			
221	<i>A. zimmermani</i>	Hawaiian Islands	<i>Rubus</i> sp.; <i>Rubus</i> <i>vitifolius</i>	Rosaceae	North America; Pacific Islands

NB – No information was found on host plants for 151 species in the table above.

(a): The actual distribution of the species may differ from what is reported here as this table is based only on Brown et al. (2008).

Appendix B – List of *Acleris* spp. reported from the EU

This table is based on Brown et al. (2008) and the Fauna Europaea database.

No.	Species	Distribution in the EU	Distribution in non-EU Europe
1.	<i>Acleris abietana</i>	UK, Austria, Belgium, Czech Republic, Italy, Hungary, Germany, France, Denmark, Lithuania, Poland, Romania Slovakia Slovenia The Netherlands	European Russia, Switzerland
2.	<i>Acleris arcticana</i>	Finland, Sweden	Norway
3.	<i>Acleris aspersana</i>	Bulgaria, Croatia, Estonia, Finland, Ireland, Latvia, Sweden, The Netherlands, UK, Austria, Belgium, Czech Republic, Italy, Hungary, Germany, France, Denmark	European Russia, Liechtenstein, Norway, Switzerland
4.	<i>Acleris bergmanniana</i>	Austria, Belgium, UK, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany Hungary Ireland, Italy, Latvia, Lithuania, Luxembourg, Poland, Romania, Slovakia, Slovenia, Spain, Netherlands, Sweden	Albania, Bosnia and Herzegovina, European Russia, North Macedonia, Norway, Switzerland, Ukraine
5.	<i>Acleris boscanoides</i>	Bulgaria, Croatia, Greece	European Turkey, North Macedonia, Ukraine
6.	<i>Acleris caledoniana</i>	UK, Ireland, Poland	
7.	<i>Acleris comariana</i>	Austria, Belgium, UK, Bulgaria, Czech Republic, Denmark, Estonia, Finland, France, Germany, Ireland, Italy, Latvia, Lithuania, Luxembourg, Poland, Slovakia, Spain, Netherlands, Sweden	European Russia, Norway, Switzerland
8.	<i>Acleris cristana</i>	Austria, Belgium, UK, Bulgaria, Czech Republic, Denmark, Estonia, Finland, France, Germany, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Poland, Romania, Slovakia, Slovenia, Spain, Netherlands, Sweden	European Russia, Norway, Switzerland, Ukraine
9.	<i>Acleris effractana</i>	UK, Denmark, Germany, Poland, Finland, Lithuania, Poland, Estonia, Sweden	Liechtenstein, Norway
10.	<i>Acleris emargana</i>	Austria, Belgium, UK, Bulgaria, Czech Republic, Denmark, Estonia, Finland, France, Germany, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Poland, Romania, Slovakia, Slovenia, Spain, Netherlands, Sweden	European Russia, Liechtenstein, Norway, Switzerland
11.	<i>Acleris ferrugana</i>	Austria, Belgium, UK, Czech Republic, Denmark, Estonia, Finland, France, Germany, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Netherlands, Sweden	European Russia, Norway, Switzerland, Ukraine
12.	<i>Acleris fimbriana</i>	Denmark, Estonia, Finland, France, Germany, Hungary, Italy, Latvia, Lithuania, Poland, Romania, Slovakia, Sweden	European Russia, Norway, Ukraine
13.	<i>Acleris forsskaleana</i>	Austria, Belgium, UK, Bulgaria, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Poland, Romania, Slovakia, Slovenia, Spain, Netherlands, Sweden	Albania, European Russia, Liechtenstein, North Macedonia, Norway, Switzerland, Ukraine
14.	<i>Acleris hastiana</i>	Austria, Belgium, UK, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Poland, Portugal, Slovakia, Slovenia, Spain, Netherlands, Sweden	Bosnia and Herzegovina, European Russia, North Macedonia, Norway, Switzerland, Ukraine
15.	<i>Acleris hippophaeana</i>	Austria, Belgium, France, Germany, Italy, Romania, Slovakia	European Russia, Switzerland

No.	Species	Distribution in the EU	Distribution in non-EU Europe
16.	<i>Acleris holmiana</i>	Austria, Belgium, Bulgaria Czech Republic, Denmark, Estonia, Finland, France, Germany, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Poland, Slovakia, Slovenia, Spain, Netherlands, Sweden	Albania, Bosnia and Herzegovina, European Russia, North Macedonia, Norway, Switzerland
17.	<i>Acleris hyemana</i>	Austria, Belgium, UK, Czech Republic, Denmark, Estonia, Finland, France, Germany, Ireland, Italy, Latvia, Lithuania, Poland, Slovakia, Spain, Netherlands, Sweden	European Russia, Norway, Switzerland
18.	<i>Acleris implexana</i>	Finland, Sweden	European Russia, Norway
19.	<i>Acleris kochiella</i>	Austria, Belgium, UK, Czech Republic, Denmark, Estonia, France, Germany, Hungary, Italy, Latvia, Poland, Romania, Slovakia, Slovenia, Spain, Netherlands, Sweden	Bosnia and Herzegovina, European Russia, Switzerland, Ukraine
20.	<i>Acleris lacordairana</i>	Austria, Estonia, Germany, Hungary, Italy, Latvia, Poland	European Russia, Switzerland
21.	<i>Acleris laterana</i>	Austria, Belgium, UK, Bulgaria, Czech Republic, Denmark, Estonia, Finland, France, Germany, Ireland, Italy, Latvia, Lithuania, Luxembourg, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden	European Russia, Norway, Switzerland, Ukraine
22.	<i>Acleris lipsiana</i>	Austria, Belgium, UK, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Italy, Latvia, Lithuania, Poland, Romania, Slovakia, Spain, Netherlands, Sweden	European Russia, Norway, Switzerland
23.	<i>Acleris literana</i>	Austria, Belgium, UK, Bulgaria, Czech Republic, Denmark, Estonia, Finland, France, Germany, Hungary, Ireland, Italy, Latvia, Luxembourg, Poland, Romania, Slovakia, Slovenia, Spain, Netherlands, Sweden	Albania, European Russia, North Macedonia, Norway, Switzerland, Ukraine
24.	<i>Acleris logiana</i>	Austria, Belgium, UK, Czech Republic, Denmark, Estonia, Finland, France, Germany, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Poland, Romania, Slovakia, Slovenia, Spain, Netherlands, Sweden	European Russia, Norway, Switzerland
25.	<i>Acleris lorquiniana</i>	Austria, Belgium, UK, Bulgaria, Czech Republic, Denmark, Estonia, Finland, France, Germany, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, Netherlands, Sweden	European Russia, Liechtenstein, Switzerland
26.	<i>Acleris maccana</i>	Austria, UK, Czech Republic, Denmark, Estonia, Finland, France, Germany, Latvia, Lithuania, Poland, Slovakia, Slovenia, Sweden	European Russia, Norway, Switzerland
27.	<i>Acleris notana</i>	Austria, Belgium, UK, Bulgaria, Czech Republic, Denmark, Estonia, Finland, France, Germany, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Poland, Romania, Slovakia, Slovenia, Spain, Netherlands, Sweden	European Russia, Norway, Switzerland, Ukraine
28.	<i>Acleris obtusana</i>	Estonia, Finland, Latvia, Sweden	Norway
29.	<i>Acleris permutana</i>	Austria, Belgium, Croatia, UK, Czech Republic, Denmark, France, Germany, Hungary, Italy, Luxembourg, Portugal, Romania, Slovakia, Slovenia, Spain, Netherlands, Sweden	European Russia, North Macedonia
30.	<i>Acleris quercinana</i>	Austria, Belgium, Bulgaria, Czech Republic, Denmark, France, Germany, Greece, Hungary, Italy, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Netherlands, Sweden	Albania, Bosnia and Herzegovina, North Macedonia, Switzerland, Ukraine

No.	Species	Distribution in the EU	Distribution in non-EU Europe
31.	<i>Acleris rhombana</i>	Austria, Belgium, UK, Bulgaria, Czech Republic, Denmark, Estonia, Finland, France, Germany, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Netherlands, Sweden	Bosnia and Herzegovina, European Russia, European Turkey, North Macedonia, Norway, Switzerland, Ukraine
32.	<i>Acleris roscidana</i>	Austria, Czech Republic, Estonia, Finland, France, Germany, Hungary, Italy, Latvia, Lithuania, Poland, Romania, Slovakia, Sweden	European Russia, Norway, Switzerland, Ukraine
33.	<i>Acleris rufana</i>	Austria, Belgium, UK, Bulgaria, Czech Republic, Denmark, Estonia, Finland, France, Germany, Hungary, Ireland, Italy, Latvia, Lithuania, Poland, Romania, Slovakia, Slovenia, Spain, Netherlands, Sweden	European Russia, Norway, Switzerland
34.	<i>Acleris scabrana</i>	Austria, Belgium, Czech Republic, Finland, France, Germany, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, Netherlands	European Russia, Switzerland, Ukraine
35.	<i>Acleris schalleriana</i>	Austria, Belgium, UK, Czech Republic, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Netherlands, Sweden	Bosnia and Herzegovina, European Russia, North Macedonia, Norway, Switzerland, Ukraine
36.	<i>Acleris shepherdana</i>	Austria, Belgium, UK, Czech Republic, Denmark, Estonia, Finland, France, Germany, Hungary, Italy, Lithuania, Luxembourg, Poland, Slovakia, Netherlands, Sweden	European Russia, Norway, Switzerland
37.	<i>Acleris sparsana</i>	Austria, Belgium, UK, Czech Republic, Denmark, Estonia, Finland, France, Germany, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Norway, Poland, Romania, Slovakia, Slovenia, Spain, Netherlands, Sweden	European Russia, Liechtenstein, North Macedonia, Norway, Switzerland
38.	<i>Acleris umbrana</i>	Austria, Belgium, UK, Czech Republic, Denmark, Estonia, Finland, France, Germany, Hungary, Italy, Latvia, Lithuania, Poland, Romania, Slovakia, Sweden	European Russia, Norway, Switzerland
39.	<i>Acleris undulana</i>	Cyprus, Spain	
40.	<i>Acleris variegana</i>	Austria, Belgium, UK, Bulgaria, Czech Republic, Cyprus, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Netherlands, Sweden	Albania, Bosnia and Herzegovina, European Russia, North Macedonia, Norway, Switzerland, Ukraine