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Characterisation of fruit trees in the EU: a tool for crop-based survey of Union quarantine pests

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Abstract

This technical report was prepared in the context of the EFSA mandate on plant pest surveillance (M-2020-0114) at the request of the European Commission. Its purpose is to support Member States in planning and preparing crop-based surveys of Union quarantine pests in line with Commission Implementing Regulation (EU) 2019/2072. In particular, the report includes a list of species reported as hosts of the regulated pests targeted by the call: GP/EFSA/PLANTS/2022/05 – 'Development of crop-based survey tools for plant pests of fruit trees, conifers, and palms and ornamentals in the EU' – Lot 1. Additionally, a classification of their occurrence in the EU is provided. The report provides basic information regarding the cultivation in the EU of 19 species of fruit trees widely cultivated in the EU, hosting at least one pest of the call in the families of the Ebenaceae, i.e. persimmon (*Diospyros kaki* L. f.); Ericaceae, i.e. bilberry (*Vaccinium myrtillus* L.), high-bush blueberry (*Vaccinium corymbosum*); Lythraceae, i.e. pomegranate (*Punica granatum* L.); Moraceae, i.e. silkworm mulberry (*Morus alba*), fig (*Ficus carica* L.); Rosaceae, i.e. apple (*Malus domestica* Borkh.), pear (*Pyrus communis* L.), quince (*Cydonia oblonga* Mill.), plum (*Prunus domestica*), almond (*Prunus dulcis* Miller D.A. Webb.), apricot (*Prunus armeniaca* L.), sour cherry (*Prunus cerasus*), peach (*Prunus persica* (L.) Batsch), sweet cherry (*Prunus avium* L.), Japanese plum (*Prunus salicina* Lindl.), loquat (*Eriobotrya japonica* (Thunb.) Lindl.); Rutaceae, i.e. bitter orange (*Citrus × aurantium* L.); and Vitaceae, i.e. grape (*Vitis vinifera*). For the selection of cultivated fruit-tree species, information on the main phenological stages, management practices, agroecosystems, climate suitability and distribution, regulatory requirements and trade of key commodities are provided.

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Keywords: crop-based surveillance, crop characterisation, fruit trees, pest detection, plant pest, Union quarantine pests

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1 Introduction

The scope of this report is to characterise fruit trees within the EU that are hosts of the Union quarantine pests specified in Lot 1 of the call GP/EFSA/PLANTS/2022/05, titled 'Development of crop-based survey tools for plant pests of fruit trees, conifers, palms, and ornamentals in the EU' (as listed in Table 1). From all the potential hosts of these pests, a selection of fruit trees widely cultivated in the EU was made. The report covers the following species: *Malus domestica*, *Pyrus communis*, *Cydonia oblonga*, *Prunus domestica*, *Prunus dulcis*, *Prunus armeniaca*, *Prunus cerasus*, *Prunus persica*, *Prunus avium*, *Prunus salicina*, *Eriobotrya japonica*, *Punica granatum*, *Morus alba*, *Ficus carica*, *Diospyros kaki*, *Vitis vinifera*, *Citrus × aurantium*, *Vaccinium myrtillus*, and *Vaccinium corymbosum*. This crop report details their presence in the EU and provides a comprehensive overview including phenology, cultivation practices, agroecosystems, climate suitability and distribution, trade and import of key commodities, and phytosanitary regulation.

Table 1: List of Union quarantine pests that are the subject of grant GP/EFSA/PLANTS/2022/05 'Development of crop-based survey tools for plants – LOT 1: pests of fruit trees'

#	Scientific name	Taxonomical category	EPPO code
1	<i>Acrobasis pirivorella</i> (Matsumura)	Insect	[NUMOPI]
2	<i>Anthonomus quadrigibbus</i> Say	Insect	[TACYQU]
3	<i>Apiosporina morbosa</i> (Schwein.) Arx	Fungus	[DIBOMO]
4	<i>Apriona</i> spp.	Insect	
	a. <i>Apriona cinerea</i>		[APRICI]
	b. <i>Apriona germari</i>		[APRIGE]
	c. <i>Apriona rugicollis</i>		[APRIJA]
5	<i>Botryosphaeria kuwatsukai</i> (Hara) G. Y. Sun and E. Tanaka	Fungus	[PHYOPI]
6	<i>Carposina sasakii</i> Matsumara	Insect	[CARSSA]
7	<i>Grapholita</i> spp.	Insect	
	a. <i>Grapholita inopinata</i> (Heinrich)		[CYDIIN]
	b. <i>Grapholita packardi</i> Zeller		[LASPPA]
	c. <i>Grapholita prunivora</i> (Walsh)		[LASPPR]
8	<i>Gymnosporangium</i> spp. (except: <i>Gymnosporangium amelanchieris</i> E. Fisch. ex F. Kern [GYMNAM], <i>Gymnosporangium atlanticum</i> Guyot and Malençon [GYMNAT], <i>Gymnosporangium clavariiforme</i> (Wulfen) DC [GYMNCF], <i>Gymnosporangium confusum</i> Plowr. [GYMNCO], <i>Gymnosporangium cornutum</i> Arthur ex F. Kern [GYMNCR], <i>Gymnosporangium cornutum</i> Arthur ex F. Kern [GYMNCR], <i>Gymnosporangium fusisporum</i> E. Fisch [GYMNFS], <i>Gymnosporangium gaeumannii</i> H. Zogg [GYMNGA], <i>Gymnosporangium gracile</i> Pat. [GYMNGR], <i>Gymnosporangium minus</i> Crowell [GYMNMI], <i>Gymnosporangium orientale</i> P. Syd. and Syd. [GYMNOR], <i>Gymnosporangium sabiniae</i> (Dicks.) G. Winter [GYMNFU], <i>Gymnosporangium torminali-juniperini</i> E. Fisch. [GYMNTJ], <i>Gymnosporangium tremelloides</i> R. Harting [GYMNTR])	Fungus	[1GYMNG]
9	<i>Longidorus diadecturus</i> Eveleigh and Allen	Nematode	[LONGDI]
10	<i>Phyllosticta solitaria</i> Ellis and Everhart	Fungus	[PHYSSL]
11	<i>Saperda candida</i> Fabricius	Insect	[SAPECN]
12	<i>Venturia nashicola</i> S. Tanaka and S. Yamamoto	Fungus	[VENTNA]
13	<i>Xiphinema</i> spp.	Nematode	
	a. <i>Xiphinema americanum</i> Cobb <i>sensu stricto</i>		[XIPHAA]
	b. <i>Xiphinema bricolense</i> Ebsary, Vrain and Graham		[XIPHBC]
	c. <i>Xiphinema inaequale</i> Khan et Ahmad		[XIPHNA]

2 Plant species

In total, 159 species are reported as hosts for at least one of the targeted pests (Table 2). The presence of these host plants in Europe is determined based on information from Euro+Med (online), which includes curated data on plant species occurrence in Europe derived from sources such as Flora Europaea, Med-Checklist, Flora of Macaronesia, as well as regional and national floras and checklists. This information is complemented by data from the EPPO Global Database (online), GBIF (online), and relevant scientific literature.

Each species has been assigned a type of occurrence, categorised into five distinct groups: cultivated (C), invasive (I), introduced-ornamental (IO), native (N), and virtually absent (VA). The category 'C' refers to species that are commonly cultivated in the EU. These species are not necessarily native to the area where they are cultivated. 'I' denotes species that are not native to the area and have been introduced, whether intentionally or accidentally, and are characterised by their ability to establish, proliferate, and spread aggressively outside often to the detriment of native species and ecosystems. 'IO' species are those brought into an area primarily for ornamental purposes. This category includes garden shrubs and trees, such as bonsai, which are typically cultivated in controlled environments like gardens and parks. 'N' describes species that occur naturally in a region, ecosystem, or habitat. 'VA' refers to species that are rarely found or have a very limited presence in the EU; specimens of these species are typically found in botanical gardens, private collections, etc.

From all the plants potentially being host of one of the pests specified in Table 1, 19 cultivated fruit crops were retained. Species present in the EU in other categories (I, IO, N, VA) or cultivated (C) but not being a fruit crop were not retained for further analysis.

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Table 2: List of fruit-tree species associated with the pests specified in the call (C: cultivated; I: invasive; IO: introduced-ornamental; N: native; VA: virtually absent)

Host plant	Family	Occurrence	Pest
<i>Chenopodium quinoa</i> ¹	Chenopodiaceae	C	<i>Longidorus diadecturus</i>
<i>Cucumis sativus</i>	Cucurbitaceae	C	<i>Longidorus diadecturus</i>
<i>Diospyros kaki</i> ^{2,A}	Ebenaceae	C	<i>Apriona germari</i> , <i>A. rugicollis</i>
<i>Vaccinium corymbosum</i> ²	Ericaceae	C	<i>Grapholita packardi</i>
<i>Vaccinium myrtillus</i> ^{2,B}	Ericaceae	C	<i>Grapholita packardi</i> , <i>Longidorus diadecturus</i>
<i>Vaccinium macrocarpon</i> ²	Ericaceae	C	<i>Grapholita packardi</i>
<i>Juglans regia</i> ²	Juglandaceae	C	<i>Apriona germari</i>
<i>Punica granatum</i> ^{2,C}	Lythraceae	C	<i>Carposina sasakii</i> , <i>Apriona germari</i> , <i>A. rugicollis</i>
<i>Broussonetia papyrifera</i> ²	Moraceae	C	<i>Apriona germari</i>
<i>Ficus carica</i> ^{2,D}	Moraceae	C	<i>Apriona cinerea</i> , <i>A. germari</i> , <i>A. rugicollis</i>
<i>Morus alba</i> ^{2,E}	Moraceae	C	<i>Apriona germari</i> , <i>A. rugicollis</i>
<i>Moringa oleifera</i> ¹	Moringaceae	C	<i>Apriona cinerea</i>
<i>Cydonia oblonga</i> ^{2,F}	Rosaceae	C	<i>Anthonomus quadrigibbus</i> , <i>Botryosphaeria kuwatsukai</i> , <i>Carposina sasakii</i> , <i>Grapholita inopinata</i> , <i>G. packardi</i> , <i>G. prunivora</i> , <i>Gymnosporangium asiaticum</i> , <i>G. clavipes</i> , <i>Saperda candida</i>
<i>Eriobotrya japonica</i> ^{2,G}	Rosaceae	C	<i>Apriona germari</i> , <i>A. rugicollis</i> , <i>Grapholita inopinata</i>
<i>Malus domestica</i> ^{2,H}	Rosaceae	C	<i>Anthonomus quadrigibbus</i> , <i>Apriona cinerea</i> , <i>A. germari</i> , <i>A. rugicollis</i> , <i>Botryosphaeria kuwatsukai</i> , <i>Carposina sasakii</i> , <i>Grapholita packardi</i> , <i>G.</i>

^A GBIF (Global Biodiversity Information Facility) occurrence *Diospyros kaki*. Available online: <https://doi.org/10.15468/dl.vmjji3> [Accessed: 15 August 2023]

^B GBIF (Global Biodiversity Information Facility) occurrence *Vaccinium myrtillus*. Available online: <https://doi.org/10.15468/dl.fb92nd> [Accessed: 15 August 2023]

^C GBIF (Global Biodiversity Information Facility) occurrence *Punica granatum*. Available online: <https://doi.org/10.15468/dl.5ah98e> [Accessed: 15 August 2023]

^D GBIF (Global Biodiversity Information Facility) occurrence *Ficus carica*. Available online: <https://doi.org/10.15468/dl.k8ps5v> [Accessed: 15 August 2023]

^E GBIF (Global Biodiversity Information Facility) occurrence *Morus alba*. Available online: <https://doi.org/10.15468/dl.mujiemb> [Accessed: 15 August 2023]

^F GBIF (Global Biodiversity Information Facility) occurrence *Cydonia oblonga*. Available online: <https://doi.org/10.15468/dl.y9fac4> [Accessed: 15 August 2023]

^G GBIF (Global Biodiversity Information Facility) occurrence *Eriobotrya japonicum*. Available online: <https://doi.org/10.15468/dl.cszuwc> [Accessed: 15 August 2023]

^H GBIF (Global Biodiversity Information Facility) occurrence *Malus domestica*. Available online: <https://doi.org/10.15468/dl.d8yevz> [Accessed: 15 August 2023]

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			<i>prunivora</i> , <i>G. inopinata</i> , <i>Gymnosporangium asiaticum</i> , <i>G. clavipes</i> , <i>G. globosum</i> , <i>G. yamadae</i> , <i>Phyllosticta solitaria</i> , <i>Saperda candida</i>
<i>Malus pumila</i> (syn. <i>M. domestica</i>) ¹	Rosaceae	C	<i>Gymnosporangium clavipes</i> , <i>G. juniperi-viginianae</i> , <i>G. yamadae</i>
<i>Malus spectabilis</i> syn. of <i>M. domestica</i> var. <i>spectabilis</i> ¹	Rosaceae	C	<i>Carposina sasakii</i> , <i>Grapholita inopinata</i> , <i>Gymnosporangium asiaticum</i>
<i>Prunus armeniaca</i> ^{2,1}	Rosaceae	C	<i>Carposina sasakii</i> , <i>Apiosporina morbosa</i>
<i>Prunus avium</i> ^{2,1}	Rosaceae	C	<i>Apiosporina morbosa</i> , <i>Grapholita packardi</i> , <i>G. prunivora</i> , <i>Saperda candida</i>
<i>Prunus cerasus</i> ^{2,K}	Rosaceae	C	<i>Anthonomus quadrigibbus</i> , <i>Apiosporina morbosa</i> , <i>Grapholita packardi</i>
<i>Prunus domestica</i> ^{2,1}	Rosaceae	C	<i>Apiosporina morbosa</i> , <i>Carposina sasakii</i> , <i>Grapholita prunivora</i> , <i>Saperda candida</i>
<i>Prunus dulcis</i> ^{2,M}	Rosaceae	C	<i>Carposina sasakii</i>
<i>Prunus persica</i> ^{2,N}	Rosaceae	C	<i>Apiosporina morbosa</i> , <i>Apriona cinerea</i> , <i>Carposina sasakii</i> , <i>Grapholita packardi</i> , <i>G. prunivora</i> , <i>Saperda candida</i>
<i>Prunus pseudocerasus</i> ²	Rosaceae	C	<i>Apriona germari</i>
<i>Pyrus communis</i> ^{2,O}	Rosaceae	C	<i>Acrobasis pirivorella</i> , <i>Anthonomus quadrigibbus</i> , <i>Apriona cinerea</i> , <i>Botryosphaeria kuwatsukai</i> , <i>Carposina sasakii</i> , <i>Grapholita inopinata</i> , <i>G. packardi</i> , <i>Gymnosporangium asiaticum</i> , <i>G. clavipes</i> , <i>Saperda candida</i>
<i>Pyrus pyrifolia</i> ³	Rosaceae	C	<i>Acrobasis pirivorella</i> , <i>Apriona germari</i> , <i>Botryosphaeria kuwatsukai</i> , <i>Carposina sasakii</i> , <i>Grapholita inopinata</i> , <i>Gymnosporangium asiaticum</i> , <i>Venturia nashicola</i>
<i>Sorbus aucuparia</i> ²	Rosaceae	C	<i>Carposina sasakii</i>

¹ GBIF (Global Biodiversity Information Facility) occurrence *Prunus armeniaca*. Available online: <https://doi.org/10.15468/dl.ss27fj> [Accessed: 15 August 2023]

² GBIF (Global Biodiversity Information Facility) occurrence *Prunus avium*. Available online: <https://doi.org/10.15468/dl.kgtbvd> [Accessed: 15 August 2023]

^K GBIF (Global Biodiversity Information Facility) occurrence *Prunus cerasus*. Available online: <https://doi.org/10.15468/dl.gw5qfz> [Accessed: 15 August 2023]

^L GBIF (Global Biodiversity Information Facility) occurrence *Prunus domestica*. Available online: <https://doi.org/10.15468/dl.sm984s> [Accessed: 15 August 2023]

^M GBIF (Global Biodiversity Information Facility) occurrence *Prunus dulcis*. Available online: <https://doi.org/10.15468/dl.uaa9kf> [Accessed: 15 August 2023]

^N GBIF (Global Biodiversity Information Facility) occurrence *Prunus persica*. Available online: <https://doi.org/10.15468/dl.yw9m9r> [Accessed: 15 August 2023]

^O GBIF (Global Biodiversity Information Facility) occurrence *Pyrus communis*. Available online: <https://doi.org/10.15468/dl.i4qk6x> [Accessed: 15 August 2023]



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<i>Citrus × aurantium</i> ^{2,P}	Rutaceae	C	<i>Apriona germari</i>
<i>Populus × canadensis</i> ²	Salicaceae	C	<i>Apriona germari</i> , <i>A. rugicollis</i>
<i>Populus deltoides</i> ²	Salicaceae	C	<i>Apriona cinerea</i>
<i>Populus tomentosa</i> ²	Salicaceae	C	<i>Apriona germari</i> , <i>A. rugicollis</i>
<i>Petunia × hybrida</i>	Solanaceae	C	<i>Longidorus diadecturus</i>
<i>Vitis labrusca</i> ²	Vitaceae	C	<i>Longidorus diadecturus</i>
<i>Vitis vinifera</i> ^{2,Q}	Vitaceae	C	<i>Xiphinema americanum sensu stricto</i> , <i>X. bricolense</i> , <i>X. inaequale</i>
<i>Prunus salicina</i> ¹	Rosaceae	C	<i>Apiosporina morbosa</i> , <i>Carposina sasakii</i> , <i>Grapholita inopinata</i>
<i>Cornus sericea</i> ²	Cornaceae	I	<i>Anthonomus quadrigibbus</i>
<i>Crataegus crus-galli</i> ²	Rosaceae	I	<i>Anthonomus quadrigibbus</i>
<i>Prunus serotina</i> ²	Rosaceae	I	<i>Anthonomus quadrigibbus</i> , <i>Apiosporina morbosa</i> , <i>Grapholita packardi</i>
<i>Robinia pseudoacacia</i> ²	Fabaceae	I	<i>Apriona germari</i> , <i>A. rugicollis</i>
<i>Celtis sinensis</i> ^{1,4}	Cannabaceae	IO	<i>Apriona germari</i> , <i>A. rugicollis</i>
<i>Cunninghamia lanceolata</i> ⁴	Cupressaceae	IO	<i>Apriona germari</i>
<i>Juniperus chinensis</i> ²	Cupressaceae	IO	<i>Gymnosporangium asiaticum</i> , <i>Gymnosporangium yamadae</i>
<i>Juniperus virginiana</i> ²	Cupressaceae	IO	<i>Gymnosporangium asiaticum</i> , <i>G. clavipes</i> , <i>G. juniperi-viginiana</i> , <i>G. globosum</i>
<i>Styphnolobium japonicum</i> ⁴	Fabaceae	IO	<i>Apriona germari</i>
<i>Firmiana simplex</i> ⁴	Malvaceae	IO	<i>Apriona germari</i>
<i>Melia azedarach</i> ²	Meliaceae	IO	<i>Apriona germari</i>
<i>Fagus crenata</i> ⁴	Moraceae	IO	<i>Apriona rugicollis</i>
<i>Ficus hispida</i> ⁴	Moraceae	IO	<i>Apriona germari</i>
<i>Ficus retusa</i> ⁴	Moraceae	IO	<i>Apriona germari</i>
<i>Morus indica</i> ¹	Moraceae	IO	<i>Apriona cinerea</i> , <i>A. germari</i> , <i>A. rugicollis</i>
<i>Paulownia spp.</i> ²	Paulowniaceae	IO	<i>Apriona germari</i>
<i>Amelanchier alnifolia</i> ²	Rosaceae	IO	<i>Anthonomus quadrigibbus</i> , <i>Saperda candida</i>
<i>Amelanchier arborea</i> ²	Rosaceae	IO	<i>Anthonomus quadrigibbus</i>
<i>Amelanchier canadensis</i> ²	Rosaceae	IO	<i>Anthonomus quadrigibbus</i> , <i>Saperda candida</i>
<i>Amelanchier laevis</i> ²	Rosaceae	IO	<i>Saperda candida</i>
<i>Borkhausenia intermedia</i> ¹	Rosaceae	IO	<i>Saperda candida</i>

^P GBIF (Global Biodiversity Information Facility) occurrence *Citrus aurantium*. Available online: <https://doi.org/10.15468/dl.wa82dp> [Accessed: 15 August 2023]

^Q GBIF (Global Biodiversity Information Facility) occurrence *Vitis vinifera*. Available online: <https://doi.org/10.15468/dl.qb6kee> [Accessed: 15 August 2023]



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<i>Chaenomeles japonica</i> ¹	Rosaceae	IO	<i>Botryosphaeria kuwatsukai</i> , <i>Carposina sasakii</i> , <i>Grapholita inopinata</i> , <i>Gymnosporangium asiaticum</i>
<i>Chaenomeles lagenaria</i> ²	Rosaceae	IO	<i>Carposina sasakii</i> , <i>Gymnosporangium asiaticum</i>
<i>Crataegus mollis</i> ¹	Rosaceae	IO	<i>Anthonomus quadrigibbus</i>
<i>Crataegus punctata</i> ¹	Rosaceae	IO	<i>Anthonomus quadrigibbus</i>
<i>Malus × micromalus</i> ⁵	Rosaceae	IO	<i>Gymnosporangium yamadae</i> , <i>Carposina sasakii</i> , <i>Botryosphaeria kuwatsukai</i>
<i>Malus baccata</i> ⁴	Rosaceae	IO	<i>Apriona germari</i> , <i>Grapholita inopinata</i> , <i>Gymnosporangium yamadae</i> , <i>Phyllosticta solitaria</i>
<i>Malus toringo</i> ⁴	Rosaceae	IO	<i>Carposina sasakii</i> , <i>Grapholita inopinata</i> , <i>G. asiaticum</i> , <i>G. yamadae</i>
<i>Prunus tomentosa</i> ⁴	Rosaceae	IO	<i>Apiosporina morbosa</i>
<i>Prunus virginiana</i> ¹	Rosaceae	IO	<i>Anthonomus quadrigibbus</i> , <i>Apiosporina morbosa</i> , <i>Grapholita packardi</i>
<i>Pseudocdonia sinensis</i> ⁴	Rosaceae	IO	<i>Carposina sasakii</i> , <i>Gymnosporangium asiaticum</i>
<i>Pyrus betulifolia</i> ⁴	Rosaceae	IO	<i>Gymnosporangium asiaticum</i> , <i>Venturia nashicola</i>
<i>Pyrus calleryana</i> ⁴	Rosaceae	IO	<i>Gymnosporangium asiaticum</i> , <i>G. clavipes</i> , <i>Venturia nashicola</i>
<i>Pyrus ussuriensis</i> ¹	Rosaceae	IO	<i>Acrobasis pirivorella</i> , <i>Grapholita inopinata</i> , <i>Gymnosporangium asiaticum</i> , <i>Venturia nashicola</i>
<i>Salix babylonica</i> ²	Salicaceae	IO	<i>Apriona germari</i> , <i>A. rugicollis</i>
<i>Ulmus americana</i> ¹	Ulmaceae	IO	<i>Longidorus diadecturus</i>
<i>Ulmus pumila</i> ¹	Ulmaceae	IO	<i>Apriona germari</i>
<i>Zelkova serrata</i> ²	Ulmaceae	IO	<i>Apriona rugicollis</i>
<i>Sorbus americana</i> ⁴	Rosaceae	IO	<i>Saperda candida</i>
<i>Cornus mas</i> ²	Cornaceae	N	<i>Carposina sasakii</i>
<i>Juniperus communis</i> ²	Cupressaceae	N	<i>Gymnosporangium clavipes</i>
<i>Juniperus excelsa</i> ²	Cupressaceae	N	<i>Gymnosporangium asiaticum</i>
<i>Juniperus sabina</i> ²	Cupressaceae	N	<i>Gymnosporangium asiaticum</i>
<i>Platycarya strobilacea</i> ¹	Juglandaceae	N	<i>Apriona germari</i>
<i>Maclura pomifera</i> ¹	Moraceae	N	<i>Apriona cinerea</i>
<i>Crataegus spp.</i> ²	Rosaceae	N	<i>Apriona rugicollis</i>
<i>Malus sylvestris</i> ²	Rosaceae	N	<i>Phyllosticta solitaria</i>
<i>Prunus mahaleb</i> ²	Rosaceae	N	<i>Apiosporina morbosa</i>
<i>Prunus padus</i> ²	Rosaceae	N	<i>Apiosporina morbosa</i>



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<i>Pyrus serrulate</i> (syn. <i>Sorbus domestica</i>) ²	Rosaceae	N	<i>Gymnosporangium asiaticum</i>
<i>Rubus</i> spp. ²	Rosaceae	N	<i>Apriona germari</i>
<i>Populus alba</i> ²	Salicaceae	N	<i>Apriona cinerea</i>
<i>Populus nigra</i> var. <i>italica</i> ²	Salicaceae	N	<i>Apriona germari</i>
<i>Populus nigra</i> ²	Salicaceae	N	<i>Apriona cinerea</i>
<i>Salix gracilistyla</i> ¹	Salicaceae	N	<i>Apriona germari</i>
<i>Acer negundo</i> ²	Spindaceae	N	<i>Longidorus diadecturus</i>
<i>Ulmus</i>	Ulmaceae	N	<i>Apriona germari</i>
<i>Populus alba</i> ²	Salicaceae	N	<i>Apriona germari</i>
<i>Cupressus duclouxiana</i> ⁴	Cupressaceae	VA	<i>Gymnosporangium asiaticum</i>
<i>Juniperus procumbens</i> ⁴	Cupressaceae	VA	<i>Gymnosporangium asiaticum</i> , <i>G. yamadae</i>
<i>Juniperus scopulorum</i>	Cupressaceae	VA	<i>Gymnosporangium asiaticum</i>
<i>Juniperus squamata</i> ¹	Cupressaceae	VA	<i>Gymnosporangium asiaticum</i>
<i>Juniperus tibetica</i> ¹	Cupressaceae	VA	<i>Gymnosporangium asiaticum</i>
<i>Enkianthus perulatus</i> ⁴	Ericaceae	VA	<i>Apriona rugicollis</i>
<i>Triadica sebifera</i> ¹	Euphorbiaceae	VA	<i>Apriona germari</i>
<i>Vernicia fordii</i> ¹	Euphorbiaceae	VA	<i>Apriona germari</i>
<i>Cajanus cajan</i> ²	Fabaceae	VA	<i>Apriona germari</i>
<i>Cercis canadensis</i> ²	Fabaceae	VA	<i>Longidorus diadecturus</i>
<i>Quercus acuta</i> ¹	Fagaceae	VA	<i>Apriona germari</i>
<i>Juglans mandshurica</i> ¹	Juglandaceae	VA	<i>Apriona germari</i>
<i>Pterocarya stenoptera</i> ¹	Jungladaceae	VA	<i>Apriona germari</i>
<i>Cinnamomum camphora</i> ¹	Lauraceae	VA	<i>Apriona germari</i>
<i>Lagerstroemia indica</i> ¹	Lythraceae	VA	<i>Apriona germari</i>
<i>Bombax ceiba</i> ¹	Malvaceae	VA	<i>Apriona germari</i>
<i>Artocarpus heterophyllus</i> ²	Moraceae	VA	<i>Apriona germari</i>
<i>Artocarpus integer</i> ²	Moraceae	VA	<i>Apriona germari</i>
<i>Broussonetia kazinoki</i> ²	Moraceae	VA	<i>Apriona germari</i>
<i>Morus macroura</i> ⁴	Moraceae	VA	<i>Apriona germari</i>
<i>Pinus massoniana</i> ⁴	Pinaceae	VA	<i>Apriona germari</i>
<i>Pinus yunnanensis</i> ⁴	Pinaceae	VA	<i>Apriona germari</i>
<i>Ziziphus jujuba</i> ²	Rhamnaceae	VA	<i>Carposina sasakii</i>
<i>Ziziphus mauritania</i> ²	Rhamnaceae	VA	<i>Apriona cinerea</i> , <i>Carposina sasakii</i>
<i>Aronia arbutifolia</i> ²	Rosaceae	VA	<i>Carposina sasakii</i> , <i>Saperda candida</i>
<i>Chaenomeles × superba</i> ²	Rosaceae	VA	<i>Gymnosporangium asiaticum</i>
<i>Chaenomeles cathayensis</i> ²	Rosaceae	VA	<i>Gymnosporangium asiaticum</i>
<i>Crataegus cuneata</i> ²	Rosaceae	VA	<i>Carposina sasakii</i> , <i>Gymnosporangium asiaticum</i> , <i>Grapholita inopinata</i>
<i>Crataegus gracilior</i> ⁴	Rosaceae	VA	<i>Gymnosporangium globosum</i>



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<i>Crataegus holmesiana</i> ²	Rosaceae	VA	<i>Anthonomus quadrigibbus</i> , <i>Grapholita prunivora</i>
<i>Crataegus macrosperma</i> ⁴	Rosaceae	VA	<i>Anthonomus quadrigibbus</i>
<i>Crataegus marshalii</i> ⁴	Rosaceae	VA	<i>Gymnosporangium clavipes</i>
<i>Crataegus mexicana</i> ¹	Rosaceae	VA	<i>Grapholita packardi</i> , <i>G. prunivora</i> , <i>Gymnosporangium globosum</i>
<i>Crataegus phaenopyrum</i> ²	Rosaceae	VA	<i>Apriona germari</i>
<i>Crataegus pinnatifida</i> ¹	Rosaceae	VA	<i>Carposina sasakii</i> , <i>Gymnosporangium asiaticum</i>
<i>Crataegus uniglora</i> ⁴	Rosaceae	VA	<i>Gymnosporangium clavipes</i>
<i>Crataegus wilsonii</i> ⁴	Rosaceae	VA	<i>Gymnosporangium asiaticum</i>
<i>Malus angustifolia</i> ⁴	Rosaceae	VA	<i>Phyllosticta solitaria</i>
<i>Malus asiatica</i> ¹	Rosaceae	VA	<i>Apriona germari</i> , <i>Gymnosporangium asiaticum</i>
<i>Malus coronaria</i> ¹	Rosaceae	VA	<i>Anthonomus quadrigibbus</i> , <i>Phyllosticta solitaria</i> , <i>Saperda candida</i>
<i>Malus halliana</i> ¹	Rosaceae	VA	<i>Gymnosporangium yamadae</i>
<i>Malus ioensis</i> ⁴	Rosaceae	VA	<i>Gymnosporangium asiaticum</i>
<i>Malus manshurica</i> ⁴	Rosaceae	VA	<i>Grapholita inopinata</i> , <i>Gymnosporangium yamadae</i>
<i>Malus prunifolia</i> ¹	Rosaceae	VA	<i>Carposina sasakii</i> , <i>Grapholita inopinata</i> , <i>G. asiaticum</i> , <i>G. yamadae</i>
<i>Pourthiaea villosa</i> ¹	Rosaceae	VA	<i>Gymnosporangium asiaticum</i>
<i>Prunus americana</i> ¹	Rosaceae	VA	<i>Apiosporina morbosa</i>
<i>Prunus davidiana</i> ¹	Rosaceae	VA	<i>Grapholita inopinata</i>
<i>Prunus emarginata</i> ¹	Rosaceae	VA	<i>Anthonomus quadrigibbus</i> , <i>Apiosporina morbosa</i>
<i>Prunus japonica</i> ⁴	Rosaceae	VA	<i>Grapholita inopinata</i>
<i>Prunus mume</i> ⁴	Rosaceae	VA	<i>Carposina sasakii</i>
<i>Prunus nigra</i> ⁴	Rosaceae	VA	<i>Apiosporina morbosa</i>
<i>Prunus pensylvanica</i> ¹	Rosaceae	VA	<i>Anthonomus quadrigibbus</i> , <i>Apiosporina morbosa</i>
<i>Prunus pumila</i> ⁴	Rosaceae	VA	<i>Apiosporina morbosa</i>
<i>Pyrus bretschneideri</i> ⁴	Rosaceae	VA	<i>Carposina sasakii</i> , <i>Gymnosporangium asiaticum</i> , <i>Venturia nashicola</i>
<i>Pyrus fauriei</i> ⁴	Rosaceae	VA	<i>Gymnosporangium asiaticum</i>
<i>Pyrus lindleyi</i> ⁴	Rosaceae	VA	<i>Gymnosporangium asiaticum</i>
<i>Citrus unshiu</i> ¹	Rutaceae	VA	<i>Apriona germari</i>
<i>Populus × generosa</i> ¹	Salicaceae	VA	<i>Apriona cinerea</i>
<i>Populus ciliata</i> ⁴	Salicaceae	VA	<i>Apriona cinerea</i>
<i>Populus maximowiczii</i> ¹	Salicaceae	VA	<i>Apriona germari</i>



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<i>Populus yunnanensis</i> ¹	Salicaceae	VA	<i>Apriona cinerea</i>
<i>Salix tetrasperma</i> ¹	Salicaceae	VA	<i>Apriona germari</i>
<i>Camellia oleifera</i> ¹	Theaceae	VA	<i>Apriona germari</i>
<i>Schima superba</i> ⁴	Theaceae	VA	<i>Apriona germari</i>
<i>Debregeasia saeneb</i> ⁴	Urticaceae	VA	<i>Apriona cinerea</i>

References: ¹EPPO, online; ²EURO+MED, online; ³Kaim et al., 2006; ⁴GBIF, online; ⁵Wang et al., 2019.



3 Phenology

Crop phenology (i.e. timing of life cycle events) plays a critical role in phytosanitary management and surveys, as it provides a framework for understanding and predicting key developmental stages where the crops are most vulnerable to pests and diseases or when certain symptoms and signs of pest presence can be detected. Timely monitoring of these stages allows for the strategic application of phytosanitary measures and the application of risk-based surveys. The phenology of fruit trees varies widely depending on the specific climatic and environmental conditions of the different regions or areas where crops are cultivated in the Member States. These regional and local particularities pose a challenge in generalising the precise phenology for any particular fruit crop across all situations. However, there are some general periods or seasons, where particular phenological stages occur (Table 3). Phenological stages have been grouped at family level where LsD: Leaf senescence – Dormancy; Do: Dormancy; Bb: bud breaking; Bs: Bud swell; Le: Leaf emergence; Fl: flowering; Fs: fruit-set; Fg: fruit growth; Ri: ripening; Ha: harvest; Fg: fig development; Sb: start of bloom; Fb: full bloom; Ma: maturation, FmV: fruit maturation – veraison; *: perennial.

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Table 3: Phenology of selected fruit-tree species. Phenological stages have been grouped at family level where LsD: Leaf senescence – Dormancy; Do: Dormancy; Bb: bud breaking; Bs: Bud swell; Le: Leaf emergence; Fl: flowering; Fs: fruit-set; Fg: fruit growth; Ri: ripening; Ha: harvest; Fg: fig development; Sb: start of bloom; Fb: full bloom; Ma: maturation, FmV: fruit maturation – veraison; *: perennial

Tree species	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Family Ebenaceae												
<i>Diospyros kaki</i> ^{*,1,2}	Ha	Bb	Bb	Fl, Fs	Fl, Fs, Fd	Fd	Fd	Fd	Fd	Ha	Ha	Ha
¹ García-Carbonell et al., 2002; ² Kluge and Tessmer, 2018.												
Family Ericaceae												
<i>Vaccinium corymbosum</i> ¹	LsD	LsD	Bs	Bs, Le, Fl	Le, Fl	Fd	Fd, Ri, Ha	Fd, Ri, Ha	Ri, Ha		LsD	LsD
<i>Vaccinium myrtillus</i> ²	LsD	LsD	LsD	Bs	Bs, Le, Fl	Le Fl, Fd	Fd, Ri, Ha	Fd, Ri, Ha	Ri, Ha		LsD	LsD
¹ Selås et al., 2015; ² Nestby et al., 2011.												
Family Lithraceae												
<i>Punica granatum</i> ¹	LsD		Bb	Bb	Fl, Fs	Fl, Fs, Fd	Fd	Fd	Fd, Ma	Ma, Ha	LsD, Ma, Ha	LsD, Ha
¹ Melgarejo et al., 1997												
Family Moraceae												
<i>Ficus carica</i> ^{X,1,2,3}	Do	Do	Bs	Bs, Bb, Le	Le	Fd	Fd	Fd, Ri, Ha	Fd, Ri, Ha	Ri, Ha		Do
<i>Morus alba</i> ^{4,5}	LsD	LsD	Bs	Bs, Bb, Le, Fl	Le, Fl, Fs	Fs	Fg, Ha	Fg, Ha			LsD	LsD

^X The common fig is a gynodioecious species with two sexual forms: male trees (caprifigs) that produce syconia with separate male and female flowers, and female trees that produce syconia with only female flowers that will develop into edible figs. Since only male trees produce pollen, the common fig is functionally a dioecious species. Three types of female figs can be distinguished: the common type, the Smyrna and the San Pedro. The common type produces fruits parthenocarpically without pollination and can be of two types: unifera varieties that produce only one crop in the summer/fall (figs) and bifera varieties that produce two crops (*brevas* in late spring and figs in summer/fall). The Smyrna type requires pollination

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with pollen from caprifigs to produce fruits. The San Pedro type produces a first crop (brebas) parthenocarpically and a second main crop (figs) after pollination with pollen from caprifigs. Male trees flower in spring and summer, while female trees flower in spring (Ikegami et al., 2022).

¹Nuzzo et al., 2022; ²Flaishman et al., 2008; ³Giraldo et al., 2010; ⁴Duke, 2001; ⁵Mo et al., 2022.

Family Rosaceae

Maloideae

<i>Cydonia oblonga</i> ^{1,2}	LsD	LsD	Bs	Bs, Bb, Le	Le, Fl	Fl, Fs	Fs, Fg	Fg,	Fg, Ha	Ha	Ha, LsD	LsD
<i>Eriobotrya japonica</i> ³	Fs, Fg	Fs, Fg, Ha	Fs, Fg, Ha	Ha, Fg	Ha	Ha			Bs	Bb, Fl	Fl	Fl, Fs
<i>Malus domestica</i> ^{4,5,6}	LsD	LsD	Bs	Bs, Bb, Le	Le, Fl	Fl, Fs	Fs	Fg, Ha	Fg, Ha	Ha	LsD	LsD
<i>Pyrus communis</i> ⁷	LsD	LsD	Bs	Bs, Bb, Le	Le, Fl	Fl, Fs	Fs, Fg	Fg, Ha	Fg, Ha	Ha	LsD	LsD

¹Martínez-Valero et al., 2001; ²Bell and Leitão, 2010; ³Martínez-Calvo et al., 1999; ⁴Boechel et al., 2022; ⁵Davies et al., 2022; ⁶OECD, 2022;

⁷Wertheim, 2002.

Prunoideae

<i>Prunus armeniaca</i> ¹	LsD	LsD, Fl	Bs, Fl	Bs, Bb, Le, Fl, Fs	Le, Fs, Fg, Ha	Fs, Fg, Ha	Fs, Fg, Ha	Fg, Ha			LsD	LsD
<i>Prunus avium</i> ^{1,2}	LsD	LsD	Bs, Fl	Bs, Bb, Le, Fl, Fs	Le, Fl, Fs, Fg, Ha	Fs, Fg, Ha	Fg, Ha					LsD
<i>Prunus cerasus</i> ^{1,2,3}	LsD	LsD	Bs	Bs, Bb, Le, Fl	Le, Fl, Fs	Fs, Fg, Ha	Fg, Ha					LsD
<i>Prunus domestica</i> ^{1,4}	LsD	LsD	Bs, Fl	Bs, Bb, Le, Fl	Le, Fs	Fs	Fs, Fg, Ha	Fg, Ha	Fg, Ha	LsD	LsD	LsD

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<i>Prunus dulcis</i> ^{1,5}	LsD, Fl	LsD, Fl	Bs, Fl, Fs	Bs, Bb, Le, Fs	Le, Fs	Fs, Fg	Fg	Ha	Ha	LsD, Ha	LsD, Ha	LsD
<i>Prunus persica</i> ^{1,6}	LsD	LsD	Bs, Fl, Fs	Bs, Bb, Le, Fl, Fs	Le, Fg, Ha	Fg, Ha	Fg, Ha	Ha				LsD
<i>Prunus salicina</i> ^{1,7}	LsD	LsD	Bs, Fl	Bs, Bb, Le, Fl	Le, Fs	Fs, Fg, Ha	Fg, Ha	Fg, Ha				LsD

¹Fadón et al., 2020; ²Dondini et al., 2008; ³Song et al., 2008; ⁴Rodrigo and Guerra, 2014; ⁵El Yamani et al., 2019; ⁶Penso et al., 2020; ⁷Webster, 1996.

Family Rutaceae

<i>Citrus × aurantium</i> ^{*,1,2,3}	Ha	Ha	Sb	Sb, Fb	Fd, Ma	Fd, Ma	Fd, Ma	Fd, Ma	Fd, Ma			Ha
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¹Dugo et al., 2002; ²Agusti et al., 2020; ³Pardo et al., 2020.

Family Vitaceae

<i>Vitis vinifera</i> ^{1,2,3}	LsD	LsD		Bb	Bb, Fl	Fl, Fs	Fs, Fd	Fd, FmV, Ha	FmV, Ha	Ha		LsD
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¹Lorenz et al., 1995; ²García de Cortázar-Atauri, 2009; ³Piña-Rey et al., 2021.

4 Cultivation practices (Crop Management)

Effective management of horticultural practices is crucial from a phytosanitary perspective. It is not only relevant for the cultivation of the crop, but also allows the timely detection and control of pests. Activities such as field preparation, grafting, fertilisation, pruning, and harvesting are scheduled throughout the year and can help to plan interventions and surveys. Regular monitoring during these management activities is key for early pest detection. Crop management depends on the specific environmental conditions and cultural practices of the Member States. These regional and local particularities make it difficult to generalise cultivation practices for any fruit crop across all situations. However, there are some general practices that can be generally applied to different fruit-tree species (Table 4). The cultivation cycles of *Vaccinium myrtillus* (bilberry) and *Morus alba* (white mulberry) have been excluded. This is because these species are traditionally either found in semi-wild states or have been cultivated primarily for sericulture, the practice of rearing silkworms for silk production, particularly for *M. alba*. For detailed information on the management and phenology of individual fruit crops, it is advisable to consult specific references for each fruit crop.

Table 4: Overview of cultivation practices for fruit trees in the EU, i.e. *Vaccinium corymbosum*, *Punica granatum*, *Ficus carica*, *Cydonia oblonga*, *Eriobotrya japonica*, *Malus domestica*, *Pyrus communis*, *Prunus armeniaca*, *P. avium*, *P. cerasus*, *P. domestica*, *P. dulcis*, *P. persica*, *P. salicina*, *Citrus × aurantium*, and *Vitis vinifera*. Information for different fruit-tree species has been grouped at family level

Family Ericaceae

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
<i>Vaccinium corymbosum</i>												
Field preparation												
Fertilisation												
Pruning												
Harvest												

Family Lithraceae

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
<i>Punica granatum</i> ¹												
Field preparation												
Scion selection												
Grafting												
Fertilisation												
Pruning												
Harvest												

¹Melgarejo et al., 1997.

Family Moraceae

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
<i>Ficus carica</i> ^{1,2}												
Field preparation												
Scion selection												
Grafting												
Fertilisation												



5 Agroecosystems and main uses

Agroecosystems represent the diverse agricultural environments where crops may occur (Table 5), and different pest management is implemented. Five different agroecosystems have been identified to address the types of agroecosystems in which the cultivated fruits crops present in the EU could be present. These agroecosystems are either protected; greenhouses and nurseries; open nurseries and orchards; naturalised; or urban environments. The type of agroecosystem may influence the presence and behaviour of pests and hence, surveillance strategies. For instance, open fields may have different pest pressures compared to urban gardens, and therefore management practices and surveys must be tailored accordingly.

For some fruit crops, cultivation and management strategies may vary according to the final destination, use, and quality of the produce (Minas et al., 2018; Musacchi and Serra, 2018; Sidu et al., 2022; Pereyra et al., 2022; Reynolds, 2022; Verma et al., 2023). These management variations may also need to be considered for pest surveillance.

Table 5: Types of agroecosystems relevant for the cultivated fruit crops

	Protected, greenhouses and nurseries	Open nurseries and orchards	Naturalised	Urban environments
Ebenaceae				
<i>Diospyros kaki</i>	Rarely	Yes	No	Yes
Ericaceae				
<i>Vaccinium corymbosum</i>	Yes	Yes	Yes	Yes ^a
<i>Vaccinium myrtillus</i> ¹	Yes	Yes	No	Yes
Lithraceae				
<i>Punica granatum</i>	Rarely	Yes	Yes	Yes
Moraceae				
<i>Ficus carica</i> ^{2,3}	Rarely	Yes	Yes	Yes ^a
<i>Morus alba</i> ⁴	Rarely	Yes	Yes	Yes
Rosaceae				
Subfamily Maloideae				
<i>Cydonia oblonga</i> ³	Rarely	Yes	Yes	Yes
<i>Eriobotrya japonica</i>	Rarely	Yes	No	Yes ^a
<i>Malus domestica</i> ^{2,3,5,6}	Rarely	Yes	Yes	Yes ^a
<i>Pyrus communis</i> ^{2,3,5,6}	Rarely	Yes	Yes	Yes ^a
Subfamily Prunoideae				
<i>Prunus armeniaca</i>	Rarely	Yes	Yes	Yes
<i>Prunus avium</i>	Rarely	Yes	Yes	Yes ^a
<i>Prunus cerasus</i>	Rarely	Yes	Yes	Yes
<i>Prunus domestica</i>	Rarely	Yes	Yes	Yes ^a
<i>Prunus dulcis</i>	Rarely	Yes	Yes	Yes
<i>Prunus persica</i>	Rarely	Yes	Yes	Yes
<i>Prunus salicina</i>	Rarely	Yes	Yes	Yes ^a
Rutaceae				
<i>Citrus × aurantium</i>	Rarely	Yes	Yes	Yes ^a
Vitaceae				
<i>Vitis vinifera</i>	Rarely	Yes	Yes	Yes ^a



References: ¹Zoratti et al., 2016; ²Sansavini et al., 2000; ³Orlandi et al., 2022; ⁴Medina et al., 2009; ⁵Bergmeier et al., 2010; ⁶Pantera et al., 2018.

^aCrop species that can be cultivated for ornamental purposes; these may be found outdoor in urban environments.

6 Climate suitability and distribution

The selected fruit crops occur in different climatic areas. Climate suitability for each crop is given using the Köppen–Geiger climate classification based on the correspondence between the potential cultivation areas in the EU and the climate according to this classification (Table 6, Figure 1).

Table 6: Climate suitability for selected fruit crops based on the Köppen–Geiger climate classification

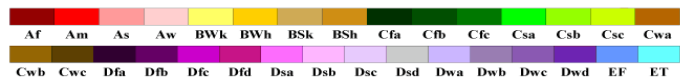
Family	Scientific name	Common name	Köppen–Geiger climate classification
Ebenaceae	<i>Diospyros kaki</i>	Persimmon	Csa, Csb
Ericaceae	<i>Vaccinium corymbosum</i>	High-bush blueberry	Dfb Cfa, Cfb Csa, Csb
	<i>Vaccinium myrtillus</i>	Blueberry	Dfc, Dwc Cfb, Cfc Dfb, Dwb Cfc
Lithraceae	<i>Punica granatum</i>	Pomegranate	Cfa, Cwa Csa, Csb
Moraceae	<i>Ficus carica</i>	Fig	Csa, Csb Cfa, Cfb
	<i>Morus alba</i>	White Mulberry	Cfb Csa, Csb Cfa, Cwa
Rosaceae	<i>Cydonia oblonga</i>	Quince	Csa, Csb Cfb Dfa, Dfb
	<i>Eriobotrya japonica</i>	Loquat	Csa, Csb Cfa
	<i>Malus domestica</i>	Apple	Cfa, Cfb Dfb, Dfa Csa, Csb
	<i>Pyrus communis</i>	Pear	Cfb Csa, Csb Dfa, Dfb
	<i>Prunus armeniaca</i>	Apricot	Csa, Csb Cfa, Cfb
	<i>Prunus avium</i>	Sweet Cherry	Csa, Csb
	<i>Prunus cerasus</i>	Sour Cherry	Cfb, Cfc
	<i>Prunus domestica</i>	Plum	Cfa, Cfb
	<i>Prunus dulcis</i>	Almond	Csa, Csb
	<i>Prunus persica</i>	Peach	Csa, Csb Cfa, Cfb
<i>Prunus salicina</i>	Japanese Plum	Cfa, Cfb	
Rutaceae	<i>Citrus × aurantium</i>	Bitter Orange	Csa, Csb Cfa, Cfb



Vitaceae	<i>Vitis vinifera</i>	Grape	Csa, Csb Cfa, Cfb Dfa, Dfb
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World Map of Köppen–Geiger Climate Classification

updated with CRU TS 2.1 temperature and VASCLimO v1.1 precipitation data 1951 to 2000



Main climates

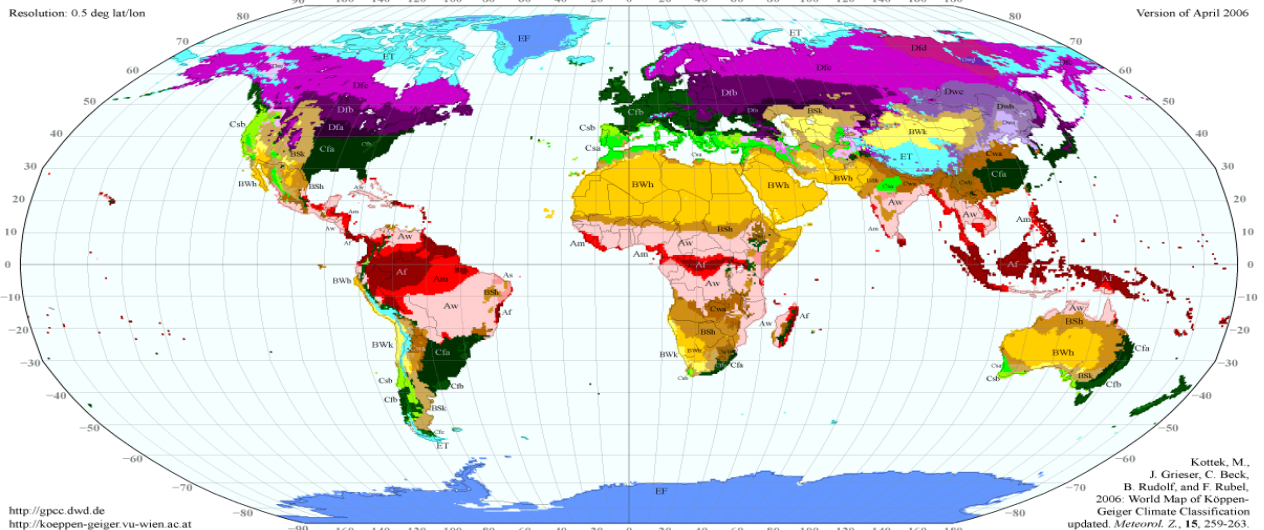
- A: equatorial
- B: arid
- C: warm temperate
- D: snow
- E: polar

Precipitation

- W: desert
- S: steppe
- f: fully humid
- s: summer dry
- w: winter dry
- m: monsoonal

Temperature

- h: hot arid
- k: cold arid
- a: hot summer
- b: warm summer
- c: cool summer
- d: extremely continental
- F: polar frost
- T: polar tundra



<http://gpcc.dwd.de>
<http://koepen-geiger.vu-wien.ac.at>

Kottek, M., J. Grieser, C. Beck, B. Rudolf, and F. Rubel, 2006: World Map of Köppen–Geiger Climate Classification updated. *Meteorol. Z.* 15, 259–263.

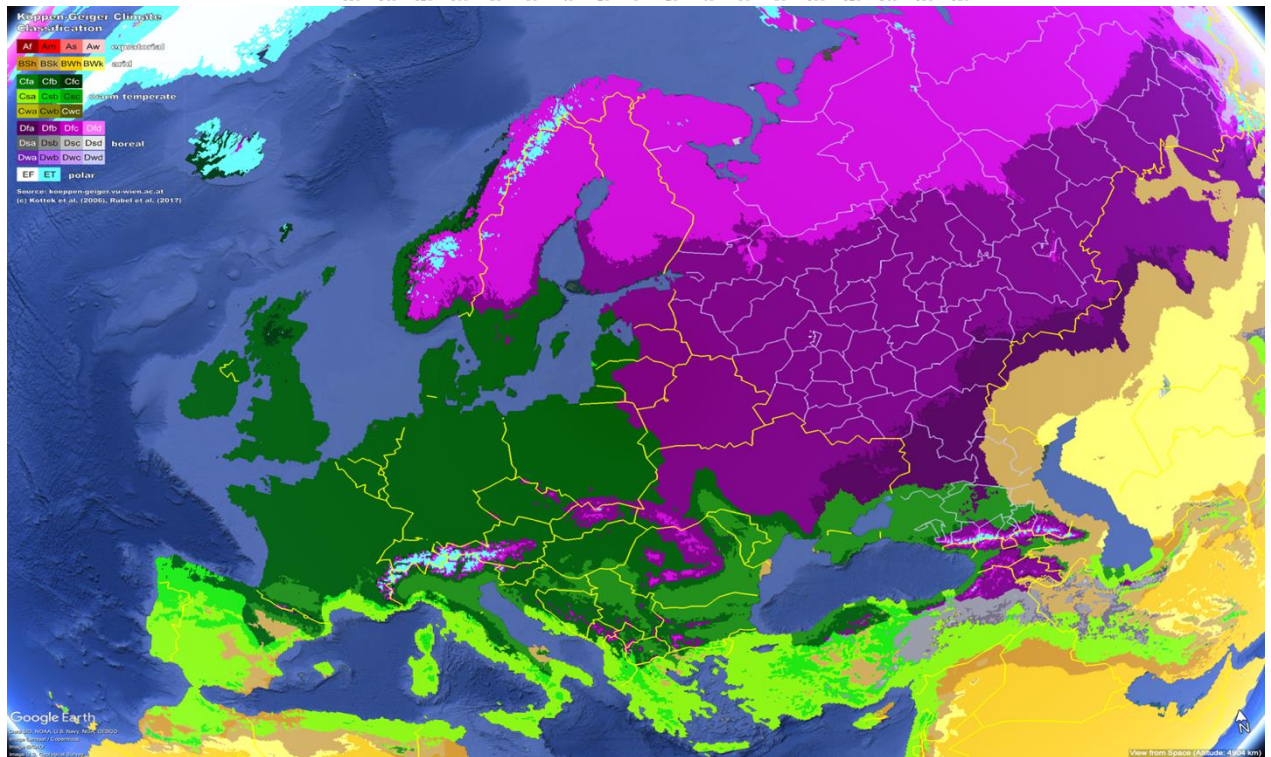


Figure 1: Köppen–Geiger climatic zones. The upper panel represents all climatic areas of the world and the lower panel represents climatic areas for Europe (Kottek et al., 2006). Different colours represent different climates. Climatic zones are described in the top legend (panel above) or top-left (panel below) with a standard two- or three-letter code where letter codes correspond with the following climatic zones: Af: Tropical rainforest; Am: Tropical monsoon; Aw: Tropical savanna; BWh: Hot desert; BWk: Cold desert; BSh: Hot semi-arid; BSk: Cold semi-arid; Cfa: ...



Humid subtropical; Cwa: Monsoon-influenced humid subtropical; Cwb: Subtropical highland; Cfb: Marine west coast; Cfc: Subpolar oceanic; Csa: Hot-summer Mediterranean; Csb: Warm-summer Mediterranean; Dfa: Hot-summer continental; Dfb: Warm-summer continental; Dfc: Subarctic or boreal; Dfd: Extremely cold subarctic or boreal; Dwa: Monsoon-influenced hot-summer continental; Dwb: Monsoon-influenced warm-summer continental; Dwc: Subarctic or boreal monsoon; ET: Tundra; EF: Ice cap; HT: Highland tundra; HF: Highland ice cap

The distribution of the selected fruit crops is based on occurrence data obtained from Eurostat (Figure 2 and Figure 3).



7 Regulation

7.1 Overview

Import of fruit-tree species into the EU is mainly regulated by:

- 1 Regulation (EU) 2016/2031¹⁸ of the European Parliament of the Council of 26 October 2016 on protective measures against pests of plants (Plant Health Law). This Regulation establishes rules to determine the phytosanitary risks posed by any species, strain or biotype of pathogenic agents, animals or parasitic plants injurious to plants or plant products ('pests') and measures to reduce those risks to an acceptable level.
- 2 Commission Implementing Regulation (EU) 2019/2072¹⁹ of 28 November 2019 establishing uniform conditions for the implementation of Regulation (EU) 2016/2031 of the European Parliament and the Council, as regards protective measures against pests of plants. This regulation implements Regulation (EU) 2016/2031, as regards the listing of Union quarantine pests, protected zone quarantine pests and the European Union-regulated non-quarantine pests, and the measures on plants, plant products and other objects to reduce the risks of those pests to an acceptable level.
- 3 Commission Implementing Regulation (EU) 2021/2285²⁰ of 14 December 2021 amending Implementing Regulation (EU) 2019/2072 as regards the listing of pests, prohibitions and requirements for the introduction into, and movement within, the European Union of plants, plant products and other objects, and repealing Decisions 98/109/EC and 2002/757/EC and Implementing Regulations (EU) 2020/885 and (EU) 2020/1292
- 4 Commission Implementing Regulation (EU) 2018/2019²¹ of 18 December 2018 establishing a provisional list of high-risk plants, plant products or other objects, within the meaning of Article 42 of Regulation (EU) 2016/2031 and a list of plants for which phytosanitary certificates are not required for introduction into the European Union, within the meaning of Article 73 of that Regulation. The plants, plant products and other objects listed in Annex I are considered high-risk plants, plant products and other objects within the meaning of Article 42(1) of Regulation (EU) 2016/2031, and their introduction into the European Union territory shall be prohibited pending a risk assessment. Article 2 also states that a phytosanitary certificate shall be required for the introduction into the European Union of plants, other than the plants included in the list referred to in Article 72(1) of Regulation (EU) 2016/2031. However, fruits listed in Annex II shall be excluded from this requirement.

7.2 General regulations for selected host plants

¹⁸ Regulation (EU) 2016/2031 of the European Parliament of the Council of 26 October 2016 on protective measures against pests of plants, amending Regulations (EU) No 228/2013, (EU) No 652/2014 and (EU) No 1143/2014 of the European Parliament and of the Council and repealing Council Directives 69/464/EEC, 74/647/EEC, 93/85/EEC, 98/57/EC, 2000/29/EC, 2006/91/EC and 2007/33/EC OJ L 317, 23.11.2016, p. 4–104.

¹⁹ Commission Implementing Regulation (EU) 2019/2072 of 28 November 2019 establishing uniform conditions for the implementation of Regulation (EU) 2016/2031 of the European Parliament and the Council, as regards protective measures against pests of plants, and repealing Commission Regulation (EC) No 690/2008 and amending Commission Implementing Regulation (EU) 2018/2019 OJ L 319, 10.12.2019, p. 1–279.

²⁰ Commission Implementing Regulation (EU) 2021/2285 of 14 December 2021 amending Implementing Regulation (EU) 2019/2072 as regards the listing of pests, prohibitions and requirements for the introduction into, and movement within, the Union of plants, plant products and other objects, and repealing Decisions 98/109/EC and 2002/757/EC and Implementing Regulations (EU) 2020/885 and (EU) 2020/1292 C/2021/8982 OJ L 458, 22.12.2021, p. 173–283.

²¹ Commission Implementing Regulation (EU) 2018/2019 of 18 December 2018 establishing a provisional list of high risk plants, plant products or other objects, within the meaning of Article 42 of Regulation (EU) 2016/2031 and a list of plants for which phytosanitary certificates are not required for introduction into the Union, within the meaning of Article 73 of that Regulation C/2018/8877 OJ L 323, 19.12.2018, p. 10–15.

According to the Commission Implementing Regulation 2019/2072, 2018/2019 or 2016/2031 different requirements apply to the selected fruit crops (Table 7).

Table 7: Specific regulatory requirements/restrictions for commodities of the cultivated fruit crops present in the EU

Family	Scientific name	Regulation
Ebenaceae	<i>Diospyros kaki</i>	<i>Diospyros</i> plants for planting are included as high-risk plants in the Commission Implementing Regulation (EU) 2018/2019. Also, the current Commission Implementing Regulation (EU) 2021/2285 considers <i>Diospyros</i> wood or other commodities regarding pests included in the current EFSA call in the following points of Annex VII, i.e. 32.4 regarding <i>Apriona cinerea</i> (point 32.4). 103 and 104 regarding <i>Apriona germari</i> (103 and 104); regarding <i>Apriona rugicollis</i> (point 105).
Ericaceae	<i>Vaccinium corymbosum</i>	The Commission Implementing Regulation (EU) 2019/2072 considers in the following points of Annex VII the import of plants for planting, other than plants in tissue culture and seeds in regard to <i>Grapholita packardi</i> (point 43) and fruits of <i>Vaccinium</i> in regard to <i>G. packardi</i> (point 63).
	<i>Vaccinium myrtillus</i>	
Lithraceae	<i>Punica granatum</i>	The current Commission Implementing Regulation (EU) 2021/2285 considers <i>Punica</i> wood or other commodities regarding pests included in the current EFSA call in the following points of Annex VII, i.e. wood or other commodities regarding pests included in the current EFSA call in the following points of Annex VII regarding <i>A. rugicollis</i> (points 32.3, 105 and 106).
Moraceae	<i>Ficus carica</i>	<i>Ficus carica</i> plants for planting are included as high-risk plants in the Commission Implementing Regulation (EU) 2018/2019. Also, the current Commission Implementing Regulation (EU) 2021/2285 considers <i>Ficus</i> wood or other commodities regarding pests included in the current EFSA call in the following points of Annex VII regarding <i>Apriona germari</i> (points 32.2, 103 and 104); regarding <i>A. rugicollis</i> (points 32.3, 105 and 106); regarding <i>A. cinerea</i> (points 32.4, 107 and 108).
	<i>Morus alba</i>	The current Commission Implementing Regulation (EU) 2021/2285 considers <i>Morus</i> wood or other commodities regarding pests included in the current EFSA call in the following points of Annex VII regarding <i>A. rugicollis</i> (points 32.3, 105 and 106).
Rosaceae	<i>Cydonia oblonga</i>	The Commission Implementing Regulation (EU) 2019/2072 considers in the following points of Annex VII regarding the import of plants for planting of <i>Cydonia</i> in regard to <i>Saperda candida</i> (point 42) wood of <i>Cydonia</i> in regard to <i>S. candida</i> (point 98); wood chips of <i>Cydonia</i> in regard to <i>S. candida</i> (point 99); plants for planting of <i>Cydonia</i> in regard to <i>Grapholita packardi</i> (point 43).
	<i>Eriobotrya japonica</i>	The current Commission Implementing Regulation (EU) 2021/2285 considers <i>Eriobotrya japonica</i> wood or other commodities regarding pests included in the current EFSA call in the following points of Annex VII, i.e. wood or other commodities regarding pests included in the current EFSA call in the following points of Annex VII in regard to <i>A. germari</i> (points 32.2, 103 and 104); and to <i>A. rugicollis</i> (points 32.3, 105 and 106).
	<i>Malus domestica</i>	<i>Malus</i> plants for planting are included as high-risk plants in the Commission Implementing Regulation (EU) 2018/2019. The Commission Implementing Regulation (EU) 2019/2072 considers in the following points of Annex VII the import of plants for planting of <i>Malus</i> in regard to <i>Saperda candida</i> (point 42); wood of <i>Malus</i> in regard to <i>S. candida</i> (point 98); fruits in regard to <i>Anthonomus quadrigibbus</i> (point 45); plants for planting of <i>Malus</i> in regard to <i>Grapholita packardi</i> (point 43); fruits of <i>Malus</i> in regard to <i>Grapholita packardi</i> (point 63); fruits of <i>Malus</i> in regard to <i>Grapholita prunivora</i> and <i>G. inopinata</i> (point 66); fruits of <i>Malus</i> in



		regard to <i>Botryosphaeria kuwatsukai</i> (point 64); plants for planting of <i>Malus</i> in regard to <i>Phyllosticta solitaria</i> (point 45). Moreover, the current Commission Implementing Regulation (EU) 2021/2285 considers <i>Malus</i> wood or other commodities regarding pests included in the current EFSA call in the following points of Annex VII referring to the import in regard to <i>Apriona germari</i> (points 103 and 104); in regard to <i>A. rugicollis</i> (points 105 and 106); in regard to <i>A. cinerea</i> (points 107 and 108).
	<i>Pyrus communis</i>	The Commission Implementing Regulation (EU) 2019/2072 considers in the following points of Annex VII regarding the import of: plants for planting of <i>Pyrus</i> in regard to <i>Saperda candida</i> (point 42); wood of <i>Pyrus</i> in regard to <i>S. candida</i> (point 98); wood chips of <i>Pyrus</i> in regard to <i>S. candida</i> (point 99); fruits of <i>Pyrus</i> in regard to <i>Anthonomus quadrigibbus</i> (point 65); plants for planting of <i>Pyrus</i> in regard to <i>Grapholita packardi</i> (point 43); fruits of <i>Pyrus</i> in regard to <i>G. packardi</i> (point 63); plants for planting of <i>Malus</i> in regard to <i>Phyllosticta solitaria</i> (point 45). Also, the current Commission Implementing Regulation (EU) 2021/2285 considers <i>Malus</i> wood or other commodities regarding pests included in the current EFSA call in the following points of Annex VII referring to the import in regard to <i>Apriona germari</i> (points 103 and 104); in regard to <i>A. rugicollis</i> (points 105 and 106); in regard to <i>A. cinerea</i> (points 107 and 108).
	<i>Prunus armeniaca</i>	<p><i>Prunus</i> plants for planting are included as high-risk plants in the Commission Implementing Regulation (EU) 2018/2019.</p> <p>The Commission Implementing Regulation (EU) 2019/2072 considers in the following points of Annex VII the import of: plants for planting of <i>Prunus</i> in regard to <i>Saperda candida</i> (point 42); wood of <i>Prunus</i> in regard to <i>S. candida</i> (point 98); wood chips of <i>Prunus</i> in regard to <i>S. candida</i> (point 99); plants for planting of <i>Prunus</i> in regard to <i>Grapholita packardi</i> (point 43); fruits of <i>Prunus</i> in regard to <i>Grapholita packardi</i> (point 63); plants for planting of <i>Prunus</i> in regard to <i>Phyllosticta solitaria</i> (point 45).</p> <p>Also, the current Commission Implementing Regulation (EU) 2021/2285 considers <i>Prunus</i> wood or other commodities regarding pests included in the current EFSA call in the following points of Annex VII referring to the import in regard to <i>Apriona germari</i> (points 103 and 104); in regard to <i>A. rugicollis</i> (points 105 and 106); in regard to <i>A. cinerea</i> (points 107 and 108).</p>
	<i>Prunus avium</i>	
	<i>Prunus cerasus</i>	
	<i>Prunus domestica</i>	
	<i>Prunus dulcis</i>	
	<i>Prunus persica</i>	
	<i>Prunus salicina</i>	
Rutaceae	<i>Citrus × aurantium</i>	The current Commission Implementing Regulation (EU) 2021/2285 considers <i>citrus</i> wood or other commodities regarding pests included in the current EFSA call in the following points of Annex VII referring to the import in regard to <i>Apriona germari</i> (points 103 and 104).
Vitaceae	<i>Vitis vinifera</i>	Transfer of plant material into the EU is regulated by Commission Implementing Regulation (2016/2031). The introduction of grapevine plant material into the EU is prohibited with the exception of material transfer for scientific purposes and breeding. The conditions under which plants, and plant products may be introduced into or moved within the Community for trial or scientific purposes and for work on varietal selections is regulated by Commission Directive 2008/61/EC of 17 June 2008.

8 Trade and import

Basic data on production (Figure 3) and import (Tables 8–17) of relevant commodities into the EU are given below. Only species for which data were available on import and export were included in this section.

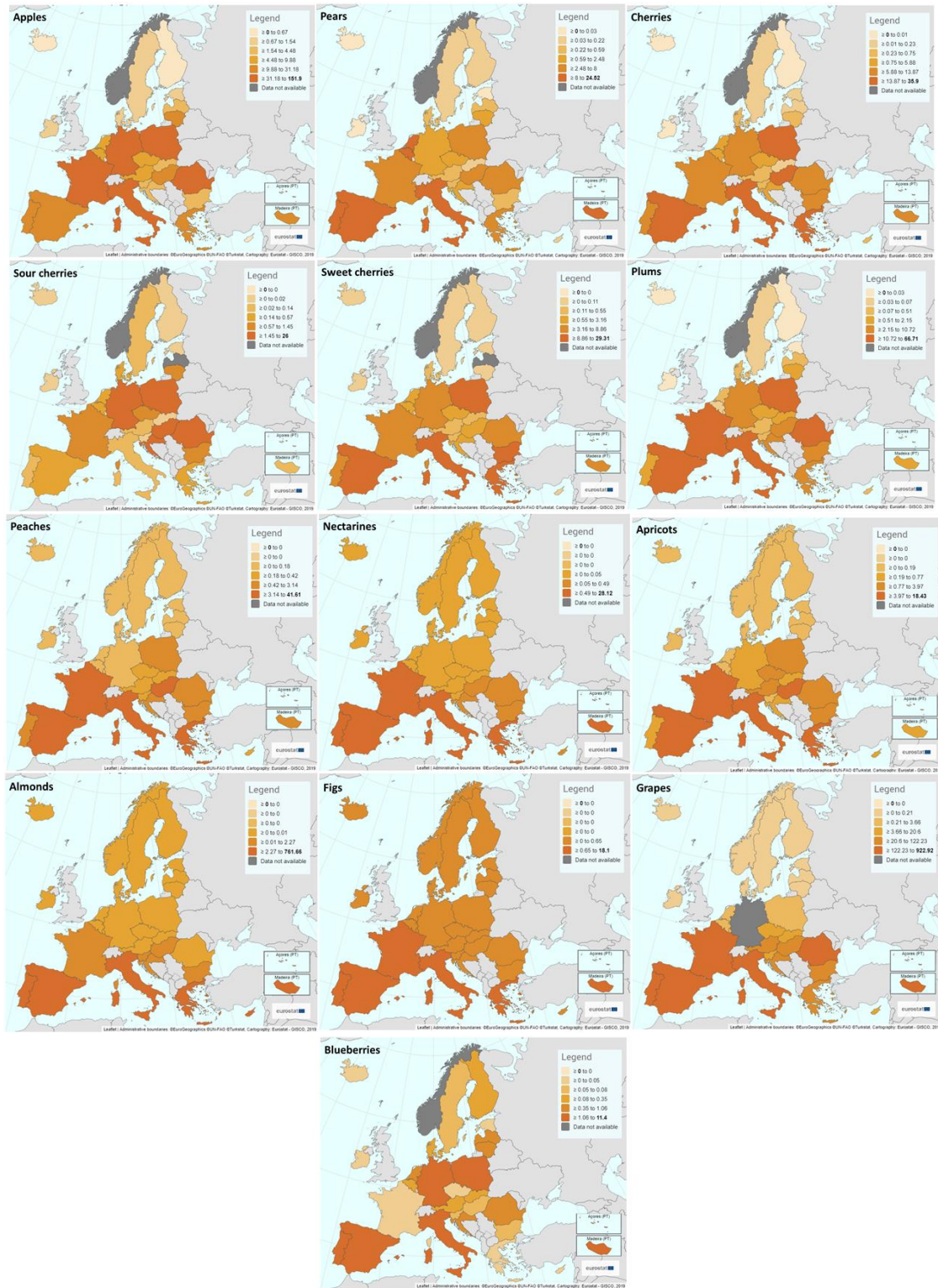


Figure 3: Production area (cultivation/harvested/production) (1000 ha) in EU standard humidity in 2022 in EU, Norway, and Iceland of different fruit commodities (Apples (code: F1110), Pears (code: F1120), Cherries (code: F1240), Sour cherries (code: F1241), Sweet cherries (code: F1242), Plums (code: F1250), Peaches (code: F1210), Nectarines (code: F1220), Apricots (code: F1230), Almonds (code: F4300), Figs (code: F2100), Grapes (code: W1000), Blueberries (code: F3300)) (data: Eurostat)

Characterisation of fruit trees in the EU

Table 8: Production area (cultivation/harvested/production) (1000 ha) of different fruit crops in the EU. Eurostat codes: Apples (code: F1110), Pears (code: F1120), Cherries (code: F1240), Sour cherries (code: F1241), Sweet cherries (code: F1242), Plums (code: F1250), Peaches (code: F1210), Nectarines (code: F1220), Apricots (code: F1230), Almonds (code: F4300), Figs (code: F2100), Grapes (code: W1000), Blueberries (code: F3300) (data shown correspond with the production in 2022; data: Eurostat)

Country	Apple	Pear	Cherry	Sour cherry	Sweet cherry	Plum	Peach	Nectarine	Apricot	Almond	Fig	Grape	Blueberry
Austria	6.30	0.57	0.29	0.02	0.27	0.21	0.18	0.00	0.86	0.00	0.00	42.84	0.22
Belgium	5.23	10.57	1.13	0.21	0.92	0.05	0.00	0.00	0.00	0.00	0.00	0.68	0.12
Bulgaria	3.72	0.58	11.91	1.11	10.80	9.40	2.46	0.08	3.05	1.51	0.03	28.47	0.06
Croatia	3.65	0.60	2.96	2.05	0.91	3.56	0.49	0.12	0.31	1.04	0.56	20.60	0.40
Cyprus	0.40	0.07	0.23	0.00	0.00	0.42	0.22	0.09	0.19	2.40	0.19	6.10	0.00
Czechia	7.01	0.80	2.07	1.21	0.86	1.92	0.28	0.00	1.11	0.00	0.00	16.42	0.00
Denmark	1.41	0.29	0.68	0.49	0.19	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.08
Estonia	0.71	0.00	0.01	0.01	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Finland	0.62	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09
France	54.02	5.91	7.54	0.76	6.78	15.09	5.91	5.59	11.36	2.21	0.84	757.55	0.00
Germany	33.11	2.07	7.30	1.57	5.74	4.79	0.11	0.00	0.29	0.00	0.00	:	3.40
Greece	10.65	4.35	16.97	0.14	16.83	2.15	29.95	8.28	9.36	18.44	1.43	84.71	0.00
Hungary	23.82	2.48	15.82	12.74	3.08	7.00	3.61	0.27	5.82	0.42	0.00	58.01	0.05
Iceland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ireland	0.71	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Italy	53.73	24.52	28.74	0.13	28.61	12.04	0.00	17.16	17.45	53.89	1.49	709.89	1.30
Latvia	3.06	0.22	0.10	:	:	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.55
Lithuania	9.88	0.84	0.74	0.73	0.02	0.73	0.00	0.00	0.00	0.00	0.00	0.00	0.35
Luxembourg	0.10	0.01	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	1.22	0.00
Malta	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.46	0.00
Netherlands	5.90	10.10	0.76	0.21	0.55	0.26	0.00	0.00	0.00	0.00	0.00	0.21	0.82
Norway	:	:	:	:	:	:	0.00	0.00	0.00	0.00	0.00	0.00	:
Poland	151.90	5.50	35.90	26.00	9.90	16.50	0.8	0.00	1.00	0.00	0.00	1.10	11.4
Portugal	13.73	10.85	6.38	0.10	6.28	1.64	2.91	0.92	0.60	63.88	3.62	175.79	2.62
Romania	54.07	3.20	5.88	2.57	3.31	66.71	1.22	0.07	1.96	0.00	0	159.74	0.8
Slovakia	1.54	0.10	0.16	0.00	0.16	0.59	0.27	0.00	0.19	0.00	0.00	7.79	0.08
Slovenia	2.03	0.22	0.23	0.01	0.22	0.07	0.23	0.00	0.09	0.02	0.02	14.42	0.07
Spain	29.25	19.11	29.46	0.16	29.31	13.25	41.61	28.12	18.43	761.66	18.10	922.92	4.81
Sweden	1.45	0.12	0.05	0.05	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.09	0.05



Characterisation of fruit trees in the EU

Table 9: Import volumes of different fruits by EU countries (FAO, online; all data in metric tons). Data shown correspond with the reported figures in 2021

Countries	Apple	Pears	Quince	Figs	Almonds	Plums (and sloes)	Grapes	Blueberries
Austria	66726.96	16199.37	4133.64	10252.22	4652.06	11713.02	43750.47	144.45
Belgium	107276.05	36758.95	320.18	3352.61	16831.76	11108.98	45817.43	11.7
Bulgaria	51156.78	6381.47	316.03	1904.48	2214.91	418.08	9875.16	
Croatia	18714.39	8582.12	452.1	810.67	1883.58	7413.47	11760.2	
Czechia	62853.96	13682.74	13.04	849.75	4720.41	9312.58	49590.62	
Denmark	58576.14	14072.07	79.46	1273.59	10514.08	3708.3	24750.19	
Estonia	12591.34	4233.18	1.21	86.99	529.23	1514.92	5851.78	
Finland	32759.22	9894.89	8.38	225.27	1100.22	2348.53	17236.87	
France	224053.87	125393.66	1342.97	19677.99	48390.26	20884.3	134070.13	2513.87
Germany	606142.78	166469.92	3634.4	20013.73	114968.05	50215.17	331801.09	141.7
Greece	30577.39	3895.63	98.97	753.32	10151.81	943.45	1131.48	
Hungary	27669.16	6328.86	80.35	1162.7	1029.31	1403.85	15920.21	
Iceland	3171.02	810.04	7.25	26.22	146.69	179.15	1191.11	
Ireland	47161.7	11366.18	4.7	229.98	2113.04	2042.73	17032.32	5.2
Italy	31087.91	110676.85	396.7	6037	59982.71	17626.62	19506.83	
Latvia	20131.53	7831.04	311.42	166.16	673.47	2985.83	12883.41	
Lithuania	27248.74	23917.17	2.42	132.45	2530.34	4540.27	12566.1	
Luxembourg	5227.08	1801.87	12.18	172.3	547	717.23	2405.47	
Malta	5301.38	861.89	0.43	146.63	305.17	393.87	1491.89	
Netherlands	300963.73	117746.99	1284.74	6873.33	48712.53	53799.43	459315.66	4349.68
Poland	2588.16	45257.92	269.99	2302.32	9230.12	22750.75	132324.81	343.21
Portugal	59119.11	17160.87	300.22	1378.87	4644.56	7193.95	36229.13	
Romania	92135.82	28528.59	2999.89	901.37	1378.89	13343.47	51961.69	2.62
Slovakia	38285.67	4763.78	0.8	1521.13	2105.41	2937.28	18983.23	
Slovenia	19556.03	4193.87	61.74	525.44	559.35	7842.55	22792.74	27.55
Spain	204532.22	70237.58	731.53	1584.66	137986.07	6685.94	69792.43	939.33
Sweden	84666.31	24542.78	313.56	1505.96	5106.23	4667.88	27329.97	

Characterisation of fruit trees in the EU

Table 10: Import volumes to the EU of quince (FAO, online) per country of origin; all data in metric tons) (only top 15 exporters to EU shown); reported figures correspond to year 2021

Türkiye	17309.6
Azerbaijan	1113.57
Serbia	328.29
Uzbekistan	163.57
Republic of Moldova	143.1
Chile	90.13
North Macedonia	50.67
Belarus	7.8
Georgia	5.8
Syrian Arab Republic	4.43
United Kingdom	2.76
Tunisia	1.9
Russian Federation	1.89
Armenia	1.61
Albania	1.57

Table 11: Import volumes to the EU of apple (FAO, online) per country of origin; all data in metric tons) (only top 15 exporters to EU shown); reported figures correspond to year 2021

Egypt, Arab Rep.	308821
United Kingdom	188867
Belarus	119751
Saudi Arabia	71870.4
India	65691.3
Kazakhstan	57068.2
Norway	32307.2
Jordan	30977.2
Israel	26829.1
United Arab Emirates	24761.6
Switzerland	16076.2
Ukraine	16031.6
Colombia	15550.6
Mongolia	12751.3
Bosnia and Herzegovina	12616.6

Table 12: Import volumes to the EU of pears (FAO, online) per country of origin; all data in metric tons) (only top 15 exporters to EU shown); reported figures correspond to year 2021

South Africa	122015.96
Türkiye	95332.59
Chile	61478.3
Belarus	46561.9
China, mainland	9439.52
Serbia	6989.4
Azerbaijan	5564.44
Lebanon	3815.93
Bosnia and Herzegovina	1873.07
United Kingdom	907.34
Georgia	779.55
Uruguay	599.9
Republic of Moldova	247.38

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 Table 13: Import volumes to the EU of figs (FAO, online) per country of origin; all data in metric tons) (only top 15 exporters to EU shown); reported figures correspond to year 2021

Belarus	111871
United Kingdom	107469
Morocco	36190
Brazil	20373.4
Kazakhstan	14632.4
Norway	13176.4
Switzerland	7816.63
Ukraine	6954.53
China	5142.78
Libya	4552.8
Saudi Arabia	4472.86
Israel	3682.89
Russian Federation	3409.62
Serbia, FR(Serbia/Montenegro)	3376.32
Bosnia and Herzegovina	2671.65

Table 14: Import volumes to the EU of grapes (FAO, online) per country of origin; all data in metric tons) (only top 15 exporters to EU shown); reported figures correspond to year 2021

South Africa	253241.74
Türkiye	230536.84
Peru	148821.43
India	131837.73
Uzbekistan	109296.75
Egypt	103317.77
Chile	87754.06
Republic of Moldova	64426.18
Brazil	55428.48
Namibia	30043.27
North Macedonia	23699.66
Azerbaijan	9961.68
Tajikistan	9246.82
Morocco	6628.28
Belarus	6009.37

Table 15: Import volumes to the EU of blueberries (FAO, online) per country of origin; all data in metric tons) (only top 15 exporters to EU shown); reported figures correspond to year 2021

Morocco	3428.04
Peru	2233.41
Chile	1434.67
South Africa	655.26
Serbia	283.08
Zimbabwe	204.11
Türkiye	117.84
Montenegro	50
Bosnia and Herzegovina	41.24
Côte d'Ivoire	15.84
Saudi Arabia	8
Argentina	3.6
Zambia	1.7
Egypt	1.69
Iran	0.52

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Table 16: Import volumes to the EU of plums (FAO, online; all data in metric tons) (only top 15 exporters to EU shown); reported figures correspond to year 2021

Chile	16024.36
Azerbaijan	5891.04
Bosnia and Herzegovina	5783.14
Georgia	3417.74
Albania	433.52
Armenia	372.06
Belarus	67.92
Egypt	36.62
Colombia	29.7
Iran	29.06
Australia	26.2
Argentina	23.45
Cameroon	10.45
Brazil	4.13
Afghanistan	1.89

Table 17: Import volumes to the EU of almonds (FAO, online; all data in metric tons) (only top 15 exporters to EU shown); reported figures correspond to year 2021

Australia	14423.03
China, mainland	5135.53
Chile	2630.67
Afghanistan	407.6
Iran	254.72
Belarus	252.92
Argentina	140.42
Canada	139.72
India	43.04
Indonesia	18.99
Bolivia	15.11
Albania	10.39
Bosnia and Herzegovina	5.15
Côte d'Ivoire	2.76
Egypt	1.75

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Relevant EFSA outputs

- Index of the EFSA Plant Pest Survey Toolkit: <https://efsa.europa.eu/plants/planthealth/monitoring/surveillance/index>
- Characterisation of crops in the EU: <https://efsa.europa.eu/plants/planthealth/monitoring/surveillance/characterisation-crops-eu>