

EXTERNAL SCIENTIFIC REPORT

Extensive literature search on cropping practices of host plants of some harmful organisms listed in Annex II A II of Directive 2000/29/EC.

M.P.M. Derkx, J.H.D. Brouwer, P.J.M. van Breda, G. Heijerman-Peppelman, B. Heijne, M.E.C.M. Hop and C.F.M. Wubben

Stichting Dienst Landbouwkundig Onderzoek (DLO), Droevendaalsesteeg 1, 6708 PB Wageningen, The Netherlands

ABSTRACT

The European Commission is currently seeking advice from EFSA (Mandate M-2012-0272) to assess for *Arabid mosaic virus*, *Raspberry ringspot virus*, *Strawberry latent ringspot virus*, *Tomato black ring virus*, *Strawberry mild yellow edge virus*, *Strawberry crinkle virus*, *Daktulosphaira vitifoliae*, *Eutetranychus orientalis*, *Parasaissetia nigra*, *Clavibacter michiganensis* spp. *michiganensis*, *Xanthomonas campestris* pv. *vesicatoria*, *Didymella ligulicola* and *Phytophthora fragariae* the risk to plant health for the EU territory and to evaluate the effectiveness of risk reduction options in reducing the level of risk. In addition, the Panel is requested to provide an opinion on the effectiveness of the present EU requirements against these organisms laid down in Council Directive 2000/29/EC. As a consequence EFSA needs insight in the cropping practices of *Citrus* spp., *Fragaria x ananassa*, *Ribes* spp., *Rubus* spp., *Vaccinium* spp., *Humulus lupulus*, *Vitis vinifera*, *Prunus armeniaca*, *P. avium*, *P. cerasus*, *P. domestica* and *P. persica*, which are host plants for these pests. An extensive and systematic literature search was done in which scientific and grey/technical literature was retrieved from the 28 EU Member States, Iceland and Norway. All references were stored in EndNote libraries, separately for scientific literature and grey/technical literature. For each reference information is provided on the source/search strategy, the crop, the country, the topic (cropping practice, propagation, protection or irrigation (only for *Citrus*)) and protected cultivation vs. field production. Yields of references depended on the crop and on the country. Over 27,000 references were provided to EFSA. This allows EFSA to quickly find information on crop production, both indoors and outdoors, of all crops that were studied in this extensive literature search. The data can be used by EFSA for the present mandate, but are also an excellent basis for other current and future mandates.

KEY WORDS

Crop production, Cropping systems, Cultivation, Europe, Fruit crops, Plant protection, Propagation

Any enquiries related to this output should be addressed to rasa.procurement@efsa.europa.eu

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SUMMARY

The European Commission is currently seeking advice from EFSA (Mandate M-2012-0272) to assess for *Arabis mosaic virus*, *Raspberry ringspot virus*, *Strawberry latent ringspot virus*, *Tomato black ring virus*, *Strawberry mild yellow edge virus*, *Strawberry crinkle virus*, *Daktulosphaera vitifoliae*, *Eutetranychus orientalis*, *Parasaissetia nigra*, *Clavibacter michiganensis* spp. *michiganensis*, *Xanthomonas campestris* pv. *vesicatoria*, *Didymella ligulicola* and *Phytophthora fragariae* the risk to plant health for the EU territory and to evaluate the effectiveness of risk reduction options in reducing the level of risk. In addition, the Panel is requested to provide an opinion on the effectiveness of the present EU requirements against these organisms laid down in Council Directive 2000/29/EC. As a preparatory work to perform the risk assessment, data and information are needed regarding the cropping practices of the host crops of the above organisms. The main host crops of these pests are fruit trees, fruit berries, citrus, grapevines, hop and some vegetables and ornamentals. Whereas an extensive literature search on the main vegetable and ornamental hosts (including chrysanthemum for *D. ligulicola* and tomato for *C. michiganensis* spp. *michiganensis* and for *X. campestris* pv. *vesicatoria*) has already been conducted in a previous procurement procedure, the current procurement procedure deals with the crop production practices of *Citrus* spp., *Fragaria x ananassa*, *Ribes* spp., *Rubus* spp., *Vaccinium* spp., *Humulus lupulus*, *Vitis vinifera*, *Prunus armeniaca*, *P. avium*, *P. cerasus*, *P. domestica* and *P. persica* in the 28 European Member States, Iceland and Norway, discriminating on cropping practices, propagation- and crop protection techniques. The extensive and systematic literature searches on crop production practices resulted in over 27,000 relevant references, which were grouped per crop and per country. All references were stored in EndNote libraries, separately for scientific literature, retrieved from CAB Abstracts and technical/grey literature, retrieved from AGRIS, ARTIK and website searches from stakeholder associations, extension services, national/regional authorities and national libraries. Each reference in the EndNote files has a label (cropping practice, propagation, protection or irrigation (only for *Citrus*)). Moreover, information is provided on protected cultivation/field production. Yields of references depended on the crop and on the country. Most information was found on *V. vinifera*: over 6,600 references. Nearly 4,000 references were collected for *F. x ananassa*, 2,000-3,000 references each were collected for *Citrus* spp., *P. avium* + *P. cerasus*, *P. domestica* and *P. persica*. About 1,500 references were collected for *P. armeniaca*. 700-1,100 references each were collected for *Ribes* spp., *Rubus* spp., *Vaccinium* spp. and *H. lupulus*.

The country with the highest number of references was Italy. Over 6,400 hits were collected from this country, of which nearly 40 % was on *V. vinifera* and nearly 17 % on *P. persica*. Most species were well represented in Italy with the exception of *H. lupulus*, which is of no importance in Italy. Other countries with very high yields were Spain (> 3,000 hits) and France (> 2,400 hits). As for Italy, most important crops for France were *V. vinifera* and *P. persica*. For Spain over one third of the references was on *Citrus* spp. and about 25 % on *V. vinifera*. Like in Italy, little information was found on *H. lupulus* in France and Spain. In comparison with the other crops and with other countries relatively little information was found on the berry species *Ribes*, *Rubus* and *Vaccinium* in France and Spain. Countries with more than 1,000 hits included Germany, Netherlands, Poland, Romania and Slovenia. Countries with 500-1000 hits each included Belgium, Bulgaria, Czech Republic, Hungary and UK. Nearly 500 hits were retrieved from Greece, Latvia and Portugal. Countries with 200-400 hits included Austria, Croatia, Denmark, Estonia, Finland, Lithuania, Norway, Slovakia and Sweden. Cyprus yielded about 100 hits. Hardly any information was found from Iceland (only *F. x ananassa* and *Rubus*), Irish Republic (only *F. x ananassa*, cherries, *P. domestica* and *Ribes*), Luxembourg (only *V. vinifera*) and Malta (*Citrus* spp., *F. x ananassa*, *P. armeniaca*, *P. domestica*, *P. persica*, *Prunus* stone fruits and *V. vinifera*).

The storage of all references in EndNote libraries, in which each reference is accompanied by the name of the crop, the country, the label (cropping practice, propagation, protection or irrigation (only

for *Citrus*)), the search strategy/source and information on protected cultivation/field production allows EFSA to quickly find information on crop production, both indoors and outdoors, of the crops that were studied in this extensive literature search. These data can be used by EFSA for the present mandate, but are also an excellent basis for other current and future mandates.

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BACKGROUND AS PROVIDED BY EFSA

Arabis mosaic virus, *Raspberry ringspot virus*, *Strawberry latent ringspot virus*, *Tomato black ring virus*, *Strawberry mild yellow edge virus*, *Strawberry crinkle virus*, *Daktulosphaera vitifoliae*, *Eutetranychus orientalis*, *Parasaissetia nigra*, *Clavibacter michiganensis* spp. *michiganensis*, *Xanthomonas campestris* pv. *vesicatoria*, *Didymella ligulicola* and *Phytophthora fragariae* are listed in Annex II A II of Council Directive 2000/29/EC as harmful organisms known to occur in the EU and whose introduction into and spread within the EU is banned if they are found present on certain plants or plant products.

The European Commission is currently seeking advice from EFSA (Mandate M-2012-0272) to assess for these organisms the risk to plant health for the EU territory and to evaluate the effectiveness of risk reduction options in reducing the level of risk. In addition, the Panel is requested to provide an opinion on the effectiveness of the present EU requirements against these organisms laid down in Council Directive 2000/29/EC. As a preparatory work to perform the risk assessment, data and information are needed regarding the cropping practices of the host crops of the above organisms.

The main host crops of these pests are fruit trees, fruit berries, citrus, grapevines, hop and some vegetables and ornamentals. Whereas an extensive literature search on the main vegetable and ornamental hosts (including chrysanthemum for *Didymella ligulicola* and tomato for *C. michiganensis* spp. *michiganensis* and for *X. campestris* pv. *vesicatoria*) has already been conducted in a previous procurement procedure, preparatory work is still needed to conduct an extensive literature search covering the fruit crops and the other main host crops of these pests.

The process of extensive literature search corresponds to the first three steps (preparation of protocols and questions, search, selection of studies) of the Systematic Literature Review process as described in EFSA (2010)¹.

Data and information on these crops could be used by EFSA also in preparatory work for other current and future mandates.

TERMS OF REFERENCE AS PROVIDED BY EFSA

To address the above mentioned needs, the Plant Health Unit of EFSA launches a procurement to conduct an extensive search of scientific and technical literature on cropping practices, crop protection practices and plant propagation techniques in the EU for the main host crops of the above mentioned harmful organisms listed in Annex II A II of Council Directive 2000/29/EC. This search can also be useful for other current and future mandates received by EFSA on plant pests affecting the same crops.

The extensive literature search should be performed according to EFSA's guidance on systematic review methodologies¹. The extensive search of scientific and technical literature and documentation should cover the most updated information available in the 27 Member States of the European Union, as well as in Croatia, Iceland and Norway².

¹ European Food Safety Authority, 2010. Application of systematic review methodology to food and feed safety assessments to support decision making. EFSA Journal 2010; 8(6):1637. [90 pp.]. doi:10.2903/j.efsa.2010.1637. Available online: <http://www.efsa.europa.eu/en/efsajournal/pub/1637.htm>

² The terms of reference are taken from the original tender specifications dated before the accession of Croatia to the EU.

Technical and grey literature including technical documentation (technical reports and guidelines) from national/regional authorities and stakeholders associations should also be considered and information should be collected for each country (each EU Member State, as well as Croatia, Iceland and Norway) and/or, when applicable (e.g. for countries with large regional variation in crops and cropping practices), at regional (NUTS 2) level.

The topics to be addressed in the search are:

- Cropping practices (e.g. crop rotation, tillage systems, soilless cultivation, planting/sowing practices, irrigation, mulching, pruning, organic farming, harvesting)
- Crop protection practices (e.g. soil sterilisation, integrated pest and disease management, guidelines for chemical and biological pest control)
- Plant propagation practices (e.g. propagation and grafting techniques, certifications schemes and guidelines, list of recommended cultivars)

The extensive literature search should be performed for each crop listed in table 1.

The searches should cover the most updated published scientific literature available in the data/information sources relevant to the field of Plant Health, in the 27 Member States of the European Union, as well as in Croatia, Iceland and Norway.

The searches should as well cover the grey literature, such as the technical and scientific information available in all the 27 EU Member States, Croatia, Iceland and Norway. Apart from the open web search engine, this information could be retrieved from the web-sites of Member States national and/or regional authorities, farmers/growers associations, agricultural extension services, etc.

This contract/grant was awarded by EFSA to:

Stichting Dienst Landbouwkundig Onderzoek
Droevendaalsesteeg 1
6708 PB Wageningen
The Netherlands
Contact person: Dr. ir. M.P.M. Derkx, tel +31 252 462121, ria.derkx@wur.nl

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1. INTRODUCTION AND OBJECTIVES

EFSA is requested by the European Commission to give advice on the risk to plant health for the EU territory of seven organisms harmful to horticulture whose introduction into and spread within the EU is banned if they are found present on certain plants or plant products. The advice should cover also the evaluation of the effectiveness of risk reduction options. These harmful organisms, as listed in Annex II A II of Council Directive 2000/29/EC are *Arabid mosaic virus*, *Raspberry ringspot virus*, *Strawberry latent ringspot virus*, *Tomato black ring virus*, *Strawberry mild yellow edge virus*, *Strawberry crinkle virus*, *Daktulosphaira vitifoliae*, *Eutetranychus orientalis*, *Parasaissetia nigra*, *Clavibacter michiganensis spp. michiganensis*, *Xanthomonas campestris pv. vesicatoria*, *Didymella ligulicola* and *Phytophthora fragariae*.

In addition the EFSA Plant Health Panel is requested to provide an opinion on the effectiveness of the present EU requirements against the above-listed organisms. In order to well perform the risk assessment, data and information are needed on crop production of the main horticultural host crops of these harmful organisms, particularly on cropping practices, crop protection guidelines/general practices and on plant propagation techniques.

The main host crops of these pests are fruit trees, fruit berries, citrus, grapevine, hop and some vegetables and ornamentals. Whereas an extensive literature search on the main vegetable and ornamental hosts (including chrysanthemum for *D. ligulicola* and tomato for *C. michiganensis spp. michiganensis* and for *X. campestris pv. vesicatoria*) has already been conducted in a previous 2012 procurement procedure, preparatory work is still needed to conduct an extensive literature search covering the fruit crops and the other main host crops of these pests. The objective of this project was to retrieve data and information on crop production of these crops, as listed in Table 1.

Study questions were:

- Which cropping practices (e.g. crop rotation, tillage systems, soilless cultivation, planting/sowing practices, irrigation, fertilization, mulching, pruning, thinning, organic farming, harvesting) are described for the species listed in Table 1? Both field production and protected production were included.
- Which crop protection practices (e.g. soil sterilisation, integrated pest and disease management, guidelines for chemical and biological pest control) are described for the species listed in Table 1?
- Which propagation practices (e.g. propagation and grafting techniques, certification schemes and guidelines, lists of recommended cultivars and rootstocks) are described for the species listed in Table 1?

Data and information were retrieved by a systematic, extensive and reproducible literature search in different databases. Searches were done for all 28 Member States of the European Union, as well as for Iceland and Norway. In addition, websites from relevant stakeholders, advice services, extension services, regional/national authorities and national libraries were searched.

The outcome of these searches were collected in several files in the reference management programme EndNote, one file for the scientific literature and one file for the technical/grey literature. This allows transparency and reproducibility.

As a result of this study, data and information on current cultivation practices of these crops will be available for the present mandate, but can also be used by EFSA for other current and future mandates.

Table 1: Species included in the extensive literature search on cropping practices of host plants of some harmful organisms listed in Annex II A II of Council Directive 2000/29/EC.

Family	Species/genus	Common name
<i>Rosaceae</i>	<i>Prunus domestica</i>	plum
	<i>Prunus persica</i>	peach/nectarine
	<i>Prunus armeniaca</i>	apricot
	<i>Prunus avium</i>	sweet cherry
	<i>Prunus cerasus</i>	sour cherry
	<i>Fragaria x ananassa</i>	strawberry
	<i>Rubus idaeus</i> (and other raspberry species cultivated in EU for commercial purposes)	raspberry
<i>Ericaceae</i>	<i>Vaccinium</i> spp. (blueberry and cranberry species cultivated in EU for commercial purposes)	blueberry, cranberry
<i>Grossulariaceae</i>	<i>Ribes</i> spp. (currant species cultivated in EU for commercial purposes)	currant
Rutaceae	<i>Citrus</i> spp. (citrus species and hybrids cultivated in EU for commercial purposes)	cultivated citrus species (e.g. sweet orange, bitter orange, lemon, grapefruit, mandarine orange)
Cannabaceae	<i>Humulus lupulus</i>	hop
Vitaceae	<i>Vitis vinifera</i>	grapevine

2. MATERIALS AND METHODS

2.1. Species and time periods under study

The searches in the different databases were performed in literature from different years onward as indicated in Table 2. In agreement with EFSA, final decisions were made on the species within each genus to be included in the study. These species, as listed in Table 2, were specifically grouped in the Endnote libraries. It was decided to group all references on *Citrus* species in one group *Citrus* spp. with the exception of *C. aurantium*, which was separately grouped. References on *Fortunella* (kumquat) were also placed in a separate group in the *Citrus* Endnote library. Within the *Fragaria* genus references on *Fragaria x ananassa* and references on *F. vesca* were included. For *Ribes* spp., *Rubus* spp. and *Vaccinium* spp. the selected references were labelled as far as possible on species level, e.g. *R. nigrum* and *R. rubrum*. When a species name was not mentioned in a reference, the

reference was included under the genus name e.g. *Ribes* (other/not specified), including also minor species.

Prunus species included in the study were *P. armeniaca*, *P. avium*, *P. cerasus*, *P. domestica* and *P. persica*. For cherry references it was not always possible to discriminate between *P. avium*, the sweet cherry and *P. cerasus*, the sour cherry. These references were included under *Prunus* spp. cherries. The searches for *P. domestica* (European plums) also yielded quite some references on *P. salicina*, the Japanese plum types and to a lesser extent on *P. cerasifera*, the cherry plum. When these papers matched the selection criteria, they were included in the Endnote libraries and labelled on the specific species. We did not specifically search for these species. Damson plums are included in the EndNote libraries as *P. domestica* subsp. *insititia*, the mirabelle plum is included under *P. domestica*. However, databases like CAB Abstracts and also authors do not always use names of plums in a consistent way, e.g. mirabelle plum is sometimes called *P. domestica* subsp. *insititia*, whereas the correct name is *P. domestica* subsp. *syriaca*. CAB Abstracts, however, does not use the keyword *Prunus domestica* subsp. *syriaca*.

In case an author wrote about mirabelle plums and CAB added the keyword *Prunus domestica* subsp. *insititia* we included the reference in the group *Prunus domestica* subsp. *insititia*, e.g. Gignoux-Spitz, C. 1996. The mirabelle plum. CTIFL, 211 p. CAB Keyword *Prunus domestica* subsp. *insititia*.

In addition to searches on specific *Prunus* species, searches were also done on stone fruits. When the species could not be figured out from such a reference and the reference matched the selection criteria, it was included under *Prunus* spp. in the EndNote libraries 'stone fruits'.

Table 2: Overview of all species that were included in the searching exercises and the periods of the different species under study.

Genus	Species	Period under study
<i>Citrus</i>	<i>Citrus aurantium</i>	1984-
	<i>Citrus</i> spp.	
	<i>Fortunella</i>	
<i>Ribes</i>	<i>Ribes nigrum</i>	1995-
	<i>Ribes rubrum</i>	
	<i>Ribes silvestre</i>	
	<i>Ribes uva-crispa</i>	
	<i>Ribes</i> (other/unspecified)	
<i>Rubus</i>	<i>Rubus arcticus</i>	1995-
	<i>Rubus chamaemorus</i>	
	<i>Rubus fruticosus</i>	
	<i>Rubus idaeus</i>	
	<i>Rubus inermis</i>	

	<i>Rubus ulmifolius</i>	
	<i>Rubus</i> (other/unspecified)	
<i>Vaccinium</i>	<i>Vaccinium angustifolium</i>	1995-
	<i>Vaccinium ashei</i>	
	<i>Vaccinium corymbosum</i>	
	<i>Vaccinium macrocarpon</i>	
	<i>Vaccinium myrtillus</i>	
	<i>Vaccinium oxycoccus</i>	
	<i>Vaccinium uliginosum</i>	
	<i>Vaccinium vitis-idaea</i>	
	<i>Vaccinium</i> (other/unspecified)	
<i>Fragaria</i>	<i>Fragaria x ananassa</i>	1995-
	<i>Fragaria vesca</i>	
<i>Vitis</i>	<i>Vitis vinifera</i>	2000-
<i>Humulus</i>	<i>Humulus lupulus</i>	1990-
<i>Prunus</i>	<i>Prunus armeniaca</i>	1995-
	<i>Prunus avium</i>	
	<i>Prunus cerasus</i>	
	<i>Prunus</i> spp. cherries	
	<i>Prunus domestica</i>	
	<i>Prunus domestica</i> subsp. <i>insititia</i>	
	<i>Prunus cerasifera</i>	
	<i>Prunus salicina</i>	
	<i>Prunus persica</i>	
	Stone fruits	

2.2. Search strategies

Different search strategies were developed for different databases. Search strategies were developed for CAB Abstracts, AGRIS, ARTIK, Wageningen catalogue and Staff Publications. The search strategies for the different crops within a specific database were principally similar with many terms referring to cropping practice, propagation, crop protection and irrigation (only for *Citrus*). Specific crop terms were added, like frigoplants for strawberry and citriculture for *Citrus* species. Search terms included country names of the 28 EU Member States, including former names, like Czechoslovakia, and German Democratic Republic, and the names Iceland and Norway. In order to group references according to the requested labels cropping practice, propagation, protection and for *Citrus* spp. also irrigation, four groups of search commands were defined, one group with search terms related to cropping practice, one group with search terms related to propagation, one group with search terms related to crop protection and one group with search terms related to irrigation. This allowed to easily label groups of specific references in the EndNote files, in which the outcome of the searches were collected. Search terms also included species names, including Latin names, former names and common names. Many search terms were combined in order to retrieve a maximum number of relevant papers.

Boolean operators, truncation, field and phrase searching and specific tools and database functionalities, such as thesauri, were used to ensure that relevant search terms are included and the appropriate literature is found.

2.2.1. CAB Abstracts

The search strategy in CAB Abstracts for *Citrus* spp. is described in Table 3, for *Ribes* spp. in Table 4, for *Rubus* spp. in Table 5, for *Vaccinium* spp. in Table 6, for *Fragaria x ananassa* in Table 7, for *Vitis vinifera* in Table 8, for *Humulus lupulus* in Table 9, and for *Prunus* spp. in Table 10. Besides searching on EU Member State names (28), including former names, like Czechoslovakia, and German Democratic Republic, searches were done on European Union. The CAB Thesaurus 2012 was used to find terms, specific terminology and synonyms (<http://www.cabi.org>). For searches in CAB Abstracts CABI codes were included in the search terms. CABICODES are classification codes applied to all records to indicate the broad subject areas within which they fall. The CABICODES (<http://www.cabi.org/>) used are listed in Table 11. Boolean operators used are AND, OR and NOT. Truncation (*) was used to retrieve all possible suffix variations of the root word indicated. The wild card character ? was used within or at the end of a search term to substitute for one or no characters. The explode command was used in CAB's hierarchal list of thesaurus terms. It tells OvidSP to search for the thesaurus term itself including all its narrower terms, down to all levels (<http://www.cabi.org/?page=2044&site=170> Advanced Searching of CAB Abstracts, p. 25, 28-29).

The adjacency operator (Adj) was used to indicate the maximum number of words between two search terms, e.g. chemical adj5 control means that a hit is included when chemical and control are within five words of each other in any order.

Table 3: Search strategy for *Citrus* spp. in CAB Abstracts.

EFSAfruitCABCitrus 20130501

1. exp european union/ or exp european union countries/ or czechoslovakia.hw or estonian ssr.hw or latvian ssr.hw or lithuanian ssr.hw or german democratic republic.hw or german federal republic.hw or croatia.hw or iceland.hw or norway.hw

2. (ff060 or ff061 or ff062 or ff100 or ff150 or ff400 or jj300 or jj600 or jj700 or jj900 or nn050 or nn300 or nn400 or nn420 or nn440 or nn450 or nn452 or nn453 or nn460 or nn500 or pp400 or qq110).cc

3. cane? or canopy shaker? or citriculture or closed system? or exp closed systems/ or coco peat or cocopeat or coir or cold tolerance or crop density or crop husbandry or exp crop husbandry/ or crop management or exp crop management/ or crop production or crop yield? or cropping or exp cropping systems/ or cultivation or cultural measure? or cultural method? or exp cultural methods/ or day length or daylength or earliness or ecological farming or electric?? conductivity or farming system? or fertili?ation or fertili?er? or fertili?ing or floriculture? or forcing or frost control or frost protection or fruit yield? or glass house? or glasshouse? or grading or greenhouse? or growing media or growth retardant? or exp growth retardants/ or growth retardation or hail protection or harvester? or exp harvesters/ or harvesting or exp harvesting/ or heat tolerance or heating or hydroponic? or intercropping or interplanting or land preparation or leaching or light regime? or light relation? or lighting or long day plant? or macrotunnel? or microtunnel? or mulch* or mycorrhiz* or nets or orchard? or organic farming or exp organic farming/ or pH or photoperiod or picking or plant density or plant growth regulat* or exp plant growth regulators/ or plant nutrition or plant training or planting or plasticulture? or plug plant? or postharvest system? or practice? or primocane? or protective structure? or protocol? or pruning or exp pruning/ or ridge? or ridging or rockwool or rotation? or shading or soil amendment? or exp soil amendments/ or soil management or soil preparation or soilless culture? or exp soilless culture/ or sorting or spacing or staking or storage or storing or substrate? or supplementary light or thinning or tillage or exp tillage/ or tilling or traditional farming or "tree architecture" or "tree shaker?" or "tree training" or trellis or trunk shaker? or tunnel? or ventilation or windbreak? or wind protection

4. 1 and (2 or 3)

5.(ff160 or ff170 or nn451).cc

6. bed plant? or budding or budwood? or certificat* or culture media or cutting? or daughter plant? or elite or graft* or exp grafting/ or exp in vitro culture/ or interstock* or layering? or micrografting or micropropagat* or mother plant? or motherplant? or pathogen elimination or planting stock? or nurser* or plug plant? or pollinat* or propagat* or exp propagation/ or exp propagation materials/ or recommended adj4 cultivar? or recommended adj4 variet* or "root stock?" or rootstock? or runner? or scion? or seed production or seed treatment or seedling culture or (seedling adj5 production) or (seedling? adj5 treatment) or sowing or exp sowing/ or stock type? or stocktype? or stolon? or tissue culture or exp tissue culture/ or virus free or virusfree or vitro culture or vitro production

7. 1 and (5 or 6)

8. (ff400 or ff500 or ff6600 or ff610 or ff620 or ff700 or hh* or jj100 or nn430 or qq111).cc

9. acaricide? or exp arthropod pests/ or bacterial disease? or bactericide? or biocontrol or biological control or biopesticide? or bird control or boring insect? or (chemical adj5 control) or cracking or crop damage or crop protection or cultural control or disease control or exp disease control/ or (disease adj5 management) or disease prevention or eradication or fruit drop? or fruit rot? or fumigant? or fungal disease? or fungicide? or gummosis or herbicide? or hyperparasit* or insect control or insect pest? or insecticide? or integrated control or integrated pest management or interception? or ipm or larvicide? or mite control or mold? or molluscicide? or mould? or natural enem* or exp natural enemies/ or nemat?cide? or nematode control or nozzle? or parasitic wasp? or parasitoid? or pest control or exp pest control/ or (pest adj5 management) or pesticide? or exp pesticides/ or phytopathogen* or plant disease? or exp plant diseases/ or plant parasit* or exp plant parasites/ or plant pathogen* or exp plant pathogens/ or plant pest? or plant protection or postharvest decay or postharvest treatment or predac?ous arthropod* or predac?ous insect? or predac?ous mite?

or predatory arthropod* or exp predatory arthropods/ or predatory insect? or predatory mite? or preventive measure? or quarant?ine or resistance breeding or (breeding adj15 disease resistance) or (plant breeding adj15 disease resistance) or (plant breeding methods adj15 disease resistance) or (breeding adj15 pest resistance) or (plant breeding adj15 pest resistance) or (plant breeding methods adj15 pest resistance) or plant disorders or exp plant disorders/ or rodenticide? or slug? or snail? or soil disinfect* or soil disinfest* or soil disinfect* or soil disinfest* or soil fumigat* or soil sterili?ation or soil treatment or exp soil treatment/ or solarization or sprayer? or spraying? or exp spraying equipment/ or storage pest? or stored products pest? or weed control or weeding

10. 1 and (8 or 9)

11. (FF062 or JJ800 or NN440).cc or chemigation or desiccation tolerance or drainage or drought resistance or drought stress* or drought tolerance or fertigat* or flooding tolerance or humidity or irrigat* or exp irrigation/ or microirrigat* or plant water relation* or rain shelter? or salinity or salt tolerance or sprinkl* or "water use efficiency"

12. citrus or Fortunella or Limonia aurantifolia or Poncirus trifoliata or (calamondin? or citrange? or citrangequat? or citremon? or citron? or clementine? or grapefruit? or kumquat? or lemon? or limes or mandarin? or oranges or pummelo? or satsuma? or tangelo? or tangerines or tangor?).ti,hw

13. (199? or 20??).yr

14. 4 and 12 and 13 (Cropping practice zonder irrigation)

15. 7 and 12 and 13 (Propagation)

16. 10 and 12 and 13 (Protection)

17. 1 and 11 and 12 and 13 (Irrigation separately)

Table 4: Search strategy for *Ribes* spp. in CAB Abstracts.

EFSAfruitCABRibes20130506

1. exp european union/ or exp european union countries/ or czechoslovakia.hw or estonian ssr.hw or latvian ssr.hw or lithuanian ssr.hw or german democratic republic.hw or german federal republic.hw or croatia.hw or iceland.hw or norway.hw

2. (ff060 or ff061 or ff062 or ff100 or ff150 or ff400 or jj300 or jj600 or jj700 or jj800 or jj900 or nn050 or nn300 or nn400 or nn420 or nn430 or nn440 or nn450 or nn452 or nn453 or nn460 or nn500 or pp400 or qq110).cc

3. cane? or canopy shaker? or closed system? or exp closed systems/ or coco peat or cocopeat or coir or cold tolerance or crop density or crop husbandry or exp crop husbandry/ or crop management or exp crop management/ or crop production or crop yield? or cropping or exp cropping systems/ or cultivation or cultural measure? or cultural method? or exp cultural methods/ or day length or daylength or desiccation tolerance or drainage or drought resistance or drought stress* or drought tolerance or earliness or ecological farming or electric?? conductivity or ever bearing or everbearing or farming system? or fertigat* or fertili?ation or fertili?er? or fertili?ing or flooding tolerance or florican? or forcing or frost control or frost protection or fruit yield? or glass house? or glasshouse? or grading or greenhouse? or growing media or growth retardant? or exp growth retardants/ or growth retardation or hail protection or harvester? or exp harvesters/ or harvesting or exp harvesting/ or heat

tolerance or heating or humidity or hydroponic? or intercropping or interplanting or irrigat* or exp irrigation/ or june bearing or junebearing or land preparation or leaching or light regime? or light relation? or lighting or long day plant? or macrotunnel? or microirrigat* or microtunnel? or mulch* or mycorrhiz* or nets or orchard? or organic farming or exp organic farming/ or pH or photoperiod or picking or pinching or plant density or plant growth regulat* or exp plant growth regulators/ or plant nutrition or plant training or plant water relation* or planting or plasticulture? or postharvest system? or practice? or primocane? or protective structure? or exp protective structures/ or protocol? or pruning or exp pruning/ or rain shelter? or raised bed? or ridge? or ridging or rockwool or rotation? or salinity or salt tolerance or shading or soil amendment? or exp soil amendments/ or soil management or soil preparation or soilless culture? or exp soilless culture? or sorting or spacing or sprinkl* or staking or storage or storing or substrate? or supplementary light or thinning or tillage or exp tillage/ or tilling or traditional farming or "tree architecture" or "tree shaker?" or "tree training" or trellis or trunk shaker? or tunnel? or ventilation or "water use efficiency" or windbreak? or wind protection

4. 1 and (2 or 3)

5.(ff160 or ff170 or nn451).cc

6.bed plant? or budding or budwood? or certificat* or culture media or cutting? or daughter plant? or elite or frigo plant? or graft* or exp grafting/ or exp in vitro culture/ or interstock* or layering? or micrografting or micropropagat* or mother plant? or motherplant? or nurser* or pathogen elimination or planting stock? or plug plant? or pollinat* or propagat* or exp propagation/ or exp propagation materials/ or recommended adj4 cultivar? or recommended adj4 variet* or "root stock?" or rootstock? or runner* or scion? or seed production or seed treatment or seedling culture or (seedling adj5 production) or (seedling? adj5 treatment) or stolon? or sowing or exp sowing/ or stock type? or stocktype? or tissue culture or exp tissue culture/ or virus free or virusfree or vitro culture or vitro production

7. 1 and (5 or 6)

8. (ff400 or ff500 or ff6600 or ff610 or ff620 or ff700 or hh* or jj100 or nn430 or qq111).cc

9. acaricide? or exp arthropod pests/ or bacterial disease? or bactericide? or biocontrol or biological control or biopesticide? or bird control or boring insect? or chemigation or (chemical adj5 control) or cracking or crop damage or crop protection or cultural control or disease control or exp disease control/ or (disease adj5 management) or disease prevention or eradication or fruit drop? or fruit rot? or fumigant? or fungal disease? or fungicide? or gummosis or herbicide? or hyperparasit* or insect control or insect pest? or insecticide? or integrated control or integrated pest management or interception? or ipm or larvicide? or mite control or mold? or molluscicide? or mould? or natural enem* or exp natural enemies/ or nemat?cide? or nematode control or nozzle? or parasitic wasp? or parasitoid? or pest control or exp pest control/ or (pest adj5 management) or pesticide? or exp pesticides/ or phytopathogen* or plant disease? or exp plant diseases/ or plant parasit* or exp plant parasites/ or plant pathogen* or exp plant pathogens/ or plant pest? or plant protection or postharvest decay or predac?ous arthropod* or predac?ous insect? or predac?ous mite? or predatory arthropod* or exp predatory arthropods/ or predatory insect? or predatory mite? or preventive measure? or quarant?ine or resistance breeding or (breeding adj15 disease resistance) or (plant breeding adj15 disease resistance) or (plant breeding methods adj15 disease resistance) or (breeding adj15 pest resistance) or (plant breeding adj15 pest resistance) or (plant breeding methods adj15 pest resistance) or plant disorders or exp plant disorders/ or rodenticide? or slug? or snail? or soil disinfect* or soil desinfect* or soil disinfest* or soil fumigat* or soil sterili?ation or soil treatment or exp soil treatment/ or solarization or sprayer? or spraying? or exp spraying equipment/ or storage

pest? or stored products pest? or weed control or weeding

10. 1 and (8 or 9)

11. ribes or grossularia uva-crispa or ribes grossularia or currant?.ti,hw or (gooseberr* not chinese gooseberr*).ti,hw

12. 4 and 11 and (1995 or 1996 or 1997 or 1998 or 1999 or 20??).yr

13. 7 and 11 and (1995 or 1996 or 1997 or 1998 or 1999 or 20??).yr

14. 10 and 11 and (1995 or 1996 or 1997 or 1998 or 1999 or 20??).yr

Table 5: Search strategy for *Rubus* spp. in CAB Abstracts.

EFSAfruitCABRubus20130503

1. exp european union/ or exp european union countries/ or czechoslovakia.hw or estonian ssr.hw or latvian ssr.hw or lithuanian ssr.hw or german democratic republic.hw or german federal republic.hw or croatia.hw or iceland.hw or norway.hw

2. (ff060 or ff061 or ff062 or ff100 or ff150 or ff400 or jj300 or jj600 or jj700 or jj800 or jj900 or nn050 or nn300 or nn400 or nn420 or nn430 or nn440 or nn450 or nn452 or nn453 or nn460 or nn500 or pp400 or qq110).cc

3. cane? or canopy shaker? or closed system? or exp closed systems/ or coco peat or cocopeat or coir or cold tolerance or crop density or crop husbandry or exp crop husbandry/ or crop management or exp crop management/ or crop production or crop yield? or cropping or exp cropping systems/ or cultivation or cultural measure? or cultural method? or exp cultural methods/ or day length or daylength or desiccation tolerance or drainage or drought resistance or drought stress* or drought tolerance or earliness or ecological farming or electric?? conductivity or ever bearing or everbearing or farming system? or fertigat* or fertili?ation or fertili?er? or fertili?ing or flooding tolerance or florican? or forcing or frost control or frost protection or fruit yield? or glass house? or glasshouse? or grading or greenhouse? or growing media or growth retardant? or exp growth retardants/ or growth retardation or hail protection or harvester? or exp harvesters/ or harvesting or exp harvesting/ or heat tolerance or heating or humidity or hydroponic? or intercropping or interplanting or irrigat* or exp irrigation/ or june bearing or junebearing or land preparation or leaching or light regime? or light relation? or lighting or long day plant? or macrotunnel? or microirrigat* or microtunnel? or mulch* or mycorrhiz* or nets or orchard? or organic farming or exp organic farming/ or pH or photoperiod or picking or pinching or plant density or plant growth regulat* or exp plant growth regulators/ or plant nutrition or plant training or plant water relation* or planting or plasticulture? or postharvest system? or practice? or primocane? or protective structure? or exp protective structures/ or protocol? or pruning or exp pruning/ or rain shelter? or raised bed? or ridge? or ridging or rockwool or rotation? or salinity or salt tolerance or shading or soil amendment? or exp soil amendments/ or soil management or soil preparation or soilless culture? or exp soilless culture? or sorting or spacing or sprinkl* or staking or storage or storing or substrate? or supplementary light or thinning or tillage or exp tillage/ or tilling or traditional farming or "tree architecture" or "tree shaker?" or "tree training" or trellis or trunk shaker? or tunnel? or ventilation or "water use efficiency" or windbreak? or wind protection

4. 1 and (2 or 3)

5.(ff160 or ff170 or nn451).cc

6. bed plant? or budding or budwood? or certificat* or culture media or cutting? or daughter plant? or elite or frigo plant? or graft* or exp grafting/ or exp in vitro culture/ or interstock* or layering? or micrografting or micropropagat* or mother plant? or motherplant? or nurser* or pathogen elimination or planting stock? or plug plant? or pollinat* or propagat* or exp propagation/ or exp propagation materials/ or recommended adj4 cultivar? or recommended adj4 variet* or "root stock?" or rootstock? or runner* or scion? or seed production or seed treatment or seedling culture or (seedling adj5 production) or (seedling? adj5 treatment) or stolon? or sowing or exp sowing/ or stock type? or stocktype? or tissue culture or exp tissue culture/ or virus free or virusfree or vitro culture or vitro production

7. 1 and (5 or 6)

8. (ff400 or ff500 or ff6600 or ff610 or ff620 or ff700 or hh* or jj100 or nn430 or qq111).cc

9. acaricide? or exp arthropod pests/ or bacterial disease? or bactericide? or biocontrol or biological control or biopesticide? or bird control or boring insect? or chemigation or (chemical adj5 control) or cracking or crop damage or crop protection or cultural control or disease control or exp disease control/ or (disease adj5 management) or disease prevention or eradication or fruit drop? or fruit rot? or fumigant? or fungal disease? or fungicide? or gummosis or herbicide? or hyperparasit* or insect control or insect pest? or insecticide? or integrated control or integrated pest management or interception? or ipm or larvicide? or mite control or mold? or molluscicide? or mould? or natural enem* or exp natural enemies/ or nemat?cide? or nematode control or nozzle? or parasitic wasp? or parasitoid? or pest control or exp pest control/ or (pest adj5 management) or pesticide? or exp pesticides/ or phytopathogen* or plant disease? or exp plant diseases/ or plant parasit* or exp plant parasites/ or plant pathogen* or exp plant pathogens/ or plant pest? or plant protection or postharvest decay or predac?ous arthropod* or predac?ous insect? or predac?ous mite? or predatory arthropod* or exp predatory arthropods/ or predatory insect? or predatory mite? or preventive measure? or quarant?ine or resistance breeding or (breeding adj15 disease resistance) or (plant breeding adj15 disease resistance) or (plant breeding methods adj15 disease resistance) or (breeding adj15 pest resistance) or (plant breeding adj15 pest resistance) or (plant breeding methods adj15 pest resistance) or plant disorders or exp plant disorders/ or rodenticide? or slug? or snail? or soil desinfect* or soil disinfect* or soil disinfest* or soil fumigat* or soil sterili?ation or soil treatment or exp soil treatment/ or solarization or sprayer? or spraying? or exp spraying equipment/ or storage pest? or stored products pest? or weed control or weeding

10. 1 and (8 or 9)

11. rubus or (cloudberr* or cutleaf blackberr* or evergreen blackberr* or raspberr* or wild blackberr*).ti,hw

12. 4 and 11 and (199? or 20??).yr

13. 7 and 11 and (199? or 20??).yr

14. 10 and 11 and (199? or 20??).yr

Table 6: Search strategy for *Vaccinium* spp. in CAB Abstracts.

EFSAfruitCABVaccinium20130507

1. exp european union/ or exp european union countries/ or czechoslovakia.hw or estonian ssr.hw or latvian ssr.hw or lithuanian ssr.hw or german democratic republic.hw or german federal republic.hw

or croatia.hw or iceland.hw or norway.hw

2. (ff060 or ff061 or ff062 or ff100 or ff150 or ff400 or jj300 or jj600 or jj700 or jj800 or jj900 or nn050 or nn300 or nn400 or nn420 or nn430 or nn440 or nn450 or nn452 or nn453 or nn460 or nn500 or pp400 or qq110).cc

3. cane? or canopy shaker? or closed system? or exp closed systems/ or coco peat or cocopeat or coir or cold tolerance or crop density or crop husbandry or exp crop husbandry/ or crop management or exp crop management/ or crop production or crop yield? or cropping or exp cropping systems/ or cultivation or cultural measure? or cultural method? or exp cultural methods/ or day length or daylength or desiccation tolerance or drainage or drought resistance or drought stress* or drought tolerance or earliness or ecological farming or electric?? conductivity or ever bearing or everbearing or farming system? or fertigat* or fertili?ation or fertili?er? or fertili?ing or flooding tolerance or florican? or forcing or frost control or frost protection or fruit yield? or glass house? or glasshouse? or grading or greenhouse? or growing media or growth retardant? or exp growth retardants/ or growth retardation or hail protection or harvester? or exp harvesters/ or harvesting or exp harvesting/ or heat tolerance or heating or humidity or hydroponic? or intercropping or interplanting or irrigat* or exp irrigation/ or june bearing or junebearing or land preparation or leaching or light regime? or light relation? or lighting or long day plant? or macrotunnel? or microirrigat* or microtunnel? or mulch* or mycorrhiz* or nets or orchard? or organic farming or exp organic farming/ or pH or photoperiod or picking or pinching or plant density or plant growth regulat* or exp plant growth regulators/ or plant nutrition or plant training or plant water relation* or planting or plasticulture? or postharvest system? or practice? or primocane? or protective structure? or exp protective structures/ or protocol? or pruning or exp pruning/ or rain shelter? or raised bed? or ridge? or ridging or rockwool or rotation? or salinity or salt tolerance or shading or soil amendment? or exp soil amendments/ or soil management or soil preparation or soilless culture? or exp soilless culture? or sorting or spacing or sprinkl* or staking or storage or storing or substrate? or supplementary light or thinning or tillage or exp tillage/ or tilling or traditional farming or "tree architecture" or "tree shaker?" or "tree training" or trellis or trunk shaker? or tunnel? or ventilation or "water use efficiency" or windbreak? or wind protection

4. 1 and (2 or 3)

5.(ff160 or ff170 or nn451).cc

6.bed plant? or budding or budwood? or certificat* or culture media or cutting? or daughter plant? or elite or frigo plant? or graft* or exp grafting/ or exp in vitro culture/ or interstock* or layering? or micrografting or micropropagat* or mother plant? or motherplant? or nurser* or pathogen elimination or planting stock? or plug plant? or pollinat* or propagat* or exp propagation/ or exp propagation materials/ or recommended adj4 cultivar? or recommended adj4 variet* or "root stock?" or rootstock? or runner* or scion? or seed production or seed treatment or seedling culture or (seedling adj5 production) or (seedling? adj5 treatment) or stolon? or sowing or exp sowing/ or stock type? or stocktype? or tissue culture or exp tissue culture/ or virus free or virusfree or vitro culture or vitro production

7. 1 and (5 or 6)

8. (ff400 or ff500 or ff6600 or ff610 or ff620 or ff700 or hh* or jj100 or nn430 or qq111).cc

9. acaricide? or exp arthropod pests/ or bacterial disease? or bactericide? or biocontrol or biological control or biopesticide? or bird control or boring insect? or chemigation or (chemical adj5 control) or cracking or crop damage or crop protection or cultural control or disease control or exp disease

control/ or (disease adj5 management) or disease prevention or eradication or fruit drop? or fruit rot? or fumigant? or fungal disease? or fungicide? or gummosis or herbicide? or hyperparasit* or insect control or insect pest? or insecticide? or integrated control or integrated pest management or interception? or ipm or larvicide? or mite control or mold? or molluscicide? or mould? or natural enem* or exp natural enemies/ or nemat?cide? or nematode control or nozzle? or parasitic wasp? or parasitoid? or pest control or exp pest control/ or (pest adj5 management) or pesticide? or exp pesticides/ or phytopathogen* or plant disease? or exp plant diseases/ or plant parasit* or exp plant parasites/ or plant pathogen* or exp plant pathogens/ or plant pest? or plant protection or postharvest decay or predac?ous arthropod* or predac?ous insect? or predac?ous mite? or predatory arthropod* or exp predatory arthropods/ or predatory insect? or predatory mite? or preventive measure? or quarant?ine or resistance breeding or (breeding adj15 disease resistance) or (plant breeding adj15 disease resistance) or (plant breeding methods adj15 disease resistance) or (breeding adj15 pest resistance) or (plant breeding adj15 pest resistance) or (plant breeding methods adj15 pest resistance) or plant disorders or exp plant disorders/ or rodenticide? or slug? or snail? or soil desinfect* or soil desinfest* or soil disinfect* or soil disinfest* or soil fumigat* or soil sterili?ation or soil treatment or exp soil treatment/ or solarization or sprayer? or spraying? or exp spraying equipment/ or storage pest? or stored products pest? or weed control or weeding

10. 1 and (8 or 9)

11. vaccinium or oxycoccus macrocarpus or oxycoccus palustris or oxycoccus quadripetala or (bilberr* or blaeberr* or blueberr* or cowberr* or cranberr* or lingonberr*).ti,hw

12. 4 and 11 and (1995 or 1996 or 1997 or 1998 or 1999 or 20??).yr

13. 7 and 11 and (1995 or 1996 or 1997 or 1998 or 1999 or 20??).yr

14. 10 and 11 and (1995 or 1996 or 1997 or 1998 or 1999 or 20??).yr

Table 7: Search strategy for *Fragaria x ananassa* in CAB Abstracts.

EFSAfruitCABFragaria20130501

1. exp european union/ or exp european union countries/ or czechoslovakia.hw or estonian ssr.hw or latvian ssr.hw or lithuanian ssr.hw or german democratic republic.hw or german federal republic.hw or croatia.hw or iceland.hw or norway.hw

2. (ff060 or ff061 or ff062 or ff100 or ff150 or ff400 or jj300 or jj600 or jj700 or jj800 or jj900 or nn050 or nn300 or nn400 or nn420 or nn430 or nn440 or nn450 or nn452 or nn453 or nn460 or nn500 or pp400 or qq110).cc

3. cane? or canopy shaker? or closed system? or exp closed systems/ or coco peat or cocopeat or coir or cold tolerance or crop density or crop husbandry or exp crop husbandry/ or crop management or exp crop management/ or crop production or crop yield? or cropping or exp cropping systems/ or cultivation or cultural measure? or cultural method? or exp cultural methods/ or day length or daylength or desiccation tolerance or drainage or drought resistance or drought stress* or drought tolerance or earliness or ecological farming or electric?? conductivity or ever bearing or everbearing or farming system? or fertigat* or fertili?ation or fertili?er? or fertili?ing or flooding tolerance or florican? or forcing or frost control or frost protection or fruit yield? or glass house? or glasshouse? or grading or greenhouse? or growing media or growth retardant? or exp growth retardants/ or growth retardation or hail protection or harvester? or exp harvesters/ or harvesting or exp harvesting/ or heat tolerance or heating or humidity or hydroponic? or intercropping or interplanting or irrigat* or exp

irrigation/ or june bearing or junebearing or land preparation or leaching or light regime? or light relation? or lighting or long day plant? or macrotunnel? or microirrigat* or microtunnel? or mulch* or mycorrhiz* or nets or orchard? or organic farming or exp organic farming/ or pH or photoperiod or picking or pinching or plant density or plant growth regulat* or exp plant growth regulators/ or plant nutrition or plant training or plant water relation* or planting or plasticulture? or postharvest system? or practice? or primocane? or protective structure? or exp protective structures/ or protocol? or pruning or exp pruning/ or rain shelter? or raised bed? or ridge? or ridging or rockwool or rotation? or salinity or salt tolerance or shading or soil amendment? or exp soil amendments/ or soil management or soil preparation or soilless culture? or exp soilless culture? or sorting or spacing or sprinkl* or staking or storage or storing or substrate? or supplementary light or thinning or tillage or exp tillage/ or tilling or traditional farming or "tree architecture" or "tree shaker?" or "tree training" or trellis or trunk shaker? or tunnel? or ventilation or "water use efficiency" or windbreak? or wind protection

4. 1 and (2 or 3)

5.(ff160 or ff170 or mn451).cc

6.bed plant? or budding or budwood? or certificat* or culture media or cutting? or daughter plant? or elite or frigo plant? or graft* or exp grafting/ or exp in vitro culture/ or interstock* or layering? or micrografting or micropropagat* or mother plant? or motherplant? or nurser* or pathogen elimination or planting stock? or plug plant? or pollinat* or propagat* or exp propagation/ or exp propagation materials/ or recommended adj4 cultivar? or recommended adj4 variet* or "root stock?" or rootstock? or runner* or scion? or seed production or seed treatment or seedling culture or (seedling adj5 production) or (seedling? adj5 treatment) or stolon? or sowing or exp sowing/ or stock type? or stocktype? or tissue culture or exp tissue culture/ or virus free or virusfree or vitro culture or vitro production

7. 1 and (5 or 6)

8. (ff400 or ff500 or ff6600 or ff610 or ff620 or ff700 or hh* or jj100 or nn430 or qq111).cc

9. acaricide? or exp arthropod pests/ or bacterial disease? or bactericide? or biocontrol or biological control or biopesticide? or bird control or boring insect? or chemigation or (chemical adj5 control) or cracking or crop damage or crop protection or cultural control or disease control or exp disease control/ or (disease adj5 management) or disease prevention or eradication or fruit drop? or fruit rot? or fumigant? or fungal disease? or fungicide? or gummosis or herbicide? or hyperparasit* or insect control or insect pest? or insecticide? or integrated control or integrated pest management or interception? or ipm or larvicide? or mite control or mold? or molluscicide? or mould? or natural enem* or exp natural enemies/ or nemat?cide? or nematode control or nozzle? or parasitic wasp? or parasitoid? or pest control or exp pest control/ or (pest adj5 management) or pesticide? or exp pesticides/ or phytopathogen* or plant disease? or exp plant diseases/ or plant parasit* or exp plant parasites/ or plant pathogen* or exp plant pathogens/ or plant pest? or plant protection or postharvest decay or predac?ous arthropod* or predac?ous insect? or predac?ous mite? or predatory arthropod* or exp predatory arthropods/ or predatory insect? or predatory mite? or preventive measure? or quarant?ine or resistance breeding or (breeding adj15 disease resistance) or (plant breeding adj15 disease resistance) or (plant breeding methods adj15 disease resistance) or (breeding adj15 pest resistance) or (plant breeding adj15 pest resistance) or (plant breeding methods adj15 pest resistance) or plant disorders or exp plant disorders/ or rodenticide? or slug? or snail? or soil disinfect* or soil desinfect* or soil disinfest* or soil fumigat* or soil sterili?ation or soil treatment or exp soil treatment/ or solarization or sprayer? or spraying? or exp spraying equipment/ or storage pest? or stored products pest? or weed control or weeding

10. 1 and (8 or 9)
11. fragaria ananassa or fragaria x ananassa or strawberr*.ti,hw
12. 4 and 11 and (199? or 20??).yr
13. 7 and 11 and (199? or 20??).yr
14. 10 and 11 and (199? or 20??).yr

Table 8: Search strategy for *Vitis vinifera* in CAB Abstracts.

EFSAfruitCABVitis20131016

1. exp european union/ or exp european union countries/ or czechoslovakia.hw or estonian ssr.hw or latvian ssr.hw or lithuanian ssr.hw or german democratic republic.hw or german federal republic.hw or croatia.hw or iceland.hw or norway.hw
2. (ff060 or ff061 or ff062 or ff100 or ff150 or ff400 or jj300 or jj600 or jj700 or jj800 or jj900 or nn050 or nn300 or nn400 or nn420 or nn440 or nn450 or nn452 or nn453 or nn460 or nn470 or nn500 or pp400 or qq110).cc
3. cane? or canopy management or canopy shaker? or closed system? or exp closed systems/ or coco peat or cocopeat or coir or cold tolerance or cone? or crop density or crop husbandry or exp crop husbandry/ or crop management or exp crop management/ or crop production or crop yield? or cropping or exp cropping systems/ or cultivation or cultural measure? or cultural method? or exp cultural methods/ or cutting or day length or daylength or defoliation or desiccation tolerance or drainage or drought resistance or drought stress* or drought tolerance or drying or earliness or ecological farming or electric?? conductivity or ever bearing or everbearing or farming system? or fertigat* or fertili?ation or fertili?er? or fertili?ing or flooding tolerance or floriscane? or forcing or frost control or frost protection or fruit yield? or girdling or glass house? or glasshouse? or grading or grape production or grape yield? or greenhouse? or growing media or growth retardant? or exp growth retardants/ or growth retardation or hail net? or hail protection or harvester? or exp harvesters/ or harvesting or exp harvesting/ or heat tolerance or heating or hedging or humidity or hydroponic? or intercropping or interplanting or irrigat* or exp irrigation/ or june bearing or junebearing or kiln? or land preparation or leaching or leaf removal or light regime? or light relation? or lighting or long day plant? or macrotunnel? or mechanical method? or mechanization or microirrigat* or microtunnel? or mulch* or mycorrhiz* or nets or netting or orchard? or organic farming or exp organic farming/ or pH or photoperiod or picking or pinching or plant density or plant growth regulat* or exp plant growth regulators/ or plant nutrition or plant training or plant water relation* or planting or plastic film? or plasticulture? or postharvest system? or practice? or primocane? or protective structure? or exp protective structures/ or protocol? or pruning or exp pruning/ or rain shelter? or raised bed? or ridge? or ridging or ripping or rockwool or rotation? or salinity or salt tolerance or shading or shelter* or soil amendment? or exp soil amendments/ or soil management or soil preparation or soilless culture? or exp soilless culture? or sorting or spacing or sprinkl* or staking or storage or storing or stripping or substrate? or suckering or supplementary light or support system? or supports.hw or tensile strength or thinning or ties or tillage or twine? or exp tillage/ or tilling or topping or traditional farming or training.sh or training form? or training system? or "tree architecture" or "tree shaker?" or "tree training" or trellis* or trimming or trunk shaker? or tunnel? or tying or ventilation or vine density or vine training or vineyard management or "water use efficiency" or wind protection or windbreak? or wirework

4. 1 and (2 or 3)

5.(ff160 or ff170 or mn451).cc

6. bed plant? or budding or budwood? or certificat* or culture media or cutting? or daughter plant? or elite or frigo plant? or graft* or exp grafting/ or exp in vitro culture/ or interstock* or layering? or micrografting or micropropagat* or mother plant? or motherplant? or nurser* or pathogen elimination or planting stock? or plug plant? or pollinat* or propagat* or exp propagation/ or exp propagation materials/ or (recommended adj4 cultivar?) or (recommended adj4 variet*) or rhizome? or "root stock?" or rootstock? or runner* or scion? or seed production or seed treatment or seedling culture or (seedling adj5 production) or (seedling? adj5 treatment) or stolon? or sowing or exp sowing/ or stock type? or stocktype? or tissue culture or exp tissue culture/ or virus free or virusfree or vitro culture or vitro production

7. 1 and (5 or 6)

8. (ff400 or ff500 or ff6600 or ff610 or ff620 or ff700 or hh* or jj100 or nn430 or qq111).cc

9. acaricide? or exp arthropod pests/ or bacterial disease? or bactericide? or biocontrol or biological control or biopesticide? or bird control or boring insect? or chemigation or (chemical adj5 control) or cracking or crop damage or crop protection or cultural control or disease control or exp disease control/ or (disease adj5 management) or disease prevention or eradication or fruit drop? or fruit rot? or fumigant? or fungal disease? or fungicide? or gummosis or herbicide? or hyperparasit* or insect control or insect pest? or insecticide? or integrated control or integrated pest management or interception? or ipm or larvicide? or mite control or mold? or molluscicide? or mould? or natural enem* or exp natural enemies/ or nemat?cide? or nematode control or nozzle? or parasitic wasp? or parasitoid? or pest control or exp pest control/ or (pest adj5 management) or pesticide? or exp pesticides/ or phytopathogen* or plant disease? or exp plant diseases/ or plant parasit* or exp plant parasites/ or plant pathogen* or exp plant pathogens/ or plant pest? or plant protection or postharvest decay or predac?ous arthropod* or predac?ous insect? or predac?ous mite? or predatory arthropod* or exp predatory arthropods/ or predatory insect? or predatory mite? or preventive measure? or quarant?ine or resistance breeding or (breeding adj15 disease resistance) or (plant breeding adj15 disease resistance) or (plant breeding methods adj15 disease resistance) or (breeding adj15 pest resistance) or (plant breeding adj15 pest resistance) or (plant breeding methods adj15 pest resistance) or plant disorders or exp plant disorders/ or rodenticide? or shelterbelt? or slug? or snail? or soil disinfect* or soil disinfect* or soil disinfect* or soil disinfect* or soil fumigat* or soil sterili?ation or soil treatment or exp soil treatment/ or solarization or sprayer? or spraying? or exp spraying equipment/ or storage pest? or stored products pest? or sucker? or weed control or weeder? or weeding

10. 1 and (8 or 9)

11. vitis vinifera or (grape? or grapevine? or raisin or raisins or tablegrape? or vineyard? or viticultur* or winegrape?).ti,hw (20131028)

12. 4 and 11 and (20??).yr

13. 7 and 11 and (20??).yr

14. 10 and 11 and (20??).yr

Extra:

vitis and (interstock? or planting stock? or "root stock?" or rootstock? or stock type? or stocktype?)

Table 9: Search strategy for *Humulus lupulus* in CAB Abstracts.

EFSAfruitCABHumulus20130708

1. exp european union/ or exp european union countries/ or czechoslovakia.hw or estonian ssr.hw or latvian ssr.hw or lithuanian ssr.hw or german democratic republic.hw or german federal republic.hw or croatia.hw or iceland.hw or norway.hw

2. (ff060 or ff061 or ff062 or ff100 or ff150 or ff400 or jj300 or jj600 or jj700 or jj800 or jj900 or nn050 or nn300 or nn400 or nn420 or nn440 or nn450 or nn452 or nn453 or nn460 or nn470 or nn500 or pp400 or qq110).cc

3. cane? or canopy shaker? or closed system? or exp closed systems/ or coco peat or cocopeat or coir or cold tolerance or cone? or crop density or crop husbandry or exp crop husbandry/ or crop management or exp crop management/ or crop production or crop yield? or cropping or exp cropping systems/ or cultivation or cultural measure? or cultural method? or exp cultural methods/ or cutting or day length or daylength or desiccation tolerance or drainage or drought resistance or drought stress* or drought tolerance or drying or earliness or ecological farming or electric?? conductivity or ever bearing or everbearing or farming system? or fertigat* or fertili?ation or fertili?er? or fertili?ing or flooding tolerance or florican? or forcing or frost control or frost protection or fruit yield? or glass house? or glasshouse? or grading or greenhouse? or growing media or growth retardant? or exp growth retardants/ or growth retardation or hail protection or harvester? or exp harvesters/ or harvesting or exp harvesting/ or heat tolerance or heating or humidity or hydroponic? or intercropping or interplanting or irrigat* or exp irrigation/ or june bearing or junebearing or kiln? or land preparation or leaching or light regime? or light relation? or lighting or long day plant? or macrotunnel? or mechanization or microirrigat* or microtunnel? or mulch* or mycorrhiz* or nets or netting or orchard? or organic farming or exp organic farming/ or pH or photoperiod or picking or pinching or plant density or plant growth regulat* or exp plant growth regulators/ or plant nutrition or plant training or plant water relation* or planting or plasticulture? or postharvest system? or practice? or primocane? or protective structure? or exp protective structures/ or protocol? or pruning or exp pruning/ or rain shelter? or raised bed? or ridge? or ridging or rockwool or rotation? or salinity or salt tolerance or shading or soil amendment? or exp soil amendments/ or soil management or soil preparation or soilless culture? or exp soilless culture? or sorting or spacing or sprinkl* or staking or storage or storing or substrate? or supplementary light or support system? or supports.hw or tensile strength or thinning or ties or tillage or twine? or exp tillage/ or tilling or traditional farming or training.sh or "tree architecture" or "tree shaker?" or "tree training" or trellis* or trunk shaker? or tunnel? or ventilation or "water use efficiency" or wind protection or windbreak? or wirework

4. 1 and (2 or 3)

5.(ff160 or ff170 or nn451).cc

6. bed plant? or budding or budwood? or certificat* or culture media or cutting? or daughter plant? or elite or frigo plant? or graft* or exp grafting/ or exp in vitro culture/ or interstock* or layering? or micrografting or micropropagat* or mother plant? or motherplant? or nurser* or pathogen elimination or planting stock? or plug plant? or pollinat* or propagat* or exp propagation/ or exp propagation materials/ or recommended adj4 cultivar? or recommended adj4 variet* or rhizome? or "root stock?" or rootstock? or runner* or scion? or seed production or seed treatment or seedling culture or

(seedling adj5 production) or (seedling? adj5 treatment) or stolon? or sowing or exp sowing/ or stock type? or stocktype? or tissue culture or exp tissue culture/ or virus free or virusfree or vitro culture or vitro production

7. 1 and (5 or 6)

8. (ff400 or ff500 or ff6600 or ff610 or ff620 or ff700 or hh* or jj100 or nn430 or qq111).cc

9. acaricide? or exp arthropod pests/ or bacterial disease? or bactericide? or biocontrol or biological control or biopesticide? or bird control or boring insect? or chemigation or (chemical adj5 control) or cracking or crop damage or crop protection or cultural control or disease control or exp disease control/ or (disease adj5 management) or disease prevention or eradication or fruit drop? or fruit rot? or fumigant? or fungal disease? or fungicide? or gummosis or herbicide? or hyperparasit* or insect control or insect pest? or insecticide? or integrated control or integrated pest management or interception? or ipm or larvicide? or mite control or mold? or molluscicide? or mould? or natural enem* or exp natural enemies/ or nemat?cide? or nematode control or nozzle? or parasitic wasp? or parasitoid? or pest control or exp pest control/ or (pest adj5 management) or pesticide? or exp pesticides/ or phytopathogen* or plant disease? or exp plant diseases/ or plant parasit* or exp plant parasites/ or plant pathogen* or exp plant pathogens/ or plant pest? or plant protection or postharvest decay or predac?ous arthropod* or predac?ous insect? or predac?ous mite? or predatory arthropod* or exp predatory arthropods/ or predatory insect? or predatory mite? or preventive measure? or quarant?ine or resistance breeding or (breeding adj15 disease resistance) or (plant breeding adj15 disease resistance) or (plant breeding methods adj15 disease resistance) or (breeding adj15 pest resistance) or (plant breeding adj15 pest resistance) or (plant breeding methods adj15 pest resistance) or plant disorders or exp plant disorders/ or rodenticide? or slug? or snail? or soil disinfect* or soil desinfect* or soil disinfest* or soil fumigat* or soil sterili?ation or soil treatment or exp soil treatment/ or solarization or sprayer? or spraying? or exp spraying equipment/ or storage pest? or stored products pest? or weed control or weeding

10. 1 and (8 or 9)

11. humulus lupulus or (hop or hops or hoptarden?).ti,hw

12. 4 and 11 and (199? or 20??).yr

13. 7 and 11 and (199? or 20??).yr

14. 10 and 11 and (199? or 20??).yr

Table 10: Search strategy for *Prunus* spp. in CAB Abstracts.

EFSAfruitCABPrunus20131216

1. exp european union/ or exp european union countries/ or czechoslovakia.hw or estonian ssr.hw or latvian ssr.hw or lithuanian ssr.hw or german democratic republic.hw or german federal republic.hw or croatia.hw or iceland.hw or norway.hw

2. (ff060 or ff061 or ff062 or ff100 or ff150 or ff400 or jj300 or jj600 or jj700 or jj800 or jj900 or nn050 or nn300 or nn400 or nn420 or nn440 or nn450 or nn452 or nn453 or nn460 or nn470 or nn500 or pp400 or qq110).cc

3. branching or cane? or canopy management or canopy shaker? or closed system? or exp closed

systems/ or coco peat or cocopeat or coir or cold resistance or cold stress or cold tolerance or cone? or crop density or crop husbandry or exp crop husbandry/ or crop load? or crop management or exp crop management/ or crop production or crop yield? or cropping or exp cropping systems/ or cultivation or cultural measure? or cultural method? or exp cultural methods/ or cutting or day length or daylength or defoliation or desiccation tolerance or drainage or drought resistance or drought stress* or drought tolerance or drying or earliness or ecological farming or electric?? conductivity or ever bearing or everbearing or farming system? or feather* or fertigat* or fertili?ation or fertili?er? or fertili?ing or flooding tolerance or florican? or forcing or frost control or frost protection or frost resistance or fruit yield? or girdling or glass house? or glasshouse? or grading or greenhouse? or growing media or growth retardant? or exp growth retardants/ or growth retardation or hail net? or hail protection or hailnet? or harvester? or exp harvesters/ or harvesting or exp harvesting/ or heat tolerance or heating or hedging or humidity or hydroponic? or intercropping or interplanting or irrigat* or exp irrigation/ or june bearing or junebearing or kiln? or land preparation or leaching or leaf removal or light regime? or light relation? or lighting or long day plant? or macrotunnel? or mechanical method? or mechanization or microirrigat* or microtunnel? or mulch* or mycorrhiz* or nets or netting or orchard floor? or organic farming or exp organic farming/ or pH or photoperiod or picking or pinching or plant density or plant growth regulat* or exp plant growth regulators/ or plant nutrition or plant training or plant water relation* or planting or plastic film? or plasticulture? or polytunnel? or postharvest system? or practice? or primocane? or protective structure? or exp protective structures/ or protocol? or pruning or exp pruning/ or rain shield? or raised bed? or ridge? or ridging or ripping or rockwool or rotation? or salinity or salt tolerance or shading or shelf life or shelf lives or shelflife or shelter* or soil amendment? or exp soil amendments/ or soil management or soil preparation or soilless culture? or exp soilless culture? or sorting or spacing or sprinkl* or staking or storage or storing or stripping or substrate? or suckering or supplementary light or support system? or supports.hw or tensile strength or thinning or ties or tillage or twine? or exp tillage/ or tilling or topping or traditional farming or training.sh or training form? or training system? or "tree architecture" or "tree shaker?" or "tree training" or trellis* or trimming or trunk shaker? or tunnel? or tying or ventilation or "water use efficiency" or wind protection or windbreak? or wirework

4. 1 and (2 or 3)

5.(ff160 or ff170 or nn451).cc

6. bed plant? or bud stick? or bud wood? or budding or budstick? or budwood? or certificat* or culture media or cutting? or daughter plant? or elite or frigo plant? or graft* or exp grafting/ or exp in vitro culture/ or interstock* or layering? or micrografting or micropropagat* or mother plant? or motherplant? or nurser* or pathogen elimination or planting stock? or plug plant? or pollinat* or propagat* or exp propagation/ or exp propagation materials/ or (recommended adj4 cultivar?) or (recommended adj4 variet*) or rhizome? or "root stock?" or rootstock? or runner* or scion? or seed production or seed treatment or seedling culture or (seedling adj5 production) or (seedling? adj5 treatment) or stolon? or sowing or exp sowing/ or stock type? or stocktype? or tissue culture or exp tissue culture/ or virus free or virusfree or vitro culture or vitro production

7. 1 and (5 or 6)

8. (ff400 or ff500 or ff6600 or ff610 or ff620 or ff700 or hh* or jj100 or nn430 or qq111).cc

9. acaricide? or exp arthropod pests/ or bacterial disease? or bactericide? or biocontrol or biological control or biopesticide? or bird control or boring insect? or chemigation or (chemical adj5 control) or cracking or crop damage or crop protection or cultural control or disease control or exp disease control/ or (disease adj5 management) or disease prevention or eradication or fruit drop? or fruit rot?

or fumigant? or fungal disease? or fungicide? or gummosis or herbicide? or hyperparasit* or insect control or insect pest? or insecticide? or integrated control or integrated pest management or interception? or ipm or larvicide? or mite control or mold? or molluscicide? or mould? or natural enem* or exp natural enemies/ or nemat?cide? or nematode control or nozzle? or parasitic wasp? or parasitoid? or pest control or exp pest control/ or (pest adj5 management) or pesticide? or exp pesticides/ or phytopathogen* or plant disease? or exp plant diseases/ or plant parasit* or exp plant parasites/ or plant pathogen* or exp plant pathogens/ or plant pest? or plant protection or postharvest decay or predac?ous arthropod* or predac?ous insect? or predac?ous mite? or predatory arthropod* or exp predatory arthropods/ or predatory insect? or predatory mite? or preventive measure? or quarant?ine or resistance breeding or (breeding adj15 disease resistance) or (plant breeding adj15 disease resistance) or (plant breeding methods adj15 disease resistance) or (breeding adj15 pest resistance) or (plant breeding adj15 pest resistance) or (plant breeding methods adj15 pest resistance) or plant disorders or exp plant disorders/ or rodenticide? or shelterbelt? or slug? or snail? or soil disinfect* or soil disinfest* or soil disinfect* or soil disinfest* or soil fumigat* or soil sterili?ation or soil treatment or exp soil treatment/ or solarization or splitting or sprayer? or spraying? or exp spraying equipment/ or storage pest? or stored products pest? or sucker? or weed control or weeder? or weeding

10. 1 and (8 or 9)

11.

Crop 1: prunus domestica or (damson? or plums or prunes).ti,hw or ((plum or prune).ti and prunus)

Crop 2: prunus persica or (peaches or nectarin??).ti,hw or (peach.ti and prunus)

Crop 3: prunus armeniaca or apricot?.ti,hw

Crop 4: prunus avium or prunus cerasus or cherries.ti,hw or (cherry.ti and prunus)

Crop 5: (stone fruit? or stonefruit?).ti,hw

12. 4 and 11 and (1995 or 1996 or 1997 or 1998 or 1999 or 20??).yr

13. 7 and 11 and (1995 or 1996 or 1997 or 1998 or 1999 or 20??).yr

14. 10 and 11 and (1995 or 1996 or 1997 or 1998 or 1999 or 20??).yr

Table 11: CABICODES used in the literature searches in CAB Abstracts.

CABICODE	Description
FF60	Plant Physiology and Biochemistry
FF61	Plant Nutrition
FF62	Plant Water Relations
FF100	Plant production
FF150	Plant cropping systems
FF160	Plant propagation
FF170	<i>In vitro</i> Culture of Plant Material

FF400	Mycorrhizas and Fungi of Economic Importance; Symbiotic Nitrogen Fixation
FF500	Weeds and Noxious Plants
FF600	Pests, Pathogens and Biogenic Diseases of Plants
FF610	Viral, Bacterial and Fungal Diseases of Plants
FF620	Plant Pests
FF700	Plant Disorders and Injuries (Not caused directly by Organisms)
HH000	Pathogen, Pest, Parasite and Weed Management
HH100	Biological Control
HH200	Environmental Pest Management
HH300	Integrated Pest Management
HH400	Pesticides and Drugs (General)
HH405	Pesticides and Drugs; Control
HH410	Pesticide and Drug Resistance
HH420	Pesticides and Drugs; Chemistry and Formulation
HH430	Pesticide and Drug Residues and Ecotoxicology
HH500	Repellents and Attractants
HH600	Host Resistance and Immunity
HH700	Other Control Measures
JJ100	Soil Biology
JJ300	Soil Physics
JJ600	Soil Fertility
JJ700	Fertilizers and other Amendments
JJ800	Soil Water Management (Irrigation and Drainage)
JJ900	Soil Management
NN050	Automation and Control

NN300	Farm and Horticultural Structures
NN400	Agricultural and Forestry Equipment (General)
NN420	Fertilizer Application Equipment
NN430	Pest and Weed Control Equipment
NN440	Irrigation and Drainage Equipment
NN450	Soil cultivation and Handling Equipment
NN451	Crop Sowing and Planting Equipment
NN452	Crop Tending Equipment
NN453	Crop Harvesting Equipment
NN460	Cleaning, Grading, Handling, Storage and Transport Equipment
NN470	Drying equipment
NN500	Storage equipment
PP400	Erosion; Soil and Water Conservation
QQ110	Food Storage and Preservation
QQ111	Storage Problems and Pests of Food

2.2.2. AGRIS

The search strategy in AGRIS for *Citrus* spp. is described in Table 12, for *Ribes* spp. in Table 13, for *Rubus* spp. in Table 14, for *Vaccinium* spp. in Table 15, for *Fragaria x ananassa* in Table 16, for *Vitis vinifera* in Table 17, for *Humulus lupulus* in Table 18, and for *Prunus* spp. in Table 19. The AGROVOC Thesaurus was used to find terms, specific terminology and synonyms. AGRIS index codes were included in the search terms. AGRIS index codes are classification codes applied to all records to indicate the broad subject areas within which they fall. The AGRIS index codes (<http://www.fao.org/scripts/agris/c-categ.htm>) used are listed in Table 20. Boolean operators used are AND, OR and NOT. Truncation (*) was used to retrieve all possible suffix variations of the root word indicated. The wild card character ? was used within or at the end of a search term to substitute for one or no characters. The explode command was used in the AGROVOC thesaurus. It tells OvidSP to search for the thesaurus term itself including its narrower terms of one level down. The adjacency operator (adj) (adjacent) was used to indicate the maximum number of words between two search terms, e.g. chemical adj5 control means that a hit is included when chemical and control are within five words of each other in any order.

Table 12: Search strategy for *Citrus* spp. in AGRIS.

<p>Cropping practice: (f01 or f04 or f06 or f07 or f08 or f50 or f61 or f62 or p30).cc or alternative agriculture or alternative methods or biodynamic agriculture or biological farming or cane? or canopy shaker? or citriculture or conventional farming or plant production or exp plant production/ or crop yield? or closed system? or coco peat or cocopeat or coir or cold tolerance or composting or crop husbandry or crop management or exp crop management/ or crop rotation? or exp crop rotation/ or crop yield? or cropping or exp cropping systems/ or cultivation or exp cultivation/ or cultural measure? or cultural method? or exp cultural methods/ or day length or daylength or earliness or ecological farming or electrical conductivity or farming system? or exp farming systems/ or fertili?ation or fertili?er* or fertili?ing or field preparation or floriculture? or forcing or frost control or frost protection or fruit growing or fruit yield? or girdling or glass house? or glasshouse? or grading or greenhouse? or growing media or growth retard* or harvester? or exp harvesters/ or harvesting or exp harvesting/ or heating or hilling or hoeing or humidity or hydroponic? or exp hydroponics or intercropping or exp intercropping or interplanting or land preparation or light regime? or exp light regimes/ or light relation? or lighting or long day plant? or macrotunnel? or microtunnel? or mulch* or mycorrhiz* or nets or orchard? or organic farming or pH or photoperiod* or picking or plant density or plant growth regulator? or plant growth substance? or exp plant growth substances/ or plant nutrition or exp plant nutrition/ or plant population or plant training or planting or plasticulture? or postharvest system* or practice? or primocane? or protective structure? or exp protective structures/ or protocol? or pruning or exp pruning/ or ridge? or ridging or rockwool or shading or soil amendment? or exp soil amendments/ or soil heating or soil management or soil preparation or soilless culture? or exp soilless culture/ or sorting or spacing or staking or storage or storing or crop storage or substrate? or supplementary light or thinning or tillage or exp tillage/ or tilling or topping or traditional farming or "tree architecture" or "tree shaker?" or "tree training" or trellis or trunk shaker? or tunnel? or ventilation or wind protection or windbreak?</p> <p>Propagation: (f02 or f03 or f30 or f63).cc or bed plant? or budding or budwood? or certificat* or culture media or exp culture media/ or cutting? or exp cutting/ or exp cuttings/ or daughter plant? or elite or frigo plant? or graft compatibility or grafting? or exp grafting/ or grafts or exp in vitro culture/ or interstock* or layering or micrograft* or micropropagat* or mother plant? or motherplant? or nurser* or pathogen elimination or exp plant propagation/ or planting stock? or plug plant? or pollinat* or preplanting treatment or exp preplanting treatment/ or propagat* or exp propagation/ or exp propagation materials/ or recommended adj4 cultivar? or recommended adj4 variet* or "root stock?" or rootstock* or exp rootstocks/ or runner? or scion? or seed production or exp seed production or seed treatment or exp seed treatment or seedbed preparation or exp seedbed preparation or seedling culture or seedling production or exp seedling production or (seedling? adj5 treatment) or stolon? or sowing or exp sowing/ or tissue culture or exp tissue culture/ or exp vegetative propagation/ or virus free or virusfree or vitro culture or vitro production</p> <p>Protection: (h or j11).cc or acaricide? or bacterial disease? or bactericide? or exp bactericides/ or biocontrol or biological control or exp biological control/ or biopesticide? or exp biopesticides or bird control or chemical control or exp chemical control/ or crop protection or cultural control or cultural disease control or cultural pest control or disease control or exp disease control/ or (disease adj5 management) or disease prevention or eradication or fumigant? or fumigation or fungal disease? or fungicide? or herbicide? or hyperparasit* or insect control or insect pest? or insecticide? or integrated control or exp integrated control/ or integrated pest management or interception? or ipm or larvicide? or mite control or mold? or molluscicide? or mould? or natural enem* or nemat?cide? or nematode</p>

control or parasitic wasp? or parasitoid? or pest control or exp pest control/ or pest insect? or exp pest insects/ or pest management or exp pest management/ or pesticide? or exp pesticides/ or phytopathogen* or plant disease* or exp plant diseases/ or plant parasit* or plant pathogen* or plant pest? or plant protection or postharvest decay or predac?ous arthropod* or predac?ous insect? or predac?ous mite? or predatory arthropod* or predatory insect? or predatory mite? or preventive measure? or quarant?ine or resistance breeding or (breeding adj15 disease resistance) or (plant breeding adj15 disease resistance) or (breeding adj15 pest resistance) or (plant breeding adj15 pest resistance) or rodenticide? or slug? or snail? or soil desinfect* or soil desinfest* or soil disinfect* or soil disinfest* or soil sterili?ation or soil treatment or exp soil treatment/ or spraying or storage pest? or stored products pest? or weed control or weeding

Irrigation:

(f06 or p10 or p11).cc or chemigation or desiccation tolerance or drainage or drought resistance or drought stress* or drought tolerance or fertigat* or exp fertigation/ or flooding tolerance or irrigat* or exp irrigation/ or leaching or microirrigat* or plant water relation? or exp plant water relations/ or salinity or salt tolerance or sprinkl* or "water use efficiency"

Crops:

citrus or fortunella or limonia aurantifolia or Poncirus trifoliata or (calamondin? or citrange? or citrangequat? or citremon? or citron? or clementine? or grapefruit? or kumquat? or lemon? or limes or mandarin? or oranges or pummelo? or satsuma? or tangelo? or tangerines or tangor?).ti,ie,ec,ei

Countries:

(austria or belgium or bulgaria or cyprus or croatia or czech republic or czechoslovakia or csfr or denmark or estonia or european union or finland or france or germany or greece or hungary or iceland or irish republic or (ireland not northern ireland) or italy or latvia or lithuania or luxembourg or malta or netherlands or norway or poland or portugal or romania or slovakia or slovak republic or slovenia or spain or sweden or uk or great britain or united kingdom or scotland or wales or england or northern ireland).ti,ec,ie,ei,gc or exp austria or exp belgium or exp bulgaria or exp croatia or exp cyprus or exp czech republic or exp czechoslovakia or exp denmark or exp estonia or exp finland or exp france or exp germany or exp greece or exp hungary or exp iceland or exp ireland or exp irish republic or exp italy or exp latvia or exp lithuania or exp luxembourg or exp malta or exp netherlands or exp norway or exp poland or exp portugal or exp romania or exp slovak republic or exp slovakia or exp slovenia or exp spain or exp sweden or exp great britain or exp united kingdom or exp england or exp scotland or exp wales or exp northern ireland or exp european union or exp european union countries

Table 13: Search strategy for *Ribes* spp. in AGRIS.

Cropping practice:

(f01 or f04 or f06 or f07 or f08 or f50 or f61 or f62 or p10 or p11 or p30).cc or alternative agriculture or alternative methods or anti hail or biodynamic agriculture or biological farming or cane? or canopy shaker? or chemigat* or conventional farming or plant production or exp plant production/ or crop yield? or closed system? or coco peat or cocopeat or coir or cold tolerance or composting or crop husbandry or crop management or exp crop management/ or crop rotation? or exp crop rotation/ or crop yield? or cropping or exp cropping systems/ or cultivation or exp cultivation/ or cultural measure? or cultural method? or exp cultural methods/ or day length or daylength or desiccation tolerance or drainage or drought resistan* or drought stress* or drought toleran* or earliness or ecological farming or electrical conductivity or farming system? or exp farming systems/ or fertigat* or exp fertigation or fertili?ation or fertili?er* or fertili?ing or field preparation or flooding toleran* or florricane? or forcing or frost control or frost protection or fruit growing or fruit yield? or girdling or

glass house? or glasshouse? or grading or greenhouse? or growing media or growth retard* or hail control* or hail net or hail protection or hail shelter* or harvester? or exp harvesters/ or harvesting or exp harvesting/ or heating or hilling or hoeing or humidity or hydroponic? or exp hydroponics or intercropping or exp intercropping or interplanting or irrigat* or exp irrigation or land preparation or leaching or light regime? or exp light regimes/ or light relation? or lighting or long day plant? or macrotunnel? or microirrigat* or microtunnel? or mulch* or mycorrhiz* or nets or orchard? or organic farming or pH or photoperiod* or picking or plant density or plant growth regulator? or plant growth substance? or exp plant growth substances/ or plant nutrition or exp plant nutrition/ or plant population or plant training or plant water relation* or exp plant water relations or planting or plastic film cover* or plasticulture? or postharvest system* or practice? or primocane? or protective structure? or exp protective structures/ or protocol? or pruning or exp pruning/ or rain cover* or rain protection or rain shelter* or ridge? or ridging or rockwool or salinity or salt toleran* or sprinkl* or shading or soil amendment? or exp soil amendments/ or soil heating or soil management or soil preparation or soilless culture? or exp soilless culture/ or sorting or spacing or sprinkl* or staking or storage or storing or crop storage or substrate? or supplementary light or thinning or tillage or exp tillage/ or tilling or topping or traditional farming or "tree architecture" or "tree shaker?" or "tree training" or trellis or trunk shaker? or tunnel? or ventilation or "water use efficiency" or wind protection or windbreak?

Propagation:

(f02 or f03 or f30 or f63).cc or bed plant? or budding or budwood? or certificat* or culture media or exp culture media/ or cutting? or exp cutting/ or exp cuttings/ or daughter plant? or elite or frigo plant? or graft compatibility or grafting? or exp grafting/ or grafts or exp in vitro culture/ or interstock* or layering or micrograft* or micropropagat* or mother plant? or motherplant? or nurser* or pathogen elimination or exp plant propagation/ or planting stock? or plug plant? or pollinat* or preplanting treatment or exp preplanting treatment/ or propagat* or exp plant propagation/ or exp propagation materials/ or (recommended adj4 cultivar?) or (recommended adj4 variet*) or "root stock?" or rootstock* or exp rootstocks/ or runner? or scion? or seedbed* or seed production or exp seed production or seed treatment or exp seed treatment or seedbed preparation or exp seedbed preparation or seedling culture or seedling production or exp seedling production or (seedling? adj5 treatment) or stolon? or sowing or exp sowing/ or tissue culture or exp tissue culture/ or exp vegetative propagation/ or virus free or virusfree or vitro culture or vitro production

Protection:

(h or j11).cc or acaricide? or bacterial disease? or bactericide? or exp bactericides/ or biocontrol or biological control or exp biological control/ or biopesticide? or exp biopesticides or bird control or chemical control or exp chemical control/ or crop protection or cultural control or cultural disease control or cultural pest control or disease control or exp disease control/ or (disease adj5 management) or disease prevention or eradication or fumigant? or fumigation or fungal disease? or fungicide? or herbicide? or hyperparasit* or insect control or insect pest? or insecticide? or integrated control or exp integrated control/ or integrated pest management or interception? or ipm or larvicide? or mite control or mold? or molluscicide? or mould? or natural enem* or nemat?cide? or nematode control or nozzle* or parasitic wasp? or parasitoid? or pest control or exp pest control/ or pest insect? or exp pest insects/ or pest management or exp pest management/ or pesticide? or exp pesticides/ or phytopathogen* or plant disease* or exp plant diseases/ or plant parasit* or plant pathogen* or plant pathology or plant pest? or plant protection or plant viroid* or plant virus* or exp plant viruses or pollen-borne or postharvest decay or predac?ous arthropod* or predac?ous insect? or predac?ous mite? or predatory arthropod* or predatory insect? or predatory mite? or preventive measure? or quarant?ine or resistance breeding or (breeding adj15 disease resistance) or (plant breeding adj15 disease resistance) or (breeding adj15 pest resistance) or (plant breeding adj15 pest resistance) or rodenticide? or slug? or snail? or soil disinfect* or soil disinfest* or soil disinfect* or soil disinfest* or soil sterili?ation or soil treatment or exp soil treatment/ or spraying or storage pest? or stored

products pest? or weed control or weeding

Crops:

ribes or grossularia uva-crispa or ribes grossularia or (currant? or jostaberr*).ti,ec,ei,ie or (gooseberr* not chinese gooseberr*).ti,ec,ei,ie

Countries:

(austria or belgium or bulgaria or cyprus or croatia or czech republic or czechoslovakia or csfr or denmark or estonia or european union or finland or france or germany or greece or hungary or iceland or irish republic or (ireland not northern ireland) or italy or latvia or lithuania or luxembourg or malta or netherlands or norway or poland or portugal or romania or slovakia or slovak republic or slovenia or spain or sweden or uk or great britain or united kingdom or scotland or wales or england or northern ireland).ti,ec,ie,ei,gc or exp austria or exp belgium or exp bulgaria or exp croatia or exp cyprus or exp czech republic or exp czechoslovakia or exp denmark or exp estonia or exp finland or exp france or exp germany or exp greece or exp hungary or exp iceland or exp ireland or exp irish republic or exp italy or exp latvia or exp lithuania or exp luxembourg or exp malta or exp netherlands or exp norway or exp poland or exp portugal or exp romania or exp slovak republic or exp slovakia or exp slovenia or exp spain or exp sweden or exp great britain or exp united kingdom or exp england or exp scotland or exp wales or exp northern ireland or exp european union or exp european union countries

Years:

(1995 or 1996 or 1997 or 1998 or 1999 or 20??).yr

Table 14: Search strategy for *Rubus* spp. in AGRIS.

Cropping practice:

(f01 or f04 or f06 or f07 or f08 or f50 or f61 or f62 or p10 or p11 or p30).cc or alternative agriculture or alternative methods or anti hail or biodynamic agriculture or biological farming or cane? or canopy shaker? or chemigat* or conventional farming or plant production or exp plant production/ or crop yield? or closed system? or coco peat or cocopeat or coir or cold tolerance or composting or crop husbandry or crop management or exp crop management/ or crop rotation? or exp crop rotation/ or crop yield? or cropping or exp cropping systems/ or cultivation or exp cultivation/ or cultural measure? or cultural method? or exp cultural methods/ or day length or daylength or desiccation tolerance or drainage or drought resistan* or drought stress* or drought toleran* or earliness or ecological farming or electrical conductivity or farming system? or exp farming systems/ or fertigat* or exp fertigation or fertili?ation or fertili?er* or fertili?ing or field preparation or flooding toleran* or florican? or forcing or frost control or frost protection or fruit growing or fruit yield? or girdling or glass house? or glasshouse? or grading or greenhouse? or growing media or growth retard* or hail control* or hail net or hail protection or hail shelter* or harvester? or exp harvesters/ or harvesting or exp harvesting/ or heating or hilling or hoeing or humidity or hydroponic? or exp hydroponics or intercropping or exp intercropping or interplanting or irrigat* or exp irrigation or land preparation or leaching or light regime? or exp light regimes/ or light relation? or lighting or long day plant? or macrotunnel? or microirrigat* or microtunnel? or mulch* or mycorrhiz* or nets or orchard? or organic farming or pH or photoperiod* or picking or plant density or plant growth regulator? or plant growth substance? or exp plant growth substances/ or plant nutrition or exp plant nutrition/ or plant population or plant training or plant water relation* or exp plant water relations or planting or plastic film cover* or plasticulture? or postharvest system* or practice? or primocane? or protective structure? or exp protective structures/ or protocol? or pruning or exp pruning/ or rain cover* or rain protection or rain shelter* or ridge? or ridging or rockwool or salinity or salt toleran* or sprinkl* or shading or soil amendment? or exp soil amendments/ or soil heating or soil management or soil

preparation or soilless culture? or exp soilless culture/ or sorting or spacing or sprinkl* or staking or storage or storing or crop storage or substrate? or supplementary light or thinning or tillage or exp tillage/ or tilling or topping or traditional farming or "tree architecture" or "tree shaker?" or "tree training" or trellis or trunk shaker? or tunnel? or ventilation or "water use efficiency" or wind protection or windbreak?

Propagation:

(f02 or f03 or f30 or f63).cc or bed plant? or budding or budwood? or certificat* or culture media or exp culture media/ or cutting? or exp cutting/ or exp cuttings/ or daughter plant? or elite or frigo plant? or graft compatibility or grafting? or exp grafting/ or grafts or exp in vitro culture/ or interstock* or layering or micrograft* or micropropagat* or mother plant? or motherplant? or nurser* or pathogen elimination or exp plant propagation/ or planting stock? or plug plant? or pollinat* or preplanting treatment or exp preplanting treatment/ or propagat* or exp plant propagation/ or exp propagation materials/ or (recommended adj4 cultivar?) or (recommended adj4 variet*) or "root stock?" or rootstock* or exp rootstocks/ or runner? or scion? or seedbed* or seed production or exp seed production or seed treatment or exp seed treatment or seedbed preparation or exp seedbed preparation or seedling culture or seedling production or exp seedling production or (seedling? adj5 treatment) or stolon? or sowing or exp sowing/ or tissue culture or exp tissue culture/ or exp vegetative propagation/ or virus free or virusfree or vitro culture or vitro production

Protection:

(h or j11).cc or acaricide? or bacterial disease? or bactericide? or exp bactericides/ or biocontrol or biological control or exp biological control/ or biopesticide? or exp biopesticides or bird control or chemical control or exp chemical control/ or crop protection or cultural control or cultural disease control or cultural pest control or disease control or exp disease control/ or (disease adj5 management) or disease prevention or eradication or fumigant? or fumigation or fungal disease? or fungicide? or herbicide? or hyperparasit* or insect control or insect pest? or insecticide? or integrated control or exp integrated control/ or integrated pest management or interception? or ipm or larvicide? or mite control or mold? or molluscicide? or mould? or natural enem* or nemat?cide? or nematode control or nozzle* or parasitic wasp? or parasitoid? or pest control or exp pest control/ or pest insect? or exp pest insects/ or pest management or exp pest management/ or pesticide? or exp pesticides/ or phytopathogen* or plant disease* or exp plant diseases/ or plant parasit* or plant pathogen* or plant pathology or plant pest? or plant protection or plant viroid* or plant virus* or exp plant viruses or pollen-borne or postharvest decay or predac?ous arthropod* or predac?ous insect? or predac?ous mite? or predatory arthropod* or predatory insect? or predatory mite? or preventive measure? or quarant?ine or resistance breeding or (breeding adj15 disease resistance) or (plant breeding adj15 disease resistance) or (breeding adj15 pest resistance) or (plant breeding adj15 pest resistance) or rodenticide? or slug? or snail? or soil disinfect* or soil disinfest* or soil disinfect* or soil disinfest* or soil sterili?ation or soil treatment or exp soil treatment/ or spraying or storage pest? or stored products pest? or weed control or weeding

Crops:

rubus or (blackberr* or boysenberr* or bramble* or caneberr* or cloudberr* or loganberr* or raspberr* or tayberr* or youngberr*).ti,ec,ei,ie

Countries:

(austria or belgium or bulgaria or cyprus or croatia or czech republic or czechoslovakia or csfr or denmark or estonia or european union or finland or france or germany or greece or hungary or iceland or irish republic or (ireland not northern ireland) or italy or latvia or lithuania or luxembourg or malta or netherlands or norway or poland or portugal or romania or slovakia or slovak republic or slovenia or spain or sweden or uk or great britain or united kingdom or scotland or wales or england or

northern ireland).ti,ec,ie,ei,gc or exp austria or exp belgium or exp bulgaria or exp croatia or exp cyprus or exp czech republic or exp czechoslovakia or exp denmark or exp estonia or exp finland or exp france or exp germany or exp greece or exp hungary or exp iceland or exp ireland or exp irish republic or exp italy or exp latvia or exp lithuania or exp luxembourg or exp malta or exp netherlands or exp norway or exp poland or exp portugal or exp romania or exp slovak republic or exp slovakia or exp slovenia or exp spain or exp sweden or exp great britain or exp united kingdom or exp england or exp scotland or exp wales or exp northern ireland or exp european union or exp european union countries

Years:

(1995 or 1996 or 1997 or 1998 or 1999 or 20??).yr

Table 15: Search strategy for *Vaccinium* spp. in AGRIS.

Cropping practice:

(f01 or f04 or f06 or f07 or f08 or f50 or f61 or f62 or p10 or p11 or p30).cc or alternative agriculture or alternative methods or anti hail or biodynamic agriculture or biological farming or cane? or canopy shaker? or chemigat* or conventional farming or plant production or exp plant production/ or crop yield? or closed system? or coco peat or cocopeat or coir or cold tolerance or composting or crop husbandry or crop management or exp crop management/ or crop rotation? or exp crop rotation/ or crop yield? or cropping or exp cropping systems/ or cultivation or exp cultivation/ or cultural measure? or cultural method? or exp cultural methods/ or day length or daylength or desiccation tolerance or drainage or drought resistan* or drought stress* or drought toleran* or earliness or ecological farming or electrical conductivity or farming system? or exp farming systems/ or fertigat* or exp fertigation or fertili?ation or fertili?er* or fertili?ing or field preparation or flooding toleran* or florican? or forcing or frost control or frost protection or fruit growing or fruit yield? or girdling or glass house? or glasshouse? or grading or greenhouse? or growing media or growth retard* or hail control* or hail net or hail protection or hail shelter* or harvester? or exp harvesters/ or harvesting or exp harvesting/ or heating or hilling or hoeing or humidity or hydroponic? or exp hydroponics or intercropping or exp intercropping or interplanting or irrigat* or exp irrigation or land preparation or leaching or light regime? or exp light regimes/ or light relation? or lighting or long day plant? or macrotunnel? or microirrigat* or microtunnel? or mulch* or mycorrhiz* or nets or orchard? or organic farming or pH or photoperiod* or picking or plant density or plant growth regulator? or plant growth substance? or exp plant growth substances/ or plant nutrition or exp plant nutrition/ or plant population or plant training or plant water relation* or exp plant water relations or planting or plastic film cover* or plasticulture? or postharvest system* or practice? or primocane? or protective structure? or exp protective structures/ or protocol? or pruning or exp pruning/ or rain cover* or rain protection or rain shelter* or ridge? or ridging or rockwool or salinity or salt toleran* or sprinkl* or shading or soil amendment? or exp soil amendments/ or soil heating or soil management or soil preparation or soilless culture? or exp soilless culture/ or sorting or spacing or sprinkl* or staking or storage or storing or crop storage or substrate? or supplementary light or thinning or tillage or exp tillage/ or tilling or topping or traditional farming or "tree architecture" or "tree shaker?" or "tree training" or trellis or trunk shaker? or tunnel? or ventilation or "water use efficiency" or wind protection or windbreak?

Propagation:

(f02 or f03 or f30 or f63).cc or bed plant? or budding or budwood? or certificat* or culture media or exp culture media/ or cutting? or exp cutting/ or exp cuttings/ or daughter plant? or elite or frigo plant? or graft compatibility or grafting? or exp grafting/ or grafts or exp in vitro culture/ or interstock* or layering or micrograft* or micropropagat* or mother plant? or motherplant? or nurser* or pathogen elimination or exp plant propagation/ or planting stock? or plug plant? or pollinat* or

preplanting treatment or exp preplanting treatment/ or propagat* or exp plant propagation/ or exp propagation materials/ or (recommended adj4 cultivar?) or (recommended adj4 variet*) or "root stock?" or rootstock* or exp rootstocks/ or runner? or scion? or seedbed* or seed production or exp seed production or seed treatment or exp seed treatment or seedbed preparation or exp seedbed preparation or seedling culture or seedling production or exp seedling production or (seedling? adj5 treatment) or stolon? or sowing or exp sowing/ or tissue culture or exp tissue culture/ or exp vegetative propagation/ or virus free or virusfree or vitro culture or vitro production

Protection:

(h or j11).cc or acaricide? or bacterial disease? or bactericide? or exp bactericides/ or biocontrol or biological control or exp biological control/ or biopesticide? or exp biopesticides or bird control or chemical control or exp chemical control/ or crop protection or cultural control or cultural disease control or cultural pest control or disease control or exp disease control/ or (disease adj5 management) or disease prevention or eradication or fumigant? or fumigation or fungal disease? or fungicide? or herbicide? or hyperparasit* or insect control or insect pest? or insecticide? or integrated control or exp integrated control/ or integrated pest management or interception? or ipm or larvicide? or mite control or mold? or molluscicide? or mould? or natural enem* or nemat?cide? or nematode control or nozzle* or parasitic wasp? or parasitoid? or pest control or exp pest control/ or pest insect? or exp pest insects/ or pest management or exp pest management/ or pesticide? or exp pesticides/ or phytopathogen* or plant disease* or exp plant diseases/ or plant parasit* or plant pathogen* or plant pathology or plant pest? or plant protection or plant viroid* or plant virus* or exp plant viruses or pollen-borne or postharvest decay or predac?ous arthropod* or predac?ous insect? or predac?ous mite? or predatory arthropod* or predatory insect? or predatory mite? or preventive measure? or quarant?ine or resistance breeding or (breeding adj15 disease resistance) or (plant breeding adj15 disease resistance) or (breeding adj15 pest resistance) or (plant breeding adj15 pest resistance) or rodenticide? or slug? or snail? or soil disinfect* or soil disinfest* or soil disinfect* or soil disinfest* or soil sterili?ation or soil treatment or exp soil treatment/ or spraying or storage pest? or stored products pest? or weed control or weeding

Crops:

vaccinium or oxycoccus macrocarpus or oxycoccus palustris or oxycoccus quadripetal* or (bilberr* or blaeber* or blueber* or cowber* or cranber* or lingonber* or whortleber*) .ti,ec,ei,ie

Countries:

(austria or belgium or bulgaria or cyprus or croatia or czech republic or czechoslovakia or csfr or denmark or estonia or european union or finland or france or germany or greece or hungary or iceland or irish republic or (ireland not northern ireland) or italy or latvia or lithuania or luxembourg or malta or netherlands or norway or poland or portugal or romania or slovakia or slovak republic or slovenia or spain or sweden or uk or great britain or united kingdom or scotland or wales or england or northern ireland).ti,ec,ie,ei,gc or exp austria or exp belgium or exp bulgaria or exp croatia or exp cyprus or exp czech republic or exp czechoslovakia or exp denmark or exp estonia or exp finland or exp france or exp germany or exp greece or exp hungary or exp iceland or exp ireland or exp irish republic or exp italy or exp latvia or exp lithuania or exp luxembourg or exp malta or exp netherlands or exp norway or exp poland or exp portugal or exp romania or exp slovak republic or exp slovakia or exp slovenia or exp spain or exp sweden or exp great britain or exp united kingdom or exp england or exp scotland or exp wales or exp northern ireland or exp european union or exp european union countries

Years:

(1995 or 1996 or 1997 or 1998 or 1999 or 20??).yr

Table 16: Search strategy for *Fragaria x ananassa* in AGRIS.

<p>Cropping practice: (f01 or f04 or f06 or f07 or f08 or f50 or f61 or f62 or p10 or p11 or p30).cc or alternative agriculture or alternative methods or anti hail or biodynamic agriculture or biological farming or cane? or canopy shaker? or chemigat* or conventional farming or plant production or exp plant production/ or crop yield? or closed system? or coco peat or cocopeat or coir or cold tolerance or composting or crop husbandry or crop management or exp crop management/ or crop rotation? or exp crop rotation/ or crop yield? or cropping or exp cropping systems/ or cultivation or exp cultivation/ or cultural measure? or cultural method? or exp cultural methods/ or day length or daylength or desiccation tolerance or drainage or drought resistan* or drought stress* or drought toleran* or earliness or ecological farming or electrical conductivity or farming system? or exp farming systems/ or fertigat* or exp fertigation or fertili?ation or fertili?er* or fertili?ing or field preparation or flooding toleran* or florricane? or forcing or frost control or frost protection or fruit growing or fruit yield? or girdling or glass house? or glasshouse? or grading or greenhouse? or growing media or growth retard* or hail control* or hail net or hail protection or hail shelter* or harvester? or exp harvesters/ or harvesting or exp harvesting/ or heating or hilling or hoeing or humidity or hydroponic? or exp hydroponics or intercropping or exp intercropping or interplanting or irrigat* or exp irrigation or land preparation or leaching or light regime? or exp light regimes/ or light relation? or lighting or long day plant? or macrotunnel? or microirrigat* or microtunnel? or mulch* or mycorrhiz* or nets or orchard? or organic farming or pH or photoperiod* or picking or plant density or plant growth regulator? or plant growth substance? or exp plant growth substances/ or plant nutrition or exp plant nutrition/ or plant population or plant training or plant water relation* or exp plant water relations or planting or plastic film cover* or plasticulture? or postharvest system* or practice? or primocane? or protective structure? or exp protective structures/ or protocol? or pruning or exp pruning/ or rain cover* or rain protection or rain shelter* or ridge? or ridging or rockwool or salinity or salt toleran* or sprinkl* or shading or soil amendment? or exp soil amendments/ or soil heating or soil management or soil preparation or soilless culture? or exp soilless culture/ or sorting or spacing or sprinkl* or staking or storage or storing or crop storage or substrate? or supplementary light or thinning or tillage or exp tillage/ or tilling or topping or traditional farming or "tree architecture" or "tree shaker?" or "tree training" or trellis or trunk shaker? or tunnel? or ventilation or "water use efficiency" or wind protection or windbreak?</p> <p>Propagation: (f02 or f03 or f30 or f63).cc or bed plant? or budding or budwood? or certificat* or culture media or exp culture media/ or cutting? or exp cutting/ or exp cuttings/ or daughter plant? or elite or frigo plant? or graft compatibility or grafting? or exp grafting/ or grafts or exp in vitro culture/ or interstock* or layering or micrograft* or micropropagat* or mother plant? or motherplant? or nurser* or pathogen elimination or exp plant propagation/ or planting stock? or plug plant? or pollinat* or preplanting treatment or exp preplanting treatment/ or propagat* or exp plant propagation/ or exp propagation materials/ or (recommended adj4 cultivar?) or (recommended adj4 variet*) or "root stock?" or rootstock* or exp rootstocks/ or runner? or scion? or seedbed* or seed production or exp seed production or seed treatment or exp seed treatment or seedbed preparation or exp seedbed preparation or seedling culture or seedling production or exp seedling production or (seedling? adj5 treatment) or stolon? or sowing or exp sowing/ or tissue culture or exp tissue culture/ or exp vegetative propagation/ or virus free or virusfree or vitro culture or vitro production</p> <p>Protection: (h or j11).cc or acaricide? or bacterial disease? or bactericide? or exp bactericides/ or biocontrol or biological control or exp biological control/ or biopesticide? or exp biopesticides or bird control or chemical control or exp chemical control/ or crop protection or cultural control or cultural disease</p>
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control or cultural pest control or disease control or exp disease control/ or (disease adj5 management) or disease prevention or eradication or fumigant? or fumigation or fungal disease? or fungicide? or herbicide? or hyperparasit* or insect control or insect pest? or insecticide? or integrated control or exp integrated control/ or integrated pest management or interception? or ipm or larvicide? or mite control or mold? or molluscicide? or mould? or natural enem* or nemat?cide? or nematode control or nozzle* or parasitic wasp? or parasitoid? or pest control or exp pest control/ or pest insect? or exp pest insects/ or pest management or exp pest management/ or pesticide? or exp pesticides/ or phytopathogen* or plant disease* or exp plant diseases/ or plant parasit* or plant pathogen* or plant pathology or plant pest? or plant protection or plant viroid* or plant virus* or exp plant viruses or pollen-borne or postharvest decay or predac?ous arthropod* or predac?ous insect? or predac?ous mite? or predatory arthropod* or predatory insect? or predatory mite? or preventive measure? or quarant?ine or resistance breeding or (breeding adj15 disease resistance) or (plant breeding adj15 disease resistance) or (breeding adj15 pest resistance) or (plant breeding adj15 pest resistance) or rodenticide? or slug? or snail? or soil disinfect* or soil desinfect* or soil disinfest* or soil disinfest* or soil sterili?ation or soil treatment or exp soil treatment/ or spraying or storage pest? or stored products pest? or weed control or weeding

Crops:

fragaria ananassa or fragaria x ananassa or strawberr*.ti,ec,ei,ie

Countries:

(austria or belgium or bulgaria or cyprus or croatia or czech republic or czechoslovakia or csfr or denmark or estonia or european union or finland or france or germany or greece or hungary or iceland or irish republic or (ireland not northern ireland) or italy or latvia or lithuania or luxembourg or malta or netherlands or norway or poland or portugal or romania or slovakia or slovak republic or slovenia or spain or sweden or uk or great britain or united kingdom or scotland or wales or england or northern ireland).ti,ec,ie,ei,gc or exp austria or exp belgium or exp bulgaria or exp croatia or exp cyprus or exp czech republic or exp czechoslovakia or exp denmark or exp estonia or exp finland or exp france or exp germany or exp greece or exp hungary or exp iceland or exp ireland or exp irish republic or exp italy or exp latvia or exp lithuania or exp luxembourg or exp malta or exp netherlands or exp norway or exp poland or exp portugal or exp romania or exp slovak republic or exp slovakia or exp slovenia or exp spain or exp sweden or exp great britain or exp united kingdom or exp england or exp scotland or exp wales or exp northern ireland or exp european union or exp european union countries

Years:

(1995 or 1996 or 1997 or 1998 or 1999 or 20??).yr

Table 17: Search strategy for *Vitis vinifera* in AGRIS.

Cropping practice:

(f01 or f04 or f06 or f07 or f08 or f50 or f61 or f62 or p10 or p11 or p30).cc or alternative agriculture or alternative methods or anti hail or bine? or biodynamic agriculture or biological farming or cane? or canopy management or canopy shaker? or chemigat* or conventional farming or plant production or exp plant production/ or crop yield? or closed system? or coco peat or cocopeat or coir or cold tolerance or composting or cone? or crop husbandry or crop management or exp crop management/ or crop rotation? or exp crop rotation/ or crop yield? or cropping or exp cropping systems/ or cultivation or exp cultivation/ or cultural measure? or cultural method? or exp cultural methods/ or cutting or day length or daylength or defoliation or desiccation tolerance or drainage or drought resistan* or drought stress* or drought toleran* or drying or earliness or ecological farming or farming system? or exp farming systems/ or fertigat* or exp fertigation or fertili?ation or fertili?er* or fertili?ing or field

preparation or flooding toleran* or floricane? or forcing or frost control or frost protection or fruit growing or fruit yield? or girdling or glass house? or glasshouse? or grading or grape production or grape yield? or greenhouse? or growing media or growth retard* or hail control* or hail net or hail protection or hail shelter* or harvester? or exp harvesters/ or harvesting or exp harvesting/ or heating or hilling or hoeing or humidity or hydroponic? or exp hydroponics or intercropping or exp intercropping or interplanting or irrigat* or exp irrigation or kiln? or land preparation or leaching or leaf removal or light regime? or exp light regimes/ or light relation? or lighting or long day plant? or macrotunnel? or mechanical method? or mechanization or microirrigat* or microtunnel? or mulch* or mycorrhiz* or nets or netting or orchard? or organic farming or pH or photoperiod* or picking or plant* density or plant growth regulator? or plant growth substance? or exp plant growth substances/ or plant nutrition or exp plant nutrition/ or plant population or plant water relation* or exp plant water relations or planting or plastic film? or plasticulture? or postharvest system* or practice? or primocane? or protective structure? or exp protective structures/ or protocol? or pruning or exp pruning/ or rain cover* or rain protection or rain shelter* or ridge? or ridging or rockwool or salinity or salt toleran* or sprinkl* or shading or soil amendment? or exp soil amendments/ or soil heating or soil management or soil preparation or soilless culture? or exp soilless culture/ or sorting or spacing or sprinkl* or staking or storage or storing or crop storage or string* or stripping or substrate? or suckering or supplementary light or tensile strength or ties or thinning or tillage or exp tillage/ or tilling or topping or traditional farming or training or "tree architecture" or "tree shaker?" or trellis* or trimming or trunk shaker? or tunnel? or twine? or ventilation or vine? or vineyard management or "water use efficiency" or wind protection or windbreak? or wire*

Propagation:

(f02 or f03 or f30 or f63).cc or bed plant? or budding or budwood? or certificat* or culture media or exp culture media/ or cutting? or exp cutting/ or exp cuttings/ or daughter plant? or elite or frigo plant? or graft compatibility or grafting? or exp grafting/ or grafts or exp in vitro culture/ or interstock* or layering or micrograft* or micropropagat* or mother plant? or motherplant? or nurser* or pathogen elimination or exp plant propagation/ or planting stock? or plug plant? or pollinat* or preplanting treatment or exp preplanting treatment/ or propagat* or exp plant propagation/ or exp propagation materials/ or (recommended adj4 cultivar?) or (recommended adj4 variet*) or rhizome? or "root stock?" or rootstock* or exp rootstocks/ or runner? or scion? or seedbed* or seed production or exp seed production or seed treatment or exp seed treatment or seedbed preparation or exp seedbed preparation or seedling culture or seedling production or exp seedling production or (seedling? adj5 treatment) or stolon? or sowing or exp sowing/ or tissue culture or exp tissue culture/ or exp vegetative propagation/ or virus free or virusfree or vitro culture or vitro production

Protection:

(h or j11).cc or acaricide? or bacterial disease? or bactericide? or exp bactericides/ or biocontrol or biological control or exp biological control/ or biopesticide? or exp biopesticides or bird control or chemical control or exp chemical control/ or crop protection or cultural control or cultural disease control or cultural pest control or disease control or exp disease control/ or (disease adj5 management) or disease prevention or eradication or fumigant? or fumigation or fungal disease? or fungicide? or herbicide? or hyperparasit* or insect control or insect pest? or insecticide? or integrated control or exp integrated control/ or integrated pest management or interception? or ipm or larvicide? or mite control or mold? or molluscicide? or mould? or natural enem* or nemat?cide? or nematode control or nozzle* or parasitic wasp? or parasitoid? or pest? or exp pest control/ or exp pest insects/ or exp pest management/ or pesticide? or exp pesticides/ or exp pests/ or phytopathogen* or plant disease* or exp plant diseases/ or plant parasit* or plant pathogen* or plant pathology or plant pest? or plant protection or plant viroid* or plant virus* or exp plant viruses or pollen-borne or postharvest decay or predac?ous arthropod* or predac?ous insect? or predac?ous mite? or predatory arthropod* or predatory insect? or predatory mite? or preventive measure? or quarant?ine or resistance breeding or

(breeding adj15 disease resistance) or (plant breeding adj15 disease resistance) or (breeding adj15 pest resistance) or (plant breeding adj15 pest resistance) or rodenticide? or slug? or snail? or soil desinfect* or soil desinfect* or soil disinfect* or soil disinfest* or soil sterili?ation or soil treatment or exp soil treatment/ or spraying or storage pest? or stored products pest? or sucker? or weed control or weeding

Crops:

vitis vinifera or (grape? or grapevine? or raisin or raisins or tablegrape? or vineyard? or viticultur* or winegrape?). ti,ec,ei,ie

Extra: vitis and (interstock? or planting stock? or "root stock?" or rootstock? or stock type? or stocktype?)

Countries:

(austria or belgium or bulgaria or cyprus or croatia or czech republic or czechoslovakia or csfr or denmark or estonia or european union or finland or france or "federal republic of germany" or german democratic republic or germany or greece or hungary or iceland or irish republic or (ireland not northern ireland) or italy or latvia or lithuania or luxembourg or malta or netherlands or norway or poland or portugal or romania or slovakia or slovak republic or slovenia or spain or sweden or uk or great britain or united kingdom or scotland or wales or england or northern ireland).ti,ec,ie,ei,gc or exp austria or exp belgium or exp bulgaria or exp croatia or exp cyprus or exp czech republic or exp czechoslovakia or exp denmark or exp estonia or exp finland or exp france or exp germany or exp greece or exp hungary or exp iceland or exp ireland or exp irish republic or exp italy or exp latvia or exp lithuania or exp luxembourg or exp malta or exp netherlands or exp norway or exp poland or exp portugal or exp romania or exp slovak republic or exp slovakia or exp slovenia or exp spain or exp sweden or exp great britain or exp united kingdom or exp england or exp scotland or exp wales or exp northern ireland or exp european union or exp european union countries

Years:

20??.yr

Table 18: Search strategy for *Humulus lupulus* in AGRIS.

Cropping practice:

(f01 or f04 or f06 or f07 or f08 or f50 or f61 or f62 or p10 or p11 or p30).cc or alternative agriculture or alternative methods or anti hail or bine? or biodynamic agriculture or biological farming or cane? or canopy shaker? or chemigat* or conventional farming or plant production or exp plant production/ or crop yield? or closed system? or coco peat or cocopeat or coir or cold tolerance or composting or cone? or crop husbandry or crop management or exp crop management/ or crop rotation? or exp crop rotation/ or crop yield? or cropping or exp cropping systems/ or cultivation or exp cultivation/ or cultural measure? or cultural method? or exp cultural methods/ or cutting or day length or daylength or desiccation tolerance or drainage or drought resistan* or drought stress* or drought toleran* or drying or earliness or ecological farming or farming system? or exp farming systems/ or fertigat* or exp fertigation or fertili?ation or fertili?er* or fertili?ing or field preparation or flooding toleran* or florican? or forcing or frost control or frost protection or fruit growing or fruit yield? or girdling or glass house? or glasshouse? or grading or greenhouse? or growing media or growth retard* or hail control* or hail net or hail protection or hail shelter* or harvester? or exp harvesters/ or harvesting or exp harvesting/ or heating or hilling or hoeing or humidity or hydroponic? or exp hydroponics or intercropping or exp intercropping or interplanting or irrigat* or exp irrigation or kiln? or land preparation or leaching or light regime? or exp light regimes/ or light relation? or lighting or long day plant? or macrotunnel? or mechanization or microirrigat* or microtunnel? or mulch* or mycorrhiz*

or nets or netting or orchard? or organic farming or pH or photoperiod* or picking or plant density or plant growth regulator? or plant growth substance? or exp plant growth substances/ or plant nutrition or exp plant nutrition/ or plant population or plant water relation* or exp plant water relations or planting or plastic film cover* or plasticulture? or postharvest system* or practice? or primocane? or protective structure? or exp protective structures/ or protocol? or pruning or exp pruning/ or rain cover* or rain protection or rain shelter* or ridge? or ridging or rockwool or salinity or salt toleran* or sprinkl* or shading or soil amendment? or exp soil amendments/ or soil heating or soil management or soil preparation or soilless culture? or exp soilless culture/ or sorting or spacing or sprinkl* or staking or storage or storing or crop storage or string* or substrate? or supplementary light or tensile strength or ties or thinning or tillage or exp tillage/ or tilling or topping or traditional farming or training or "tree architecture" or "tree shaker?" or trellis* or trunk shaker? or tunnel? or twine? or ventilation or vine? or "water use efficiency" or wind protection or windbreak? or wire*

Propagation:

(f02 or f03 or f30 or f63).cc or bed plant? or budding or budwood? or certificat* or culture media or exp culture media/ or cutting? or exp cutting/ or exp cuttings/ or daughter plant? or elite or frigo plant? or graft compatibility or grafting? or exp grafting/ or grafts or exp in vitro culture/ or interstock* or layering or micrograft* or micropropagat* or mother plant? or motherplant? or nurser* or pathogen elimination or exp plant propagation/ or planting stock? or plug plant? or pollinat* or preplanting treatment or exp preplanting treatment/ or propagat* or exp plant propagation/ or exp propagation materials/ or (recommended adj4 cultivar?) or (recommended adj4 variet*) or rhizome? or "root stock?" or rootstock* or exp rootstocks/ or runner? or scion? or seedbed* or seed production or exp seed production or seed treatment or exp seed treatment or seedbed preparation or exp seedbed preparation or seedling culture or seedling production or exp seedling production or (seedling? adj5 treatment) or stolon? or sowing or exp sowing/ or tissue culture or exp tissue culture/ or exp vegetative propagation/ or virus free or virusfree or vitro culture or vitro production

Protection:

(h or j11).cc or acaricide? or bacterial disease? or bactericide? or exp bactericides/ or biocontrol or biological control or exp biological control/ or biopesticide? or exp biopesticides or bird control or chemical control or exp chemical control/ or crop protection or cultural control or cultural disease control or cultural pest control or disease control or exp disease control/ or (disease adj5 management) or disease prevention or eradication or fumigant? or fumigation or fungal disease? or fungicide? or herbicide? or hyperparasit* or insect control or insect pest? or insecticide? or integrated control or exp integrated control/ or integrated pest management or interception? or ipm or larvicide? or mite control or mold? or molluscicide? or mould? or natural enem* or nemat?cide? or nematode control or nozzle* or parasitic wasp? or parasitoid? or pest? or exp pest control/ or exp pest insects/ or exp pest management/ or pesticide? or exp pesticides/ or exp pests/ or phytopathogen* or plant disease* or exp plant diseases/ or plant parasit* or plant pathogen* or plant pathology or plant pest? or plant protection or plant viroid* or plant virus* or exp plant viruses or pollen-borne or postharvest decay or predac?ous arthropod* or predac?ous insect? or predac?ous mite? or predatory arthropod* or predatory insect? or predatory mite? or preventive measure? or quarant?ine or resistance breeding or (breeding adj15 disease resistance) or (plant breeding adj15 disease resistance) or (breeding adj15 pest resistance) or (plant breeding adj15 pest resistance) or rodenticide? or slug? or snail? or soil disinfect* or soil disinfect* or soil disinfect* or soil disinfect* or soil sterili?ation or soil treatment or exp soil treatment/ or spraying or storage pest? or stored products pest? or weed control or weeding

Crops:

humulus lupulus or (hop or hops or hoggarden?).ti,ec,ei,ie

Countries:

(austria or belgium or bulgaria or cyprus or croatia or czech republic or czechoslovakia or csfr or denmark or estonia or european union or finland or france or "federal republic of germany" or german democratic republic or germany or greece or hungary or iceland or irish republic or (ireland not northern ireland) or italy or latvia or lithuania or luxembourg or malta or netherlands or norway or poland or portugal or romania or slovakia or slovak republic or slovenia or spain or sweden or uk or great britain or united kingdom or scotland or wales or england or northern ireland).ti,ec,ie,ei,gc or exp austria or exp belgium or exp bulgaria or exp croatia or exp cyprus or exp czech republic or exp czechoslovakia or exp denmark or exp estonia or exp finland or exp france or exp germany or exp greece or exp hungary or exp iceland or exp ireland or exp irish republic or exp italy or exp latvia or exp lithuania or exp luxembourg or exp malta or exp netherlands or exp norway or exp poland or exp portugal or exp romania or exp slovak republic or exp slovakia or exp slovenia or exp spain or exp sweden or exp great britain or exp united kingdom or exp england or exp scotland or exp wales or exp northern ireland or exp european union or exp european union countries

Years:

(199? or 20??).yr

Table 19: Search strategy for *Prunus* spp. in AGRIS.

Cropping practice:

(f01 or f04 or f06 or f07 or f08 or f50 or f61 or f62 or p10 or p11 or p30).cc or alternative agriculture or alternative methods or anti hail or bine? or biodynamic agriculture or biological farming or branching or canopy management or canopy shaker? or chemigat* or conventional farming or plant production or exp plant production/ or crop yield? or closed system? or coco peat or cocopeat or coir or cold resistance or cold stress* or cold tolerance or composting or cone? or crop husbandry or crop load? or crop management or exp crop management/ or crop rotation? or exp crop rotation/ or crop yield? or cropping or exp cropping systems/ or cultivation or exp cultivation/ or cultural measure? or cultural method? or exp cultural methods/ or cutting or day length or daylength or defoliation or desiccation tolerance or drainage or drought resistan* or drought stress* or drought toleran* or drying or earliness or ecological farming or farming system? or exp farming systems/ or feather* or fertigat* or exp fertigation or fertili?ation or fertili?er* or fertili?ing or field preparation or flooding toleran* or forcing or frost control or frost damage or frost injur* or frost protection or frost resistance or fruit growing or fruit yield? or girdling or glass house? or glasshouse? or grading or greenhouse? or growing media or growth retard* or hail control* or hail net or hail protection or hail shelter* or hardiness or harvester? or exp harvesters/ or harvesting or exp harvesting/ or heating or hilling or hoeing or humidity or hydroponic? or exp hydroponics or intercropping or exp intercropping or interplanting or irrigat* or exp irrigation or kiln? or land preparation or leaching or leaf removal or light regime? or exp light regimes/ or light relation? or lighting or long day plant? or macrotunnel? or mechanical method? or mechanization or microirrigat* or microtunnel? or mulch* or mycorrhiz* or nets or netting or orchard floor* or organic farming or pH or photoperiod* or picking? or plant* density or plant growth regulator? or plant growth substance? or exp plant growth substances/ or plant nutrition or exp plant nutrition/ or plant population or plant water relation* or exp plant water relations or planting or plastic film? or plasticulture? or postharvest system* or practice? or protective structure? or exp protective structures/ or protocol? or pruning or exp pruning/ or rain cover* or rain protection or ridge? or ridging or rockwool or salinity or salt toleran* or shading or shelf life? or shelf lives or shelflife* or shelter* or soil amendment? or exp soil amendments/ or soil heating or soil management or soil preparation or soilless culture? or exp soilless culture/ or sorting or spacing or sprinkl* or staking or storage or storing or crop storage or string* or stripping or substrate? or suckering or supplementary light or temperature resistance or tensile strength or ties or thinning or tillage or exp tillage/ or tilling or topping or traditional farming or training or "tree architecture" or "tree shaker?" or trellis* or trimming or trunk shaker? or tunnel? or ventilation or "water use

efficiency" or wind protection or windbreak? or wire*

Propagation:

(f02 or f03 or f30 or f63).cc or bed plant? or bud stick? or bud wood or budding or budstick? or budwood? or certif* or (cultivar* adj10 list?) or culture media or exp culture media/ or cutting? or exp cutting/ or exp cuttings/ or daughter plant? or description list? or descriptive list? or elite or graft compatibility or grafting? or exp grafting/ or grafts or exp in vitro culture/ or interstock* or layering or micrograft* or micropropagat* or mother plant? or motherplant? or nurser* or pathogen elimination or exp plant propagation/ or planting stock? or pollinat* or preplanting treatment or exp preplanting treatment/ or propagat* or exp plant propagation/ or exp propagation materials/ or (recommended adj4 cultivar?) or (recommended adj4 variet*) or replant* or rhizome? or "root stock?" or rootstock* or exp rootstocks/ or runner? or scion? or seedbed* or seed production or exp seed production or seed treatment or exp seed treatment or seedbed preparation or exp seedbed preparation or seedling culture or seedling production or exp seedling production or (seedling? adj5 treatment) or stolon? or sowing or exp sowing/ or tissue culture or exp tissue culture/ or (variet* adj10 list?) or exp vegetative propagation/ or virus free or virusfree or vitro culture or vitro production

Protection:

(h or j11).cc or acaricide? or bacterial disease? or bactericide? or exp bactericides/ or biocontrol or biological control or exp biological control/ or biopesticide? or exp biopesticides or bird control or chemical control or exp chemical control/ or cracking or crop protection or cultural control or cultural disease control or cultural pest control or disease control or exp disease control/ or (disease adj5 management) or disease prevention or eradication or fumigant? or fumigation or fungal disease? or fungicide? or herbicide? or hyperparasit* or insect control or insect pest? or insecticide? or integrated control or exp integrated control/ or integrated pest management or interception? or ipm or larvicide? or mite control or mold? or molluscicide? or mould? or natural enem* or nemat?cide? or nematode control or nozzle* or parasitic wasp? or parasitoid? or pest? or exp pest control/ or exp pest insects/ or exp pest management/ or pesticide? or exp pesticides/ or exp pests/ or phytopathogen* or plant disease* or exp plant diseases/ or plant parasit* or plant pathogen* or plant pathology or plant pest? or plant protection or plant viroid* or plant virus* or exp plant viruses or pollen-borne or postharvest decay or predac?ous arthropod* or predac?ous insect? or predac?ous mite? or predatory arthropod* or predatory insect? or predatory mite? or preventive measure? or quarant?ine or resistance breeding or (breeding adj15 disease resistance) or (plant breeding adj15 disease resistance) or (breeding adj15 pest resistance) or (plant breeding adj15 pest resistance) or rodenticide? or slug? or snail? or soil disinfect* or soil disinfest* or soil disinfect* or soil disinfest* or soil sterili?ation or soil treatment or exp soil treatment/ or splitting or spraying or storage pest? or stored products pest? or sucker? or weed control or weeding

Crops:

Crop 1: prunus domestica or (damson? or plums or prunes).ti,ec,ei,ie or ((plum or prune).ti and prunus)

Crop 2: prunus persica or (peaches or nectarin??).ti,ec,ei,ie or (peach.ti and prunus)

Crop 3: prunus armeniaca or apricot?.ti,ec,ei,ie

Crop 4: prunus avium or prunus cerasus or cherries.ti,ec,ei,ie or (cherry.ti and prunus)

Crop 5: (stone fruit? or stonefruit?).ti,ec,ei,ie (Crops 1-4 are excluded)

Countries:

(austria or belgium or bulgaria or cyprus or croatia or czech republic or czechoslovakia or csfr or denmark or estonia or european union or finland or france or "federal republic of germany" or german democratic republic or germany or greece or hungary or iceland or irish republic or (ireland not

northern ireland) or italy or latvia or lithuania or luxembourg or malta or netherlands or norway or poland or portugal or romania or slovakia or slovak republic or slovenia or spain or sweden or uk or great britain or united kingdom or scotland or wales or england or northern ireland).ti,ec,ie,ei,gc or exp austria or exp belgium or exp bulgaria or exp croatia or exp cyprus or exp czech republic or exp czechoslovakia or exp denmark or exp estonia or exp finland or exp france or exp germany or exp greece or exp hungary or exp iceland or exp ireland or exp irish republic or exp italy or exp latvia or exp lithuania or exp luxembourg or exp malta or exp netherlands or exp norway or exp poland or exp portugal or exp romania or exp slovak republic or exp slovakia or exp slovenia or exp spain or exp sweden or exp great britain or exp united kingdom or exp england or exp scotland or exp wales or exp northern ireland or exp european union or exp european union countries

Years:

(1995 or 1996 or 1997 or 1998 or 1999 or 20??).yr

Table 20: AGRIS index codes used in the literature searches in AGRIS (<http://www.fao.org/scripts/agris/c-categ.htm>).

AGRIS index code	Description
F01	Crop husbandry
F02	Plant propagation
F04	Fertilizing
F06	Irrigation
F07	Soil cultivation
F08	Cropping patterns and systems
F30	Plant genetics and breeding
F50	Plant structure
F61	Plant physiology – Nutrition
F62	Plant physiology – Growth and development
F63	Plant physiology - Reproduction
H	Protection of plants and stored products
J11	Handling, transport, storage and protection of plant products
P10	Water resources and management
P11	Drainage

2.2.3. ARTIK, Wageningen catalogue and Staff Publications

The search strategy in the Dutch databases ARTIK, Wageningen catalogue and Staff Publications is described for all species in Table 22. Boolean operators used are AND, OR and NOT. Truncation (*) was used to retrieve all possible suffix variations of the root word indicated. The wild card character ? was used within or at the end of a search term to substitute for one character. Sometimes terms were enclosed in quotes, e.g. "blauwe bessenteelt", which means that the exact phrase is being searched.

Table 22: Search strategy for *Ribes*, *Rubus*, *Vaccinium*, *Fragaria x ananassa*, *Vitis vinifera*, *Humulus lupulus*, *Prunus avium*, *Prunus cerasus*, *Prunus armeniaca*, *Prunus persica*, *Prunus domestica* and stone fruits in ARTIK, Wageningen catalogue and Staff Publications.

Ribes

ribes* OR grossularia OR blackcurrant* OR currant* OR jostaberr* OR gooseberr* OR aalbes* OR bes OR bessen* OR jostabes* OR kruisbes* OR rodebessen* OR rosebessen* OR zwartebessen* OR beeren* OR johannisbeer* OR jostabeer* OR stachelbeer*

Rubus

rubus* OR blackberr* OR boysenberr* OR bramble* OR caneber* OR cloudberr* OR loganberr* OR raspberr* OR tayberr* OR youngberr* OR braam* OR bramen* OR frambo* OR herfstframbo* OR zomerframbo* OR brombeer* OR himbeer*

Vaccinium

Vaccinium* OR "blauwe bes" OR "blauwe bessen" OR "blauwe bessenteelt" OR blauwebes* OR bosbes OR bosbessen* OR cranberr* OR veenbes* OR vossebes* OR vossenbes* OR bilberr* OR blaeberr* OR blueberr* OR myrtill* OR blaubeer* OR heidelbeer* OR kulturheidelbeer* OR preiselbeer* OR kulturpreiselbeer

Fragaria

fragaria OR strawberr* OR aardbei* OR erdbeer* OR fraise* OR fraisier*

Vitis vinifera

vitis* OR druif OR druifras* OR druive* OR tafeldrui* OR wijnbouw* OR wijngaard* OR grape OR grapes OR grapevine* OR vineyard* OR viticult* OR okoweinbau* OR rebbau* OR rebe OR reben* OR rebsorte* OR tafeltraube* OR traube* OR weinbau* OR weinreb*

Humulus lupulus

"humulus lupulus" OR hop OR hops OR hopteelt* OR hopfen* OR houblon) AND NOT (hop, j OR hop, m*)

Prunus avium and Prunus cerasus

"prunus avium" OR "prunus cerasus" OR cherry OR cherries OR kers OR kersen* OR cerise* OR

cerisier* OR kirsch* OR suesskirsch* OR susskirsch* OR sauerkirsch* OR tafelkirsch*
 Prunus armeniaca
 "prunus armeniaca" OR abriko* OR apricot* OR abricot*
 Prunus persica
 "prunus persica" OR nectarin* OR perzik OR perziken OR perzikteelt* OR peach OR peaches OR
 nektarin* OR pfirsich* OR pecher*
 Prunus domestica
 "prunus domestica" OR kwets OR kwetsen* OR pruim* OR damson* OR plum OR plums OR prune
 OR prunes OR pruneau* OR prunier* OR pflaum* OR zwetsch*
 "stone fruit*" OR steenvr* OR steenfr* OR steinobst* OR "fruit* a noyau"

2.2.4. Grey/technical literature from website searches and via organisations

Extensive literature searches were done on many websites from stakeholder associations, extension services and national/regional authorities in all 28 EU Member States, Iceland and Norway. At the start of the project a list was made with potential interesting sources. This list was further expanded during the course of the project. The list partly resulted from personal knowledge from the information professionals and (key)experts involved in this project, partly from consulting colleague researchers in other EU Member States and partly from searches on the Web. An overview of all consulted websites is given in Table 23. When a website is of potential interest due to its type of information, ease of use and preferably also export facilities to EndNote, this is indicated in the table by highlighting this source.

Table 23: Organisations and websites searched to find grey/technical literature. Highlighted sources (e.g. **BOKU**) indicate that this source is of potential interest due to its type of information, ease of use and preferably also export facilities to EndNote.

Country	Organisation	URL
Austria	BOKU, Universität für Bodenkultur Wien	http://www.boku.ac.at/kataloge.html
	Bundesamt und Forschungszentrum für Landwirtschaft, Institut für Phytomedizin	http://www.bfl.ac.at/
	Versuchsstation Obst- und Weinbau Haidegg	http://www.verwaltung.steiermark.at/cms/ziel/75777092/DE
	Bundesministerium für Land - und Forstwirtschaft, Umwelt und Abteilung Wassewirtschaft	http://www.lebensministerium.at/land.html
	Arbeitsgemeinschaft für Lebensmittel-, Veterinär- und Agrarwesen (ALVA) Viticulture and pomology group	http://www.alva.at/index.php/en/about-alva
Belgium	KU Leuven Library	http://bib.kuleuven.be/ub/zoeken
	Limo Belgium	http://limo.libis.be/

	Proefcentrum Hoogstraten	http://www.proefcentrum.be/onderzoek/publicaties
	Proefcentrum fruitteelt	http://www.pcfuit.be/Voorlichting/4602/pcfuit
	Provinciaal proefcentrum voor kleinfruit	http://www.vlaamsbrabant.be/economie-landbouw/land-en-tuinbouw/onderzoek-voorlichting-beleid/telen-aardbeien-en-kleinfruit-ppk/index.jsp
	The Institute for Agricultural and Fisheries Research (ILVO)	http://www.ilvo.vlaanderen.be/default.aspx?tabid=83&language=en-US
	Vlaams Infocentrum Land- en Tuinbouw	www.vilt.be
	Flanders Centre of Postharvest Technology, BIOSYST-MeBioS, Katholieke Universiteit Leuven	http://www.biw.kuleuven.be/mebios/english/valorisation/vcbt.html
	Provincial Research and Advisory Centre, for Agriculture and Horticulture (POVLT)	http://www.inagro.be/default.aspx
	Bibliothèque des Sciences agronomiques	http://www.libnet.ulg.ac.be/
Bulgaria	University of Agriculture, Plovdiv	http://www.au-plovdiv.bg/en/content.php?id=20
	Trakia University, Fac. Of Agriculture	http://www.uni-sz.bg/engl
	Bulgarian National Center of Agricultural Sciences (NCAS)	http://www.mzgar.government.bg/NacSlujbi/NCAN/Ncan.htm
	Cyril en Methodius Nationale Bibliotheek/ union catalog cobib.bg	http://www.nationallibrary.bg/ http://www.bg.cobiss.net/
Croatia	Department of Plant Sciences, Institute for Adriatic Crops	http://www.krs.hr/en/
	Department for Breeding & Genetics of Small Cereal Crops, Agricultural Institute Osijek, Department of Fruit Growing	http://www.poljinos.hr/en/index.php?str=tekst&kat=21&id=107
	Union Catalogue of Croatian Libraries	http://opak.crolib.hr/
Cyprus	Agricultural Research Institute, Lefkosia	http://library.ari.gov.cy/agris/
	Agricultural Research Institute, Nicosia	http://www.moa.gov.cy/moa/ari/ari.nsf/page01_en/page01_en?OpenDocument&ExpandSection=8
	Ministry of Agriculture, Natural Resources and Environment	http://www.moa.gov.cy/moa/agriculture.nsf/index_en/index_en?OpenDocument
	Union Catalog Hellenic Academic Libraries	http://www.unioncatalog.gr/ucportal/index.php?lang=en
Czech Republic	Institute of Botany	http://www.ibot.cas.cz/en/
	Biology Centre of the Academy of	http://www.bc.cas.cz/en/

	Sciences of the Czech Republic, Ceske Budejovice	
	Czech Society for Horticultural Science	http://www.mendelu.cz/en/
	Research and Breeding Institute of Pomology CZ-Horice	www.vsu.cz
	Czech University of Life Sciences Prague (formerly of Agriculture)	http://www.czu.cz/en/
	Czech Academy of Agricultural Sciences	http://www.cazv.cz/?lang=en
	Agricultural and Food Library IAEI (Institute of Agricultural Economics and Information)	http://aleph.uzpi.cz/F/?func=file&file_name=find-b&local_base=uzpi&CON LNG=ENG
	University of South Bohemia - Faculty of Agriculture/Faculty of Economics - Library	http://www.lib.jcu.cz/en/home#
	Ministry of Agriculture of the Czech Republic - Library	http://eagri.cz/public/web/en/mze/search/index\$41111.html?query=&segments=eagri.mze
	Catalogues and Databases of the National Library of the Czech Republic	http://aleph.nkp.cz/F/
	Nat Lib of Czech Republic	via Endnote Online Search
	ANL - Articles from Czech Newspapers and Periodicals	http://aleph.nkp.cz/F/
	SKC - Union Catalogue of the Czech Republic	http://aleph.nkp.cz/F/
Denmark		http://www.gartneriraadgivning.dk/OmOs/Alle_Medarbejdere/MedarbejderListeAlle.htm?accountname=4b40a985-279b-4a2f-84e8-2b5dfbcc0d74
	Dansk Gartneri	
	Aarhus University	http://pure.au.dk/portal/en/organizations/8000/publications.html
	KU Life Copenhagen	http://www.bvfb.life.ku.dk/soeg_find/artikler_bibliografiske_baser.aspx
	AgroTech - Institute for Agri Technology and Food Innovation	http://agrotech.dk/en/work-areas-0
	Aarhus University, Faculty of Agriculture	http://www.agrsci.org/ny_navigation/forskning/institutter/havebrugsproduktion/udviklingscenter_aarslev/
	Landbrugsinfo	https://www.landbrugsinfo.dk/Planteval/Plantevaern/IPM/Sider/Startside.aspx
	Botanisk Centralbibliotek, Copenhagen	http://botanik.snm.ku.dk/english/Bibliotek/
	BIBLIOTEK.dk	http://bibliotek.dk/?lingo=eng
	The Danish Bibliographic Centre	http://www.dbc.dk/
	Bibliotek.dk Scientific articles	http://statsbiblioteket.dk/videnskabeligeartikler/
	Planteskolen Vester Skovgaard	www.vesterskovgaard.dk

	Danske Baer	http://www.danskebaer.dk/
Estonia	Estonian University of Life Sciences, Institute of Agricultural and Environmental Sciences, Estonia	https://www.emu.ee/en/
	Jõgeva Plant Breeding Institute, Estonia	http://www.sordiaretus.ee/
	Elnet Consortium -Estonian Libraries Network consortium	http://www.elnet.ee
	Ester Tallinn	http://tallinn.ester.ee/
	Index Scriptorum Estoniae	http://ise.elnet.ee/search
	Finland	MTT Plant Production Research
Oulu University of Applied Science		https://leevi.amkit.fi/vwebv/searchBasic
Vapo Oy, Jyväskylä, Finland		http://www.vapo.fi/en
MTT Agrifood Research Finland, Horticulture, Piikkiö		http://devepark.utu.fi/posterit/P5_MTT_Agrifood_Piikki%C3%B6.pdf
University of Helsinki		http://www.helsinki.fi/university/
University of Turku		http://www.utu.fi/en/
ARTO - Reference Database of Finnish Articles		https://arto.linneanet.fi/vwebv/searchBasic?sk=en_FI
France	AGROCAMPUS OUEST Centre d'Angers	http://www.agrodoc-ouest.org/
	INRA - French National Institute for Agricultural Research	http://www.international.inra.fr/
	Prodinra. Archive ouverte des productions de l'INRA	http://prodinra.inra.fr/?locale=fr
	Ctifl, Centre de Balandran	http://www.ctifl.fr/Pages/Ctifl/Centre.aspx?id=8
	CtifL Chef du Dép. Fruits et Technologie FR-Paris	http://www.fruits-et-legumes.net/
	UP EPHOR, Agrocampus-Ouest, Institut National d'Horticulture et de Paysage, Angers	http://www.agrocampus-ouest.fr/infogluDeliverLive/espace-telechargement/up-ephor
	France Academy of Agriculture	http://www.academie-agriculture.fr/
	Institut national de recherche en sciences et technologies pour l'environnement et l'agriculture	http://www.irstea.fr/
Germany		http://www.holzwirtschaft.org/content.php?main=howilitdb&nav=index
	Univ. Hamburg / HoWiLit	
	Technische Universität München – Fachgebiet für Obstbau	http://www.wzw.tum.de/ob/
	Hauptkatalog der Universitäts- und Landesbibliothek Bonn	http://www.ulb.uni-bonn.de/
	CIOPORA, Int.Community of Breeders of	http://www.ciopora.org/publications.

	Asexually Reproduced. Ornamental and Fruit Plants	html
	Leibniz-Institute of Vegetable and Ornamental Crops, Grossbeeren, Germany	http://www.bmelv.de/SharedDocs/Standardartikel/EN/Ministry/ResearchInnovation/LeibnizInstitutes/EN_IGZ.html
	Kompetenzzentrum Obstbau Bodensee	http://www.kob-bavendorf.de/
	Johannisbeer-Anbauer	http://www.johannisbeeranbauer.de/
	Dienstleistungszentrum Ländlicher Raum RheinlandPfalz	www.dlr-rheinpfalz.rlp.de
	Esteburg Obstbauzentrum Jork	http://www.esteburg.de/
	Gartenpraxis	www.gartenpraxis.de
	Phytomed	http://phytomed.jki.bund.de/
Greece	Benaki Phythopathological Institute	http://en.bpi.gr/section.aspx?id=6&subid=101
	University of Thessaly, Dept. of Agriculture Crop Production & Rural Environment, Lab. of Agricultural Constructions and Env. Contr., Volos	http://www.agr.uth.gr/main/index_en.html
	Agricultural University of Athens, Faculty of Crop Science	http://efp.aua.gr/en
	Aristotle University of Thessaloniki, Faculty of Agriculture, Lab. of Alternative Energy Sources in Agriculture, Thessaloniki	http://www.agro.auth.gr/eng/index.htm
	National Archive of PhD Theses	http://phdtheses.ekt.gr/eadd/
	Mediterranean Agronomic Institute of Chania	http://library.maich.gr/cgi-bin-EN/egwcgi/egwrtcl/targets.egw
	Institute of Viticulture, Floriculture and Vegetable Crops of Heraklion	http://www.nagref-her.gr/en/content/institute-viticulture-floriculture-and-vegetable-corps-heraklion
	Pomology Institute. Hellenic Agricultural organization - Demeter. Directorate general of Agricultural research	http://www.pomologyinstitute.gr/en/
	EKT databases: Greek forestry and nat. environment & Vegetable and animal production etc.	http://argo.ekt.gr/
	National Documentation Centre EKT	http://www.ekt.gr/en/
Hungary	Univ.Debrecen	http://portal.agr.unideb.hu/index.html?useLang=en
	Institute for ecology and botany, Vacratot	http://www.obki.hu/en/index.shtml
	Institute of Horticultural Technology /	http://www.mkk.szie.hu/en

	Inst. For Plant Protection, Szent Istvan University, Godollo	
	Corvinus University of Budapest, Department of Pomology	http://portal.uni-corvinus.hu/?id=44509
	Department for Plant Nutrition, Research Institute for Soil Science and Agricultural Chemistry of the Hungarian Academy of Sciences, Budapest	http://mta.hu/articles/research-institute-for-soil-sciences-and-agricultural-chemistry-of-the-hungarian-academy-of-sciences-126421
	MTAK Repository of Academic Library	http://real.mtak.hu/cgi/search/advanced
	Hungarian Academy of Sciences (special nat. res. Library)	http://www.mtak.hu/index_en.php http://real.mtak.hu/cgi/search/advanced
	Kertészet és Szőlészet	http://kertbaratmagazin.hu/
	National Agricultural Library & Documentation Centre HUNAL	http://www.omgk.hu/
	National Szechenyi Library	http://regi.oszk.hu/index_en.htm
	Nektar, Periodicals database National Bibliography of Hungary	http://nektar1.oszk.hu/LVbin/LibriVision/lv_stored_records.html#
Iceland	Agricultural University of Iceland, Reykjavik	http://www.lbhi.is/
	Icelandic national catalogue of library information	http://gegnir.is/F?RN=124597803
Irish Republic	Teagasc, Dublin Advisory Office	http://www.teagasc.ie/publications/
	NLI National Library	www.nli.ie
Italy	Laimburg Research for agriculture and Forestry	http://www.laimburg.it/en/bibliothek.asp
	Consiglio di Ricerca Agricola per le Colture Industriali (CRA-CIN)	http://sito.entecra.it/portale/index2.php
	University of Bologna	http://www.eng.unibo.it/PortaleEn/default.htm
	University of Bari - Biologia e chimica agro-forestale e ambientale	http://www.uniba.it/ricerca/dipartimenti/dibca
	Università degli Studi di Palermo, Facoltà di Agraria, Dipartimento di Agronomia Ambientale e Territoriale Sez. di Orticoltura e Floricoltura, Palermo	http://portale.unipa.it/Agraria/
	University of Naples Federico II, Facoltà di Agraria, Portici, Naples, Italy	http://www.agraria.unina.it:20100/facolta/pubNews/home.do?codFacolta=13
	University of Catania, Department of	http://www2.unict.it/en/dept-

	Agriculture and Food Science	agricultural-and-food-science
	University of Udine Dept. of Scienze agrarie e ambientali IT-Udine	http://www.uniud.it
	Agricultural Research Council, Research Centre for Soil-Plant System, Rome	http://sito.entecra.it/portale/cra_dati_istituto.php?id=202&lingua=EN
	Unione nazionale della Accademie italiane per la scienze applicate allo sviluppo dell'agricoltura, alla sicurezza alimentare e alla tutela ambientale (UNASA)	http://www.georgofili.it/home.asp?lang=ita
	Consorzio di ricerca, sperimentazione e divulgazione per l'ortofrutticoltura Piemontese	http://www.cresoricerca.it/index.asp
	National Central Library for Italy, Florence	http://www.bncf.firenze.sbn.it/
	Bibl. Nazionale Centrale Di Firenze	http://opac.bncf.firenze.sbn.it/opac/
	Centro Sperimentale per il Vivaismo	http://www.cespevi.it/
	Food and Agriculture Organization of the United Nations	http://www.fao.org/library
Latvia	Latvia University of Agriculture, Faculty of Agriculture, Institute of Soil and Plant Science, Jelgava	http://eng.llu.lv/
	The Latvia State Fruit Growing Institute, Dobele,	http://www.ltn.lv/~kaufmane/Contacts.html
	Pūre Horticultural Research Centre, Pūre, Tukuma	http://www.puresdis.lv/
	Dobele Horticultural Plant Breeding Exp. Station LV-Dobele	http://www.ddsis.lv
	Latvijas Valsts Augļkopības institūts	http://www.lvai.lv/Publikacijas_zin.html
	National Library	http://llufb.llu.lv/enindex.htm
Lithuania	Lithuanian Institute of Horticulture	http://www.lsd.lt/publikacijos.html
	Institute of Botany, Vilnius	http://www.botanika.lt/en/about/index.html
	Aleksandras Stulginskis University Library	http://www.asu.lt/biblioteka/en/7595
	Institute of Horticulture, Lithuanian Research Centre for Agriculture and Forestry, Babtai, Kaunas	http://www.lsd.lt
Luxembourg	C.R.P., Belvaux	http://www.crp.gl.lu/index.php?id=366&L=2#c1578
	Bibl. Nat de Luxembourg	http://www.bnl.public.lu/fr/index.html
Malta	Institute of Agriculture, University of	http://www.um.edu.mt/ies/studentres

	Malta	earch/mscagrsc
	The Malta Horticultural Society	http://themaltahorticulturesociety.webs.com/
	Ministry of Agriculture Malta	http://www.agric.gov.mt/home?!=1
	Plant Health Department	http://www.planthealth.gov.mt/
	National Library of Malta	http://www.libraries.gov.mt/nlm/index.htm
	Malta Organic Agriculture Movement MOAM	http://www.moam.org.mt/
The Netherlands	Library Wageningen UR	http://library.wur.nl/
	Fruitconsult	http://www.fruitconsult.com/
	Dienst Landbouw Voorlichting (DLV)	http://www.dlvplant.nl/nl/content/index.html
	Nederlandse Fruittelers organisatie	http://www.nfofruit.nl/
	Productschap Tuinbouw	http://www.tuinbouw.nl/
	LTO Groeiservice	http://www.groeiservice.nl/
	ZLTO	http://www.zlto.nl/
	ribesconsult	http://www.ribesconsult.nl/
	berry konsult	http://www.berrykonsult.eu/
	centrale adviesdienst fruitteelt	http://www.caf.nl/
Norway	Norwegian University of Life Sciences	http://www.umb.no/library/article/welcome-to-the-university-library
	Norwegian Institute for Agricultural and Environmental Research	http://www.bioforsk.no/ikbViewer/page/prosjekt/forside?p_dimension_id=16927&p_menu_id=16934&p_sub_id=16928&p_dim2=16928
	Norwegian Crop Research Institute (Planteforsk)	http://www.planteforsk.no/
	NordForsk (Nordic Council of Ministers)	http://www.nordforsk.org/en?set_language=en
	Bibsys ; library database Norw Univ Libr Life Sci	http://ask.bibsys.no/ask/action/stdsearch?kilde=biblio&bibkode=0&lang=en
	Cristin Norw. Res publ of Norw Univ Libr Life Sci	http://www.cristin.no/as/WebObjects/cristin.woa/6?la=en
	National library of Norway	http://www.nb.no/nbsok/advanced_search?lang=en
	NORART index to periodical articles	http://www.nb.no/baser/norart/englis

		h.html
Poland	Polish Society for Horticultural Science	http://psjc.icm.edu.pl/find_dokument.html
	Warsaw University of Life Sciences, Faculty of Horticulture, Biotechnology and Landscape Architecture, Warsaw	http://www.sggw.pl/en/
	Research Institute of Horticulture	http://www.insad.pl/home_en.html
	National Library of Poland	http://bn.org.pl/en/
	The Central Agricultural Library (CBR) of Michał Oczapowski	http://www.cbr.edu.pl/eng/index.php
	SIBROL-INFORMA SYSTEM FOR AGRICULTURAL RESEARCH -	http://alfa.cbr.edu.pl/F/?func=find-b-0&local_base=projekt
Portugal	University of Lisboa	http://ulisses.sibul.ul.pt/ulisses/portal/html/index.htm
	Universidade de Évora/ICAAM, Dept. de Engenharia Rural, Évora	http://www.uevora.pt/investigar/unidades_de_investigacao/icaam_instituto_de_ciencias_agrarias_e_ambientais_mediterranicas
	Instituto Superior de Agronomia, Universidade Técnica de Lisboa, Centro de Estudos de Engenharia Rural, Lisboa	http://www.isa.utl.pt/home/
	Biblioteca do Conhecimento online (Escola Superior Agrária Biblioteca)	http://www.b-on.pt/index.php?lang=en
Romania	Research Station for Fruit Growing Pitesti - Maracineni, Constanta	http://www.icdp.ro/en-index.php
	Romanian Academy of Agricultural and Forestry Sciences (AAFS) "Gheorghe Ionescu-Sisesti"	http://www.asas.ro/
	Cluj	http://horticultura.usamvcluj.ro/
	national library Romania	http://www.bibnat.ro/
Slovakia	Slovak University of Agriculture (SUA) - Slovenska pol'nohospodarska univerzita v Nitre	http://www.uniag.sk/
	Research Institute of Viticulture and Enology (RIVE) Bratislava	http://www.cvrv.sk/en/workplaces/research-institute-of-viticulture-and-enology-rive-in-bratislava/
	Ministry of Agriculture and rural development	http://www.mpsr.sk/en/
	Slovakia National Library	http://www.snk.sk/?home
	Agroinštitút Nitra	http://www.agroinstitut.sk/referencie
	Slovak Agricultural Bibliography (incl. Slovak Univ of Agric in Nitra Publ)	http://arl4.library.sk/i2/i2.entry.cls?ictx=spu&skin=1&op=ssearch&langua

		ge=3
	Slovak Library : portal to catalogs and collections of Slovak libraries	https://www.kis3g.sk/en/index.html
	Slovak Agricultural Library	http://www.slpk.sk/english/index.html
Slovenia	Agricultural Institute of Slovenia, Ljubljana	http://www.kis.si/pls/kis/!kis.web?j=EN
	Univerza v Ljubljani Biotehniška fakulteta	http://www.bf.uni-lj.si/en/libraries/about-libraries/
	Agricultural Institute of Slovenia Fruit and Vine Growing Dept. Ljubljana	http://www.kis.si
	Nacionalni institut za biologijo, Oddelek za rastlinsko fiziologijo in biotehnologijo, Ljubljana (Oddelek za entomologijo)	http://sicris.izum.si/search/org.aspx?lang=slv&mode=&id=558 http://sicris.izum.si/search/grp.aspx?lang=slv&id=1594
	COBIB.SI – (COBISS.si) Union bibliographic/catalogue database	http://cobiss4.izum.si/scripts/cobiss?ukaz=CLNG&lan=en&id=1003494149273408
	AgroWeb Slovenia	http://www.agroweb.bf.uni-lj.si/
Spain	University of Cordoba	http://helvia.uco.es/xmlui
	Instituto Canario de Investigaciones Agrarias	http://www.icia.es/
	IVIA, Instituto Valenciano, de Investigaciones Agrarias	http://www.ivia.es/
	IRTA, Research & Technology, Food & Agriculture	http://www.irta.cat/en-us/RIT/Centres/pages/Cabrils.aspx
	Fundación Cajamar / Estación Experimental de la Fundación Cajamar	http://www.fundacioncajamar.es/
	IMIDA Instituto Murciano de Investigación y Desarrollo Agrario y Alimentario, Consejería de Agricultura y Agua - Comunidad Autónoma de la Región de Murcia	http://www.imida.es/paginas/index.html
	Departamento de Producción Vegetal de la Universidad Politécnica de Cartagena	http://www.upct.es/contenido/departamentos/produccion_vegetal.php
	Universidad de Valldolid Uva Bibliotheca Universitaria (worldcat)	http://buva.worldcat.org/advancedsearch
	Universidad de Almería, Departamento de Producción Vegetal, Almería	http://cms.ual.es/UAL/universidad/departamentos/produccionvegetal/index.htm
	Universidad de Almería	http://bibencore.ual.es/iii/encore/home?lang=eng&suite=cobalt&advancedSearch=true&searchString=
	Universidad de Lleida	http://www.udl.es/

	Universidad politecnica de Madrid	http://www.upm.es/internacional
	InfoAgro	http://www.infoagro.com/
	Departamento de Protección Vegetal, Instituto de Ciencias Agrarias - CSIC, Madrid	http://www.ica.csic.es/
	Universidad de Valladolid, Dept. de Ingeniería Agrícola y Forestal, Palencia	http://www.palencia.uva.es/centros.php
	Fondació mas badia ES-La Tallada D'Emporà, Girona	
	Bibliotheca del Instituto Nacional de Investigación y Tecnología Agraria y Alimentaria (INIA)	http://iniabib.inia.es/absys/abwebp.exe/
	U Autonoma de Madrid	Via online search EndNote
	U Auto de Barcelona	Via online search EndNote
	U de Extremadura	Via online search EndNote
	U de Vallodolid	Via online search EndNote
Sweden	Swedish University of Agricultural Sciences	http://www.slu.se/en/faculties/ltj/
	Swedish Board of Agriculture	http://www.jordbruksverket.se/swedishboardofagriculture.4.6621c2fb1231eb917e680002462.html
	Royal Swedish Academy of Agriculture and Forestry (KSLA)	http://www.ksla.se/
	National Library of Sweden (LIBRIS)	http://libris.kb.se/index.jsp?language=en
	SwePUB (scholarly articles, conf papers, dissertations)	http://swepub.kb.se/?language=en
UK	Scottish crop research institute	http://www.scri.ac.uk/publications
	Hadlow College Agriculture & Horticulture, Kent	http://opac.hadlow.ac.uk/liberty/libraryHome.do
	Agricultural and Horticultural Development Board	http://www.ahdb.org.uk/about/default.aspx
	East Malling Research	http://www.emr.ac.uk/index.htm
	Ashridge nurseries	http://www.ashridgetrees.co.uk
	The James Hutton Institute	http://www.hutton.ac.uk/
	University of Oxford Bodleian Libraries - Sherardian Library of Plant Taxonomy	http://www.bodleian.ox.ac.uk/science/libraries/sherardian-library
	ADAS Horticulture	www.adas.co.uk
	SOLO Search Oxford Libraries Online	http://solo.bodleian.ox.ac.uk/primo_library/libweb/action/search.do?vid=OXVU1&fromLogin=true&reset_config=true
	COPAC : rare and unique research material by bringing together the	http://copac.ac.uk/search/form/main/

	catalogues of 90 UK and Irish Libraries	
Europe	Europe PhD theses	http://www.dart-europe.eu/basic-search.php

2.3. Preliminary literature scoping

To get a first idea of the availability of literature on crop production, contributing to answering the study questions, a preliminary literature scoping was done in *Citrus* spp., *Fragaria x ananassa*, *Ribes* spp., *Rubus* spp., *Vaccinium* spp., *Vitis vinifera*, *Prunus domestica* and *Prunus persica*. Literature scoping was done in CAB Abstracts on the OvidSP platform in literature from 2000 onward, from 1995 onward (not for *Citrus*), from 1990 onward and from 1984 onward. The draft search strategy for each species was developed at the start of the scoping exercises. The total number of references resulting from the draft search strategies were discussed with EFSA during meetings and via e-mail, after which decisions were made on the period under study (Table 2).

An important aspect in literature scoping was to identify the outcome on genus level and on species level for *Citrus* spp., *Rubus* spp., *Vaccinium* spp. and *Ribes* spp. In CAB Abstracts 66 *Citrus* species are mentioned, e.g. *Citrus limon*, *C. reticulata*, *C. clementina*, *C. sinensis*, *C. paradisi*, *C. limonia*, *Citrus sinensis* x *Poncirus trifoliata*, *C. aurantium*, *C. reshni*, *C. jambhiri*, *C. taiwanica*, *Citrus sinensis* x *Poncirus*, of which about 25 are probably cultivated worldwide. For Europe this number may be somewhat lower. Many publications only have the genus name included in CAB Abstracts, e.g. *Citrus*, not the species name, like *Citrus reticulata*. During literature scoping numbers of references per species were determined as well as numbers of references in which only the genus is mentioned. Although on a somewhat smaller scale, this genus/species aspect also exists in *Ribes* spp, *Rubus* spp. and *Vaccinium* spp. In these genera a similar protocol as in *Citrus* was followed.

2.3.1. *Citrus* spp.

The total number of references resulting from the draft search strategy in *Citrus* is given in Table 24.

Table 24: Number of references per label resulting from the draft search strategy in *Citrus* spp. Searches were done in CAB Abstracts from 2000 onward, 1990 onward and 1984 onward.

Label	2000-	1990-	1984-
Cropping practice - irrigation	974	1468	1820
Propagation	196	312	398
Protection	1009	1499	1890
Irrigation	177	286	370

Per label about 100 references were examined in detail to determine their contribution to answering the study questions. The results are summarized in Table 25. If a reference contributed to answering the study question for that specific label, e.g crop protection, it was included in the EndNote library with selected references. If it did not contribute to answering the study question for that specific label, it was excluded. These examinations were also used to determine selection criteria for future selection work.

Table 25: Results of literature scoping in *Citrus*. Total number = number of records examined. The third and fourth column represent the number of selected and non-selected references.

Label	Total number in scoping study	Number of selected references	Number of non-selected references
Cropping practice - irrigation	100	35	65
Propagation	100	48	52
Protection	106	34	72
Irrigation	100	52	48

Within the group of selected references (172 references) the outcome on genus level and on species level was determined (Table 26). No discrimination was made between rootstock and grafted variety.

Table 26: Results of literature scoping in *Citrus*. Number of references per species and number of references on *Citrus* spp. or *Fortunella* spp. without specification of the species.

Species	Number of references
<i>Citrus amblycarpa</i>	1
<i>Citrus aurantiifolia</i>	1
<i>Citrus aurantium</i>	19
<i>Citrus bergamia</i>	2
<i>Citrus clementina</i>	46
<i>Citrus depressa</i>	2
<i>Citrus jambhiri</i>	4
<i>Citrus latifolia</i>	0
<i>Citrus limettioides</i>	4
<i>Citrus limon</i>	16
<i>Citrus limon x Poncirus trifoliata</i>	0
<i>Citrus limonia</i>	5
<i>Citrus macrophylla</i>	5
<i>Citrus madurensis</i>	0
<i>Citrus maxima</i>	2
<i>Citrus medica</i>	1
<i>Citrus myrtifolia</i>	0
<i>Citrus paradisi</i>	12
<i>Citrus paradisi x Citrus reticulata</i>	0
<i>Citrus paradisi x Poncirus trifoliata</i>	0
<i>Citrus reshni</i>	6
<i>Citrus reticulata</i>	33
<i>Citrus sinensis</i>	61
<i>Citrus sinensis x Citrus reticulata</i>	1
<i>Citrus sinensis x Poncirus trifoliata</i>	24
<i>Citrus taiwanica</i>	2
<i>Citrus unshiu</i>	4
<i>Citrus volkameriana</i>	12
<i>Fortunella japonica</i>	0
<i>Fortunella margarita</i>	0
<i>Fortunella</i>	1
<i>Poncirus trifoliata</i>	4

<i>Citrus spp.</i>	41
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In agreement with EFSA it was decided to include all *Citrus* species under *Citrus spp.* in the EndNote libraries with the exception of *Citrus aurantium* and *Fortunella*.

2.3.2. *Fragaria x ananassa*

The total number of references resulting from the draft search strategy in *Fragaria x ananassa* is given in Table 27.

Table 27: Number of references per label resulting from the draft search strategy in *Fragaria x ananassa*. Searches were done in CAB Abstracts from 2000 onward, from 1995 onward, from 1990 onward and from 1984 onward.

Label	1984-	1990-	1995-	2000-
Cropping practice	2347	1874	1584	1154
Propagation	577	430	356	240
Protection	1793	1452	1264	1003

Per label about 100-150 references were examined in detail to determine their contribution to answering the study questions. The results are summarized in Table 28.

Table 28: Results of literature scoping in *Fragaria x ananassa*. Total number = number of records examined. The third and fourth column represent the numbers of selected and non-selected references.

Label	Total number in scoping study	Number of selected references	Number of non-selected references
Cropping practice	144	48	96
Propagation	157	82	75
Protection	100	56	44

2.3.3. *Ribes spp.*

The total number of references resulting from the draft search strategy in *Ribes spp.* is given in Table 29.

Table 29: Number of references per label resulting from the draft search strategy in *Ribes spp.* Searches were done in CAB Abstracts from 2000 onward, from 1995 onward, from 1990 onward and from 1984 onward.

Label	1984-	1990-	1995-	2000-
Cropping practice	703	517	385	298
Propagation	145	93	74	54
Protection	607	438	359	283

Within all references from 1995 onward the outcome on genus level and on species level was determined. The results are presented in Table 30.

From the EndNote library 1995 onward 385 references were examined in detail to determine their contribution to answering the study questions. The results are summarized in Table 4. If a reference contributed to answering the study question for that specific label, e.g. crop protection, it was included in the EndNote library with selected references. If it did not contribute to answering the study question

for that specific label, it was excluded. These examinations were also used to determine selection criteria for future selection work.

Table 30: Results of literature scoping in *Ribes* spp. Number of references per species and number of references on *Ribes* spp. without specification of the species are given. Number of hits in the scoping study is given. Total number = number of records examined. The third and fourth column represent the numbers of selected and non-selected references.

Crop		<i>Ribes</i> spp.		
Total number of hits		835		
Species	Latin name	Common name	Number of hits	
	<i>Ribes aureum</i>	golden currant (cultivated as ornamental plant)	19	
	<i>Ribes rubrum</i>	redcurrant	231	
	<i>Ribes uva-crispa</i>	gooseberry	116	
	<i>Ribes nigrum</i>	blackcurrant	537	
	<i>Ribes silvestre</i>	Colourless cultivar of redcurrant	167	
	<i>Ribes grossularia</i>	Synonym of <i>Ribes uva-crispa</i>	10	
	<i>Ribes petraeum</i>	rock red currant (wild species, not cultivated)	3	
	<i>Ribes divaricatum</i>	worcesterberry	0	
	<i>Ribes x nidigrolaria</i>	jostaberry (complex crossing between blackcurrant, gooseberry and worcesterberry)	4	
	<i>Ribes</i> spp.		38	
Number of hits in scoping study		385		
Label	Total number	selected	not selected	
Cropping practice	147	54	93	
Propagation	66	53	13	
Protection	172	104	68	

2.3.4. *Rubus* spp.

The total number of references resulting from the draft search strategy in *Rubus* spp. before selection work is given in Table 31.

Table 31: Number of references per label resulting from the draft search strategy in *Rubus* spp. Searches were done in CAB Abstracts from 2000 onward, from 1995 onward, from 1990 onward and from 1984 onward.

Label	1984-	1990-	1995-	2000-
Cropping practice	1143	850	685	543
Propagation	213	141	115	87
Protection	985	704	602	461

Within all references from 1995 onward the outcome on genus level and on species level was determined. The results are presented in Table 32.

Table 32. Results of literature scoping in *Rubus* spp. Number of references per species and number of references on *Rubus* spp. without specification of the species are given. Number of hits in the scoping study is given. Total number = number of records examined. The third and fourth column represent the numbers of selected and non-selected references.

Crop		<i>Rubus</i> spp.	
Total number of hits		1411	
Species	Latin name	Common name	Number of hits
	<i>Rubus idaeus</i>	raspberry	816
	<i>Rubus fruticosus</i>	blackberry	307
	<i>Rubus chamaemorus</i>	cloudberry (cultivated in Norway, Sweden, Finland)	43
	<i>Rubus arcticus</i>	Arctic raspberry (grows in Sweden, Finland, Norway, Estonia and Lithuania)	37
	<i>Rubus arcticus x stellarcticus</i>	Hybrid of arctic raspberry (cultivated in Sweden)	1
	<i>Rubus inermis</i>	elmleaf blackberry/thornless blackberry	42
	<i>Rubus ulmifolius</i> (synonym of <i>Rubus inermis</i>)	elmleaf blackberry/thornless blackberry	37
	<i>Rubus sanctus</i>		1
	<i>Rubus sanotus</i>		1
	<i>Rubus rosifolius</i>		1
	<i>Rubus caesius</i>	European dewberry	39
	<i>Rubus friesianus</i>		1
	<i>Rubus hirtus</i>		8
	<i>Rubus humulifolius</i>		1
	<i>Rubus laciniatus</i>		3
	<i>Rubus</i> spp.		249
Number of hits in scoping study		500	
Label	Total number	selected	not selected
Cropping practice	216	54	162
Propagation	62	45	17
Protection	222	72	150

From the EndNote library 1995 onward 500 references were examined in detail to determine their contribution to answering the study questions. The results are summarized in Table 32. If a reference contributed to answering the study question for that specific label, e.g. crop protection, it was included in the EndNote library with selected references. If it did not contribute to answering the study question

for that specific label, it was excluded. These examinations were also used to determine selection criteria for future selection work.

2.3.5. *Vaccinium* spp.

The total number of references resulting from the draft search strategy in *Vaccinium* spp. before selection work is given in Table 33.

Table 33: Number of references per label resulting from the draft search strategy in *Vaccinium* spp. Searches were done in CAB Abstracts from 2000 onward, from 1995 onward, from 1990 onward and from 1984 onward.

Label	1984-	1990-	1995-	2000-
Cropping practice	1011	835	734	545
Propagation	130	106	99	71
Protection	517	451	406	316

Within all references from 1995 onward the outcome on genus level and on species level was determined. The results are presented in Table 34.

From the EndNote library 1995 onward 360 references were examined in detail to determine their contribution to answering the study questions. The results are summarized in Table 34. If a reference contributed to answering the study question for that specific label, e.g. crop protection, it was included in the EndNote library with selected references. If it did not contribute to answering the study question for that specific label, it was excluded. These examinations were also used to determine selection criteria for future selection work.

Table 34: Results of literature scoping in *Vaccinium* spp. Number of references per species and number of references on *Vaccinium* spp. without specification of the species are given. Number of hits in the scoping study is given. Total number = number of records examined. The third and fourth column represent the numbers of selected and non-selected references.

Crop	<i>Vaccinium</i> spp.		
Total number of hits	1242		
Species	Latin name	Common Name	Number of hits
	<i>Vaccinium corymbosum</i>	Northern highbush blueberry	263
	<i>Vaccinium myrtillus</i>	common bilberry, wortleberry, European blueberry	457
	<i>Vaccinium ashei</i>	Rabbit-eye blueberry (cultivated in USA)	26
	<i>Vaccinium macrocarpon</i>	American cranberry	65
	<i>Vaccinium angustifolium</i>	lowbush blueberry	35
	<i>Vaccinium oxycoccus</i>	cranberry	42
	<i>Vaccinium microcarpon</i>	large cranberry	2
	<i>Vaccinium x covilleianum</i>	highbush blueberry	1
	<i>Vaccinium vitis-idaea</i>	Lingonberry, cowberry (collected in wild and	256

		cultivated)	
	<i>Vaccinium uliginosum</i>	bog bilberry, norther bilberry (wild species)	95
	<i>Vaccinium darrowii</i>	Evergreen blueberry (wild species)	1
	<i>Vaccinium</i> spp.		297
Number of hits in scoping study		360	
Label	Total number	selected	not selected
Cropping practice	201	57	144
Propagation	53	37	16
Protection	106	19	87

2.3.6. *Vitis vinifera*

The total number of references resulting from the draft search strategy in *Vitis vinifera* is given in Table 35. In agreement with EFSA it was decided to include literature from 2000 onward.

Table 35: Number of references per label resulting from the draft search strategy in *Vitis vinifera*. Searches were done in CAB Abstracts from 2000 onward, from 1995 onward, from 1990 onward and from 1984 onward.

<i>Vitis vinifera</i>	1984	1990	1995	2000
Cropping pract	7105	5947	5363	4318
Propagation	1754	1382	1209	902
Protection	5670	4752	4208	3290

2.3.7. *Prunus domestica* and *Prunus persica*

The total number of references resulting from the draft search strategy in *Prunus domestica* and *Prunus persica* is given in Table 36. In agreement with EFSA it was decided to include literature from 1995 onward.

Table 36: Number of references per label resulting from the draft search strategy in *Prunus domestica* and *Prunus persica*. Searches were done in CAB Abstracts from 2000 onward, from 1995 onward, from 1990 onward and from 1984 onward.

<i>Prunus domestica</i>	1984-	1990-	1995-	2000-
Cropping practice	1482	1129	975	494
Propagation	967	779	651	313
Protection	1348	1109	976	492
<i>Prunus persica</i>				
Cropping practice	1848	1474	1276	903
Propagation	858	657	539	341
Protection	1509	1232	1048	775

2.4. The selection process/selection criteria

Selection criteria were defined based on a previous similar exercise in vegetable and ornamental crops (Derkx *et al.*, 2013) and on literature scoping in the fruit crops under study in this project. These selection criteria were discussed with EFSA in Parma on 4 June 2013.

In general, a paper is selected when the title indicates that a paper may contribute to answering the study questions in relation to cropping practices, irrigation (*Citrus*), propagation techniques and crop protection practices/guidelines. In case of doubt summaries were studied, if available, and decisions were made.

Reasons for exclusion of papers were listed and discussed with EFSA. During the course of the project when selections were also done in other species, the list of reasons for exclusion was extended, due to typical circumstances in crops.

2.4.1. Reasons for exclusion of papers

- Fits better under other label; i.e. paper only mentions rootstock without further information on propagation: not included under label propagation
- Annual reports of organisations
- Most likely outdated information
- Very general papers, e.g. on grafting in general
- Paper is on some other crop
- Paper is on another species than the requested species, e.g. *Fragaria veridis*
- Paper is on another species with a trivial name including a fruit under study, i.e. cape gooseberry = *Physalis*
- Fruits are collected in the wild
- Wild species, e.g. brambles as understorey in forests, wild species in peat lands, bogs etc., wild *Prunus avium*
- *Prunus avium* for wood production or for landscape plantings
- Ornamental species with no edible fruits, e.g. *Ribes sanguinem*
- Vegetation studies
- Dried currants made from grapes
- Just a remark on production in some area with no information on cultivation practices
- Production in a non-EU Member State, sometimes with author from EU Member State or material from EU Member State
- Statistics, economical study
- Production history, production trends
- Phylogenetic study
- Market study
- Sector study
- Fruit organizations, e.g. cooperatives
- Food products, e.g. marmalades made with the fruit in question
- Genetic resources, germplasm collections, conservation
- Genetic transformation of fruit crops
- Physiological studies
- Molecular studies
- Working conditions unless information is given on machinery used
- Studies in which fruits are analysed for e.g. sugar content
- Papers on sensory quality, aromatics etc. in fruits
- Studies on effects of fruit on health aspects
- Compounds in fruits for medical use

- Dyes made from fruits
- Multi-spectral inspection of fruit quality
- Honey sampling
- Consumer studies
- Food allergy studies
- Analysis of pesticide residues in fruits
- Analysis of heavy metals in fruits
- Soil/groundwater studies
- Studies on water scarcity in a country or region
- First occurrence of a pest in a country
- Incidence of a pest
- Distribution studies of pathogens
- Studies in which pathogen counts are done, without discussing control measures
- Pathogen studies describing pest behaviour, like population dynamics, epidemics
- Interaction between pests
- Studies in which damage by insects are described
- Studies on pest organisms, named after some fruit crop, like blackcurrant leaf midge with no information on pest control
- Diagnosis of pests
- Studies in which sampling procedures are described
- Studies in which pest trap methods are described
- Virus studies, e.g. studies in which nucleotide sequence of virus strains are described
- Risk assessment of pesticide
- Pesticide behaviour in soil
- Cultivar studies:
 - Papers in which (new) cultivars are described, e.g. new triploid mandarin hybrids
 - Variety trials
- Papers on crop coefficients, LAI (leaf area index)(without information on cropping practices)
- Studies in which the risk of soil salinization is assessed (without information on cropping practices)

2.4.2. Reasons for inclusion of papers

- Contributing to answering the study questions on cropping practices, irrigation, propagation and crop protection of the species under study
- Impact policy scenarios on cultivation practices
- Studies describing consequences of climate change on crop production
- Semi-cultivation practices on forest land, i.e. berries
- Terroir studies in *Vitis vinifera*
- Resistance breeding (included under propagation and protection)
- Breeding studies searching for characteristics like frost tolerance (included under cropping practice and under propagation)
- Root stocks: Genetic diversity, effects on production and quality
- Certification practices/techniques
- Production characteristics of cultivars
- Effects of cultural measures and harvest date on fruit quality, e.g. sensory parameters
- Historical fruit plantings
- Fruit crop as ornamental plant, e.g. ornamental citrus plants

- Studies on *Prunus salicina* (Japanese plum types) and *Prunus cerasifera* resulting from the search strategy; There was no specific search for these species
- Cracking studies in cherries (included under cropping practice)
- Machinery
- Model studies, including Decision Support Systems.
- Models for evaluation and optimization of water use
- Post-harvest studies (storage)
- Pest management during storage of fruits
- Mechanical transmissions of pests, e.g. viroids
- Studies on natural enemies of pests, predator studies, studies on parasitoids
- Bio-based use of waste.

2.5. Storage of records

All records were stored in EndNote libraries and provided to EFSA. An overview of all EndNote libraries as provided to EFSA is given in Table 37. All scientific literature originated from CAB Abstracts. The Endnote libraries with grey literature was the result from searching and selection work in AGRIS, ARTIK, and websites/organisations searches.

Table 37: EndNote libraries provided to EFSA.

Scientific literature	Grey literature
efsaCABdefCitrus	efsaCOMBIagris+greydefCitrus
efsadefCABberries	efsadefgreyberries
efsadefCABVitis	efsadefGREYVitis
efsadefCABHumulus	efsadefGREYHumulus
efsaCABdefPrunusarmeniaca	efsadefGREYPrunusarmeniaca
efsaCABdefPrunus avium+Prunus cerasus	efsadefGREYPrunus avium+Prunus cerasus
efsaCABdefPrunusdomesticaFEB4	efsadefGREYPrunusdomestica
efsaCABdefPrunuspersica	efsadefGREYPrunuspersica
efsaCABdefPrunusStonefruits	efsadefGREYPrunusStonefruits

2.5.1. Set-up of the EndNote libraries

In addition to the fields that a database provides, e.g. on author, year, title, journal, keywords etc., each record got some additional labels to fulfil EFSA's requirements. All records were labelled with cropping practice, irrigation (only for *Citrus*), propagation or protection. These were included in the field "label". Information on date of search, crop, country, protected cultivation/field production was included in different custom fields, as explained in Table 38. Remarks on the search strategy are provided in custom 5. Inclusion of date of search and search strategy means that the search is completely transparent and can be reproduced exactly. In addition to the date, the custom 1 field contains 'y' (yes). This means that a record was selected during the selection process. Records that

were not selected during the selection process contained ‘n’ (not). These references were not included in the EndNote libraries provided to EFSA. In custom 6 information is given on protected cultivation (indoor) and field production (outdoor). Decisions were based on search terms. For protected cultivation the search terms used were protected cultivation, green(-)house, glasshouse and tunnel. For field production the search terms used were field, outdoor(s). The custom 6 field for cherries for which rain protection was used was ‘out rain cover’. Decisions on field production/protected cultivation were also based on personal knowledge of experts and taking into account that most of the fruit crops under study are mainly cultivated outdoors. When ‘in/out’ could not be decided from a reference, or was not known by the expert for the situation in some of the countries, the custom 6 field was filled with ‘unknown’.

In each EndNote library groups were made of individual crops and individual countries. Although all search results for a specific crop or EU Member State can easily be found by using the search command, this group usage allows EFSA to quickly have a list of records of individual crops and individual countries by clicking on the group in question. Moreover, it immediately gives insight in the number of records in all groups (crops and countries).

Table 38: Definition of additional fields in the EndNote libraries.

Field	Content
Label	Cropping practice Propagation Irrigation Protection
Custom 1	Date of search, e.g. 20130416
Custom 3	Crop
Custom 4	Country
Custom 6	In = protected cultivation Out = field production Out rain cover = field production, temporary rain cover for cherries unknown = not known

3. RESULTS

The total number of references from the different databases is summarized in Table 39 for all crops. Most references were collected from *Vitis vinifera*: over 6,600 hits. Nearly 4,000 references were collected from *Fragaria x ananassa*, 2,000-3,000 references each were collected from *Citrus* spp.,

Prunus avium + *Prunus cerasus*, *Prunus domestica* and *Prunus persica*. About 1,500 references were collected from *Prunus armeniaca*. 700-1,100 references each were collected from *Ribes* spp., *Rubus* spp., *Vaccinium* spp. and *Humulus lupulus*.

Literature searches in CAB Abstracts yielded high numbers of relevant references of all species. Over 15,000 references were collected from this database.

Literature searches in the AGRIS database also yielded good numbers of references of all species with a total yield of over 4,600 hits.

The Dutch database ARTIK yielded high numbers of references for the species cultivated in Western Europe with a total yield of over 2,200 hits. As species like *Citrus* spp., *Prunus armeniaca* and *Prunus persica* are not cultivated in this region, these species are hardly included in ARTIK.

In addition to searches in the AGRIS and ARTIK databases grey/technical literature was also collected via searches on websites of organisations in the 30 countries under study (table 23). These website searches resulted in nearly 800 references on *Vitis vinifera*, about 300 references each for *Citrus* spp., *Fragaria x ananassa*, *Humulus lupulus*, *Prunus armeniaca*, *Prunus avium* + *Prunus cerasus*, *Prunus domestica* and *Prunus persica* and 100-150 references each for *Ribes* spp., *Rubus* spp. and *Vaccinium* spp (Table 39). Searching on organisation websites was time-consuming. The accessibility was not always good. As a consequence, yields from literature searching from websites from stakeholder associations, advice services, national/regional authorities varied from country to country. Many potential relevant hits were translated with 'Google Translate'. These translations helped in making decisions on inclusion or exclusion of hits and categorizing in cropping practice, irrigation (only for *Citrus*), propagation and protection. This was a time-consuming part of the project, as it had to be done for each hit individually.

A summary overview of the outcome per country without discrimination on the crop is given in Table 40, both for scientific (CAB Abstracts) and for grey/technical (AGRIS, ARTIK and organisations) literature. As CAB Abstracts also works with the country code 'European Union', this code was also included in the list of countries. References with this country code refer to the European Union as a whole or to a range of countries in some region of Europe.

Over 6,400 hits were collected from Italy. Both scientific and grey/technical literature was well represented. Other countries with very high yields were Spain (> 3,000 hits) and France (> 2,400 hits). Both scientific and grey/technical literature was well represented in these two countries. Countries with more than 1,000 hits also included Germany, Netherlands, Poland, Romania and Slovenia. With the exception of Romania, all these countries yielded good numbers of grey/technical literature besides good numbers of scientific literature. Countries with 500-1000 hits each included Belgium, Bulgaria, Czech Republic, Hungary and UK. With the exception of Belgium the numbers of scientific hits from these countries were higher than the numbers of grey/technical hits. Nearly 500 hits were retrieved from Greece, Latvia and Portugal. Countries with 200-400 hits included Austria, Croatia, Denmark, Estonia, Finland, Lithuania, Norway, Slovakia and Sweden. Cyprus yielded about 100 hits. Hardly any information was found from Iceland, Irish Republic, Luxembourg and Malta. There might be several reasons for differences in yields of different countries. One reason can be the availability of literature on crop production of specific species, e.g. species like *Prunus persica*, *Prunus armeniaca* and *Vitis vinifera* are hardly cultivated in countries in northern and western Europe. Obviously, little literature is available from these species in these countries. A second reason may be the availability and accessibility of databases. Some countries are better organized in this than other countries. Thirdly, language problems contribute to the complexity of this enormous search and selection exercise. Although many terms were translated with 'Google Translate', it was not always possible to find relevant hits that could contribute to answering the study questions. Many sites do not have an English, German, French or Spanish version, and sometimes search functionalities do not work properly. The transfer of references from websites to EndNote files often had to be done manually, which was time-consuming. For some countries, like Slovenia, Finland and Sweden, it was possible to transfer references from a digital library to EndNote. Especially for Eastern European countries it was striking that some countries, like Slovenia and Poland had well organized, accessible websites.

Although databases for Slovakia and Hungary were available, no English version was available and there were no possibilities to transfer references.

3.1. Summary tables

For each crop a summary table is presented, in which the numbers of hits on cropping practice, propagation, protection and irrigation (only for *Citrus*) are listed for each country under study. Summary tables per crop per label are presented in the Tables 41-53. Similarly, summary tables are presented for individual countries with numbers of references on cropping practice, propagation, protection and irrigation (only for *Citrus*) per crop. These tables list the outcome for all crops in a specific country. Summary tables per country are presented in Tables 54-84.

Citrus spp. (Tables 41 and 42)

Scientific literature was mainly retrieved from Croatia, Cyprus, France, Italy, Portugal and Spain, representing all important *Citrus* producing countries within Europe. Except for Croatia grey/technical literature was also found for these countries.

Fragaria x ananassa (Table 43)

High numbers of references were found for Belgium (> 560), Italy (> 650) and Netherlands (> 820). Both scientific and grey/technical literature were retrieved. 180-300 references were retrieved for France, Germany, Poland, Spain and UK. For Poland little grey/technical literature was found for this species. For France, Germany, Spain and UK both scientific and grey/technical literature was found. Sufficient references (80-120) were also found for Estonia, Finland, Latvia, Lithuania, Norway and Sweden. 40-60 references were found for Austria, Croatia and Denmark. Little information was found for Cyprus, Czech Republic, Hungary, Iceland, Irish Republic, Luxembourg and Malta. In general all EU regions were well represented for *Fragaria x ananassa*.

Ribes spp. (Table 44)

The searches resulted in over 200 Dutch references on *Ribes* spp., with main emphasis on grey/technical literature. Poland produces high numbers (> 150) of scientific papers on *Ribes* species. However, it turned out to be difficult to retrieve grey/technical literature from Poland. Countries with reasonable yields of references (40-70 each) included Belgium, Denmark, Germany, Italy, Latvia, Lithuania, Sweden and UK. Some information (about 20 references per country) was found for Bulgaria, Estonia, Finland, France and Romania. Little information was found for Austria, Croatia, Cyprus, Czech Republic, Greece, Hungary, Iceland, Irish Republic, Luxembourg, Malta, Norway, Portugal, Slovakia, Slovenia and Spain.

Rubus spp. (Table 45)

The searches resulted in over 150 Dutch references and over 120 UK references on *Rubus* spp., with main emphasis on grey/technical literature for Netherlands and main emphasis on scientific literature for UK. Over 70 references each were retrieved for Belgium, Germany, Italy and Poland. 35-60 references each were retrieved for Bulgaria, Estonia, Finland, France, Hungary, Latvia, Lithuania, Norway and Sweden. Some information (about 20 references per country) was found for Slovenia and Spain. Little information was found for Austria, Croatia, Cyprus, Czech Republic, Denmark, Greece, Iceland, Irish Republic, Luxembourg, Malta, Portugal, Romania and Slovakia.

Vaccinium spp. (Table 46)

The searches resulted in 120 references on *Vaccinium* spp. from Latvia, both scientific and grey/technical literature. Literature on *Vaccinium* spp. from Italy, Netherlands and Poland was also well represented in the searches (80-100 references per country). 20-60 references per country were retrieved for Estonia, Finland, Germany, Lithuania, Norway, Romania, Spain and Sweden. Little information was found for Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, France, Greece, Hungary, Iceland, Irish Republic, Luxembourg, Malta, Portugal, Slovakia, Slovenia and UK.

Vitis vinifera (Table 47)

Over 2500 references were found for Italy. Both scientific and grey/technical literature were well represented for this country. Other countries with high yields include Austria (162), Croatia (158), France (934), Germany (452), Hungary (199), Portugal (254), Romania (360), Slovenia (460) and Spain (801). Sufficient information was also found for Bulgaria, Czech Republic, Greece, Poland and Slovakia (80-110 references each). For Luxembourg 16 references were found, for Malta 3 references. Some information (20-45 references) was found for Belgium, Netherlands and UK. Obviously little information was found for northern countries like Denmark, Estonia, Finland, Iceland, Latvia, Lithuania, Norway and Sweden, for Irish Republic but also for the southern wine-producing country Cyprus.

Humulus lupulus (Table 48)

The important hop producing countries in Europe – Czech Republic, Germany, Poland, Slovenia and UK – yielded good numbers of references on *Humulus lupulus*, both scientific hits and grey/technical hits. Quite some literature was also found for Belgium, Romania and Slovakia. All other countries, in which hop production is not important, only yielded few or no hits.

Prunus armeniaca (Table 49)

Italy, Spain and France are leading countries in numbers of references on *Prunus armeniaca*, with 448, 217 and 230 hits, respectively. Both scientific and technical/grey literature were well represented. Over 80 hits each were found for Bulgaria, Czech Republic, Hungary and Romania. Austria, Germany, Greece, Poland, Slovakia and Slovenia yielded between 25 and 60 hits each. Hardly any information was found for the southern countries Croatia, Cyprus, Malta and Portugal. Little information was also found for countries in Northern and Western Europe: Belgium, Denmark, Estonia, Finland, Iceland, Irish Republic, Latvia, Lithuania, Luxembourg, Netherlands, Norway, Sweden and UK.

Prunus avium and *Prunus cerasus* (Table 50)

About 350 references each were found for Italy and Germany. Over 200 references each were found for Hungary, Netherlands and Poland. Countries with over 100 references each include Belgium, Bulgaria, Czech Republic, France, Romania, Slovenia and Spain. Over 50 references each were found for Denmark, Estonia, Latvia and Norway. Austria, Croatia, Lithuania, Portugal, Sweden and UK yielded between 25 and 50 hits each. Little or no information was found for Cyprus, Iceland, Irish Republic, Luxembourg, Malta and Slovakia.

Prunus domestica (Table 51)

High numbers of references were found for Italy (248), Bulgaria (227), Germany (229), Poland (199), Romania (193), Netherlands (184), France (164), Spain (139) and Czech Republic (130). Between 50 and 100 references each were found for Estonia, Hungary, Latvia, Norway and Slovenia. 20-40 references each were found for Belgium, Croatia, Lithuania, Sweden and UK. 10-20 references each were found for Austria, Denmark, Finland, Greece, Portugal and Slovakia. Little information was found for Cyprus, Iceland, Irish Republic, Luxembourg and Malta.

Prunus persica (Table 52)

By far the highest number of references (> 1000) was found for Italy. Many references were also found for the important peach producing countries France (> 400) and Spain (> 400). High numbers of references were also found for Romania (172), Slovenia (136), Bulgaria (95) and Greece (90). Over 40 references were found for Czech Republic, Hungary and Poland. Relatively little references were found for Portugal (20) and Cyprus (8). Little information was also found for countries in Northern and Western Europe: Belgium, Denmark, Estonia, Finland, Iceland, Irish Republic, Latvia, Lithuania, Luxembourg, Netherlands, Norway, Sweden and UK.

Table 39: Total numbers of selected references from the different databases per crop.

Crop	Database				Total
	CAB	AGRIS	ARTIK	Grey	
<i>Citrus</i> spp.	1314	575	0	390	2279
<i>Fragaria x ananassa</i>	1953	566	1038	349	3906
<i>Ribes</i> spp.	476	106	204	101	887
<i>Rubus</i> spp.	554	160	212	151	1077
<i>Vaccinium</i> spp.	381	122	78	125	706
<i>Vitis vinifera</i>	4247	1403	205	799	6654
<i>Humulus lupulus</i>	389	121	20	248	778
<i>Prunus armeniaca</i>	1013	252	0	248	1513
<i>Prunus avium</i> + <i>Prunus cerasus</i>	1814	417	276	336	2843
<i>Prunus domestica</i>	1394	294	166	267	2121
<i>Prunus persica</i>	1686	541	6	333	2566
<i>Prunus</i> stone fruits	109	65	35	9	218
Total	15,330	4,622	2,240	3,356	

Table 40: Total numbers of relevant references per country summarized for all species, both for scientific literature (CAB Abstracts) and for grey/technical literature (AGRIS/ARTIK/organisations). European Union refers to country code 'European Union' in CAB Abstracts'. References with this country code refer to the European Union as a whole or to a range of countries in some region of Europe. For technical/grey literature it refers to a range of European Union Countries.

	Scientific	Grey	Total
Austria	267	93	360
Belgium	428	544	972
Bulgaria	566	162	728
Croatia	268	48	316
Cyprus	72	30	102
Czech Republic	538	245	783
Denmark	120	103	223
Estonia	218	99	317
European Union	35	104	139
Finland	144	84	228
France	1455	978	2433
Germany	844	806	1650
Greece	323	136	459
Hungary	643	116	759
Iceland	0	6	6
Irish Republic	10	7	17
Italy	4315	2099	6414
Latvia	209	285	494
Lithuania	226	77	303
Luxembourg	9	7	16
Malta	7	3	10
Netherlands	263	1507	1770
Norway	241	116	357
Poland	1058	290	1348
Portugal	301	162	463
Romania	1082	61	1143
Slovakia	144	70	214
Slovenia	500	622	1122
Spain	1769	1417	3186
Sweden	95	280	375
UK	362	200	562
Total	16,512	10,757	27,269

Table 41: Summary table for *Citrus* spp. - Scientific literature from CAB Abstracts - with numbers of references on cropping practice, propagation, protection and irrigation per country.

<i>Citrus</i> spp.		Scientific literature – CAB			
Country	Practice	Propagation	Protection	Irrigation	Total
Austria	0	0	0	0	0
Belgium	0	0	0	0	0
Bulgaria	0	0	1	0	1
Croatia	7	6	8	0	21
Cyprus	6	16	17	8	47
Czech Republic	0	0	0	0	0
Denmark	0	0	0	0	0
Estonia	0	0	0	0	0
European Union	1	3	1	0	5
Finland	0	0	0	0	0
France	13	16	19	4	52
Germany	3	3	2	0	8
Greece	19	9	32	2	62
Hungary	0	0	2	0	2
Iceland	0	0	0	0	0
Irish Republic	0	0	0	0	0
Italy	138	78	263	58	536
Latvia	0	0	0	0	0
Lithuania	0	0	0	0	0
Luxembourg	0	0	0	0	0
Malta	0	1	0	0	1
Netherlands	0	0	0	0	0
Norway	0	0	0	0	0
Poland	0	0	0	0	0
Portugal	18	0	37	2	57
Romania	0	0	0	0	0
Slovakia	0	0	0	0	0
Slovenia	0	0	0	0	0
Spain	150	63	236	114	563
Sweden	0	0	0	0	0
UK	1	0	4	0	5
				Total	1360

Table 42. Summary table for *Citrus* spp. – Grey/technical literature from AGRIS, ARTIK and searches on websites/organisations - with numbers of references on cropping practice, propagation, protection and irrigation per country.

<i>Citrus</i> spp.		Grey/technical literature – AGRIS, ARTIK and organisations			
Country	Practice	Propagation	Protection	Irrigation	Total
Austria	0	0	0	0	0
Belgium	0	0	0	0	0
Bulgaria	0	0	0	0	0
Croatia	0	0	0	0	0
Cyprus	2	8	6	1	17
Czech Republic	0	0	0	0	0
Denmark	0	0	0	0	0
Estonia	0	0	0	0	0
European Union	1	0	0	0	1
Finland	0	0	0	0	0
France	16	4	37	5	64
Germany	1	0	0	0	1
Greece	19	9	32	3	63
Hungary	0	0	0	0	0
Iceland	0	0	0	0	0
Irish Republic	0	0	0	0	0
Italy	81	50	124	16	271
Latvia	0	0	0	0	0
Lithuania	0	0	0	0	0
Luxembourg	0	0	0	0	0
Malta	0	0	0	0	0
Netherlands	2	1	0	0	3
Norway	1	0	0	0	1
Poland	0	0	0	0	0
Portugal	9	2	13	3	27
Romania	0	0	0	0	0
Slovakia	0	0	0	0	0
Slovenia	0	0	0	0	0
Spain	163	111	203	67	544
Sweden	0	0	0	0	0
UK	1	0	1	0	2
				Total	994

Table 58: Summary table for Cyprus with numbers of references on cropping practice (CP), propagation (Prop), protection (Prot) and irrigation (Irr) per crop, both for scientific and grey/technical literature and totals.

	Scientific literature: CAB				Technical/grey literature: AGRIS, ARTIK and organisations				Total
	CP	Prop	Prot	Irr	CP	Prop	Prot	Irr	
<i>Citrus</i> spp.	6	16	17	8	2	8	6	1	64
<i>Fragaria x ananassa</i>	4	0	0	-	0	0	0	-	4
<i>Humulus lupulus</i>	0	0	0	-	0	0	0	-	0
<i>Prunus armeniaca</i>	0	0	1	-	0	0	0	-	1
<i>Prunus avium</i> + <i>Prunus cerasus</i>	0	0	0	-	0	0	0	-	0
<i>Prunus domestica</i>	2	0	1	-	0	0	0	-	3
<i>Prunus persica</i>	1	1	3	-	1	1	1	-	8
<i>Prunus</i> stone fruits	0	0	0	-	0	1	2	-	3
<i>Ribes</i> spp.	0	0	0	-	0	0	0	-	0
<i>Rubus</i> spp.	2	1	0	-	0	0	0	-	3
<i>Vaccinium</i> spp.	0	0	0	-	0	0	0	-	0
<i>Vitis vinifera</i>	1	3	5	-	3	2	2	-	16
									Total
									102

Table 63: Summary table for Finland with numbers of references on cropping practice (CP), propagation (Prop), protection (Prot) and irrigation (Irr) per crop, both for scientific and grey/technical literature and totals.

	Scientific literature: CAB				Technical/grey literature: AGRIS, ARTIK and organisations				Total
	CP	Prop	Prot	Irr	CP	Prop	Prot	Irr	
<i>Citrus</i> spp.	0	0	0	0	0	0	0	0	0
<i>Fragaria x ananassa</i>	27	17	35	-	19	7	3	-	108
<i>Humulus lupulus</i>	0	0	0	-	0	0	0	-	0
<i>Prunus armeniaca</i>	0	0	0	-	0	0	0	-	0
<i>Prunus avium</i> + <i>Prunus cerasus</i>	2	1	0	-	8	9	0	-	20
<i>Prunus domestica</i>	1	1	1	-	2	6	0	-	11
<i>Prunus persica</i>	0	0	0	-	0	0	0	-	0
<i>Prunus</i> stone fruits	0	0	0	-	0	0	0	-	0
<i>Ribes</i> spp.	3	0	10	-	3	2	3	-	21
<i>Rubus</i> spp.	9	5	10	-	4	4	3	-	35
<i>Vaccinium</i> spp.	10	2	5	-	6	3	1	-	27
<i>Vitis vinifera</i>	0	0	5	-	1	0	0	-	6
									Total
									228

Table 64: Summary table for France with numbers of references on cropping practice (CP), propagation (Prop), protection (Prot) and irrigation (Irr) per crop, both for scientific and grey/technical literature and totals.

	Scientific literature: CAB				Technical/grey literature: AGRIS, ARTIK and organisations				Total
	CP	Prop	Prot	Irr	CP	Prop	Prot	Irr	
<i>Citrus</i> spp.	13	16	19	4	16	4	37	5	114
<i>Fragaria x ananassa</i>	54	33	81	-	30	23	43	-	264
<i>Humulus lupulus</i>	0	1	10	-	1	0	4	-	16
<i>Prunus armeniaca</i>	43	34	42	-	27	30	54	-	230
<i>Prunus avium</i> + <i>Prunus cerasus</i>	49	38	26	-	27	23	14	-	177
<i>Prunus domestica</i>	31	28	37	-	13	21	34	-	164
<i>Prunus persica</i>	83	41	80	-	83	26	99	-	412
<i>Prunus</i> stone fruits	0	3	14	-	4	7	12	-	40
<i>Ribes</i> spp.	4	4	7	-	2	1	4	-	22
<i>Rubus</i> spp.	7	5	12	-	10	4	5	-	43
<i>Vaccinium</i> spp.	3	1	1	-	8	2	1	-	16
<i>Vitis vinifera</i>	226	60	346	-	93	37	172	-	934
							Total		2432

Table 68: Summary table for Iceland with numbers of references on cropping practice (CP), propagation (Prop), protection (Prot) and irrigation (Irr) per crop, both for scientific and grey/technical literature and totals.

	Scientific literature: CAB				Technical/grey literature: AGRIS, ARTIK and organisations				Total
	CP	Prop	Prot	Irr	CP	Prop	Prot	Irr	
<i>Citrus</i> spp.	0	0	0	0	0	0	0	0	0
<i>Fragaria x ananassa</i>	0	0	0	-	4	1	0	-	5
<i>Humulus lupulus</i>	0	0	0	-	0	0	0	-	0
<i>Prunus armeniaca</i>	0	0	0	-	0	0	0	-	0
<i>Prunus avium</i> + <i>Prunus cerasus</i>	0	0	0	-	0	0	0	-	0
<i>Prunus domestica</i>	0	0	0	-	0	0	0	-	0
<i>Prunus persica</i>	0	0	0	-	0	0	0	-	0
<i>Prunus</i> stone fruits	0	0	0	-	0	0	0	-	0
<i>Ribes</i> spp.	0	0	0	-	0	0	0	-	0
<i>Rubus</i> spp.	0	0	0	-	1	0	0	-	1
<i>Vaccinium</i> spp.	0	0	0	-	0	0	0	-	0
<i>Vitis vinifera</i>	0	0	0	-	0	0	0	-	0
									Total
									6

Table 72: Summary table for Lithuania with numbers of references on cropping practice (CP), propagation (Prop), protection (Prot) and irrigation (Irr) per crop, both for scientific and grey/technical literature and totals.

	Scientific literature: CAB				Technical/grey literature: AGRIS, ARTIK and organisations				Total
	CP	Prop	Prot	Irr	CP	Prop	Prot	Irr	
<i>Citrus</i> spp.	0	0	0	0	0	0	0	0	0
<i>Fragaria x ananassa</i>	20	22	24	-	3	5	7	-	81
<i>Humulus lupulus</i>	0	0	0	-	0	0	0	-	0
<i>Prunus armeniaca</i>	0	1	0	-	0	2	1	-	4
<i>Prunus avium</i> + <i>Prunus cerasus</i>	6	6	6	-	3	10	8	-	39
<i>Prunus domestica</i>	9	10	5	-	3	6	6	-	39
<i>Prunus persica</i>	1	1	0	-	0	2	2	-	6
<i>Prunus</i> stone fruits	0	0	1	-	0	0	1	-	2
<i>Ribes</i> spp.	8	30	21	-	3	3	0	-	65
<i>Rubus</i> spp.	17	10	7	-	2	0	2	-	38
<i>Vaccinium</i> spp.	5	13	2	-	5	2	1	-	28
<i>Vitis vinifera</i>	0	0	1	-	0	0	0	-	1
	Total								303

Table 73: Summary table for Luxembourg with numbers of references on cropping practice (CP), propagation (Prop), protection (Prot) and irrigation (Irr) per crop, both for scientific and grey/technical literature and totals.

	Scientific literature: CAB				Technical/grey literature: AGRIS, ARTIK and organisations				Total
	CP	Prop	Prot	Irr	CP	Prop	Prot	Irr	
<i>Citrus</i> spp.	0	0	0	0	0	0	0	0	0
<i>Fragaria x ananassa</i>	0	0	0	-	0	0	0	-	0
<i>Humulus lupulus</i>	0	0	0	-	0	0	0	-	0
<i>Prunus armeniaca</i>	0	0	0	-	0	0	0	-	0
<i>Prunus avium</i> + <i>Prunus cerasus</i>	0	0	0	-	0	0	0	-	0
<i>Prunus domestica</i>	0	0	0	-	0	0	0	-	0
<i>Prunus persica</i>	0	0	0	-	0	0	0	-	0
<i>Prunus</i> stone fruits	0	0	0	-	0	0	0	-	0
<i>Ribes</i> spp.	0	0	0	-	0	0	0	-	0
<i>Rubus</i> spp.	0	0	0	-	0	0	0	-	0
<i>Vaccinium</i> spp.	0	0	0	-	0	0	0	-	0
<i>Vitis vinifera</i>	1	0	8	-	4	2	1	-	16
									Total
									16

4. CONCLUSIONS AND RECOMMENDATIONS

4.1. Conclusions

The extensive and systematic literature search on crop production practices of *Citrus* spp., *Fragaria x ananassa*, *Ribes* spp., *Rubus* spp., *Vaccinium* spp., *Humulus lupulus*, *Vitis vinifera*, *Prunus armeniaca*, *Prunus avium*, *Prunus cerasus*, *Prunus domestica* and *Prunus persica*, which are host crops of *Arabis mosaic virus*, *Raspberry ringspot virus*, *Strawberry latent ringspot virus*, *Tomato black ring virus*, *Strawberry mild yellow edge virus*, *Strawberry crinkle virus*, *Daktulosphaera vitifoliae*, *Eutetranychus orientalis*, *Parasaissetia nigra*, *Clavibacter michiganensis* spp. *michiganensis*, *Xanthomonas campestris* pv. *vesicatoria*, *Didymella ligulicola* and *Phytophthora fragariae* resulted in more than 27,000 relevant references. These references were grouped per crop and per country. All references were stored in EndNote libraries, separately for scientific literature, retrieved from CAB Abstracts, and technical/grey literature, retrieved from AGRIS, ARTIK and website searches from stakeholder associations, extension services, national/regional authorities and national libraries. Each reference in the EndNote file is accompanied by a label. These labels are cropping practice, propagation, protection and irrigation (only for *Citrus*). Moreover, for each reference information is provided on protected cultivation/field production. If not known, this is also indicated in the EndNote files, as unknown.

Yields of references depended on the crop and on the country. Most information was found on *Vitis vinifera*: over 6,600 references. Nearly 4,000 references were collected from *Fragaria x ananassa*, 2,000-3,000 references each were collected from *Citrus* spp., *Prunus avium* + *Prunus cerasus*, *Prunus domestica* and *Prunus persica*. About 1,500 references were collected from *Prunus armeniaca*. 700-1,100 references each were collected from *Ribes* spp., *Rubus* spp., *Vaccinium* spp. and *Humulus lupulus*.

The country with the highest number of references was Italy. Over 6,400 hits were collected from this country, of which nearly 40 % was on *Vitis vinifera* and nearly 17 % on *Prunus persica*. Most species were well represented in Italy with the exception of *Humulus lupulus*, which is not of any importance in Italy. Other countries with very high yields were Spain (> 3,000 hits) and France (> 2,400 hits). As for Italy, most important crops for France were *Vitis vinifera* and *Prunus persica*. For Spain over one third of the references was on *Citrus* spp. and about 25 % on *Vitis vinifera*. Like in Italy little information was found on *Humulus lupulus* in France and Spain. In comparison with the other crops and with other countries relatively little information was found on the berry species *Ribes*, *Rubus* and *Vaccinium* in France and Spain. Countries with more than 1,000 hits included Germany, Netherlands, Poland, Romania and Slovenia. Countries with 500-1000 hits each included Belgium, Bulgaria, Czech Republic, Hungary and UK. Nearly 500 hits were retrieved from Greece, Latvia and Portugal. Countries with 200-400 hits included Austria, Croatia, Denmark, Estonia, Finland, Lithuania, Norway, Slovakia and Sweden. Cyprus yielded about 100 hits. Hardly any information was found from Iceland (only *Fragaria x ananassa* and *Rubus*), Irish Republic (only *Fragaria x ananassa*, cherries, *Prunus domestica* and *Ribes*), Luxembourg (only *Vitis vinifera*) and Malta (*Citrus* spp., *Fragaria x ananassa*, *Prunus armeniaca*, *Prunus domestica*, *Prunus persica*, *Prunus* stone fruits and *Vitis vinifera*).

The storage of all references in EndNote libraries, in which each reference is accompanied by the name of the crop, the country, the label (cropping practice, propagation, protection and irrigation (only for *Citrus*)), the search strategy/source and information on protected cultivation/field production allows EFSA to quickly find information on crop production, both indoors and outdoors, of all crops that were studied in this extensive literature search. These data can be used by EFSA for the present mandate, but are also an excellent basis for other current and future mandates.

4.2. Recommendations

The development of extensive search strategies, in which the labels cropping practice/propagation/protection/irrigation were combined with crops and countries, the collection of organisations that may provide information on all kinds of aspects on crop production, the set-up of EndNote libraries with groups, provide an excellent and solid basis for future extensive and systematic literature searches. Such searches are a prerequisite for current and future mandates.

5. REFERENCES

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