1. *Content of the 'Topic Description' document*

1.1. Topic area

Diagnostics, field detection, surveillance, Pest/vector biology, epidemiology, taxonomy, fruit crops, vineyards

1.2. Links to the Euphresco Strategic Research Agenda

The topic addresses the following objective(s) of the 2017-2022 Euphresco Strategic Research Agenda:

☒ Objective 2017-R-1.1: to improve knowledge on the biology, epidemiology and ecology of priority invasive and (re)emerging pests

1.3. Topic title

Improved knowledge about epidemiology and distribution of priority invasive and (re)emerging arthropod pests in fruit crops and grapevines (e.g. *Aromia bungii, Popillia japonica, Halyomorpha halys*)

1.4. Description of the problem the research should solve

Several regulated and (re)emerging arthropod pests (e.g. *Aromia bungii, Popillia japonica, Halyomorpha halys, Lycorma delicatula*) are expected to cause increasing problems in fruit crops and vineyards. The occurrence of the proposed pests (and/or additional/other species) on different host plants with emphasis on fruits crops and vineyards in the partner countries shall be monitored with previously agreed tools/methods. A survey of monitoring/detection tools/methods will be organised, and a study will be undertaken on the distribution of the pests and data on their phenology and population dynamics as well as of recommended and potential containment and control measures. Additionally, monitoring and detection tools/methods shall be adapted and/or developed. Caught or sampled specimen shall also be characterized with molecular diagnostic methods to obtain information about the genetic variation of populations occurring.

1.5. Description of the expected results

The project will produce:

- Improved knowledge about the phenology, the population dynamics and the dispersal capacity of the target pests
- Updated distribution maps for the target pests with regard to the different crops (host plants)
- Recommendations about harmonised surveillance and monitoring tools/methods for the target pests
- Pre-validated molecular diagnostic methods for selected pests
- Updated phenological models for selected pests
- Improved user-friendly morphological identification tools
- Recommendations on citizen science tools for early detection of selected pests

1.6. Beneficiaries of this research product

The project will benefit to National Plant Protection Services (reference labs, inspectors, risk managers), farm advisory services and fruit and grapevine growers

1.7. Research funders and research contribution/ distribution

Funding organisation	Research activity and researchers involved

1. Austrian Agency for Health and Food Safety, Austria Sylvia Bluemel sbluemel@ages.at	-Monitoring activities for the detection of *Popillia japonica* (especially on *Rubus* spp., *Prunus* spp., *Malus* spp.), *Halyomorpha halys* and *Aromia bungii* in fruit growing areas (*Prunus* spp., *Malus* spp.) and vine-growing areas in Austria; -Contribution to the compilation of monitoring/detection tools and methods; -Contribution to the compilation of recommended and potential containment and control measures; -Provision of samples for the molecular identification; -Contribution of data (*Halyomorpha halys)* for the phenological model; Contact person: Gudrun Strauss E-mail address: gudrun.strauss@ages.at Contact person: Christa Lethmayer E-mail address: christa.lethmayer@ages.at
2. Federal Public Service Health, Food Chain Safety and Environment, Belgium Ria Nouwen ria.nouwen@health.belgium.be	Potential research activities to be confirmed after national VP-selection & peer review. -Mapping the presence/distribution and phenology of the target pests (*e.g. Aromia bungii, Popillia japonica, Halyomorpha halys*) in Belgium. The main focus will be on pome fruit (apple/pear), however monitoring can also be executed in stone fruit (sweet cherry) and soft fruits; -Adaptation and/or development of monitoring and detection tools/methods; Molecular characterisation of collected specimens; -Validation and optimisation of existing phenology models using the collected monitoring data from all partners and the specific weather data of the monitoring locations, in particularly for *H. halys;* -Contribution to compilation of recommended and potential containment and control measures; Contact person to be confirmed after national VP-selection
3. University of forestry, Bulgaria Rumen Tomov rtomov@ltu.bg	-Investigations on the occurrence and distribution of *Halyomorpha halys* in fruit growing areas in Bulgaria; -Monitoring activities for early detection detection of *Popillia japonica* in fruit growing

	areas (especially on *Rubus* spp., *Prunus* spp., *Malus* spp.) and vine-growing areas in Bulgaria; -Monitoring activities for early detection of *Aromia bungii* in fruit growing areas (on *Prunus* spp.) in Bulgaria; -Detection activities with previously agreed tools/methods; -Contribution to the compilation of tools/methods for detection; -Provision of samples for molecular identification; Contact person: Rumen Tomov E-mail address: rtomov@ltu.bg
4. National Research Institute for Agriculture, Food and Environment, France Jean-Pierre Rossi Jean-Pierre.Rossi@inra.fr	Investigations on the occurrence and distribution of *Halyomorpha halys Popillia japonica, Aromia bungii and Lycorma delicatula* in fruit and grapevine growing areas in France; Create and test new user-friendly morphological identification tools (e.g. using images and multimedia tools) for the identification of all stages: eggs masses, nymphs, adults and when relevant damage symptoms; Update mapping of *H. halys* invasion in France using citizen science via an embarked mobile phone application already effective (see http://ephytia.inra.fr/fr/P/128/Agiir); Propose and adapt citizen science as a detection/monitoring method for the other 3 invasive species (*Popillia japonica, Aromia bungii* and *Lycorma delicatula*); Molecular characterisation of collected specimens, to characterise the diversity and improve fast and reliable molecular diagnosis tools; Contribution to compilation of tools/methods for detection; Contribution to compilation of recommended and potential containment and control measures; Contact person: Jean-Claude Streito E-mail address: jean-claude.streito@inrae.fr Contact person: Jean-Pierre Rossi E-mail address: jean-pierre.rossi@inrae.fr
5. Ministry of Agriculture Forestry and Food, Slovenia Erika Oresek erika.oresek@gov.si	-Contribution to be detailed ; Contact person: Stane Trdan E-mail address: stane.trdan@bf.uni-lj.si

6. Regione Lombardia Plant Protection Service, Italy Mariangela Ciampitti mariangela.ciampitti@ersaf.lombardia.it	-Population dynamics, dispersal capacity and colonization of new agricultural and non-agricultural environments (*Popillia japonica)*; -Modelling tools for interpreting and forecasting pest phenology *(Popillia japonica)*, population abundance and spread; Early detection strategy through surveys and the citizen science tool FitoDetective (*Lycorma delicatula*); -Diagnosis by molecular analysis of *Popillia japonica, Aromia bungii* (frass analysis), *Lycorma delicatula*; -Low environmental impact strategies of pest management (*Popillia japonica, Halyomorpha halys*); -Contribution to compilation of recommended and potential containment and control measures *Halyomorpha halys*, *Aromia bungii, Popillia japonica* (also in relation to soil properties); Contact person to be confirmed later The work will be conducted in association with the following research centres: Università di Torino Università di Brescia Università di Padova Università di Verona CREA – Research Centre for Plant Protection and Certification Plant Protection Service, Piemonte

1.8. Research project partnership outside Euphresco

Euphresco funding ensures a certain level of transnational collaboration among Euphresco member countries. It is possible, if the funding consortium is interested, to contact funding organisations or research groups outside the geographical area covered by Euphresco members. The Euphresco coordinator could advertise the research topic in order to have an enlarged collaboration. If funders are interested in this possibility, please check the case below:

☐ The funding consortium of the topic mentioned in section 1.2 requires that the topic is advertised outside the Euphresco network

1.9. Any other relevant information on content

None.

7. Euphresco management aspects of the project

2.1. Indication of the topic budget

Funding organisation [a]	Mechanism [b]	Total Budget [c]
1. AGES (AT)	NC	€
2. FPS (BE)	NC / VP	€
3. LTU (BG)	NC	€
4. INRAE (FR)	NC	€
5. MAFF (SI)	NC	€
6. ERSAF (IT)	NC	€
total		€

2.2. Expected duration of the project (only for non-competitive topics)

24 Months

2.3. Identification of project coordinator

Has the research project coordinator been identified?

☒ Yes
☐ No

2.4. Any other relevant information on topic organisation and management

None.

[a] First member is project coordinator. A minimum of two partners are necessary for each proposal. Add lines as needed.
[b] Please indicate the preferred mechanism (e.g. real pot RP; virtual pot VP; non-competitive NC), or several mechanisms if there is flexibility.
[c] Optional, as this amount can still change in the next phase. In-kind contribution should also be indicated in this column.