1. Content of the 'Topic Description' document

1.1. Topic area

Diagnostics, field detection, surveillance, forestry

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
☒ Objective 2017-R-2.1: to improve knowledge on emerging pathways of entry and means of spread for pests
☒ Objective 2017-R-2.2: to expand knowledge on transmission of disease and pathogens for healthy planting material
☒ Objective 2017-R-5.3: to understand mixed infections through metagenomic analysis
☒ Objective 2017-R-5.4: to test and validate the use NGS (e.g. whole genome sequencing, metagenomics, deep sequencing, typing by sequencing) for routine diagnostics
☒ Objective 2017-I-1.1: to support knowledge exchange for efficient management and maintenance of collections

1.3. Topic title

Plant health status of *Fagus* spp. (FAGUSTAT)

1.4. Description of the problem the research should solve

Fagus spp. are widely planted for forestry and amenity purposes. In particular, *F. sylvatica* is an important forest tree in Western and Central Europe (e.g. used for wood production).
Recently, EPPO drew the attention of the National Plant Protection Organizations (NPPOs) to Beech Leaf Disease (BLD) and the potential risks it may represent for the forestry and ornamental sectors. BLD is an emerging, currently undiagnosed and seemingly lethal disease, which is rapidly spreading in the USA and Canada and is threatening *Fagus* spp., including *F. sylvatica.* Due to its rapid spread and variability in environmental conditions, it seems unlikely that BLD is an abiotic disorder. Research to pinpoint the causal agent is ongoing. Until now, diagnostic efforts have revealed an association with the foliar nematode *Litylenchus crenatae*, but its exact role remains unclear.
As this disease and other pests or diseases have the potential to impact beech forests and plantations in the Northern Hemisphere, the project should aim at defining the current plant health status of *Fagus* spp. (EU-wide or broader) and define the risk of an emerging epidemic from the US into Europe.
Systematic observations and collection of information is needed to confidently assign the phytosanitary status (absence, presence). Conducting a survey is the most reliable way to determine or verify such a plant health status (according to ISPM 8 *Determination of a pest status in an area*). In addition, for some harmful organisms there is a need for diagnostic method development or building up know-how. Furthermore, a deeper understanding of the biology and epidemiology is needed in order to better assess the risks. Specific tasks of the project could, amongst others, comprise:

- Survey for symptoms of BLD in forests, parks, botanical gardens and nurseries;
- Risk assessment posed by the movement of dormant beech plants: screening imported dormant beech plants to check for their potential as a route of entry for *Litylenchus* spp. Movement of plant material originated from Japan could be included;
- Study of the biology and epidemiology of *L. crenatae* under European climatic conditions;

- High-throughput Sequencing (HTS) study of the microbiome of beech leaves in Europe, identifying differences compared to the US, which may exacerbate the expected impacts and remains an unknown;
- Determine the susceptibility of different cultivars of *Fagus* spp. to *L. crenatae*;
- Raise public awareness on BLD;
- Organise visits to infested beech forests in the US to improve understanding of the impact and applied management practices;
- Exchange knowledge with European or/and American research consortia on these topics (e.g. detection, surveillance and monitoring strategies, diagnostic methods, and plant microbiome studies);
- Tools such as standardized methodologies for monitoring and surveying plant pests and diseases, developed in the framework of the International Plant Sentinel Network (ISPN), could be used and further developed.

1.5. Description of the expected results

In the new EU Plant Health Legislation, the emphasis is stronger than in the past on prevention, for which timely awareness of scientists, operators and the public play an important role. Research into the occurrence of specific organisms around which a new problem has arisen can make an important contribution to improving preparedness.

- Knowledge on EU-wide – or broader – plant health status of *Fagus spp.*;
- Advances in official monitoring;
- Improved understanding of the risk of an emerging epidemic in Europe;
- Improved European preparedness;

1.6. Beneficiaries of this research product

- National Plant Protection Services
- National and EU policy makers
- EPPO and its members (information contributing to EPPO PRAs)
- Forestry and ornamental sector
- Plant scientific research community

1.7. Research funders and research contribution/ distribution

Funding organisation	Research activity and researchers involved
1. Federal Public Service of Health, Food Chain Safety and Environment, Belgium Ria Nouwen ria.nouwen@health.fgov.be	Potential research activities to be confirmed after national VP-selection & peer review. -Survey on *Fagus* spp. for symptoms of BLD in Belgian forests, parks, botanical gardens and nurseries, as well as in imported dormant beech; -Study of the biology and epidemiology of *Litylenchus crenatae* under Belgian climatic conditions (if found); -Investigate the microbial community of leaves and buds using HTS to detect possible microorganisms associated with presence or absence of *L. crenateae*; -Raise public awareness for BLD in Belgium;

	-Exchange knowledge with European or/and American research consortia; Contact person to be confirmed after national VP-selection
2. Netherlands Food and Consumer Products Safety Authority, The Netherlands Martijn Schenk M.Schenk1@nvwa.nl	-Survey on *Fagus* spp. for symptoms of BLD in Dutch forests and parks; Contact person: Anne Sophie van Bruggen E-mail address: a.s.vanbruggen@nwwa.nl
3. Ministry of Agriculture Forestry and Food, Slovenia Erika Oresek erika.oresek@gov.si	-Survey on *Fagus* spp. for symptoms of BLD in Slovenian forests, parks, botanical gardens, arboreta and nurseries, as well as in imported dormant beech; -Plant Health surveys of beech via the National Forest Inventory; -Identification of other pathogens, diseases and pests that are involved in beech decline in Slovenia; -Determine the involvement of *Phytophthora* spp., *Biscogniauxia nummularia* and other endophytes in beech decline in Slovenia; -Investigate the extent of damage caused by *Petrakia liobae* (syn. *Pseudodidymella fagi*) to beech trees in Slovenia; -Investigate possible influence of climate change, especially the effect of drought stress on beech health status including analysis and prognosis for various scenarios; Contact person: Nikica Ogris E-mail address: nikica.ogris@gozdis.si Contact person: Barbara Piškur E-mail address: barbara.piskur@gozdis.si
4. Department for Environment, Food and Rural Affairs, United Kingdom Iain Dummett Iain.Dummett@defra.gov.uk	-Survey for symptoms of BLD in forests, parks, botanical gardens and nurseries; -Study of the biology and epidemiology of *Litylenchus crenatae* under UK climatic conditions (if found); -Risk assessment posed by the movement of dormant beech plants: Screening imported dormant beech plants to check their potential as a route of entry for *Litylenchus* spp.; -HTS study of the microbiome of beech leaves in Europe, identifying differences compared to

	the US, which may exacerbate the expected impacts and remains an unknown; -Raise public awareness on BLD; -Visit to infested beech forests in the US to improve understanding of the impact and applied management practices; -Exchange knowledge with European or/and American research consortia on these topics (e.g. detection, surveillance and monitoring strategies, diagnostic methods, and plant microbiome studies); Contact person: Tom Prior E-mail address: Thomas.prior@fera.co.uk
5. Forestry Commission, United Kingdom Joan Webber joan.webber@forestresearch.gov.uk	-Research activities to be detailed

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

Information to define the profile of sought partners could be useful (but not mandatory): country/region (if there are preferences), skills/expertise required, etc.

1.9. Any other relevant information on content

None.

2. *Euphresco management aspects of the project*

2.1. Indication of the topic budget

Funding organisation [a]	Mechanism [b]	Total Budget [c]
1. FPS (BE)	NC/VP	€
2. NVWA (NL)		€
3. MAFF (SI)		€
4. DEFRA (GB)		€
5. UKFC (GB)		€
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, national call launched and proposal under evaluation

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.