

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

### 1.1. Topic area

Diagnostics, field detection, surveillance

### 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-1.2: to support taxonomic research for the unambiguous identification of pests
- Objective 2017-R-2.1: to improve knowledge on emerging pathways of entry and means of spread for pests

### 1.3. Topic title

Understanding and managing the impact of *Phytophthora* in horticulture

### 1.4. Description of the problem the research should solve

Phytophthora-caused diseases are within the top 10 most commonly reported diseases in UK gardens (Royal Horticultural Society data). Within the past 20 years, approximately 350 cases of *Phytophthora* disease have been recorded from RHS Gardens. Yet the diversity of *Phytophthora* species in ornamentals and their impact in gardens is not widely studied. Plant trade is a major contributor to *Phytophthora* spread and several studies have shown the role of trade on introducing the pathogen to forests. However, the role gardens in these pathways is not well understood. Plant quarantine and visual inspections are the most common and low cost methods to intercept *Phytophthora* diseases. However, considering that the pathogen can also produce asymptomatic infections but with high reproduction of the pathogen, these methods become questionable. This has a potential impact on the effectiveness of managing outbreaks of regulated species, with the pathogen to re-appear years after eradication in gardens and the danger to spread in natural ecosystems. Currently the only available control method to gardeners is plant destruction, which not only is costly but also not effective as future planting might be also susceptible.

The aims of this project are to: 1) Identify the most prevalent *Phytophthora* species in gardens via different methods (direct isolation/ baiting and ITS sequencing, metabarcoding) of different types of samples, 2) use this knowledge to assess potential risk to plant collections within gardens, 3) reconstruct the origin and pathways of *Phytophthora* spread in gardens (that may have arrived because of the global movement of ornamental plants) and clarify the relationship between natural ecosystems-plant trade-gardens in relation to *Phytophthora* spread.

### 1.5. Description of the expected results

The project will:

- Determine the potential risk to plant collections. Understanding which species of *Phytophthora* are prevalent in gardens and associate the *Phytophthora* species and the suitability of host-plant, will allow determining if there is a risk for ornamental plant collections and prompt surveillance
- Increase the understanding of the pathways of introduction and spread of *Phytophthora* and the role of a garden ecosystem. By comparing different *Phytophthora* genotypes, genotyping and phylogenetic analysis of samples from different sites (woodlands, gardens, retail) will allow assist to determine their role on outbreaks
- Validate current biosecurity and cultural practices. The collection and processing of different sample types (soil/peat-free media, water, plant material) and compost samples from

different locations (nurseries, gardens, water resources) will provide a better insight on the presence and spread of the pathogen within a garden system (plant nursery-garden-service yards).

### 1.6. Beneficiaries of this research product

Scientists, gardeners (professional and private), plant trade stakeholders (e.g. nurseries, plant centres), woodland stakeholders.

### 1.7. Research funders and research contribution/ distribution

Funding organisation	Research activity and researchers involved
<p>1. Organisation Department of Rural and Environmental affairs, United Kingdom</p> <p>Jasmine Burr-Hersey <a href="mailto:Jasmine.Burr-Hersey@defra.gov.uk">Jasmine.Burr-Hersey@defra.gov.uk</a></p>	<p>-Project coordination; -Sampling from UK-RHS garden sites, baiting of samples, metabarcoding analysis; - Evaluation of risks for plant collections and overview of the project;</p> <p>Contact person: Fryni Drizou E.mail address: <a href="mailto:frynidrizou@rhs.org.uk">frynidrizou@rhs.org.uk</a></p> <p>Contact person: Sarah Green E.mail address: <a href="mailto:sarah.green@forestresearch.gov.uk">sarah.green@forestresearch.gov.uk</a>,</p> <p>Contact person: Anna Harris E.mail address: <a href="mailto:anna.harris@forestresearch.gov.uk">anna.harris@forestresearch.gov.uk</a></p>
<p>2. Department of Agriculture, Water and the Environment, Australia</p> <p>Keira Beattie <a href="mailto:PHSgovernancegroups@agriculture.gov.au">PHSgovernancegroups@agriculture.gov.au</a></p>	<p>-Contribution to the phylogenetic analysis;</p> <p>Contact person: Yu Pei Tan E.mail address: <a href="mailto:YuPei.Tan@daf.qld.gov.au">YuPei.Tan@daf.qld.gov.au</a></p>
<p>3. Canadian Food Inspection Agency, Canada</p> <p>Cheryl Dollard <a href="mailto:cheryl.dollard@inspection.gc.ca">cheryl.dollard@inspection.gc.ca</a></p>	<p>-DNA sample analysis and sequencing; -Contribution to the phylogenetic analysis; -Contribution with experimental protocols;</p> <p>Contact person: Guillaume Bilodeau E.mail address: <a href="mailto:Guillaume.Bilodeau@inspection.gc.ca">Guillaume.Bilodeau@inspection.gc.ca</a></p>
<p>4. Ministry of the Environment, Czech Republic</p> <p>Contact to be determined</p>	<p>-Focus on the pathways of Phytophthora introduction and spread; -Collection and analysis of samples from a variety of retailers (with the focus on non-ericaceous hosts - conifers, buxus and other mainly evergreen shrubs etc.);</p> <p>Contact person: Markéta Hrabetová E.mail address: <a href="mailto:marketa.hrabetova@vukoz.cz">marketa.hrabetova@vukoz.cz</a></p>
<p>5. Science and Advice for Scottish Agriculture, United Kingdom</p>	<p>-Contribution to be defined;</p> <p>Contact person: Rachael Campbell</p>



David Kenyon <a href="mailto:David.Kenyon@sasa.gov.scot">David.Kenyon@sasa.gov.scot</a>	E.mail address: <a href="mailto:Rachael.Campbell@sasa.gov.scot">Rachael.Campbell@sasa.gov.scot</a>
6. Benaki Phytopathological Institute, Greece  Irene Vloutoglou <a href="mailto:i.vloutoglou@bpi.gr">i.vloutoglou@bpi.gr</a>	-Contribution to biosecurity and cultural practices by collection and processing different sample types; soil/peat-free media, water, plant material, compost samples from different locations (nurseries, gardens) to provide information on the presence and spread of the pathogen within a nursery and/or garden system;  Contact person: Emilia Markellou E.mail address: <a href="mailto:e.markellou@bpi.gr">e.markellou@bpi.gr</a>
7. International Hellenic University, Department of Nutritional and Diabetics, Greece  Thomas Thomidis <a href="mailto:thomidis@cp.teithe.gr">thomidis@cp.teithe.gr</a>	-Sampling from Greek garden sites, focus on the impact of retailers on <i>Phytophthora</i> spread (e.g. supermarkets etc.) ;  Contact person: Thomas Thomidis E.mail address: <a href="mailto:thomidis@cp.teithe.gr">thomidis@cp.teithe.gr</a>
8. University of Catania, Italy  Santa Olga Cacciola <a href="mailto:olga.cacciola@unict.it">olga.cacciola@unict.it</a>	-Focus on the impact of retailers on <i>Phytophthora</i> spread (e.g. supermarkets etc.); -Collection and analysis of samples from a variety of retailers; -Contribution with experimental protocols;  Contact person: Santa Olga Cacciola E.mail address: <a href="mailto:olga.cacciola@unict.it">olga.cacciola@unict.it</a>
9. University of Tuscia, Italy  Andrea Vannini <a href="mailto:vannini@unitus.it">vannini@unitus.it</a>	-Focus on the impact of retailers on <i>Phytophthora</i> spread (e.g. supermarkets etc.) Collection and analysis of samples from a variety of retailers , contribution with experimental protocols  Contact person: Andrea Vannini E.mail address: <a href="mailto:vannini@unitus.it">vannini@unitus.it</a>
10. Ministry of Agriculture, Forestry and Food, Slovenia  Erika Oresek <a href="mailto:erika.oresek@gov.si">erika.oresek@gov.si</a>	-Collection and analysis of different sample types (soil/peat-free media, water, plant material, compost) from different locations in Slovenia (nurseries, gardens, water resources);  Contact person: Janja Zajc E.mail address: <a href="mailto:Janja.Zajc@kis.si">Janja.Zajc@kis.si</a>
11. Federal Office for Agriculture, Switzerland  Andreas von Felten <a href="mailto:andreas.vonfelten@blw.admin.ch">andreas.vonfelten@blw.admin.ch</a>	-DNA sample analysis and sequencing; -Contribution to the phylogenetic analysis; -Contribution with experimental protocols;  Contact person: Simone Prospero E.mail address: <a href="mailto:simone.prospiero@wsl.ch">simone.prospiero@wsl.ch</a>
12. University of Berkeley, United States of America	-Focus on the role and spread of <i>Phytophthora</i> spp. from woodlands to nurseries;

Matteo Garbelotto  
[matteog@berkeley.edu](mailto:matteog@berkeley.edu)

Contact person: Matteo Garbelotto  
E.mail address: [matteog@berkeley.edu](mailto:matteog@berkeley.edu)

### 1.8. Research project partnership outside Eupresco

Eupresco funding ensures a certain level of transnational collaboration among Eupresco member countries. It is possible, if the funding consortium is interested, to contact funding organisations or research groups outside the geographical area covered by Eupresco members. The Eupresco 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 Eupresco 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	Mechanism	Total Budget
1. Defra (GB)		€
2. DAWE (AU)		€
3. CFIA (CA)		€
4. MoEnv (CZ)		€
5. SASA (GB)		€
6. BPI (GR)		€
7. Teithe (GR)		€
8. Unict (IT)		€
9. Unitus (IT)		€
10. MAFF (SI)		€
11. FOAG (CH)		€
12. Berkely (US)		€

### 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.