

1. Content of the 'Topic Description' document

1.1. Topic area

Other.

1.2. Topic title

An International Plant Sentinel Network (IPSN) as an early-warning system; research on future pest threats.

1.3. Description of the problem the research should solve

With the increasing globalisation of trade and impacts of climate change the threat from plant pests and diseases is ever-growing. Much plant health legislation, including in the European Union, is heavily reliant upon lists of known damaging organisms. In turn risk assessments, such as Pest Risk Analysis (PRAs), are used to determine the potential risk these organisms pose. A vital issue for risk analysts and National Plant Protection Organisations (NPPOs) is the 'unknown' threats and the lack of knowledge regarding those new and emerging.

The IPSN's main aim is to establish a network of botanic gardens, arboreta, plant protection scientists and NPPOs that work collaboratively to provide key information on new and emerging threats to plant health. This Euphresco project will build on the work of the previous project which put in place the tools and resources needed to support the network effectively. The Euphresco partners will form a network of researchers contributing to sentinel research work; by working together, the partners will provide access to an expanded pool of expertise, diagnostic services and funding. Botanic Gardens Conservation International (BGCI) will coordinate the network. Supported by BGCI, partners will also help to establish participation from and strong links to botanic gardens and arboreta within their own (and potentially neighbouring) countries, and help to build plant health capacity and capability within these institutes.

Specifically, this new project will focus on:

- **Enhanced early detection** of new and emerging pests and diseases by raising awareness of plant health issues amongst botanic gardens and arboreta (first detection) and by the provision of tools, such as surveys, posters and leaflets to aid early detection. This will involve the coordination of multi-country surveys for priority organisms using relevant botanic gardens and arboreta (in specific countries/regions with particular host species) identified using BGCI's unique databases. Further, by developing capability and capacity in botanic gardens and arboreta to support surveillance. This will include providing training to botanic gardens and arboreta in both EPPO and priority countries and developing materials to aid surveys and raise capacity in botanic gardens and arboreta.
- The project will **support PRAs** through research coordination and evidence gathering to address knowledge gaps to support PRA activities. This includes identifying research priorities from NPPOs and RPPOs and coordinating access to trusted botanic gardens and arboreta data, as well as coordinating the activities of research partners, evaluation and data sharing. Using BGCI's unique databases, and within the limitation of data use agreements, the project will produce maps showing the location of host species in gardens and pests present. Such maps will be of value in PRAs and in prioritisation of the project's activities. It will also involve energising participation and identifying research funding.
- The **establishment of a self-sustainable network**. Throughout Phase 1 of the IPSN a high level of support and coordination was required in order to establish the initial network and to develop the tools to allow the network to function efficiently. During Phase 2 of the project, it is anticipated that the coordination function will increasingly be supported by the members of the network themselves. Sustainability will be enhanced through the

development of an on-line reporting tool and the integration of pest and disease surveillance and reporting into the normal working of botanic garden staff. Furthermore, BGCI recognises the importance of the IPSN and coordination of the network at some level is anticipated as a continuing, core activity for BGCI.

1.4. Description of the expected results

Key outputs from the project include:

- Recruitment of additional botanic gardens and arboreta to increase engagement in (first detectors), the geographical spread of and host availability of the network
- Key training and standardised surveying materials aimed at supporting garden staff with the opportunity to explore utilisation by a wider range of stakeholders
- European and international workshops in Euphresco partner countries and prioritised areas around the world
- Best practice and general support for botanic gardens and arboreta wishing to run citizen science projects or education programmes in plant health to engage garden visitors/the general public
- An electronic reporting system and front-facing database for use by a wide audience (e.g. key beneficiaries as below). The reporting system will act as a valuable tool for botanical institutes that can be integrated into day-to-day work; thus easing data collection. The database will let staff track changes in plant health and plant health professionals gather information to enhance early detection and/or risk assessments. Additionally, the database can be used to track various metrics of success including the number of institutes participating and pests highlighted as risks
- Maps illustrating the distribution of gardens, host species and pest species
- Sentinel research projects for priority organisms and priority host species; identified by Euphresco partners and NPPOs or through the use of tools such as the UK Plant Health Risk register and the EPPO Alert List. This builds on the work of the previous IPSN project and will help to provide key information to be used in PRAs
- Information posters for new and emerging organisms and susceptible host species using existing templates
- A self-sustaining system that is championed by stakeholders and supported by BGCI. Primarily, botanic gardens and arboreta, who will incorporate plant health into daily working, and government organisations and scientists, who will utilise the network to facilitate research and the collection/ analysis of data; obtaining funding as required
- BGCI are to introduce an accreditation scheme for botanic gardens in which one criterion will be active participation in pest surveillance. The success rate of which can be used to measure the IPSN's progress

1.5. Beneficiaries of this research product

The project will benefit:

- National (and Regional) Plant Protection Organisations
- EPPO and its members
- Botanic gardens and arboreta
- National, EU and International policy makers
- Scientists
- Industry and other stakeholders – forest managers, parks and gardens, the general public

1.6. Research funders and research contribution/ distribution

Funding organisation	Research activity and researchers involved
1. Department for Environment Food and	-This group will provide the overall



<p>Rural Affairs, United Kingdom</p> <p>Elspeth Steel elspeth.steel@defra.gsi.gov.uk</p>	<p>coordination of the network. They will also support and provide access to the network of European and international institutes willing to carry out sentinel research projects to meet PRA evidence gaps.</p> <p>Contact person: Ellie Barham Ellie.barham@bgci.org</p>
<p>2. Bundesministerium für Land- und Forstwirtschaft, Umwelt und Wasserwirtschaft, Austria</p> <p>Elfriede Fuhrmann Elfriede.fuhrmann@bmlfuw.gv.at</p>	<p>-Based on an evaluation carried out in a diploma work at the University of Vienna (Becker, 2016), improve protocols for collection schemes and documentation of organisms on target sentinel plant species.</p> <p>-Identification of detected pests and invasive organisms with approved identification methods in cooperation with other Austrian expert and research organisations especially within the Euphresco-network.</p> <p>-Bringing the Austrian network of botanical gardens into the project.</p> <p>Contact person: Michael Kiehn michael.kiehn@univie.ac.at</p>
<p>3. Federal Public Service of Health, Food Chain Safety and Environment, Belgium</p> <p>Ria Nouwen ria.nouwen@health.belgium.be</p>	<p>-Elaboration of a Belgian Plant Sentinel Network, integrated into the IPSN. Contribution in development of training material, and exchange of information on national and international scale. Detailed research activities: to be confirmed after national VP-selection.</p> <p>Contact person: Anne Ronse Anne.ronse@plantentuinmeise.be</p> <p>Contact person: Martine Maes Martine.maes@ilvo.vlaanderen.be</p> <p>Contact person: Anne Chandelier a.chandelier@cra.wallonie.be</p>
<p>4. Central Institute for Supervising and Testing in Agriculture, Czech Republic</p> <p>Michal Hnizdil michal.hnizdil@ukzuz.cz</p>	<p>-Activity will concentrate on surveys and monitoring of new and emerging pests in arboreta and botanical gardens in the Czech territory including laboratory testing by using molecular methods. The group will also bring in the network botanical gardens and arboreta in the Czech Republic.</p> <p>Contact person: Vladislav Rasovsky vladislav.rasovsky@ukzuz.cz</p>
<p>5. Federal Ministry of Food and Agriculture, Germany</p>	<p>-Providing input into the overall aims of the</p>



<p>Bettina Beerbaum Bettina.Beerbaum@bmel.bund.de</p>	<p>project, -Further elaborate the 'trap plant approach' by refining protocols for choosing plant species, for planting and for assessing damage.</p> <p>Contact person: Uwe Starfinger uwe.starfinger@julius-kuehn.de</p>
<p>6. Agricultural Research and analysis of the Economy Council, Italy</p> <p>Sauro Simoni sauro.simoni@crea.gov.it</p>	<p>-Gathering evidence for pests damaging historical and botanical gardens/collections, particularly referring to the Central Italian area.</p> <p>-Contributing to improving the network of existing/available knowledge activities by updating and disseminating the results.</p> <p>Contact person: Elisabetta Gargani elisabetta.gargani@crea.gov.it</p> <p>Contact person: Sauro Simoni sauro.simoni@crea.gov.it</p>
<p>7. Science and Advice for Scottish Agriculture, United Kingdom</p> <p>David Kenyon David.Kenyon@sasa.gsi.gov.uk</p>	<p>-This group will lead work on risk assessment and sentinel research projects.</p> <p>Contact person: Katherine Hayden K.Hayden@rbge.ac.uk</p>
<p>8. US Department of Agriculture, Animal and Plant Health Inspection Service, United States of America</p> <p>Contact: Ms Laurene Levy Laurene.Levy@aphis.usda.gov</p>	<p>-Provide knowledge of APHIS partners and cooperating organizations who are undertaking activities related to the establishment and development of a sentinel plant network in the U.S. and, to the extent able, communicate relevant accomplishments and encourage contact from key members.</p> <p>Contact person: Lora Katz lora.e.katz@aphis.usda.gov</p> <p>-Provide expertise in risk analysis, pest data information management, and official pest reporting requirements. Currently leading a Technical Assistance for Specialty Crops project on improving data quality in globally consulted pest information resources.</p> <p>Contact person: Heather Hartzog heather.m.hartzog@aphis.usda.gov</p>



	<p>-Provide expertise in early detection, pest reporting, and pest data information management. Formerly the entomologist for PestLens, PPQ's phytosanitary early-warning system. Currently providing scientific support to the National Science Director of Emergency Response.</p> <p>Contact person: Heather Moylett heather.moylett@aphis.usda.gov</p>
<p>9. University of Tuscia-DIBAF, Italy</p> <p>Anna Maria Vettrano vettrain@unitus.it</p>	<p>-Development of disease identification training materials.</p> <p>-Surveys in botanical gardens in Italy and abroad.</p> <p>Contact person: Anna Maria Vettrano vettrain@unitus.it</p>
<p>10. University of Lleida, Spain</p> <p>Xavier Pons pons@pvcf.udl.cat</p>	<p>-Develop a Spanish Plant Sentinel Network.</p> <p>-Develop training material related to arthropods, and arthropod pest surveys in botanical gardens in its geographical area.</p> <p>Contact person: Xavier Pons pons@pvcf.udl.cat</p>
<p>11. Plant Health Australia, Australia</p> <p>Greg Fraser gfraser@phau.com.au</p>	<p>-Contribution to be detailed</p> <p>Contact: Greg Fraser gfraser@phau.com.au</p>
<p>12. University of Copenhagen, Denmark</p> <p>Hans Peter Ravn hpr@ign.ku.dk</p>	<p>-Provide an overview of our knowledge on the fate of plants introduced to our botanical gardens and arboreta.</p> <p>-Identify specific information regarding establishment.</p> <p>-Provide a list of native tree species for monitoring overseas.</p> <p>-Provide an overview of information available on our native species from overseas.</p> <p>-Possible participation in the establishment of nurseries with Danish species under exotic conditions.</p> <p>-Contribution to matters of common project interest.</p> <p>Contact person: Hans Peter Ravn hpr@ign.ku.dk</p>
<p>13. CABI, United Kingdom</p>	<p>-Electronic reporting system and front facing database.</p>



<p>Abigail Rumsey A.Rumsey@cabi.org</p>	<p>Contact person: Abigail Rumsey A.Rumsey@cabi.org</p>
<p>14. Better Border Biosecurity, New Zealand</p> <p>Mark McNeill mark.mcneill@agresearch.co.nz</p>	<p>Using sentinel plants to forecast and future proof New Zealand native and agricultural ecosystems against plant pests and diseases. This will be achieved through:</p> <ul style="list-style-type: none"> -Collaboration with IPSN to undertake a global survey of botanic gardens to identify pests of iconic New Zealand native plants. -Plants of iconic, conservation, cultural value to both New Zealand and China to be monitored for pests and diseases. -Forage plants being grown in China will be used as sentinel plants to identify pests and diseases that could present a risk to New Zealand. -Significant New Zealand sentinel plants will be located in “hotspots” where severe plant pathogen outbreaks are occurring and screened for susceptibility to selected pathogens. <p>Contact person: Mark McNeill mark.mcneill@agresearch.co.nz</p>
<p>15. Swedish University of Agricultural Sciences</p> <p>Jonàs Oliva Jonas.oliva@slu.se</p>	<p>-Expertise in monitoring tree pathogens by the use of molecular methods. The group will also bring in the network arboreta from Sweden.</p> <p>Contact person: Jonàs Oliva Jonas.oliva@slu.se</p>
<p>16. CABI (CH)</p> <p>René Eschen r.eschen@cabi.org</p>	<p>-Identify number of trees and locations (i.e. botanical gardens) that should be included in surveys to obtain a representative overview of pests on a tree species.</p> <p>-Database of pests and diseases on selected tree species in botanical gardens, across Europe and continents.</p> <p>Contact person: René Eschen r.eschen@cabi.org</p>
<p>17. Suleyman Demirel University, Turkey</p> <p>Tugba Dogmus tugbadogmus@sdu.edu.tr</p>	<p>-Contribution to be detailed</p> <p>Contact: Tugba Dogmus tugbadogmus@sdu.edu.tr</p>

1.7. 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 to advertise the topic outside the Euphresco network

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

1.8. Any other relevant information on content

Work related to this topic was already funded under the IPSN I EUPHRESCO project which aimed to establish a base for such a network in order to provide an early warning system for new and emerging pest and pathogen risks. During this initial project, the EUPHRESCO project partners with co-ordination from Botanic Gardens Conservation International (BGCI) have been successful in establishing an international network (IPSN) and putting in place the tools and resources needed for the network to function effectively. Close collaboration with those that worked on the initial IPSN project is envisioned. Similarly, lessons learnt within this project will be used to ensure the network's utilisation and success.

18. Euphresco management aspects of the project

2.1. Indication of the topic budget

Funding organisation ^a	Mechanism ^b	Total Budget ^c
1. DEFRA (GB)	NC	€ 60 000
2. BMLFUW (AT)	NC	€ 10 000
3. FPS (BE)	VP	€ 75 000
4. CISTA (CZ)	NC	€ 2 000
5. BMEL (DE)	NC	€ 60 000
6. CREA (IT)	NC	€ 1 000
7. SASA (GB)	NC	€ 49 500
8. APHIS (USA)	NC	€ 28 106
9. UNITUS (IT)	NC	€ 10 000
10. UdL (ES)	NC	€ 6 000
11. PHA (AU)	NC	€
12. UCPH (DK)	NC	€ 27 000
13. CABI (GB)	NC	€
14. BBB (NZ)	NC	€ 3 300
15. SLU(SE)	NC	€
16. CABI (CH)	NC	€ 92 000
17. SDU (TR)	NC	€ 15 000
total		€

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

36 months.

2.3. Any other relevant information on topic organisation and management

The network already has good participation from collaborators in Australia, China, New Zealand, Russia, South Africa and the U.S. The network would like to continue to keep good communication with these individuals/institutes and expand participation to others within these countries and elsewhere. The IPSN is also already collaborating with the FPS COST Action FP1401 'A global network of nurseries as early warning system against alien tree pests (Global Warning)' which includes work packages on establishing standardised surveying practises and guides, and would like to continue to do so. The IPSN will continue to work with the COST Action and its members, and will build on what has been (and will be) produced.

^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.