

## 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
- Objective 2017-R-3.1: to identify and evaluate (horizontal) risk reduction options (effectiveness, feasibility and cost)

### 1.3. Topic title

Discovering nematode diversity in ornamental plant collections of international importance: a surveillance study

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

Apart from a few studies (Gubin and Sigareva, 2014; Hooper *et al.*, 1990; Kalinkina *et al.*, 2018; Nguyen *et al.*, 2019), the plant parasitic nematode fauna of ornamental plant collections are not well known. In contrast, countless studies focussed on the activity, diversity, impact and management of plant parasitic nematodes in agricultural crop production (Bernard *et al.*, 2017; Evans *et al.*, 1993, Garzia *et al.*, 2022). This could partly be due to a lack of expertise and resources in the horticultural industry.

The plant parasitic nematode genera most often identified in home and public gardens are; stem and bulb (*Ditylenchus* spp.), root knot (*Meloidogyne* spp.), root lesion (*Pratylenchus* spp.) and foliar nematodes (*Aphelenchoides* spp.) (Royeal Horticultural Society, advisory service data unpublished). These four genera cause clearly visible, characteristic symptoms and feed inside the plant tissue for part of their life cycle. They are therefore easier to detect and link to plant decline.

Interestingly there are almost no accounts of the presence of ecto- or semi-ectoparasitic root feeding soil borne plant parasitic species or free-living species, even though they are almost certainly present and an important part of the soil fauna and function. Establishing a baseline of species present in soils and plant material sampled from garden plantings (i.e. herbaceous borders, lawn, kitchen gardens, orchard, arboretum, tropical and temperate glasshouse, alpine rockery, new arriving plants and mature trees etc.) will give us an idea of the native, non-native and established plant parasitic species and bring awareness to possible non-native species that have not yet been reported.

Public gardens are at risk to the arrival and establishment of new pests and pathogens and offer a unique opportunity for monitoring and detection studies (Wondafrash *et al.*, 2021). The layout of gardens often evolve and change; some plants are replaced or transplanted others are bought in from elsewhere. Due to the nature of the case it is possible that plant parasitic nematodes can arrive undetected, become establish and spread.

This collaborative project aims to conduct a surveillance study documenting the occurrence of plant parasitic nematodes in public gardens across a large geographic area. Participating countries will work together to develop a sampling strategy to allow data comparisons. Samples will be processed and identified locally, data will be collated into one report and potentially, scientific publications.

### 1.5. Description of the expected results

This project aims to:

- Establish a baseline of nematode species present in soils and plant material representative of ornamental plant collections and other garden plantings
- Bring awareness to non-native or native species that have not previously been reported in gardens which would aid in detection and preparing for new threats
- Develop critical expertise and awareness for the wider horticulture industry on prevention of the spread of plant parasitic nematodes
- Exchange knowledge within research consortia on nematode diversity in our local plant collections and the possible phytosanitary risks of the findings

### 1.6. Beneficiaries of this research product

- National Plant Protection Organisations
- Researchers and technicians from phytosanitary/plant health laboratories
- Horticulture industry

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

Funding organisation	Research activity and researchers involved
<p>1. Department for Environment Food and Rural 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: RHS garden Wisely (could do other RHS gardens Rosemoor, Hyde Hall, Harlow Carr, Bridgewater) (soil + plant material). Example sample sites: tropical and temperate glasshouse, alpine house and rockery, orchard, allotments, mature trees in garden reception, mixed borders, exotic garden; -Extractions and identifications;</p> <p>Contact person: Thomas Prior E.mail address: <a href="mailto:Thomas.Prior@fera.co.uk">Thomas.Prior@fera.co.uk</a></p> <p>Contact person: Magdalena Boshoff E.mail address: <a href="mailto:magdalenaboshoff@rhs.org.uk">magdalenaboshoff@rhs.org.uk</a></p>
<p>2. Austrian Agency for Health and Food Safety, Austria</p> <p>Sylvia Bluemel <a href="mailto:sbluemel@ages.at">sbluemel@ages.at</a></p>	<p>-Sampling: Public and private gardens in Austria, 4 to 5 public gardens are currently under discussion for sampling (soil and plant material); -Extraction and identification;</p> <p>Contact person: Ines Gabl E-mail address: <a href="mailto:ines.gabl@ages.at">ines.gabl@ages.at</a></p>
<p>3. Netherlands Food and Consumer Products Safety Authority, the Netherlands</p> <p>Martijn Schenk</p>	<p>-Sampling: Belmonte, Wageningen. Survey introduced ornamentals in botanical gardens, focus on plant parasitic nematodes, ± 100 samples;</p>



<p><a href="mailto:M.schenk1@nvwa.nl">M.schenk1@nvwa.nl</a></p>	<p>-Extraction and morphological identification, and if needed confirmation by molecular techniques;</p> <p>Contact person: Anne Sophie van Bruggen E.mail address: <a href="mailto:a.s.vanbruggen@nvwa.nl">a.s.vanbruggen@nvwa.nl</a></p>
<p>4. All Russian Plant Quarantine Center Russian Federation, Russia</p> <p>Yuri Shneyder <a href="mailto:yury.shneyder@mail.ru">yury.shneyder@mail.ru</a></p>	<p>-Sampling: Moscow Botanical Garden in Moscow, Nikitsky Botanical Garden on the Crimean peninsula -Extractions and identifications;</p> <p>Contact person: Elena Khudyakova E-mail address: <a href="mailto:fer59@mail.ru">fer59@mail.ru</a></p>

### 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	Mechanism	Total Budget
1. Defra (GB)	NC	€
2. AGES (AT)	NC	€
3. NVWA (NL)	NC	€
4. VNIKR (RU)	NC	€

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

36 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.