

1. Content of the 'Topic Description' document

1.1. Topic area

C: Management of pest/vector

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-5.1: to understand the biological significance of a positive molecular diagnosis
- 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

1.3. Topic title

Pathogen survival in soil.

1.4. Description of the problem the research should solve

Soilborne plant pathogens are increasingly challenging agriculture productions all over the world mainly because of their wide host range and their ability to produce long-living survival structures. They include numerous nematodes, bacteria such as *Ralstonia solanacearum*, and *Streptomyces scabies*, viruses such as the nematode-transmitted viruses, *Tobacco Rattle virus* (TRV) or the *Potato mop-top virus* (PMTV) and many fungi and oomycetes such as species of *Fusarium*, (and most importantly the vascular wilt fungus *F. oxysporum*), *Rhizoctonia solani*, *Verticillium dahliae*, *Sclerotium rolfsii*, *Plasmodiophora brassicae*, *Spongospora subterranea*, *Pythium spp.*, etc.

Survival of soil pathogens is basically monitored by changes in the numbers of viable populations by plating dilutions of soil extracts. It is a key parameter that should be controlled in order to fight against the promoted disease especially in the case of a quarantine or a novel pest newly introduced.

This research project shall address biological aspects of survival of soil borne pathogens, attempting to assess the physiological, biochemical and pathogenic capabilities of the pathogens related to their survival especially after harvest of the soil crop.

For instance, distribution and spreading in soil, competitiveness with saprophytic soil inhabitants and their reaction to biological control agents, dependence and synergism between pathogens and variation in their virulence towards their hosts will be studied in various types of soil conditions. This could lead to a better understanding of the nature of the disease they cause and more importantly to the means to control them. In particular, it will allow to better evaluate the different practices used for soil-borne pathogens management and disinfestation such as crop rotation, soil amendments with organic matter beneficial organisms, fumigation and mulching, solarisation, etc.

In addition, the quantification of soil pathogenic populations will be evaluated by dilution plates of soil extracts, and correlated with the molecular quantification described in the topic 2019-A-324 'Reliable detection of plant pathogens in soil' allowing a better understanding of the biological significance of a positive molecular diagnosis.

1.5. Description of the expected results

The project will provide experimental information on soil pathogen survival and dispersal, related to each of the tested pathogens. Guidelines will be developed to support control measures.

1.6. Beneficiaries of this research product

- National Plant Protection Services and government bodies (reference laboratories, inspectors, risk managers).
- Approved laboratories for official diagnostic tests.
- Commercial laboratories for diagnostic tests.
- Professional associations and Technical Institutes.

1.7. Research funders and research contribution/ distribution

Funding organisation	Research activity and researchers involved
1. Ministry of Agriculture, Plant Protection and Inspection Services, Israel Yael Meller YaelM@moag.gov.il	-Project coordination; -Research on the survival of the vascular wilt fungi <i>F. oxysporum</i> and other soil borne fungi in relation with soil treatment; Contact person: Yael Meller Harel E-mail address: YaelM@moag.gov.il Contact person: Omer Frenkel E-mail address: omerf@volcani.agri.gov.il
2. Aarhus University, Denmark Mogens Nicolaisen mogens.nicolaisen@agrsci.dk	-Research on the survival of the rootknot nematode <i>Meloidogyne hapla</i> during starvation and exposure to microbial agents; Contact person: Mogens Nicolaisen E-mail address: mogens.nicolaisen@agrsci.dk
3. Netherlands Food and Consumer Products Safety Authority, the Netherlands Martijn Schenk M.Schenk1@nvwa.nl	-Contribution to be detailed; Contact person: E-mail address:
4. All Russian Plant Quarantine Center, Russian Federation Natalia Sherokolova natalia_sh@mail.ru Oxana Dobrovolskaya oxana-d@yandex.ru	-Research on the survival of <i>Ralstonia solanacearum</i> , <i>R. pseudosolanacearum</i> , <i>R. syzigii</i> ; Potato spindle tuber viroid (PSTVd), Pepino mosaic virus (PepMV) and other viruses in relation with different climatic regions of Russian Federation; Contact person: Nataliya Drenova E-mail address: drenova@mail.ru -Research on the survival of <i>Plasmodiophora brassicae</i> , <i>Spongospora subterranea</i> ,



	<p><i>Fusarium</i> spp. and other soil borne fungi in different regions of Russian Federation;</p> <p>Contact person: Mariia Kopina E-mail address: kopinamaria645@gmail.com</p>
<p>5. Ministry of Agriculture, Forestry and Food, Slovenia</p> <p>Erika Oresek erika.oresek@gov.si</p>	<p>-Application of molecular techniques for <i>R. solanacearum</i> and <i>Dickeya</i> detection in soils and other environmental samples;</p> <p>Contact person: Tanja Dreo E-mail address: tanja.dreo@nib.si</p>
<p>6. Science and Advice for Scottish Agriculture, United Kingdom</p> <p>David Kenyon david.kenyon@sasa.gov.scot</p>	<p>-Research on the survival of the blackleg pathogen <i>Pectobacterium</i> spp. in response to agronomic factors.</p> <p>Contact person: Greig Cahill E-mail address: Greig.cahill@sasa.gov.scot</p>
<p>7. Bahamas Agricultural Health & Food Safety Authority, Bahamas</p> <p>Yasmin Johnson yasminjohnson@bahamas.gov.bs</p>	<p>-Contribution to be detailed;</p> <p>Contact person: E-mail address:</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 ^a	Mechanism ^b	Total Budget ^c
1. MoA (IL)	NC	€
2. AU (DK)	NC	€
3. NVWA (NL)	NC	€
4. VNIKR (RU)	NC	€
5. MKGP (SI)	NC	€
6. SASA (GB)	NC	€
7. BAHFSA (BS)	NC	€
total		

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

30 months (from 2020-01-01 until 2022-06-01)

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.