

EUPHRESKO



Euphresco

European Phytosanitary Research and Coordination network

About

Euphresco is a network of organisations (research funders, policy makers, research organizations and industry) that aim to support the coordination of national research funding and enhance research collaboration in the phytosanitary area. After receiving funding from the FP6 and FP7 EU Framework Programmes (EUPHRESCO I and EUPHRESCO II ERA-Net projects), Euphresco has become a self-sustained network hosted by the European and Mediterranean Plant Protection Organization (EPPO).. As of April 2023, 75 organizations from 5 continents are members of the network.

Phytosanitary measures refer to ‘any legislation, regulation or official procedure having the purpose to prevent the introduction or spread of quarantine pests, or to limit the economic impact of regulated non-quarantine pests’.

Aim and objectives

The need to revive the scientific basis of the phytosanitary field has been a priority since the EPPO Madeira Declaration. Research coordination through Euphresco aims to develop and take advantage of synergies amongst national research programmes and activities and to maintain and develop scientific expertise and infrastructure that support plant health.

The specific objectives of Euphresco are:

- To coordinate transnational research programmes, by developing a common strategic research agenda
- To coordinate research funding of in the phytosanitary area, through annual rounds of calls
- To facilitate the dissemination of research outputs and adoption by the end-users, in particular the policymakers

Challenges

All plants encounter different enemies in their natural habitat, from pests like aphids or beetles, to diseases caused by fungi, bacteria or viruses. While plant pest and diseases relied on natural mechanisms for dispersal in the past, human trade and transport have opened new opportunities for rapid global dispersal. Biological invasions are as costly as natural hazards. To avoid extensive damage to society, the economy and the environment, we need measures to prevent entry, establishment and spread of pests.

The rate of entry and establishment of new damaging plant pests, diseases and invasive species is constantly increasing worldwide as trade of plants and plant products becomes more global. Climate change may also favour the movement of pests over long distances and facilitate their survival in previously unfavourable environments.

The success of Euphresco as a primarily European network for phytosanitary research coordination has set the ground for discussions on the development of initiative(s) to address the needs of other regions of the world and global phytosanitary research coordination. In the context of global trade,

phytosanitary research should be global too. Countries around the world may deal with the same harmful organisms, either as native plant pests or as non-native new pests. Joining resources can accelerate the development of solutions without increasing the costs supported by each individual country. It is not possible to avoid all the challenges to plant health posed by global trade, increasing travel activities and climate change. However, it is possible to optimise strategies to address these challenges with effective cooperation and coordination.

Scope, goals and research topics

Research activities commissioned through Euphresco focus on regulated and emerging plant pests. Small to medium-size projects are commissioned to provide evidence to specific questions. The projects are not necessarily intended to deliver break-through science and innovation, but fall into the category of explorative and applied science needed to support policy.

Interdisciplinary research is necessary to identify those pests on which transnational research efforts should focus. There is also a need to identify changes to existing and emerging trade routes, to collect information regarding growing and production practices in exporting countries and to develop knowledge on the pest biology in different production conditions in order to guide investigations on possible epidemics and to identify those pathways presenting the greatest phytosanitary risks.

Euphresco identified 8 priorities for phytosanitary research:

Know your enemy - epidemiology and taxonomy

- To improve knowledge on the biology, epidemiology and ecology of priority invasive and (re)emerging pests
- To support taxonomic research for the unambiguous identification of pests

Know your enemy - trade impact

- To improve knowledge on emerging pathways of entry and means of spread for pests
- To expand knowledge on transmission of disease and pathogens for healthy planting material

Know your enemy - assessing impact

Quantification of the likelihood and magnitude of risks posed by entry, establishment and spread of pests, their potential economic, social and environmental impacts and identification and evaluation of risk management options.

- To identify and evaluate (horizontal) risk reduction options (effectiveness, feasibility and cost)
- To develop models to summarise the understanding of the spread, establishment and impact of pests

Find your enemy - improved inspection and surveillance

- To validate risk-based sampling methodologies for phytosanitary inspections.
- To explore the use of remote sensing technologies to support surveillance and detection activities
- To test and validate the use of volatile organic compounds for early detection and pest management

- To test and validate the use of environmental DNA (eDNA) analysis in inspection and surveillance activities

Find your enemy - new diagnostic technologies in plant health

- To understand the biological significance of a positive molecular diagnosis
- To develop and validate high-throughput DNA extraction methods
- To understand mixed infections through metagenomic analysis
- To test and validate the use NGS (e.g. whole genome sequencing, metagenomics, deep sequencing, typing by sequencing) for routine diagnostics

Find your enemy - on site detection and identification of diseases and pests

- To test and validate methods for in situ detection and identification of pests

Deal with the enemy - phytosanitary measures

- To validate cost-effective and socially acceptable phytosanitary measures for consignments (pre-border and at border)
- To validate cost-effective and socially acceptable phytosanitary measures at the place of production (inland) for plants, plant products, water and soil
- To identify and validate strategies for control of pests resistant to pesticides and understand the genetics and epidemiological behaviour of resistant forms

Euphresco identified 6 priorities considering available infrastructures and collaborations.

Research infrastructures – Collections; to support taxonomy, diagnostics, surveillance and archives on pests

- To support knowledge exchange for efficient management and maintenance of collections
- To improve access to collections of phytosanitary importance
- To build a network of collections that fulfil minimum quality standards

Research infrastructures - Information technology to support plant health activities

- To support data exchange, data use and re-use for the benefit of plant health research activities
- To contribute to databases for plant pests identification and diagnostics
- To develop databases on (i) distribution of economically important crops, and (ii) cultural practices/control measures applied by the various countries
- To use information technology in pest/pathogen surveillance programmes

Cooperation - Disciplines

- To address plant health challenges through integrative approaches and support collaboration among disciplines

Cooperation - Players

- To address plant health challenges through whole-chain, multi-actor approaches

Cooperation - Initiatives

- To favour knowledge exchange and support common initiatives with relevant players

