1. Content of the 'Topic Description' document

1.1. Topic area

Diagnostics, field detection, surveillance.

1.2. Topic title

Faster, cheaper identification of emerging virus problems.

1.3. Description of the problem the research should solve

Pest diagnosis is performed by official laboratories upon request of NPPOs, growers or traders, in samples that inspectors have collected *in situ* (a consignment, a place of production, an outbreak area, a buffer zone, etc.). Resources allocated to official laboratories have decreased over time, while trade in plants and plant products, and consequently the material to be tested, have increased steadily. As indicated in the Euphresco Strategic Research Agenda (priority R-6), on-site detection and identification tests, that are both high throughput and scalable at contained costs should be developed and validated to accelerate diagnosis (especially in the case of perishable goods) and to relieve pressure on laboratories. In particular, the application of on-site detection and surveillance methods for plant viruses and viroids is needed for the quick health status assessment of plant material, and the detection of emerging virus problems. New protocols and technologies are under development (such as Oxford nanopore direct RNA sequencing - cDNA sequencing - lateral flow devices), but need to be tested, optimised and validated in order to be applicable in routine on-site testing for plant viruses. Furthermore, current barriers for the use of novel on-site technologies need to be addressed.

1.4. Description of the expected results

- Optimised and validated detection/identification method(s) that can be used for fast, reliable and cost-effective on-site detection of (un)known and emerging harmful viruses on plants and plant products (sample preparation, sequencing, data-analysis).
- Comparison of the validated detection/identification method(s) with methods that are currently being used.
- Interaction with other and future users and risk managers, in order to enhance the applicability of the method(s).
- Data analysis: application software and programming.
- Identification of barriers and recommendations to adopt these methodologies in the current legal framework R2000/29 (and R2016/2031-R625/2017 as from 12/2019) as an official test method.

1.5. Beneficiaries of this research product

Inspectors, diagnosticians, NPPO's, researchers, technology, bioinformatics, kit selling companies.

1.6. Research funders and research contribution/ distribution

Funding organisation	Research activity and researchers involved
1. Federal Public Service of Health, Food Chain Safety and Environment, Belgium Ria Nouwen ria.nouwen@health.belgium.be	-Project coordination. -Testing the Oxford Nanopore technology (ONT) on pure virus preparations. -Technology evaluation on plant samples.

	-Creating stakeholders community for on-site testing. Contact person: Sebastien Massart E.mail address: sebastien.massart@ulg.ac.be
2. Canadian Food Inspection Agency – Plant Research & Strategies, Canada Jaimie Schnell Jaimie.Schnell@inspection.gc.ca	-Validation and implementation of NGS technology for routine testing in the Sidney Laboratory Diagnostic Unit. NGS provides an alternative approach for the identification of viral pathogens in grapevines and tree fruits, reducing testing times from three years to a matter of months. Transfer of this technology from a research model to the ISO 17025 accredited diagnostic laboratory will include validation of the new technology as an official test method. Contact person: Anna-Mary Schmidt E-mail address: Anna-Mary.Schmidt@inspection.gc.ca
3. Agence nationale de sécurité sanitaire de l'alimentation, de l'environnement et du travail, France Geraldine Anthoine geraldine.anthoine@anses.fr	-Research activities to be confirmed. Contact person: Bruno Hostachy bruno.hostachy@anses.fr Contact person: Delphine Masse E-mail addresses: delphine.masse@anses.fr
4. National Institute for Agronomic Research, France Thierry Candresse thierry.candresse@inra.fr	-Contribution to be detailed Contact person: Mikhail Pooggin E-mail address: Mikhail.Pooggin@inra.fr
5. Julius Kühn Institute, Germany Silke Steinmöller silke.steinmoeller@julius-kuehn.de	-Contribution to be defined Contact person: Heiko Ziebell heiko.ziebell@julius-kuehn.de
6. Department for Environment, Food and Rural Affairs, United Kingdom Belinda Phillipson Belinda.phillipson@defra.gsi.gov.uk	-Development of sequencing and informatics methods, stakeholder engagement. Contact person: Neil Boonham E-mail address: neil.boonham@fera.co.uk

7. International Centre for Advanced Mediterranean Agronomic Studies/Mediterranean Agronomic Institute of Chania, Greece Ioannis Liveratos livieratos@maich.gr	-Plant-virus interactions, virus replication, diagnosis Contact person: Ioannis Liveratos E-mail address: livieratos@maich.gr
8. Ministry of Agriculture Forestry and Food, Slovenia Erika Oresek erika.oresek@gov.si	-Detection and identification of important plant viruses using Oxford Nanopore sequencing technology. -Test newly released sequencing kits (e.g., for direct RNA sequencing) for the detection of a selected plant RNA virus (important for the EU agriculture) using a new generation of MinIon sequencing device. -Test different sample preparation steps, including isolation of nucleic acids and different library preparation steps with the aim of producing reliable real-time sequencing data for the identification of the selected virus. Contact person: Natasa Mehle, E.mail address: natasa.mehle@nib.si Contact person: Denis Kutnjak E.mail address: denis.kutnjak@nib.si Contact person: Maja Ravnikar E.mail address: maja.ravnikar@nib.si
9. US Department of Agriculture, Animal and Plant Health Inspection Service, United States of America Christina Devorshak Christina.devorshak@aphis.usda.gov	-Research activities to be confirmed. Contact person: Gang Wei E-mail address: Gang.wei@aphis.usda.gov
10. Naktuinbouw, The Netherlands Thomas van Gurp t.v.gurp@naktuinbouw.nl	-Research activities to be confirmed. Contact person: Thomas van Gurp E-mail address: t.v.gurp@naktuinbouw.nl

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

1.8. 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. FPS (BE)	VP	€ 100 000
2. CFIA (CA)	NC	€ 30 000
3. ANSES (FR)	NC	€ 22 500
4. INRA (FR)	NC	€ 22 000
5. JKI (DE)	NC	€ 5 000
6. DEFRA (GB)	NC	€ 57 000
7. CIHEAM/MAICH (GR)	NC	€ 2 000
8. MKGP (SI)	NC	€ 6 000
9. APHIS (US)	NC	€ tbc
10. NAKTUINBOUW (NL)	NC	€ 20 000
total		€

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

[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.