

# Phytosanitary diagnostic, on-site detection and epidemiology tools for fire blight (PHYTFIRE)



## Funding

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## Research consortium

ACW-CH/ZHAW-CH, AGES-AT, PPS- NL, INRB- PT, EGE- TR, MARA-GDAR-BPPRS-TR, JKI-DE, TUW- AT, IVIA- ES, FGU VNIKR- RU, PhRL- LT, ARC- EE) + 5 associated partners from KZ, KG, LV, PL, RS

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## Goals

The project PHYTFIRE aimed at the development, adaptation, application and dissemination of innovative phytosanitary tools to fill fundamental research gaps in pathogen detection and epidemiology that will improve fire blight phytosanitary and control strategies.

## Objectives

Methods for epidemiological monitoring of pathogen populations in flowers, vectors and asymptomatic infections, and for pathogen genotyping were developed. Monitoring methods were evaluated for integration with fire blight forecasting models prognosis, for assessing fire blight treatments, and for plant inspection strategies.

## Key outputs and results

- An intensive lab training course on new and established method for *Erwinia* spp. detection and discrimination organized
- New associated partners from East European and Central Asian countries were recruited to improve their knowledge on fire blight detection and epidemiology. They provided valuable information about the fire blight situation in their own countries and delivered strains for analysis
- Laboratory assays for the detection and discrimination of *E. amylovora* and related species (*E. pyrifoliae*, *E. piriflorinigrans*, *E. uzenensis*) were developed and tested in a ring trial.
- The use of MALDI-TOF MS was validated for rapid population analysis of *E. amylovora* and related species on flower samples
- A LAMP-based diagnostic kit for onsite detection of *E. amylovora* was developed and tested
- A protocol with the most suitable methods for detection of *E. amylovora* in asymptomatic plant material was developed
- Population structure and epidemiological data were obtained by analyzing epidemic foci in Switzerland, Slovenia and the Netherlands using a VNTR high-throughput ("MLVA-6") method
- A diversity analysis of *Erwinia amylovora* isolates in Europe and Central Asia was performed to understand the dissemination routes and the forthcoming hazards represented by fire blight to the native domesticated apple germplasm in Central Asia