Master Thesis - Transmission ability of *Philaenus spumarius*, the main European vector of *Xylella fastidiosa*

Starting date: June 2026
Duration: 6 months
Working Place: Eidg. Forschungsanstalt WSL, Swiss forest protection Research Group (Zürcherstrasse 111, 8903 Birmensdorf), Agroscope, Neobiota Research Group (A Ramél 18, 6593 Cadenazzo)
Language: Italian / French / English
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Background

The insect-transmitted bacterium *Xylella fastidiosa* Wells et al. (1987) is among the most dangerous plant pathogenic bacteria in the world and poses a major risk for the EU territory with significant economic, environmental and social impacts. It is responsible for many diseases on agricultural crops, such as grapevine Pierce's disease (PD), phony disease of peach (PDP), citrus variegated chlorosis (CVC), and olive quick decline syndrome (OQDS). Native to the Americas, *X. fastidiosa* made its appearance in Europe in 2013 in Apulia's olive groves, which were severely impacted by its arrival. Infections were subsequently reported in France, Spain and Portugal. Switzerland is currently considered *Xylella*-free, but the presence of outbreaks in the neighboring countries and increasing international plant trade are elements of concern, despite the thorough measures in place for controlling imported plants and a regular surveillance of the Swiss territory.

Objective

The aim of the master thesis is to assess the transmission capacity of *Philaenus spumarius*, the main vector of the bacterium in Europe, under controlled conditions in the biosafety level 3 greenhouse at WSL.

Experimental approach and timeline

We are looking for an enthusiastic master student with the ability to work effectively in the field, greenhouse, and laboratory. The project will involve fieldwork for insect collection, caring for greenhouse assays (plants, insects), laboratory work in biosafety level 3 facilities for DNA extraction and data entry / processing. Previous laboratory experience (biosafety levels 1 or 2) is beneficial. A multidisciplinary approach will be needed to provide fundamental information on *Xylella*'s transmission capacity to support the risk and potential impacts evaluation for the Swiss landscape.

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Confederation

Federal Department of Economic Affairs, Education and Research EAER
Agroscope

Task	June	July	August	September	October	November
Laboratory training Literature research						
Field insect collection						
Transmission experiments						
Molecular analysis						
Data analysis and writing						

Work environment

The study will take place in the biosecurity level 3 facilities of **WSL (Birmensdorf)**, in collaboration with the Swiss Forest Protection Research Group from WSL and the Neobiota Research Group from Agroscope. The master topic will be embedded within a larger project entitled 'Xylella fastidiosa and the transmission capability of its insect vectors between plants of agricultural and sylvicultural interest in Switzerland' funded by SNSF with a Swiss Postdoctoral Fellowship to Júlia López Mercadal, who will be co-supervising this master topic in collaboration with Francesca Dennert from WSL.

Information about Agroscope and WSL

Agroscope is the Swiss centre of excellence for agricultural research and is affiliated with the Federal Office for Agriculture (FOAG). Agroscope makes an important contribution to a sustainable agriculture and food sector as well as to an intact environment, thereby contributing to an improved quality of life.
Agroscope research along the entire value chain of agriculture and the food sector. Its goals are a competitive and multifunctional agricultural sector, high-quality food for a healthy diet, and an intact environment. In pursuing these aims, the research institute gears itself to the needs of its service recipients.
Agroscope deals with issues in the following spheres:
• Plant Breeding, Plant Production, Plant Protection and Plant Products;
• Livestock, Feed and Products of Animal Origin;
• Food and Nutrition;
• Cropping Systems, Protection of Natural Resources, Agricultural Economics and Agricultural Engineering.

The **Swiss Federal Institute for Forest, Snow and Landscape Research (WSL)** provides science-based solutions for forests, landscapes, biodiversity, natural hazards, and snow and ice in a changing world. As a federal research institute and part of the ETH Domain, WSL commits itself to excellence in research and implementation that benefits nature and society.
WSL performs mission-oriented research as the basis for evidence-driven information for policy- makers and implementation in practice:
• Leading institute for solution-oriented terrestrial environmental research in Switzerland;
• First point of contact for stakeholders on topics related to the terrestrial environmental and to the management of natural resources and risks;

• WSL delivers key national services for Switzerland in the fields of forests, landscapes, biodiversity, natural hazards and snow and ice;
• WSL is a leader in long-term studies and in the monitoring and modelling of environmental systems; it develops and maintains unique infrastructure and data resources.