



An interdisciplinary approach to prevent *Xylella fastidiosa* outbreaks

Pauline Farigoule, Marc Barbier, Astrid Cruaud, Jean-Pierre Rossi

► To cite this version:

Pauline Farigoule, Marc Barbier, Astrid Cruaud, Jean-Pierre Rossi. An interdisciplinary approach to prevent *Xylella fastidiosa* outbreaks. 3rd European Conference on *Xylella fastidiosa* and XF-ACTORS final meeting, Apr 2021, Online Event, France. , 10.5281/zenodo.4683361 . hal-03840887

HAL Id: hal-03840887

<https://hal.inrae.fr/hal-03840887>

Submitted on 16 Nov 2022

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



Distributed under a Creative Commons Attribution - NonCommercial - NoDerivatives 4.0 International License

An interdisciplinary approach to prevent *Xylella fastidiosa* outbreaks

Pauline Farigoule^{1,2}, Marc Barbier³, Astrid Cruaud², Jean-Pierre Rossi²

¹ AgroParisTech, Paris, France

² CBGP, INRAE, CIRAD, IRD, Montpellier SupAgro, Univ. Montpellier, Montferrier-sur-Lez, France

³ UMR LISIS, INRAE, Marne-la-Vallée, France

INTRODUCTION

Since the detection of *Xylella fastidiosa* (Xf) in 2013, in Italy, European research interest into this bacterium has considerably increased (Fig. 1). Research mainly focuses on Xf biology, evolution and epidemiology (Fig. 2).

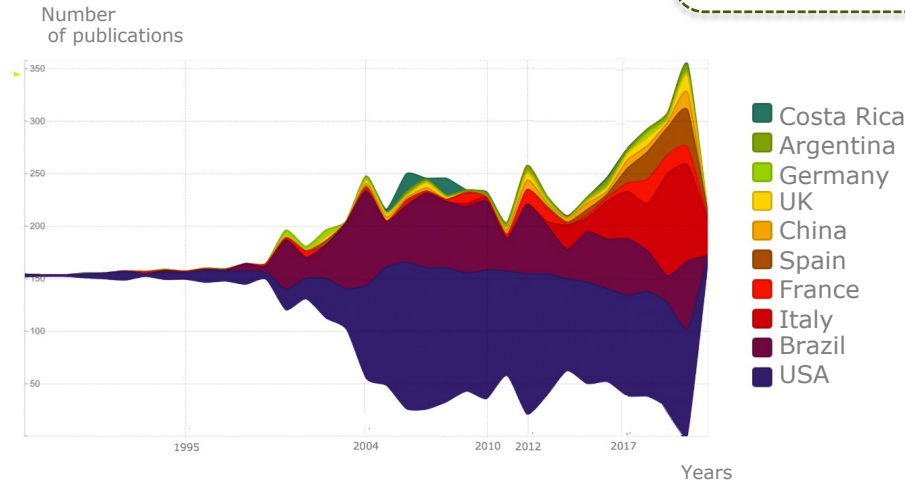


Fig. 1 : Analysis of scientific production by top 10 countries from 1987 to 2020.

(1840 publications from the Web Of Science)

However, managing the spread of Xf also requires the mobilization of other actors whose action supports research driven strategy. Indeed, people who are directly impacted (arboriculturalists, winegrowers) should be involved to slow down the spread of Xf. The involvement of farmers makes it possible to accelerate the implementation of prophylactic and control measures against Xf through a rapid transfer of knowledge.

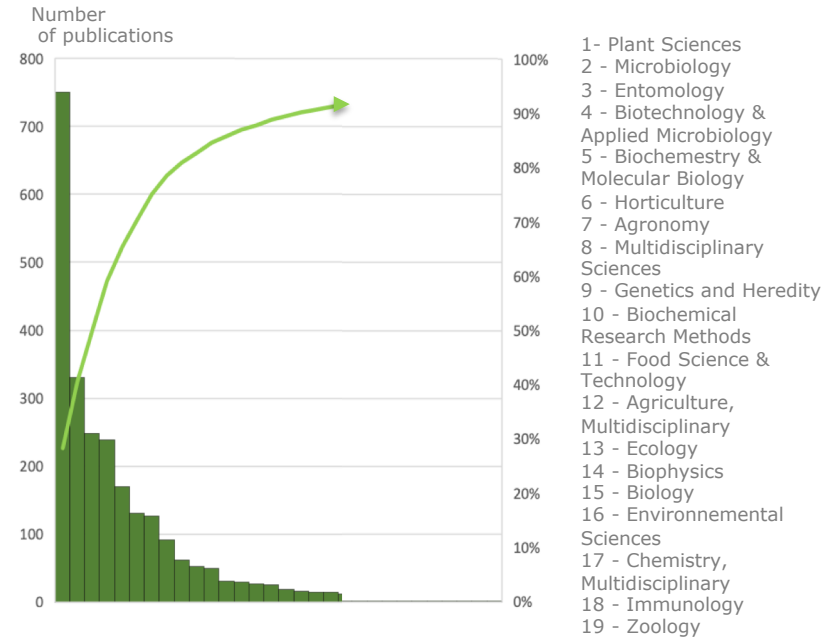


Fig. 2 : Analysis of scientific production by top 10 Web Of Science Categories from 1987 to 2020. (1840 publications from the Web Of Science)

QUESTIONS AND OBJECTIVES

To address this bottleneck at the boundary of scientific knowledge production and epidemiological watch, we propose **an interdisciplinary** work that combines the production of **knowledge in ecology** with the **analysis of the construction, use and diffusion of this knowledge to stakeholders** using social studies of science and technology practices.

- What are **the habitats where *Xf* is present** ?
In which landscapes ?
- What is **the structure of the communities** of insect vectors associated with these habitats ?
- Which insect species carry **the bacterium** ?



- How is **the scientific data** produced on *Xylella* and its insect vectors used?
- What is **the role of epidemiological surveillance actors** in the management of *Xylella*?
- **Who is impacted** by the presence of *Xylella*?



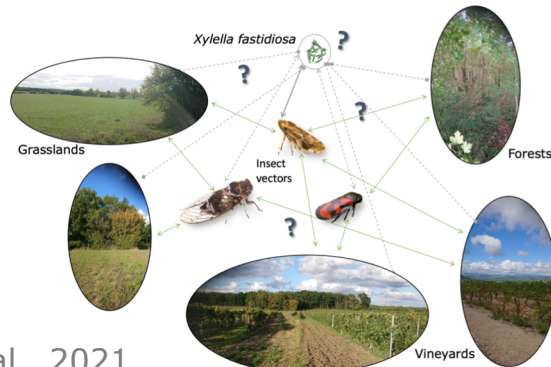
- Propose **prophylactic and control methods** to slow down or prevent the establishment of *Xf* in the uncontaminated territories.
- Provide recommendations for **the dissemination and implementation of these methods** with an evaluation of the preparedness in France.

APPROACHES

■ Ecological work

- Characterization of insect communities (fieldwork and statistical analysis)
- Detection of *Xylella fastidiosa* in insect vectors (molecular biology)

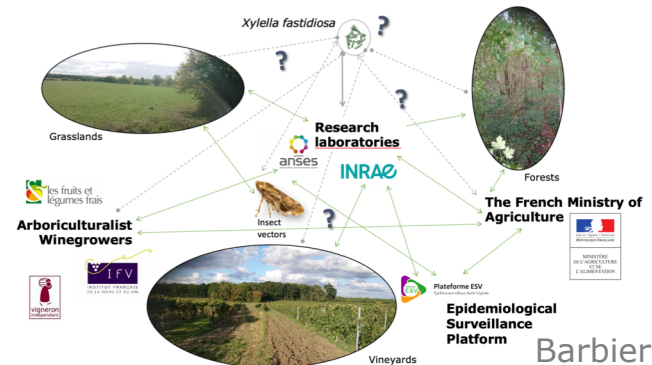
➡ Interaction networks



■ Sociological work

- Study of scientific production (scientometry, participatory observation)
- Analysis of the preparedness of the stakeholders (semi-directive interview)

➡ Networks for knowledge creation and transfer



Barbier et al., 2021

This multidisciplinary study will allow to understand the epidemiological surveillance of *Xylella fastidiosa* from several points of view. The intersection of these approaches will give keys to the actors in the development of prophylaxis and control methods against *Xylella* and in the transfer of knowledge allowing their implementation.

BIBLIOGRAPHY

Barbier M., Farigoule P., Rossi J-P., Cruaud A., A socio-semantic analysis of the research domain on *Xylella fastidiosa*. Structure and dynamics of scientific dynamics, 2021, 26-30 April, 3rd European Conference on *Xylella fastidiosa* [Poster Session].

Farigoule P., Lambert M., Gonzales A-A., Mesmin X., Nidelet S., Chartois M., Rossi J-P., Santoni S., Rasplus J-Y., Cruaud A., Sentinel insects to anticipate, detect and monitor *Xylella fastidiosa* outbreaks 2021, 26-30 April, 3rd European Conference on *Xylella fastidiosa* [Poster Session].

ACKNOWLEDGEMENTS

We thank all the collaborators on this project (fieldwork, molecular analysis, etc.) as well as all the stakeholders who accepted an interview.

This work was funded by grants from the Inrae department SPE, the Territorial Collectivity of Corsica ; the Horizon 2020 XF-ACTORS Project SFS-09-2016 and the French Ministry of Agriculture.