An interdisciplinary approach to prevent Xylella fastidiosa outbreaks

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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).

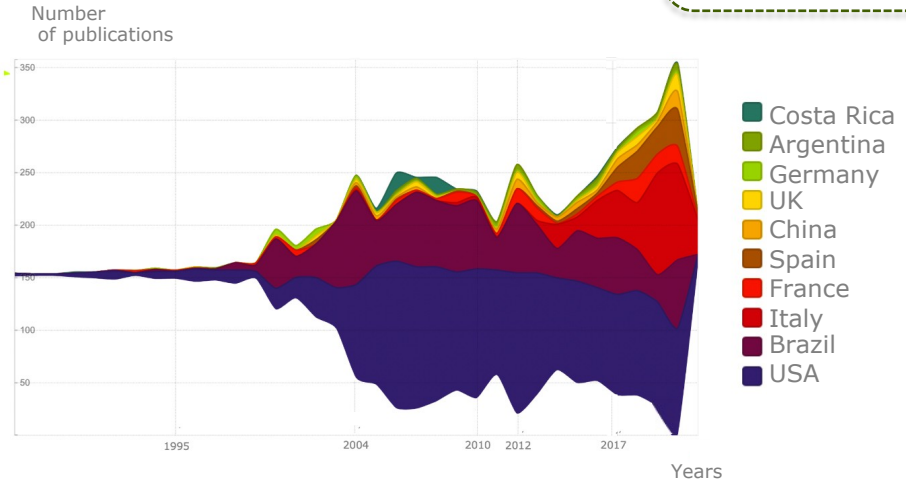


Fig. 1 : Analysis of scientific production by top 10 countries from 1987 to 2020.
(1840 publications from the Web Of Science)

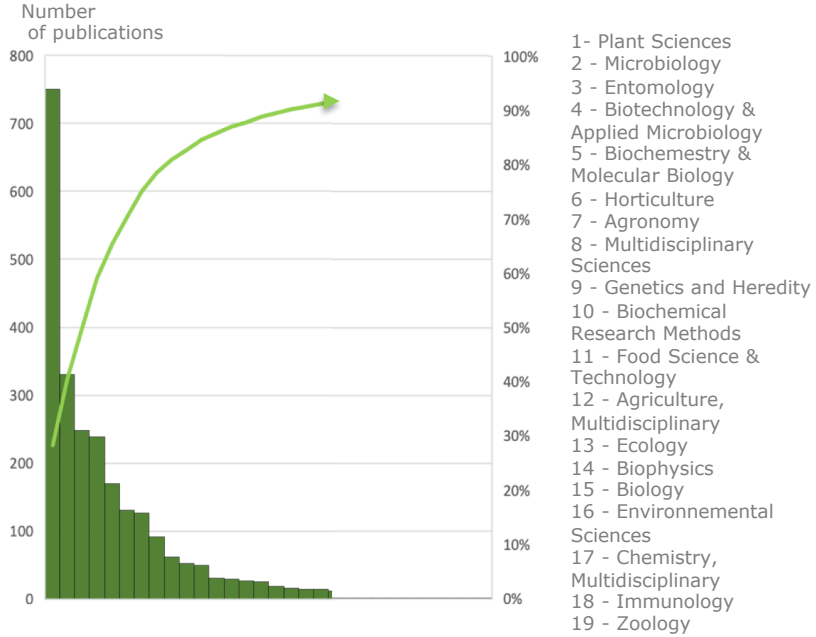


Fig. 2 : Analysis of scientific production by top 10 Web Of Science Categories from 1987 to 2020. (1840 publications from the Web Of Science)

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.

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** ?

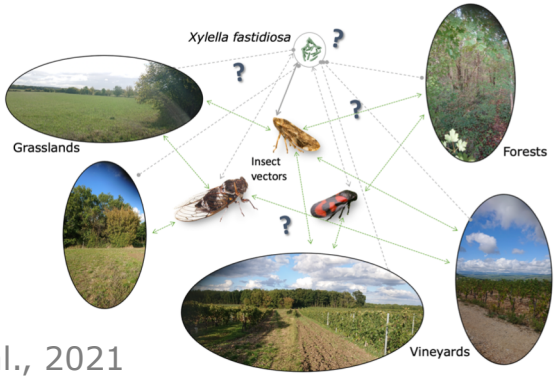
- How is **the scientific data** produced on *Xylella* and its insect vectors used?
- What is **the role of epidemiological surveillance actors** in the management of *Xylella*?
- **Who is impacted** by the presence of *Xylella*?

- 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)

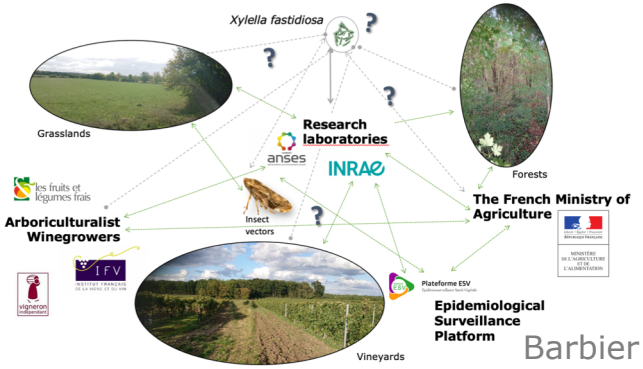
➡ Interaction networks



Farigoule et al., 2021

- **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.

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