Current EU research initiatives on Xylella fastidiosa

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Current EU research initiatives on *Xylella fastidiosa*

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The large outbreak of *Xylella fastidiosa* (*Xf*) affecting olive groves in the Salento peninsula of the Puglia region (southern Italy) and the numerous *Xf* outbreaks reported by the French Authorities in the French island of Corsica, and later on the mainland, pose major risks to the EU agriculture and plant biosecurity. Because of the complexity of the *Xf*-associated diseases, the management and the control of the infections rely on deep knowledge of the susceptible hosts, of the biology and genetics of the isolate(s), and on their interactions with the insect vector population(s), the climate conditions and the agriculture practices. As such, the EU Commission mobilized resources within the EU framework programme for research and innovation Horizon 2020. The first research program started at the end of 2015 with the project "Pest Organisms Threatening Europe" (POnTE) dealing with *X. fastidiosa* and other relevant emerging pathogens. Indeed in 2016, an H2020 project "*Xylella Fastidiosa* Active Containment Through a multidisciplinary-Oriented Research Strategy" (*XF*-ACTORS) targeting exclusively *Xf* has been funded with the aim of fulfilling the research gaps on *Xf* and of developing tools and strategies for prevention and containment of the impact of the disease spread under different agriculture management regimes. To strengthen the capability of the national plant health services to conduct robust surveys in EU and Mediterranean countries, a EUPHRESCO network has been set up to promote validation and interlaboratory performance tests and provide harmonized diagnostic approaches. These actions involve very large Consortia with ambitious work-plans covering basic and applied research on prevention, detection, surveillance and innovative control strategies for *Xf* and its vector(s). The multi-actor approach ensured by these large Consortia will facilitate interactions among research groups, share previous experiences, establish new and strengthen current collaborations among European and non-European research organizations, and increase awareness about scientific work previously done. Moreover, the European Food Safety Authority (EFSA) promoted in 2014 a "Pilot project on *Xylella fastidiosa* to reduce risk assessment uncertainties" and more recently a specific action to collect literature information and experimental data on the vectors "Collection of data and information on biology and control of vectors of *Xylella fastidiosa*". Best practices to manage the EU resources are put in place in order to maximize the efforts while avoiding research duplications.

Major expected research advances and outcomes from the ongoing projects:

POnTE "Pest Orga POnTE "Pest Organisms Threatening Europe" (H2020 cod. 635646)

- Discovery of biomolecules that can be applied to prevent or reduce host colonization by *Xf*;
- Selection of tolerant or resistant varieties;
- Discovery of endophytic bacteria that can cross protect against *Xf*;
- Development of early detection of the pathogens that can be applied for inspection at port of entry to interdict the exotic pathogens and pests;
- Discovery of an optimal biological control agent for vectors of *Xf*;
- Development of pest management regimes to mitigate the impact and the further spread of emerging diseases and alien pests.

_XF_-ACTORS "*Xylella Fastidiosa* Active Containment Through a multidisciplinary-Oriented Research Strategy" (H2020 cod. 727987)

- Extensive knowledge on the biology, genetics and pathogen-host/environment interactions;
- Extend the knowledge on the vector biology, ecology and role in disease epidemiology;
- Integrated research data on *X. fastidiosa* and implementation of regional pest risk assessment (PRA);
- Strengthen preventive measures by the promotion of integrated measures for rapid and efficient response against emerging outbreaks of *Xf;*
- Screening of a larger number of olive selections for their susceptibility to *Xf;*
- Develop sustainable management strategies aimed at reducing the economic, environmental and social impacts.

PROMODE "Harmonized protocol for monitoring and detection of *Xylella fastidiosa* in its host plants and its vectors" (EUPHRESCO2015-F-146)

- A common protocol for sampling and processing of plant/bacteria extract, with special emphasis on isolation of viable cells of *X. fastidiosa*;
- Harmonized and validated detection methods to determine prevalence of *X. fastidiosa* in plants and insects;
- Evaluate the risks of *X. fastidiosa* transmission from infected oversea ornamentals to native host plants.