



BIOVEXO – Biocontrol of Xylella and its vector in olive trees for integrated pest management

Deliverable 2.1

Summary report on available biocontrol solutions against the vector

Due Date:	31/8/2020
Submission Date:	30/9/2020
Dissemination Level:	CO (<i>also see next page</i>)
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Project acronym: BIOVEXO	Project Number: 887281
Start date of project: 01.05.2020	Project duration: May 2020 – April 2025



The BIOVEXO project has received funding from the Bio Based Industries Joint Undertaking (JU) under grant agreement No 887281. The JU receives support from the European Union's Horizon 2020 research and innovation programme and the Bio Based Industries Consortium. www.biovexo.eu

1 Publishable Summary

A key strategy in reducing *Xylella fastidiosa* infection in olive trees is to limit transmission of the pathogen by the xylem-sap feeding *Philaeus spumarius* ('meadow spittlebug'). This polyphagous insect is the main *Xf*-vector in Italy and on almond in Mallorca and is widespread throughout Europe¹.

Vector control must target both nymph (juvenile) and adult life stages, each feeding on more than 100 different host plants. In *P. spumarius*' one-year life cycle, eggs are laid in autumn and nymphs hatch the following spring. In Apulia, juvenile nymphs are present on weeds in and around orchards from February to May-June, depending to the altitude, while adult insects move to olive tree canopies in April/June and stay up to October-November (Fig.1).

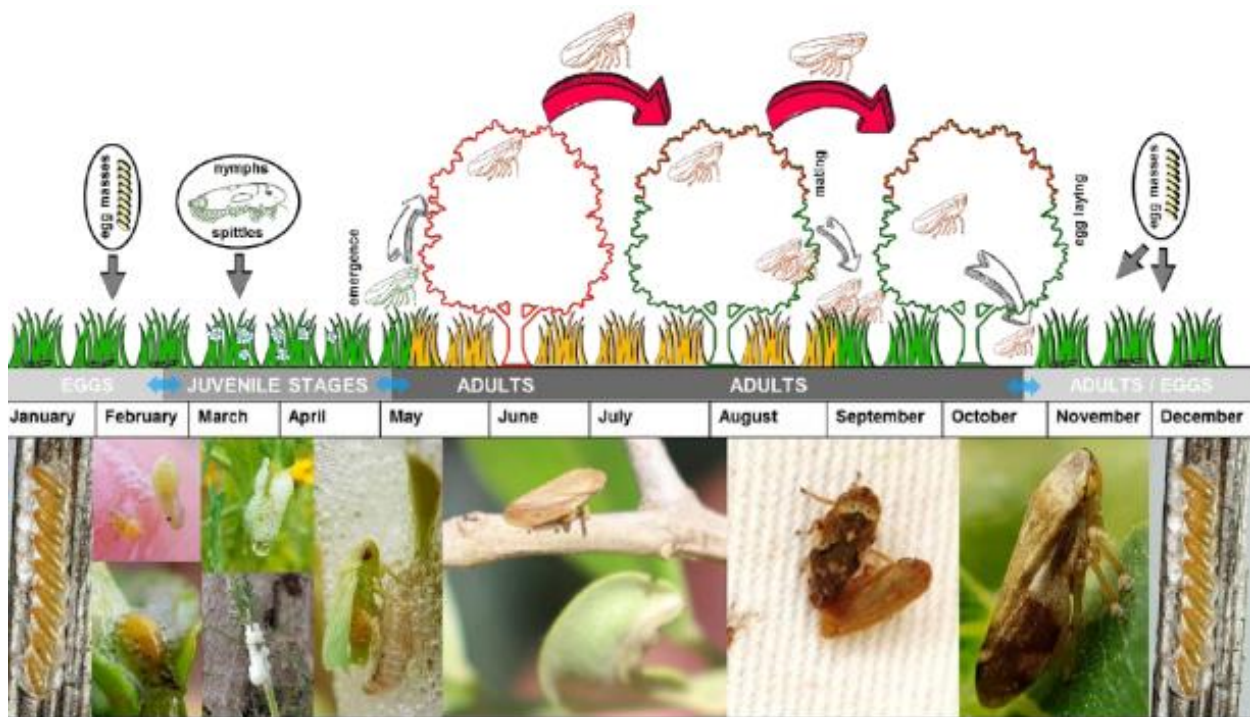


Fig. 1 Biological cycle of *P. spumarius* in Apulia (From EFSA, 2019)

Current vector control relies on soil tillage and weed removal in early spring to control juveniles and on chemical treatment to kill the adults feeding on trees when they are moving on olive/almond canopies, in the spring and during summer. However, there is no biopesticide targeting the insect vector that is commercialized and officially registered. Different field trials have been set up, from 2015, and they showed highest efficacy against *P. spumarius* of synthetic pyrethroids and neonicotinoids^{2,3,4}. Nevertheless, current treatment options are considered insufficient, not suitable for organic agriculture, and have negative environmental impact.

Novel V-biopesticides and insights into vector control are expected between submission of the BIOVEXO proposal and start the of the project – both from consortium partners, and external.

D2.1 Summary report on available biocontrol solutions against the vector

D2.1 provides an evaluation of the consortium internal solutions listed in the proposal and an overview of consortium external solutions. Based on results of experiments performed between submission of the proposal and the start of the project, we thoroughly re-evaluated all the consortium internal V-biopesticides. Furthermore, we reviewed the existing solutions for *P. spumarius* control available on the market or close to the market. The latter include products allowed by individual EU members state's national ministries with a temporary 120-days-authorization as well as other promising products that are not registered for use against *P. spumarius* but which have been tested against *P. spumarius* in scientific publications. Based on D2.1, consortium internal solutions will be updated and consortium external solutions will be chosen as reference products or will be included in the integrated pest management in WP4.

For the consortium internal V-biopesticides, Glob1 and Glob2 were withdrawn Glob1's efficacy could not be validated while Glob2 had to be withdrawn from the project due to unforeseen legal problems with the supplier. These were replaced by three more promising solutions: Glob3, Glob4 and Glob5.

In Italy, only three consortium external chemical insecticides (acetamiprid, deltamethrin and phosmet) were registered for use against *P. spumarius* at the time of submission of this proposal. One citrus oil-based organic product got a temporary 120 days-authorization. In Spain, temporary authorization was given to registered pyrethrin-based products (2% -4%) in both almond and vineyard crops. The current situation in both countries has not changed largely since the project submission. Both Italy and Balearic region released an updated general plan on vector control in 2020. In the Balearic region these consist of chemical insecticides: deltamethrin, lambda-cyhalothrin and 4% pyrethroids as well as kaolin treatments. In Italy, the use of spinetoram was authorized on olive.

¹ Update of the Scientific Opinion on the risks to plant health posed by *Xylella fastidiosa* in the EU territory. EFSA Journal 2019;17(5):5665.

² Collection of data and information on biology and control of vectors of *Xylella fastidiosa*. EFSA Journal 2019;16(5):1628

³ Evaluation of Insecticides for the Control of Juveniles of *Philaenus spumarius* L., 2015-2017. C Dongiovanni et al. Arthropod management test 2018;43(1)

⁴ Evaluation of Efficacy of Different Insecticides Against *Philaenus spumarius* L., Vector of *Xylella fastidiosa* in Olive Orchards in Southern Italy, 2015–17. C Dongiovanni et al. Arthropod management test 2018;43(1)