



FELLOWSHIP SUMMARY REPORTS

Cover page

Name: Laura Depalo

Subject of the research fellowship: Resilient pest management programs in horticultural crops based on increased plant defensive responses.

Host institution: Institut Valencià d' Investigacions Agràries (IVIA) Valencia, Spain.

Host collaborator: Alberto Urbaneja García

Dates of your fellowship: 05/10/2020 – 05/01/2021

Your consent to your report being posted on the Co-operative Research Programme's website, or alternatively, a short paragraph about your fellowship which could be used anonymously.

You have my consent to post my report on the Co-operative Research Programme's website.





1. What were the objectives of the research project? Why is the research project important?

The aim of this project was to investigate the mechanism of volatiles produced by an important species of zoophytophagous predator commonly used in biological pest control, *Nesidiocoris tenuis*. In particular the work focused on tomato and sweet pepper, two of the most important horticultural crops in EU and on its pest, *Aulacorthum solani*.

Plant defences induced by arthropod predators could offer an opportunity to increase crop resilience. Investigating the tritrophic system plant/pest/natural enemy could provide a scientific basis for developing novel and sustainable crop protection practices.

2. Were the objectives of the fellowship achieved?

The objectives were totally achieved, but I had to make some changes to the project due to pandemic situation. The original project was planned to be carried out in spring 2020, but it was shifted to autumn 2020, so in agreement with the host institution we substituted the pest involved in the trials, with a species more adapted to the season of my fellowship period.

3. What were the major achievements of the fellowship? (up to three)

1. Determination of the effects of plant volatiles induced by *N. tenuis* on the behaviour and development of the tomato pest *A. solani*.
2. Determination of the effects of plant volatiles on the behaviour and development of the natural enemy *N. tenuis*.
3. Molecular analysis of expression gene markers, to evaluate the persistence of plant defences induced by *N. tenuis* in comparison with defences induced by volatiles.

4. Will there be any follow-up work?

Is a publication envisaged? Will this be in a journal or a publication? When will it appear?

Three publications (one per each major achievement) are envisaged to be submitted in peer reviewed journals in 2021 and 2022.

Is your fellowship likely to be the start of collaboration between your home institution and your host?

The collaboration started in IVIA could continue applying the findings obtained to different tritrophic systems, more common in Italy. Therefore we will explore funding opportunities to support future collaboration between IVIA and UNIBO and including a possible exchange of students in the future.

Is your research likely to result in protected intellectual property, novel products or processes?

We did not plan to patent our findings, but we do not exclude the possibility in the future.

5. How might the results of your research project be important for helping develop regional, national or international agro-food, fisheries or forestry policies and, or practices, or be beneficial for society?

The results of my research demonstrate that developing new non-chemical tools is possible, and focus on the concept of “resilience” as a new approach to agriculture.

Sharing this approach with policy makers and stakeholders, environmental organizations and the public opinion in general and/or transferring this kind of scientific methodology to the commodity producers and farm advisors, can increase the adoption of new agricultural practices, to achieve a step change in sustainability and food security.





As stated in the project, is our intention to present our results at meetings of institutions working on sustainable pesticide use, but also farmer's organizations and technical workshops.

6. How was this research relevant to:

The objectives of the CRP?

The ultimate goal of this research was to provide a scientific basis for developing novel and sustainable technology to manage crop protection. Sharing this approach with policy makers and stakeholders can increase the adoption of new agricultural practices, to achieve a step change in sustainability and food security as expected by the scientific community, commodity producers, farm advisors, policy makers, environmental organizations and the public opinion in general.

The CRP research theme? Theme III - Transformational technologies and innovation

This concept is in line with objective research theme III, indeed understanding the basis of a natural defence mechanism of plants could provide an innovative approach to pest management. In particular, my proposal aimed to develop enhanced crops as a non-chemical alternative to pesticides, promoting a reduction of adverse effects of hazardous products

7. Satisfaction

Did your fellowship conform to your expectations?

Yes, my main objective was to achieve knowledge on new research topics, as for example different crop systems or new experimental techniques.

Will the OECD Co-operative Research Programme fellowship increase directly or indirectly your career opportunities?

This experience gave me the opportunity to improve my cv thanks to fruitful collaboration and probably several publications, but I also had the opportunity to meet new colleagues, creating good connections in my research field.

Please suggest any improvements in the Fellowship Programme.

My suggestion is to include in the eligibility criteria a minimum period to spend at the host institute, as for example 3 or more months, in order to better connect the institutes and complete the project

8. Advertising the Co-operative Research Programme

How did you learn about the Co-operative Research Programme?

A colleague submitted an application a few years ago.

What would you suggest to make it more "visible"?

Promoting on social media is always a good option to reach young researchers.

Are there any issues you would like to record?

The fellowship exceeded my expectations in providing fruitful opportunities, knowledge increasing and research connections.

