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H2020-MSCA-RISE-2016
CURE-XF - 734353

Consejo Superior de Investigaciones Científicas (CSIC) Spain, P6



CURE-XF Kick-off Meeting
CIHEAM Bari 28-29 September, 2017



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CSIC (IAS)
Córdoba (Spain)



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IAS-CSIC: General objective



- **The Institute for Sustainable Agriculture (IAS) was established in 1992 as a unique research center within the CSIC thrust in agricultural research, with *"specific focus on investigating the Andalusian agricultural systems, such as dryland and irrigated herbaceous crops and olive orchards, in order to make compatible food production with conservation of natural resources and environmental protection"*.**
- **Spearheading these objectives are 36 researchers in the Departments of Agronomy, Plant Breeding, and **Crop Protection**. They are part of a total staff of 202, including administrative and service employees, technicians, and researchers at pre- and post-doctoral levels.**





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FSAS GROUP-CROP PROTECTION-**IAS-CSIC**



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Main facilities

- Two buildings with a total area of 3200 m²
- 26 Research laboratories and 37 offices
- 16 walk in Growth and cool chambers
- Greenhouses
- Scientific equipment
- Machinery and storing facility of 320 m²
- Experimental fields: 154 ha (135 ha irrigated)
- **Biosecurity laboratory NC2+**





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Phytopathology of Sustainable Agricultural Systems Group: FSAS-Group

- **FSAS-Group aim is to increase the efficiency of agricultural systems in Mediterranean environments by using integrated management strategies of plant diseases caused by soil-borne pathogens to avoid the environmental damage and economic losses that they cause.**
- **FSAS-Group address these goals by developing innovative and environmentally-friendly management strategies to ensure both agricultural system efficiency and the yield, maintaining at the same time the quality and health of their products.**

Research lines:

Dr. Blanca B. Landa:

- **Molecular diagnosis and genetic diversity assessment of plant pathogens**
- **Biology, ecology and biogeography of plant pathogens and their antagonistic microorganisms**

Dr. Juan A. Navas-Cortés:

- **Plant disease epidemiology, modelling and climatic change**
- **Detection, monitoring and quantification of epidemics by remote sensing**





Permanent Scientists:

Dr. Juan A. Navas Cortés – Research Scientist
Dr. Pablo Castillo Castillo – Research Scientist
Dr. Rafael M. Jiménez Díaz – Research Professor
Dr. Blanca B. Landa del Castillo – Research Scientist
Dr. Hava Rapoport Goldberg – Research Scientist

PostDocs:

Dr. Miguel Montes Borrego
Dr. Juan E. Palomares Rius
Dr. David Ruano Rosa
Dra. Carmen Haro Mariscal

PhD students:

Antonio J. Archidona Yuste

Technicians:

José L. Trapero Casas
Concepción Olivares García
Juan C. Rivas Romero
Jorge Martín Barbarroja
Carolina Cantalapiedra Navarrete
Guillermo León Roper





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Projects on *Xylella fastidiosa*:

- **POnTE** 'Pest Organisms Threatening Europe'
- **XF-ACTORS** '*Xylella fastidiosa* Active Containment Through a Multidisciplinary-Oriented Research Strategy'
- **CURE -XF** 'Capacity Building And Raising Awareness In Europe And In Third Countries To Cope With *X. fastidiosa*'
- **COST action** '*Xanthomonas* y *Xylella fastidiosa*'
- **EUPHRESKO** 'Harmonization of *Xf* detection methods'



Main activities on *Xylella fastidiosa*:

- Specific early molecular diagnosis of *Xf* and validation of the new developed methodologies for the specific diagnosis of *Xf*
 - Biology and genetic diversity of *Xf* and its phylogenetic relationship with other *Xf* strains described in the world
 - Innovative and sustainable approaches for bacterial control in the host plants (AMPs, microbiome, host resistance, etc.)
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- Assessment of the spatio-temporal dynamics of *X. fastidiosa* infections
 - Development of quantitative remote sensing methods for detection and monitoring *X. fastidiosa*
 - Plant disease risk assessment and support for plant health decision-making
 - Regional climatic suitability and potential distribution of *X. fastidiosa* in Europe



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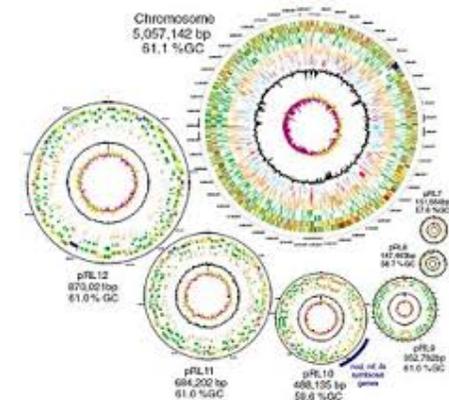
CSIC (ICA)
Madrid, Spain

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Alberto Ferreres
Arantxa Moreno



Juan Imperial





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ICA-CSIC



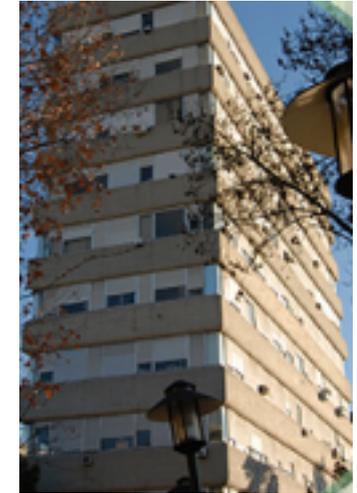
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➤ **short description:** The Institute of Agricultural Sciences (ICA) is a centre of excellence in agro-environmental research, capable to provide adequate answers to the major challenges of the modern and specialized Spanish agriculture. The scientific structure of ICA is based in three large research lines that are complementary: environmental pollution, plant health and beneficial interactions between plants and microorganisms.

Insect Vectors of Plant Pathogens (IVPP) Group works on **the interactions between insect vectors, plant pathogens and their host plants** as well as in **the biology and control of insect vectors of plant diseases**. At the International level, the group is one of the most relevant in the **area of insect-pathogen-vector interactions and insect feeding behavior**. The group is the only one in Spain with a long experience in **the Electrical Penetration Graph (EPG) technique**. The group is very well known at the international level in the application of the EPG technique to studies on the transmission mechanisms of plant pathogens by their insect vectors.

In addition the group has experience in **cultural control of insect vectors of plant pathogens** and has developed **control strategies to manage insect pests compatible with biological control agents**.

➤ **location (s):** ICA is part of the CSIC main Campus at Madrid, Spain, with other research Institutes in the Area of Chemistry, Physics, Computer Science and the main Administration building, which provides easy access and support of our research such as statistical advice or specific large equipment.



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➤ **staff number: 6**

Alberto Fereres (POnTE, XFactors)

Aranzazu Moreno (POnTE, XFactors)

Daniele Cornara (XFactors)

Marina Morente (POnTE)

Elisa Garzo (POnTE)

Maria Plaza (POnTE)



• **Main activities of IVPP Group:**

- Pathogen-vector-plant interactions: characterization of the transmission mechanisms of plant pathogens by their insect vectors and development of new control strategies to interfere with the transmission process.
- Plant pathogen and vector control in integrated production systems: new strategies to control the spread of plant pathogens based on the interference with vector population growth, landing, movement and transmission.
- Response of insect vectors and plant pathogens to variable abiotic stresses under a climate change scenario.



➤ Main facilities

➤ Labs: - Controlled Environments Service: one insect-free lab; two greenhouses -160 m²- each (one is divided into four modules with temperature, photoperiod and humidity control), nine walk-in environmental chambers, two cold chambers and eight plant growth chambers.

- Several laboratories to carry out the different disciplines involved in the project: entomology lab, molecular lab, general labs with offices...

- Specific techniques: **EPG technique, radio-frequency stylectomy...**

➤ Experimental fields: **La Poveda** Experimental Station, a 64 ha farm close to Madrid, with permanent staff. This farm includes two laboratories and specific farm machinery .

➤ Accommodation : Several hotels in the area at walking distance to ICA that is located in downtown Madrid.





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➤ Main activities on *Xylella fastidiosa*

➤ Projects

- Pest Organisms Threatening Europe (PONTE) REF. 635646. European Union. Horizon 2020 (01/11/2015-30/10-201)

- *Xylella Fastidiosa* Active Containment Through a multidisciplinary-Oriented Research Strategy (XF-ACTORS).REF. 727987. European Union. Horizon 2020 (01/11/2016-30/10/2020)

➤ Research activities

- Epidemiology and pathogen-vector interactions
- Identification of the vector(s) actually involved in the natural spread of Xf
- Characterization of the xylem-sap-feeder populations on different crops (olive, citrus, grapes, stone fruit)
- Studies on biology and ecology of xylem-sap feeder populations
- Implementation of sustainable strategies for a direct control of the Xf vector populations.



Publications

- Miranda et al. 2009. Characterization of electrical penetration graphs of *Bucephalogonia xanthophis*, a vector of *Xylella fastidiosa* in citrus. *Entomologia Experimentalis et Applicata* 130: 35-46.
- Miranda et al 2013. Influence of Citrus plants Infected with *Xylella fastidiosa* on Stylet Penetration Activities of *Bucephalogonia xanthophis* (Hemiptera: Cicadellidae). *Annals of the Entomological Society of America* 106(5): 610-618
- Lopes et al., 2014. A survey of potential insect vectors of the plant pathogenic bacterium *Xylella fastidiosa* in three regions of Spain. *Spanish Journal of Agricultural Research*, 12(3), 795-800
- Ferreres, A., Morente, M. 2016. Transmisión de *Xylella fastidiosa* y posibles estrategias de control en el olivar. *Grandes cultivos*, 8, 10-14.
- Morente et al., 2017. Vectores potenciales de *Xylella fastidiosa* en olivares de la península ibérica: prospección, riesgos y estrategias preventivas de control. *Phytoma* 285
- Miranda et al., 2017. Vectores potenciales de *Xylella fastidiosa* (Wells y col., 1987) en Mallorca (Islas Baleares) tras el foco detectado en 2016. *Phytoma*, 291, 34-40.



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Juan Imperial ICA-CSIC and CBGP



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Genomics and Biotechnology of Plants and Plant-Associated Microorganisms

- 8,000 m² lab and office space
- 24 research groups
- 5 working on Plant Pathology
- 600 m² growth chambers
- 1,200 m² greenhouses of which **200 m² P2 containment**
- **P3 containment facility**
- My group: Experience on bacterial genomics, metagenomics and plant microbiomes. Strong background on bacterial diversity, physiology and biochemistry of beneficial plant-associated bacteria
- Only very recently interested on Xf:
 - Genomic adaptations of Xf to plant and animal hosts,
 - Genomic diversity,
 - Genome reduction processes,
 - Physiological adaptations to growth in xylem and insect foreguts

