



GOBIERNO DE ESPAÑA

MINISTERIO DE ECONOMÍA Y COMPETITIVIDAD



Instituto Nacional de Investigación y Tecnología Agraria y Alimentaria



Department of Plant Protection works in the integrated control of pest, diseases and weeds in the context of sustainable agriculture.

The Department of Plant Protection is organised in four main research groups (30):

- Agricultural and forest Entomology.
- Bacteriology
- Fungal Diseases.
- Weed control.

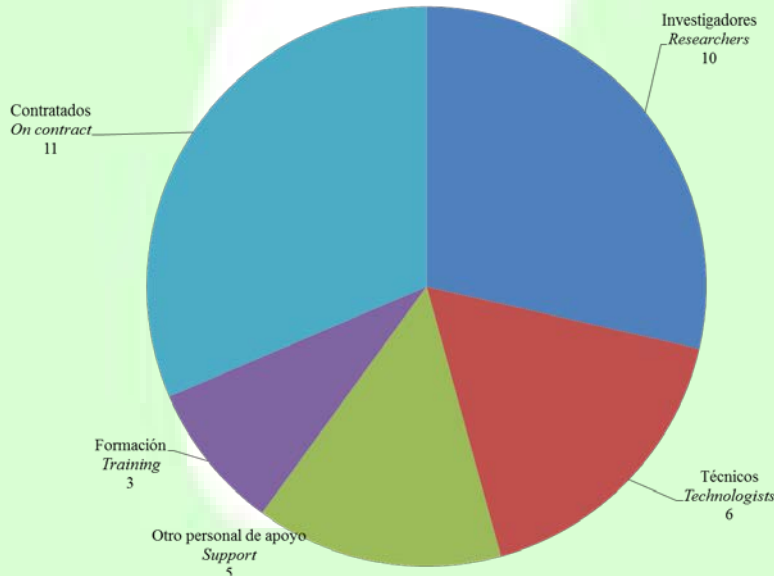
Biology, epidemiology, ecology and population dynamics of responsible agents to crop damage

Methods of detection and identification of pests, diseases and weeds

IPM of pests, disease and weeds, and its environmental effects.

Mechanisms of plant-pathogen interaction

Agricultural and environmental impact of herbicide-tolerant crops



Publications SCI (2010-2014): 53



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AGRICULTURAL AND FOREST ENTOMOLOGY


1. Development of new tools for a sustainable pest control in Mediterranean crops.

1a. Evaluation of efficacy of control methods (semiochemicals, biorational insecticides, physical methods...)

1b. Side effects on non-target arthropod fauna: paying special attention to beneficial organisms: natural enemies and pollinators



«Assessing and Monitoring the Impacts of Genetically modified plants on Agro-ecosystems»: **“NON-Target artropods”**

RTA2013-00042-C10-01 *Impact of pollutants on the abundance and diversity of **wild pollinators and honeybees*** 





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AGRICULTURAL AND FOREST ENTOMOLOGY

2. Evaluation of the effect of environmental factors on arthropod biology



IPM Strategies against Drosophila suzukii (EUPHRESCO)

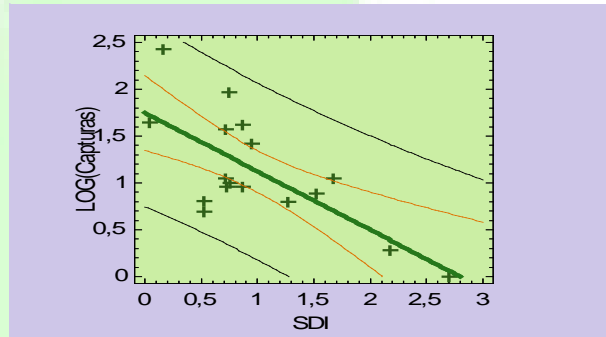


“Effect of temperature on biological parameters”

3. Effect of landscape on populations of agriculturally important insects



RTA2013-00039-C03-03 Conservation biological control of the olive fruit fly, Bactrocera oleae: effect of landscape structure and importance of predation



(3 researchers) 15 SCI (2010-2014) 1 Ph Thesis



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BACTERIOLOGY

Xanthomonas spp.



Research in Bacteriology at plant Protection Department of INIA is focused on two lines

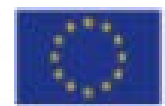


Disease control based on early detection and pathogen identification

Funded by National and international programs: RTA (Spain), CRDF (USA), FP7 Euphresco (UE), CYTED (Spain-Iberoamerica)

Plant-microbe interactions: early events in the infection

(1 researcher) 11 SCI (2010-2014)
1 Ph Thesis





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BACTERIOLOGY

1. Development methods for detection and identification of plant pathogenic bacteria in different plant hosts (Prunus spp, Citrus spp, Horticultural crops...)

1a. Bacterial plant diseases diagnosis: molecular techniques based on PCR techniques, specific detection of viable bacteria.

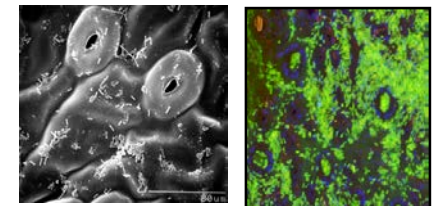
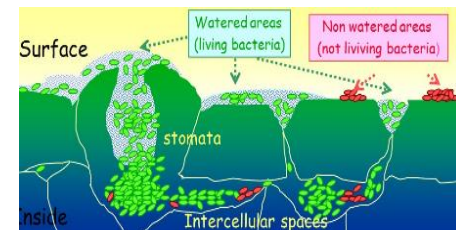
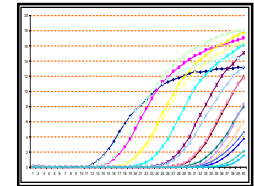
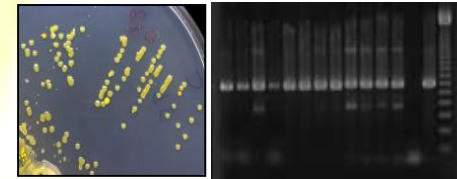
1b. Molecular characterization of plant pathogenic bacteria. Precise identification of bacteria, taxonomy, special interest on *Xanthomonas* genus:

Multilocus sequencing analysis (MLSA-MLST), Next Generation Sequencing (NGS), Barcoding

2. Plant-Bacteria Interactions mainly in *Xanthomonas* spp.

2a. Analysis of early events in the infection process: chemotaxis, motility, biofilm formation, quorum sensing under microbiological or molecular perspectives

2b. Virulence effectors in *Xanthomonas* genus. Complete Genome analysis





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FUNGAL DISEASES

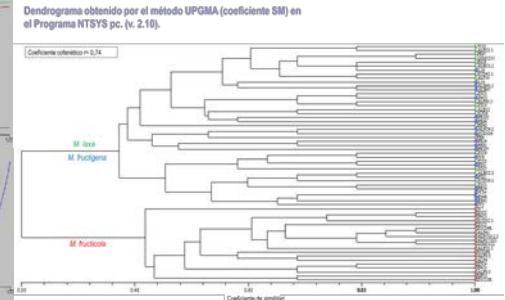
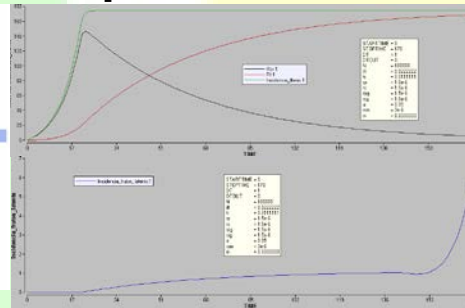
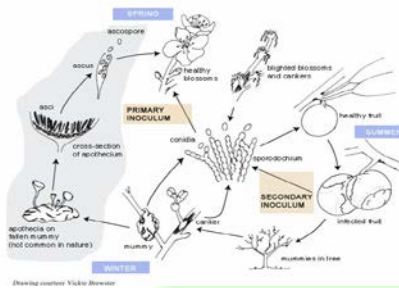
1. ETIOLOGY AND EPIDEMIOLOGY (3 projects)

a) ERA-37-DIMOS: "Development and validation of molecular tools for detection and identification of European *Monilinia* species"



STONE FRUIT

Brown rot



b) 266505 EUPHRESCO-SPAT. Strawberry Pathogens Assessment and Testing



c) E-RTA2013-00062-C05. *Fusarium solani* on Spanish strawberry crops after ban of methyl bromide



STRAWBERRY

Crown rot





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FUNGAL DISEASES

2. BIOLOGICAL CONTROL OF FUNGAL DISEASE:

Biological formulations and their ecosystem effects (2 project)

- i. BIOCOMES 612716 FP7 “Biological control manufacturers in Europe develop novel biological control products to support the implementation of Integrated Pest Management in agriculture and forestry.



- ii. RTA2013-00060-C05-01 “Identification of biocontrol mechanisms of *Penicillium oxalicum* and its application in the control of diseases of horticultural plants “



(2 researchers) 15 SCI (2010-2014)
2 Ph Thesis



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WEED CONTROL



1. WEED BIOLOGY, ECOLOGY AND POPULATION DYNAMICS

The diversity of the weed communities and its relationship with agronomical practices associated with winter cereal crops management. Invasive species

RTA2013-00009-C02: “Estrategias de manejo en agricultura de conservación para cultivos de secano y regadío en zonas semi-áridas



2. HERBICIDE RESISTANCE FROM THE CHEMICAL CONTROL OF WEEDS

Herbicide resistance in cereal grass weeds. Role of variability in herbicide response of grass population in herbicide-resistance development and on the characterization of the herbicide resistance genes.

AGL2011-23542 Estado actual, naturaleza y evolución de la resistencia a los herbicidas utilizados para el control de malas hierbas gramíneas en cereal





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WEED CONTROL

3. ENVIRONMENTAL-AGRICULTURAL EFFECTS OF HERBICIDE-TOLERANT CROPS

Herbicides select upon the variability of weed populations, the result could be:

- Flora shift
- Herbicide Resistance
- Effects upon the trophic web and the biodiversity

These processes are evaluated in the long term under field conditions for genetically modified glyphosate tolerant maize



289706 SPI Cooperation EU AMIGA. Assessing and monitoring impacts of genetically modified plants on agro-ecosystems.

EG13-075 (2013-2016) Valoración del impacto sobre el medioambiente de plantas modificadas genéticamente y otros OMG.

3 researchers; 12 SCI (2010-2015)