



# ***The Mediterranean Greenhouse Model with reduced use of inputs***

## ***Research and experimentation projects at the IFAPA Center La Mojonera (Almería)***

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**IFAPA** Instituto de Investigación y Formación Agraria y Pesquera



Instituto de Investigación y Formación Agraria y Pesquera  
**CONSEJERÍA DE AGRICULTURA, GANADERÍA, PESCA Y DESARROLLO SOSTENIBLE**



 **SUSTAINABLE DEVELOPMENT GOALS**



- Double the agricultural productivity
- Ensure sustainable production (resources)
- Increase agricultural investment

- Biodiversity conservation
- Ecosystem services
- Restore degraded habitats

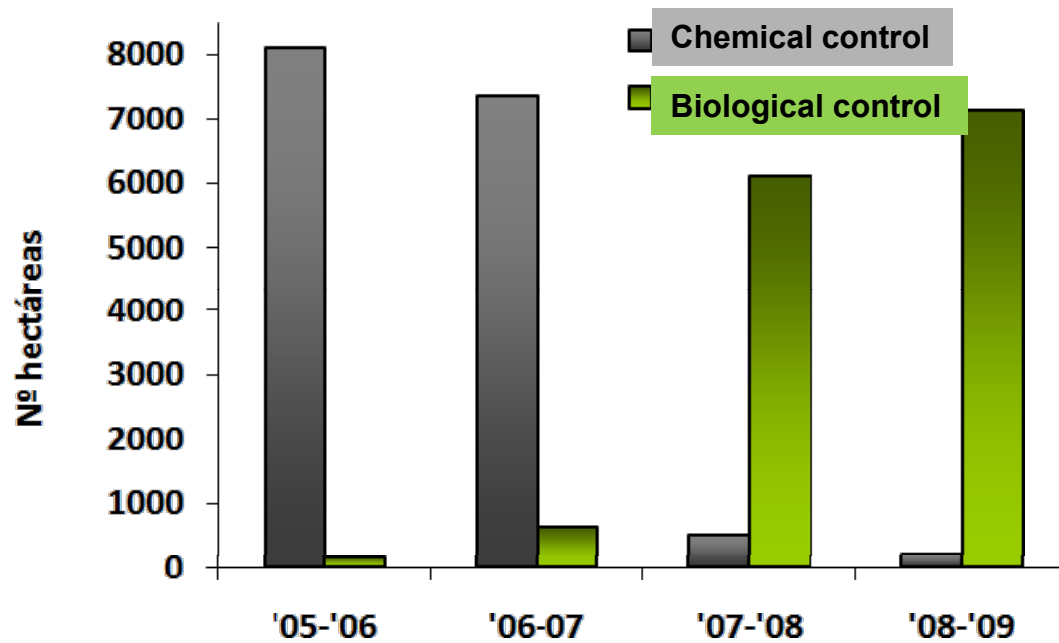
**SOLUTIONS**



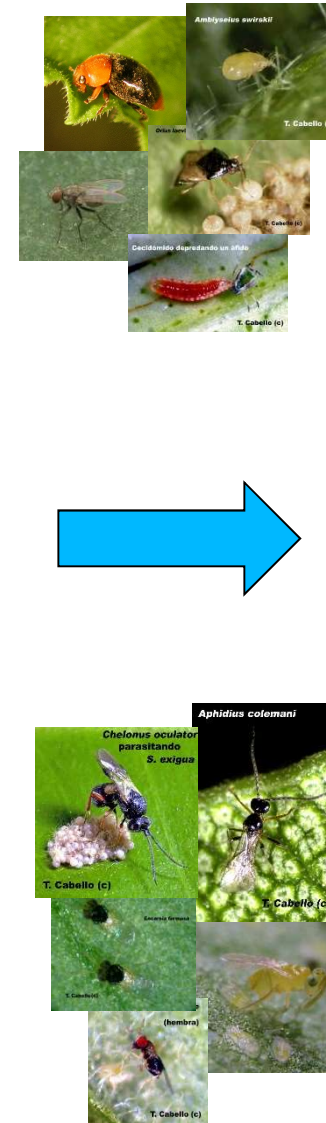
- **Medium/low technology and structure**
- **Limited investment**
- **Low water and energy consumption (sun)**
- **High production**

- **Water use efficiency (Kg/m<sup>3</sup>): 4 times higher than outdoor cultivation .**
- **Reduced use of agricultural land: Almeria greenhouses represent 1% of the Andalusian's useful agricultural arable land, but contribute 20% of the total agricultural production value and 60% of horticultural production (€).**
- **Food security (75% of production is exported to Europe without incidents in pesticide residues control, according to EFSA)**
- **Generalized use of biological control in Integrated Pest Management (IPM)**

## BIOLOGICAL CONTROL



Almeria "Green Revolution" in 2007



Pest predators

**25000 hectares currently**

Pest parasitoids

## PROTECTED ENVIRONMENTAL SURFACE IN ALMERÍA

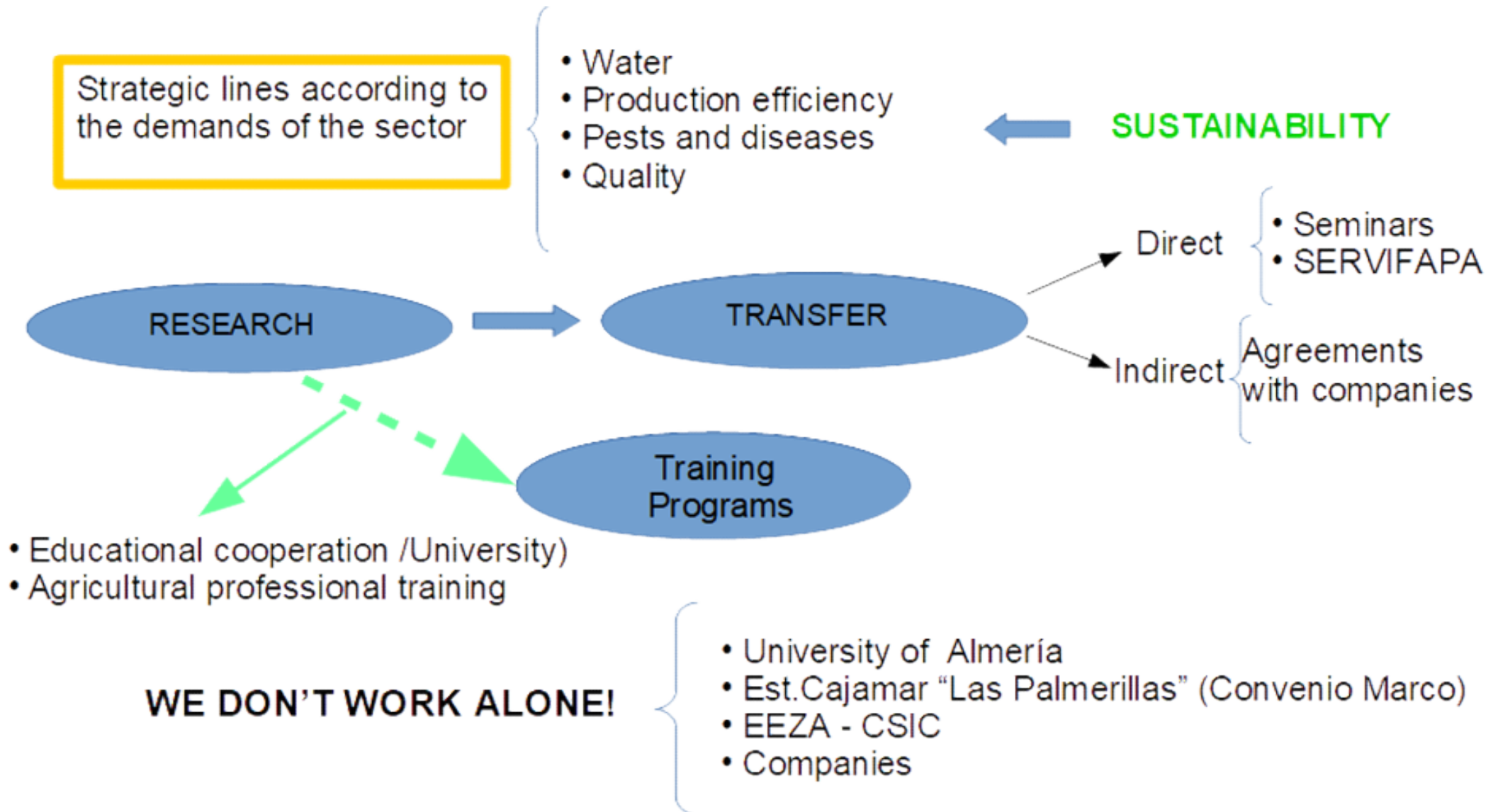


Greenhouse Surface: 3%

Protected Surface: 30%

2 Biosphere reserves





## Work line: Greenhouse technology water use efficiency

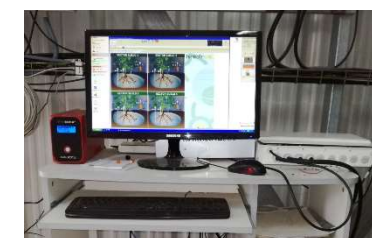
Climate control strategies to improve productivity, quality and water use efficiency: passive heat systems, renewable energy



Strategies to increase water-fertilizers use efficiency and decrease environmental pollution (nitrates).



Non-conventional water resources use: treated and desalination water.





## Work line: Crop protection (biological control, virology, soil diseases)

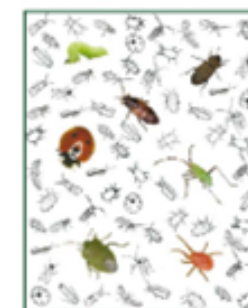
Etiology, epidemiology, and diagnosis of new diseases caused by viruses



New strategies for biological control of pests in protected horticultural crops.



Guía ilustrada de plagas y enemigos naturales en cultivos hortícolas en invernadero



Etiology, epidemiology and control of nematodes and fungi soil diseases



Biodiversity restoration for biological control in greenhouses



## Work line: Biodiversity

### OBJETIVE

Design hedges and islands of vegetation with native species around the greenhouses which act as phytosanitary barriers (with minimal labour) and also contributing to the improvement of the landscape

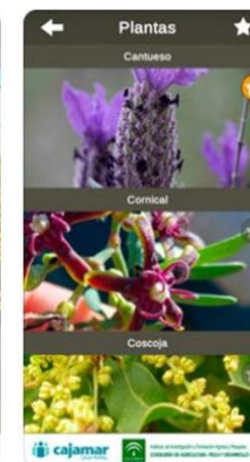


## Mobile phone APP



**PlantEN**  
Plantas  
y Enemigos

Una APP que ayuda al agricultor a diseñar setos para atraer y conservar a los enemigos naturales de las plagas de sus cultivos



## Work line: Diversification and organic agriculture



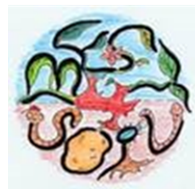
**Work line: Bioeconomy and good practices (European projects)**



Contribute to the reduction of waste at source, especially through prevention, and a greater valorization of inorganic materials from the agri-food sector: plastics (coverage of greenhouses, packaging of agrochemicals ...) and food packaging, favoring the adoption of more ecological innovative concepts by agriculture and industry, focusing mainly on SMEs.



Pathways to phase-out contentious inputs from organic agriculture in Europe



BEST 4 SOIL: Boosting 4 BEST practices for SOIL health in Europe



Transfer of INNOvative techniques for sustainable WATER use in FERTigated crops

# Thank you very much for your attention



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