



# Rice in Albufera of Valencia

**Dr Owen Jones – Previous President of IBMA**

**Vicente Dalmau Sorlí – Head of Plant Health Service of  
Generalitat Valenciana**

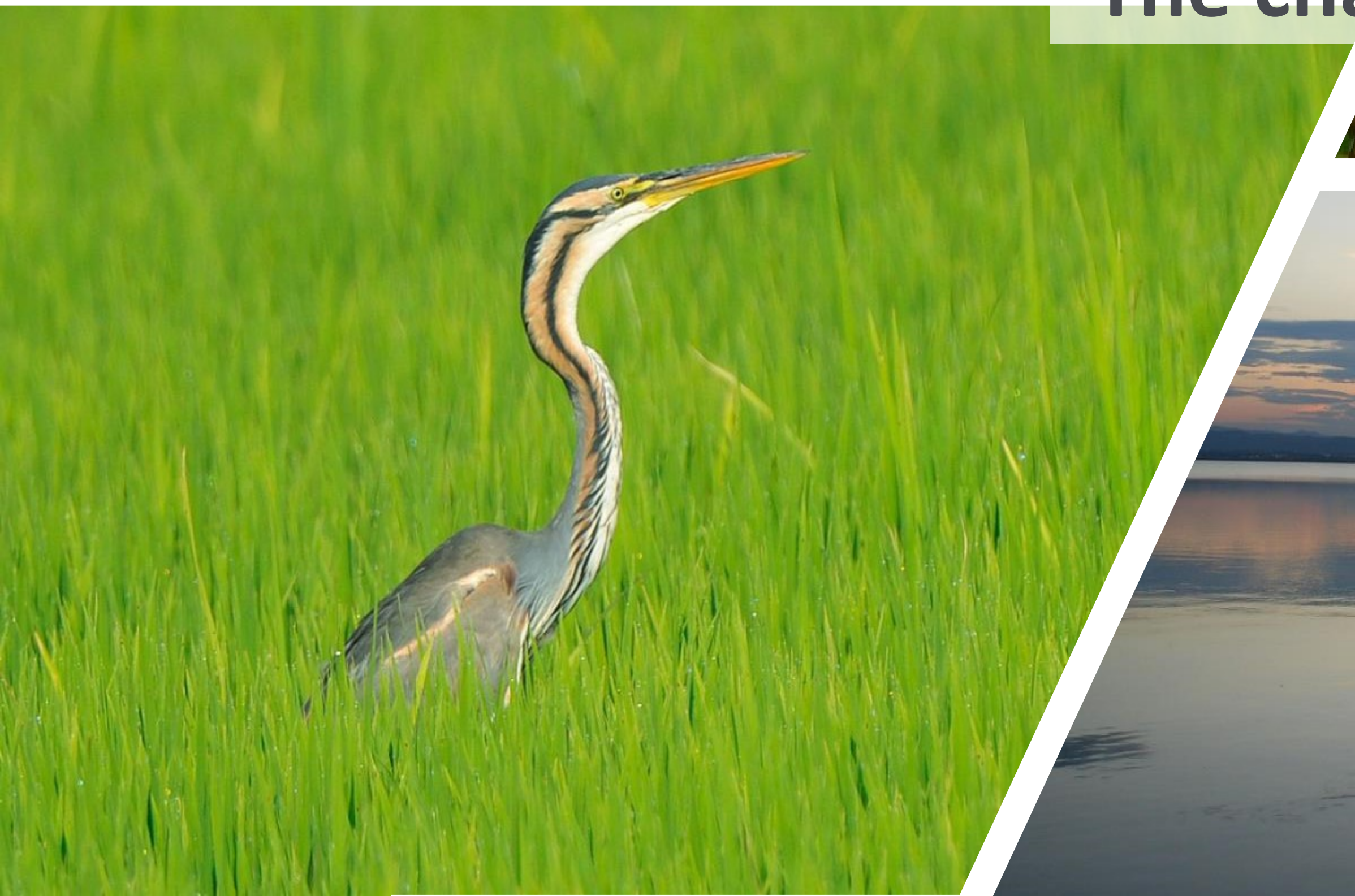
**Alessandra Moccia – IBMA Professional Group Chairman**







## The challenge





# Project Background



## Location: Albufera de Valencia

- 15,300 ha of rice surrounding 3,000 ha of freshwater lagoon
- Rice introduction is attributed to the Arabs during the 8th century
- Paella, made with round grain rice and originated in Valencia (PDO), is the best-known dish in Spanish cuisine
- Rice fields are surrounded by an area with 2,2 millions inhabitants
- Next to touristic areas

## Site of international importance for birds

- Migratory bird special site
- Natural Park since 1986
- Ramsar Convention wetland since 1989
- Special Protection Site for Birds and Nature 2000 since 1990, and
- Site of Community Importance since 2006



## Problem

- First detected in 1933, Rice Stem Borer became the most important pest for Valencia rice fields
- Use of organophosphates by aerial application to control rice stem borer (ban of aerial spraying since 2009 by the Directive 128/2009 of Sustainable Use of Pesticides)
- Detrimental effect on birds, fish, insects and aquatic ecosystems



## Solution

- Pest control by sex pheromone for rice stem borer integrated into farming practice
- Multi stakeholder interaction to find a solution: growers, industry, university and government for coordination and financial support





# Evolution of the pest control in the area

## Traditional agriculture – 30’ to 50’



**1933-1950**  
CULTURAL PRACTICES

## The ‘Era of synthetic insecticides’ – 50’ to 90’



**1950-1965**  
ORGANOCHLORINATED & ORGANOPHOSPHATES INSECTICIDES

**1965-1988**  
COLLECTIVE AERIAL SPRAYING (OP)

**1988-2005**  
AERIAL SPRAYING + MATING DISRUPTION

## The switch to biocontrol – 90’ until today



**2006-2009**  
HIGH DENSITY MATING DISRUPTION (100 units/ha)

**2009-2013**  
LOW DENSITY MATING DISRUPTION (31 units/ha)

**20014-Present**  
LOW DENSITY & BIODEGRADABLE MD (31 units/ha)

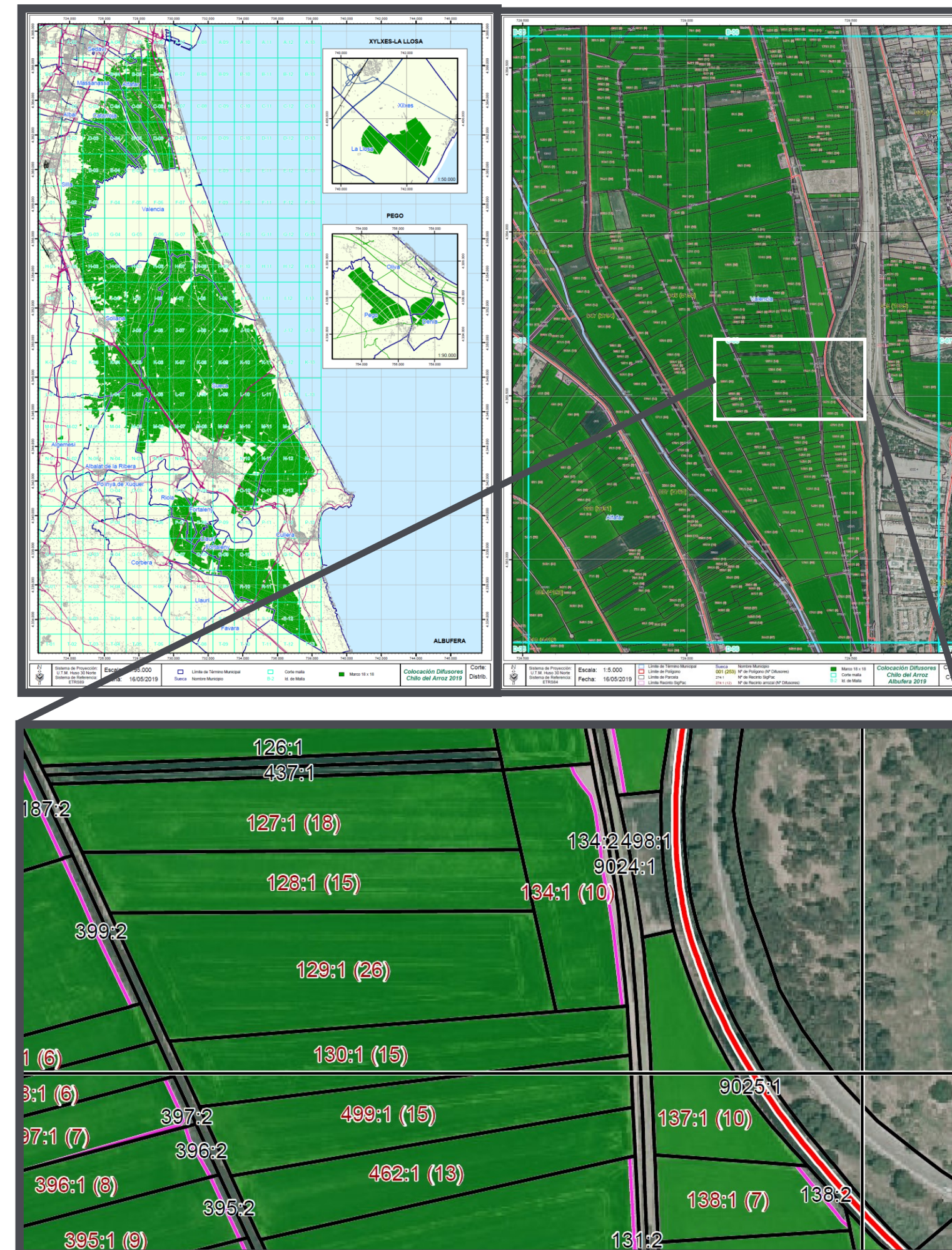


# Which are the activities?

## Preparation of the dispensers



## Preparation of field work (GIS-CAP)



- In brackets the number of dispensers for each field, area, polygon or municipality

## Placing dispensers in the field



- 480.000 dispensers to be prepared and placed (18x18m)
- Coordinated by Generalitat Valenciana who provides maps, GIS
- Very important ensuring to do the placement in the whole area and at the same time
- Prepared and placed by growers (Cooperatives)
- Up to 35 people working for these tasks

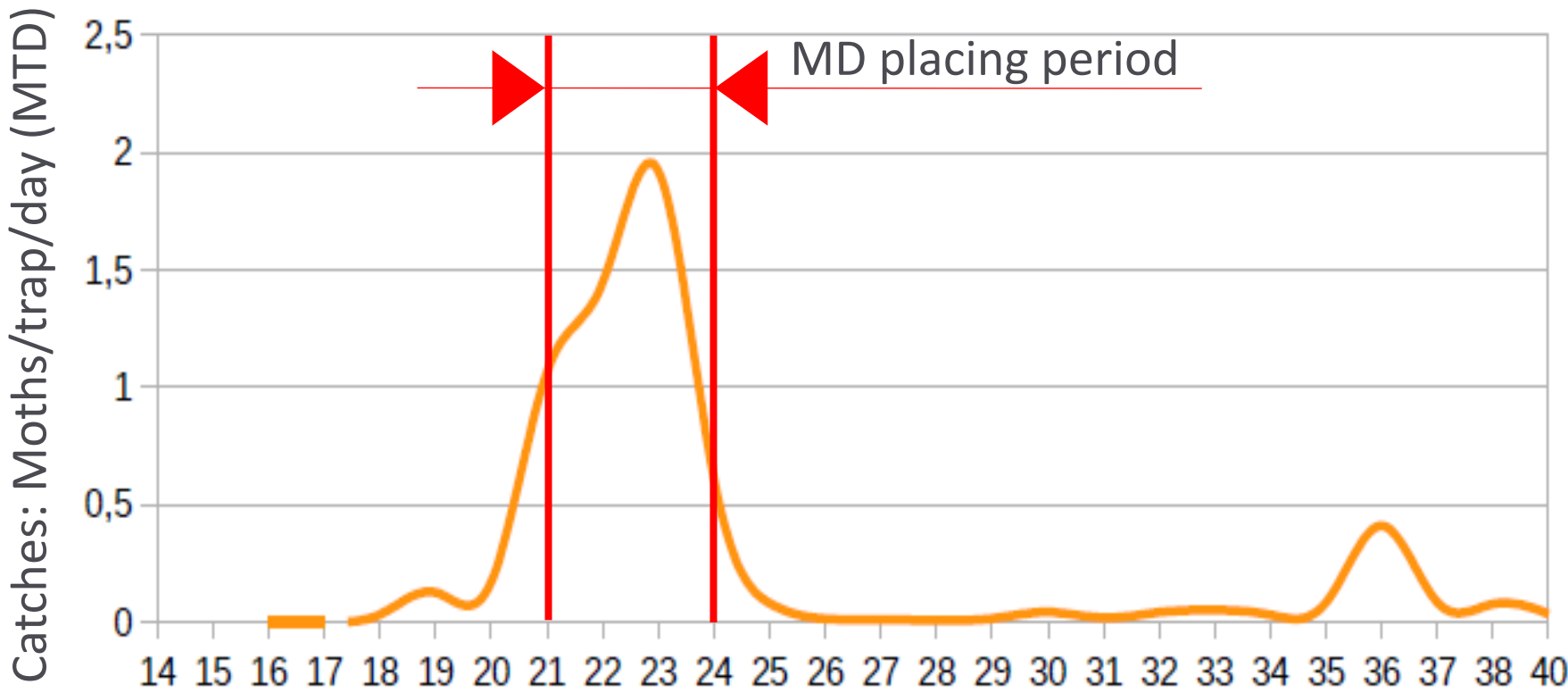


# Which are the activities?

## Monitoring during the season



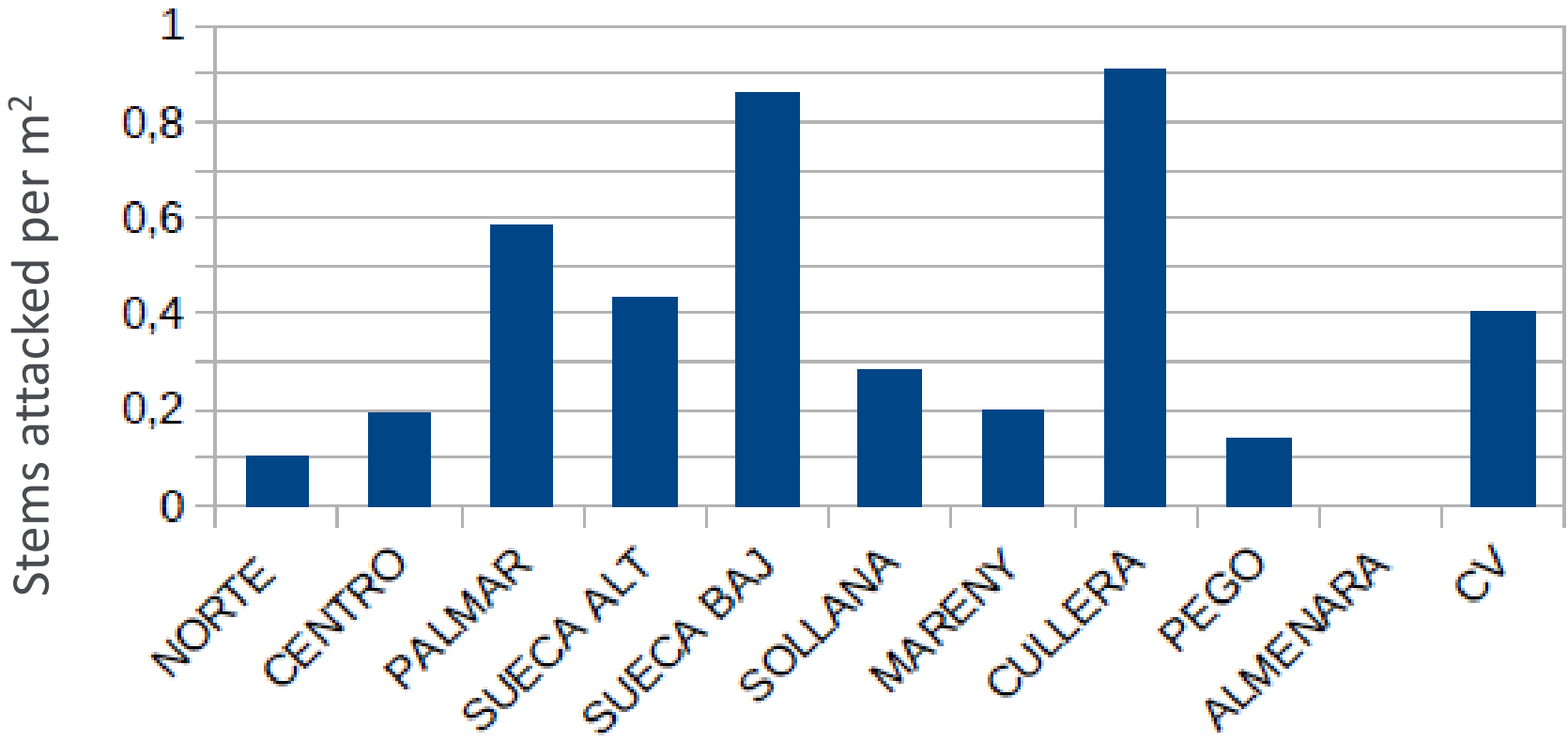
- 51 monitoring points
- Serviced weekly, even before the rice sowing
- Catches are very low (under 2 MTD) and drastically reduced after placing the pheromone dispensers
- In the 70's catches reached 60-70 MTD



## Field surveys for damage



- More than 450 fields surveyed for damages
- The Economic Injury Level is 24-61 stems attacked per m<sup>2</sup>
- In the 70's, these damages were 30-90 stems attacked per m<sup>2</sup>
- Today, levels of damage in Valencia are always below 1 stem attacked per m<sup>2</sup>





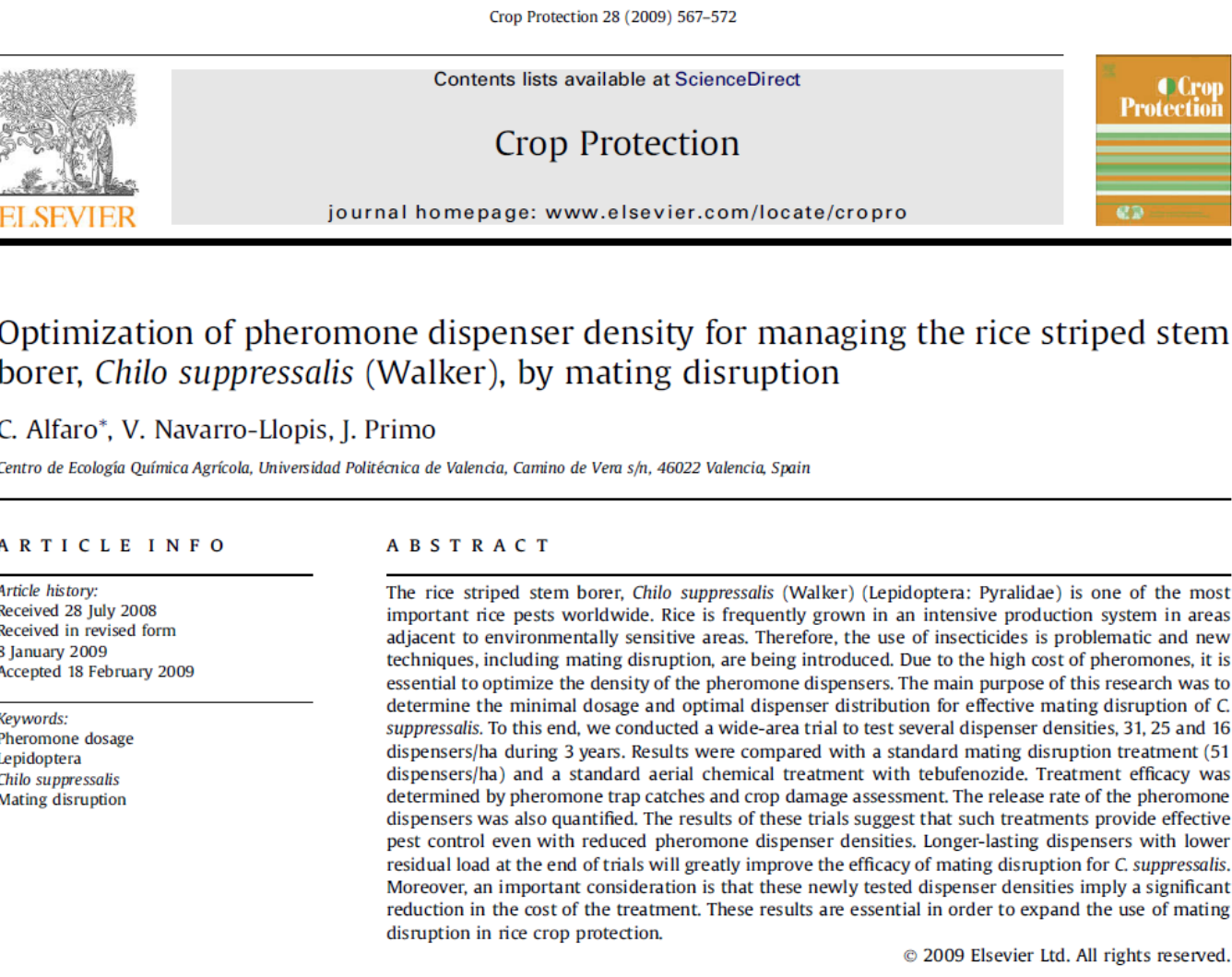
# Which are the activities?



GENERALITAT  
VALENCIANA



## Improve efficiency and cost of biocontrol



- By using a volatile capturer, and with UPV research results
- We've been able to reduce dispenser density from 100 to 31 dispensers per ha (from 10x10m to 18x18m)
- The efficacy of the technique has been maintained



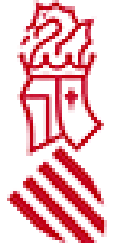
## Improvement of dispenser performance



- Registration of the product in Spain and submit to the call of tenders
- Improve the dispenser:
  - reducing the amount of remaining pheromone
  - biodegradability of dispensers (cellulose replacing PVC)



# Link to other initiatives



GENERALITAT  
VALENCIANA



Directive 2009/128/EC to achieve the sustainable use of pesticides



By using MD, the application rate is reduced almost 40 times, from 296,4 g of insecticide per ha in chemical control to only 7,75 g of pheromone per ha

Plant Health Surveys for early detection of harmful organisms



GENERALITAT VALENCIANA

CONSELLERIA DE PRESIDÈNCIA I AGRICULTURA, PESCA, ALIMENTACIÓ I AIGUA

DIRECCIÓ GENERAL DE PRODUCCIÓ AGRÀRIA I RAMADERIA  
SANITAT VEGETAL

EL CARACOL MANZANA  
*Pomacea insularum*

Los caracoles manzana son moluscos gasterópodos del Género *Pomacea*, Familia *Ampulariidae*. Originarios de Sudamérica, se trata de especies acuáticas de agua dulce con gran capacidad de adaptación. En España se encuentra la especie *Pomacea insularum*. Detectado por primera vez en 2009, se ha extendido por el Delta del Ebro. Esta especie está considerada como una de las 100 especies invasoras más perjudiciales



Hembra adulta y huevos de *Pomacea insularum* (Miguel A. López)

Foto: Protocolo prospección Género *Pomacea* (MAGRAMA)





# What are the costs?



GENERALITAT  
VALENCIANA



- Since 2002, the Spanish Plant Health Law allows to declare of Public Interest the control of a specific pest, under certain conditions
- In 2004, the regional department of agriculture declared of Public Interest the control of Rice Stem Borer (**compulsory collective control by mating disruption**).



- Today, supply, preparation and placing of dispensers: 450.000 €/year
- In 2008-2010 the cost was 66 €/ha, 2,2 times higher than now (30€/ha)
- They're funded entirely by the regional department of agriculture (Generalitat Valenciana)
- This aid is compatible with the internal market (R702/2014 art. 26 Aid for the costs of control of plant pests as part of a public programme at regional level)



# What has been the impact so far?



01

## TECHNICAL RESULT

Since 2006 the pest is fully controlled by mating disruption avoiding of the use of approx. 50,000 L of synthetic insecticides each year.  
Close to 100% effectiveness, insignificant damage, lower than conventional spraying.

02

## ECONOMIC RESULT

Lower cost than conventional spraying.  
The use of mating disruption allows the coexistence of an important economic activity (such as the rice cultivation) in an area which as been declared a natural reserve and that is, additionally, a touristic site in the region.

03

## SOCIETAL RESULT

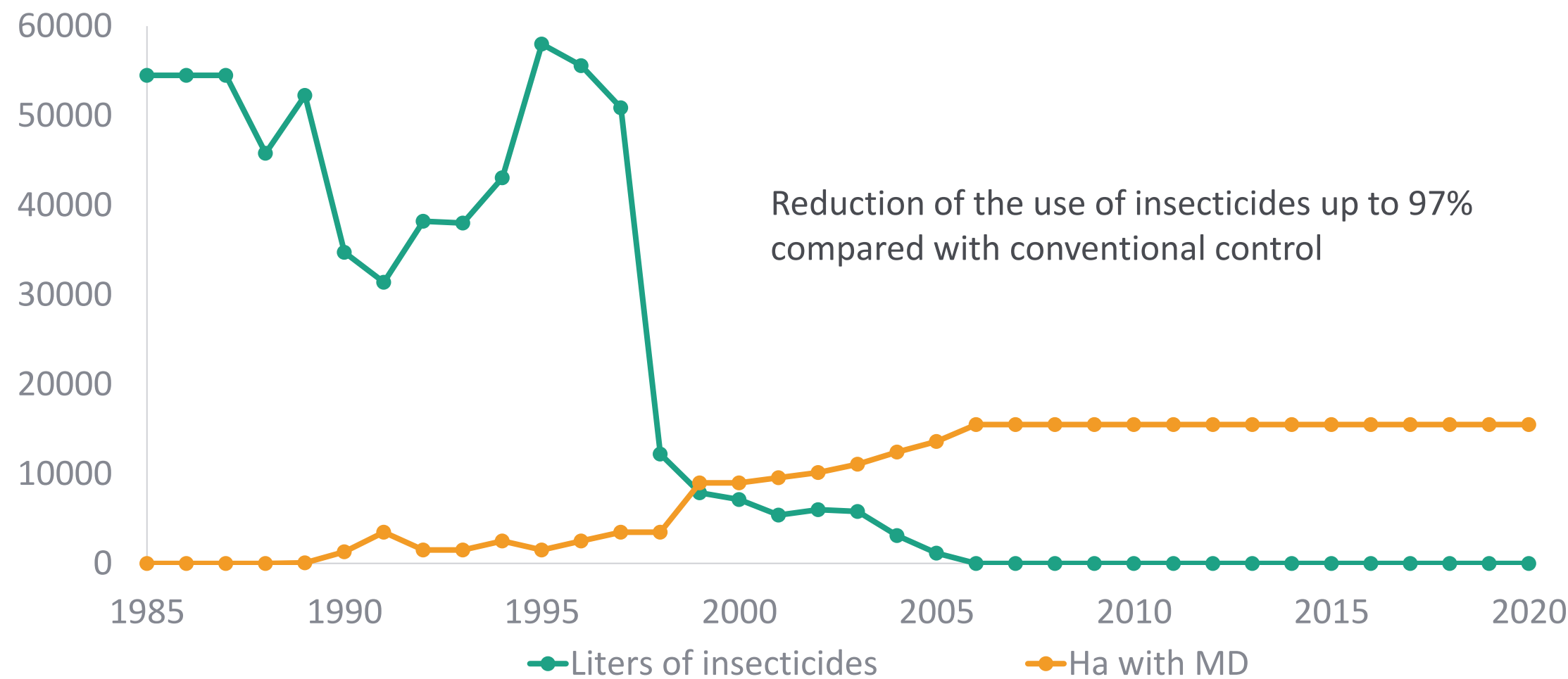
Production of insecticide-free rice. And significant reduction of operators, workers and bystander exposure to hazardous substances and chemical pesticides.

04

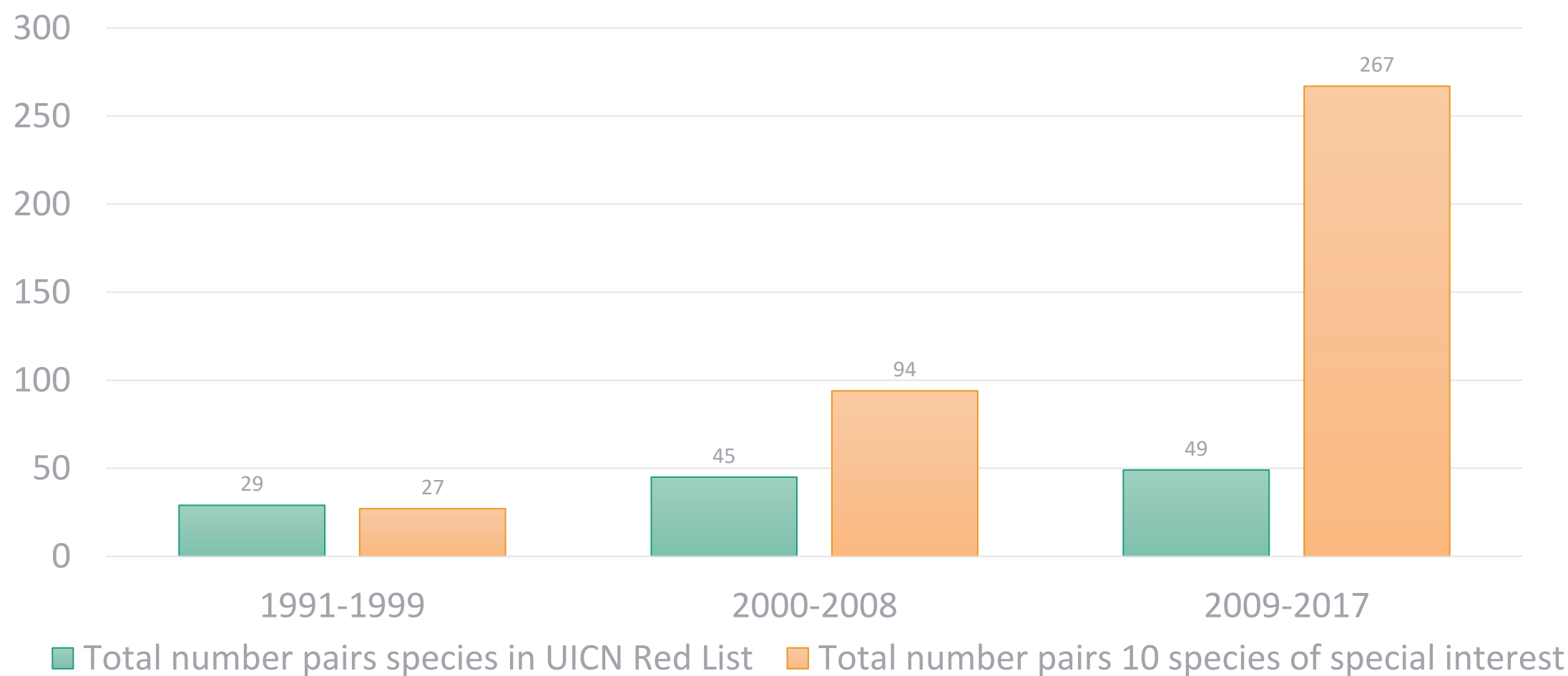
## ENVIRONMENTAL RESULT

The switch to biocontrol allowed to significantly decrease pollution and environmental exposure to chemical pesticides, increasing biodiversity enabling resilient rice cropping systems.

Evolution of insecticide use



Evolution of nesting aquatic birds





## The future...

- Reduce the number of dispensers/ha (reduce the placing costs: 10 dispensers per ha)
- Reduce the winter populations and spraying only pest refuges or foci
- Adjust treatment dates by selective pheromone application at hotspots



# CONTACT US

## IBMA

International Biocontrol Manufacturers  
Association AISBL

Rue de Treves 61, 1040 Brussels, Belgium

**WWW.IBMA-GLOBAL.ORG**



### HEAD OF PLANT HEALTH SERVICE GENERALITAT VALENCIANA

Vicente Dalmau Sorlí

[dalmau\\_vic@gva.es](mailto:dalmau_vic@gva.es)



### SEMIOCHEMICALS PROFESSIONAL GROUP CHAIR

Alessandra Moccia

[Alessandra.Moccia@suterra.com](mailto:Alessandra.Moccia@suterra.com)



### CONSULTANT

Dr Owen Jones

[owenj@plaga.co.uk](mailto:owenj@plaga.co.uk)



### EXECUTIVE DIRECTOR IBMA

Jennifer Lewis

[Jennifer.lewis@ibma-global.org](mailto:Jennifer.lewis@ibma-global.org)