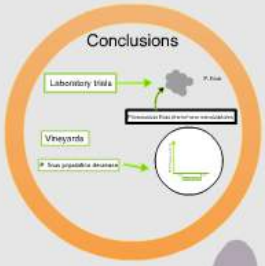
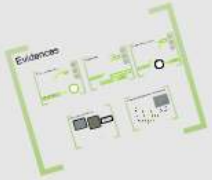
New perspectives on the biological control of Planococcus ficus

C. Mourato, Ricardo Petersen-Silva, R. Neto, J.C. Franco, C. Frescata

ABIM
Annual Biocontrol Industry Meeting





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New perspectives on the biological control of *Planococcus ficus*

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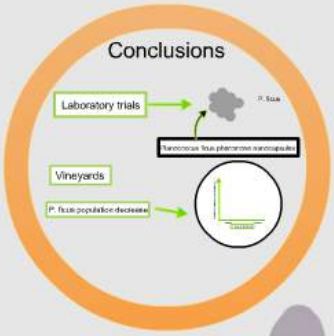

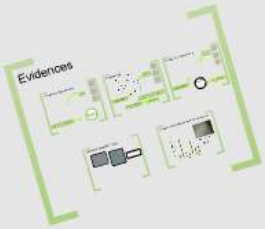

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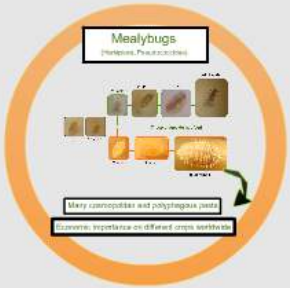
Prezi

The pest and traditional control methods



Mealybugs tend to refuge under the bark

Feed on phloem and excrete honeydew

- Promote the growth of fungi
- Can transmit viral diseases

- Wine grapes loose quality
- Table grapes become unmarketable

Control methods

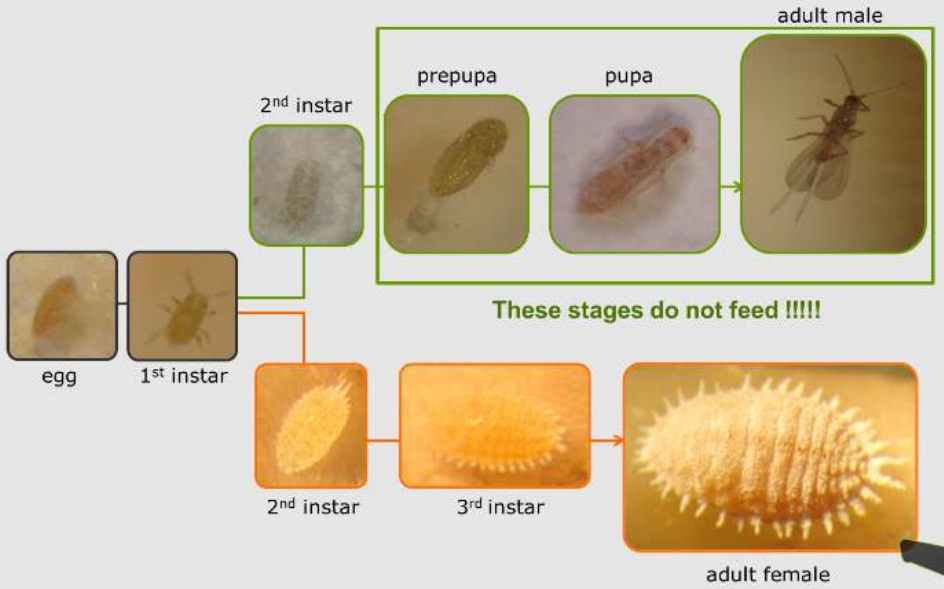
- Chemical control
- Biological control

- Short term intervals
- Parasitoid population settlement

Classical biological control

Mealybugs

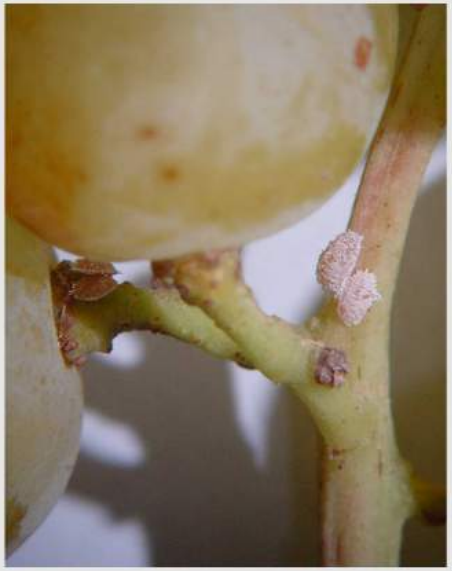
(Hemiptera, Pseudococcidae)



Many cosmopolitan and polyphagous pests

Economic importance on different crops worldwide

Mealybugs tend to refuge under the bark



Feed on phloem and excrete honeydew

- Promote the growth of fungi
- Can transmit viral diseases

- Wine grapes loose quality
- Table grapes become unmarketable

Control methods

Chemical control

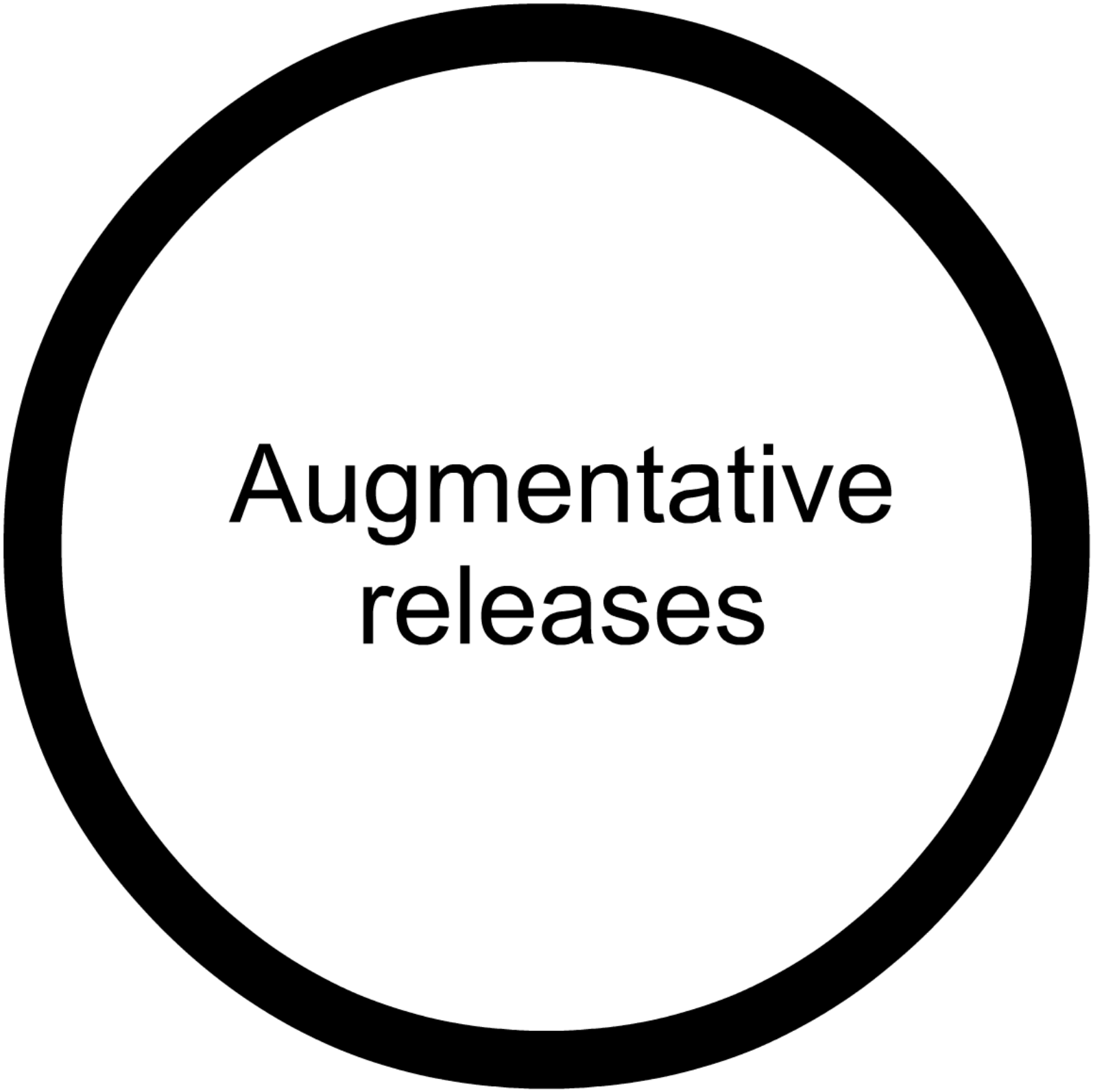
Anagyrus sp. near pseudococci

Short term intervals ✓

Parasitoid population settlement ✗

Biological control

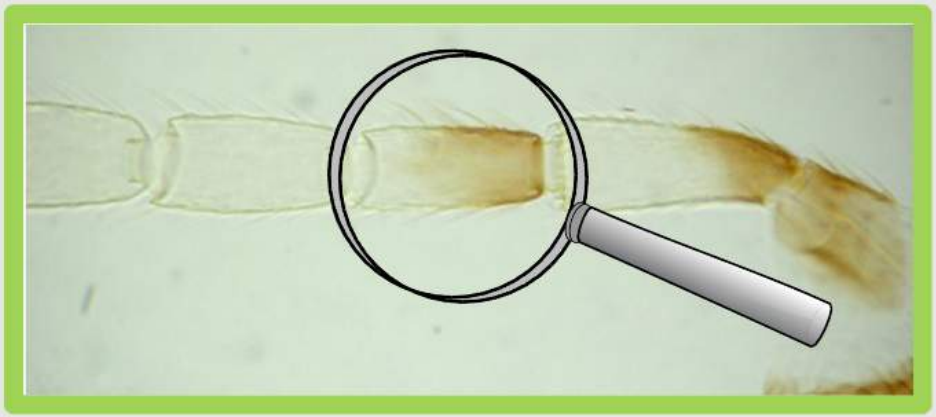
Classical biological control



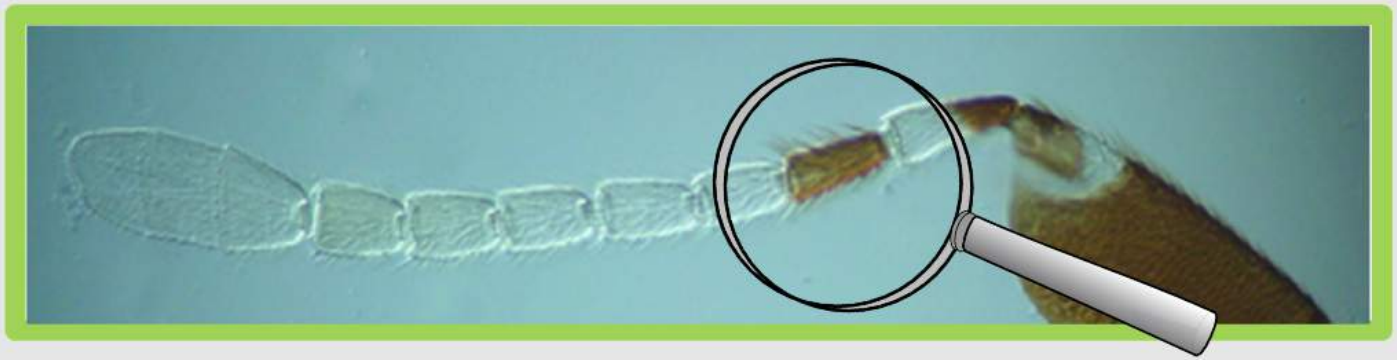
Anagyrus sp. near pseudococci

Short term intervals

Parasitoid population settlement

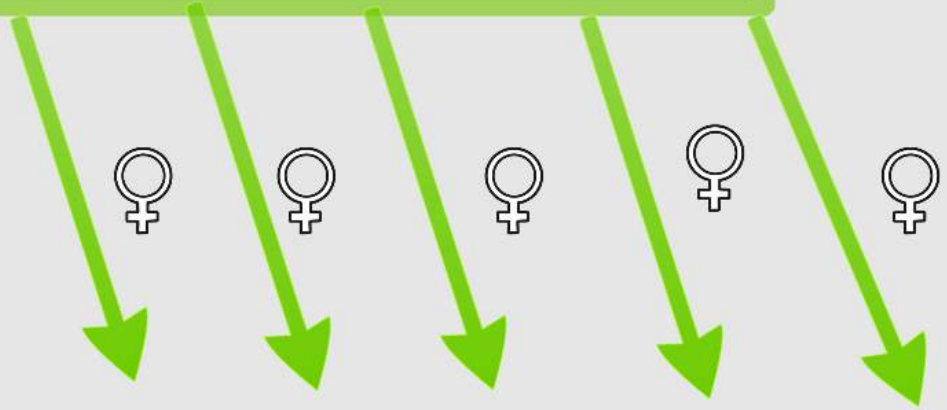


Anagyrus pseudococci (Girault)



Anagyrus sp. near pseudococci (Girault)

Anagyrus sp. near pseudococci



Vinemealybug sex pheromone

DOI: 10.1111/j.1570-7458.2007.00643.x

Kairomonal response of the parasitoid *Anagyrus* spec. nov. near *pseudococci* to the sex pheromone of the vine mealybug

J.C. Franco[1]*, E.B. Silva[1], E. Cortegano[1], L. Campos[1], M. Branco[2], A. Zada[3] & Z. Mendel[3]

Two strategies...

Parasitoid mass release

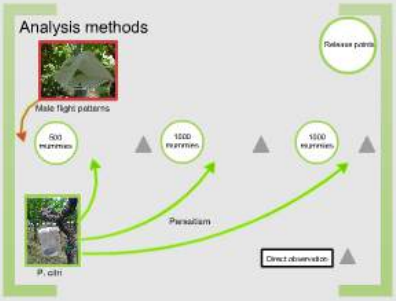
Modality I

Modality II

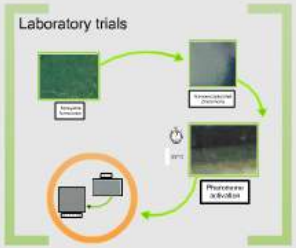
Control

P. ficus pheromone dispenser

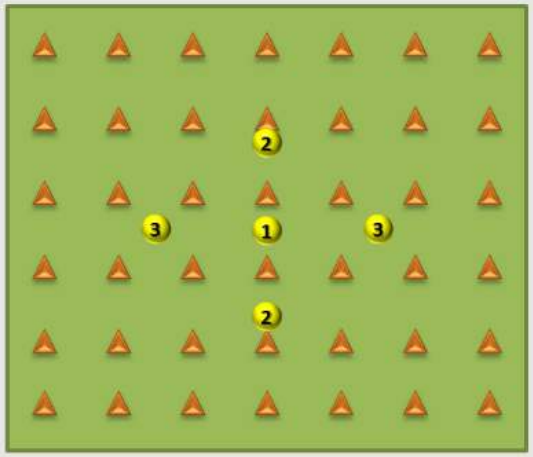
Anagyrus sp. near pseudococci release point



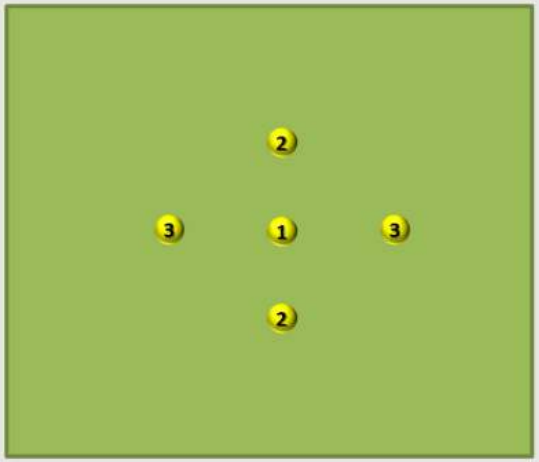
Sprayable P. ficus sex pheromone.



Parasitoid mass release



Modality I



Modality II

Control

P. ficus pheromone dispenser

Anagyrus sp. near pseudococci release point

Analysis methods

Male flight patterns

Release points

500 mummies

1000 mummies

1000 mummies

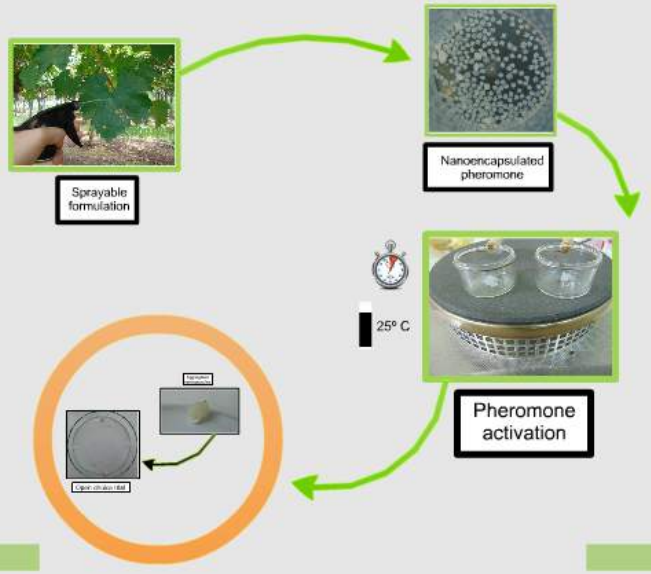
P. citri

Parasitism

Direct observation

Sprayable P. ficus sex pheromone.

Laboratory trials



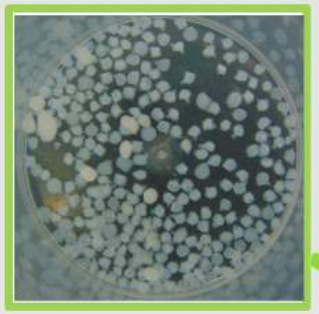
Field trials

VS

Citrus orchard

Laboratory trials

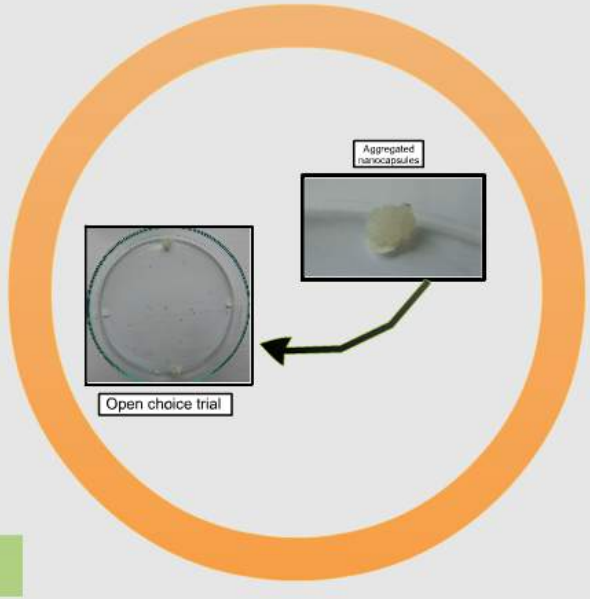
Sprayable formulation



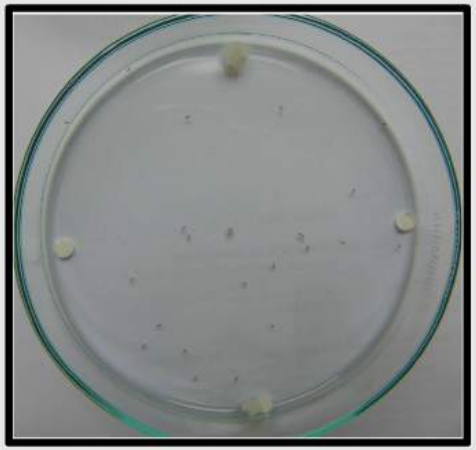
Nanoencapsulated pheromone

25º C

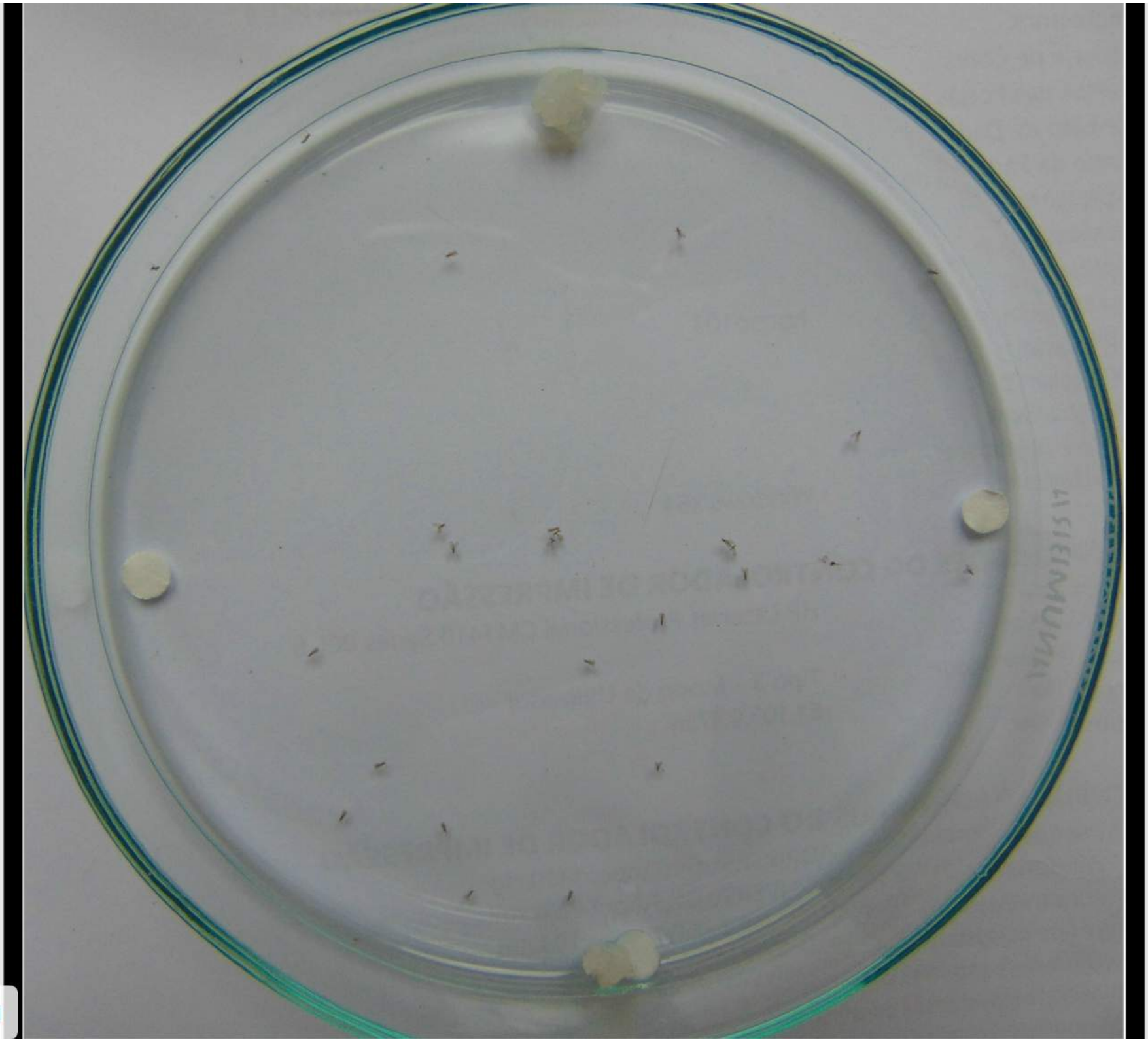
Pheromone activation



Aggregated nanocapsules



Open choice trial



Field trials

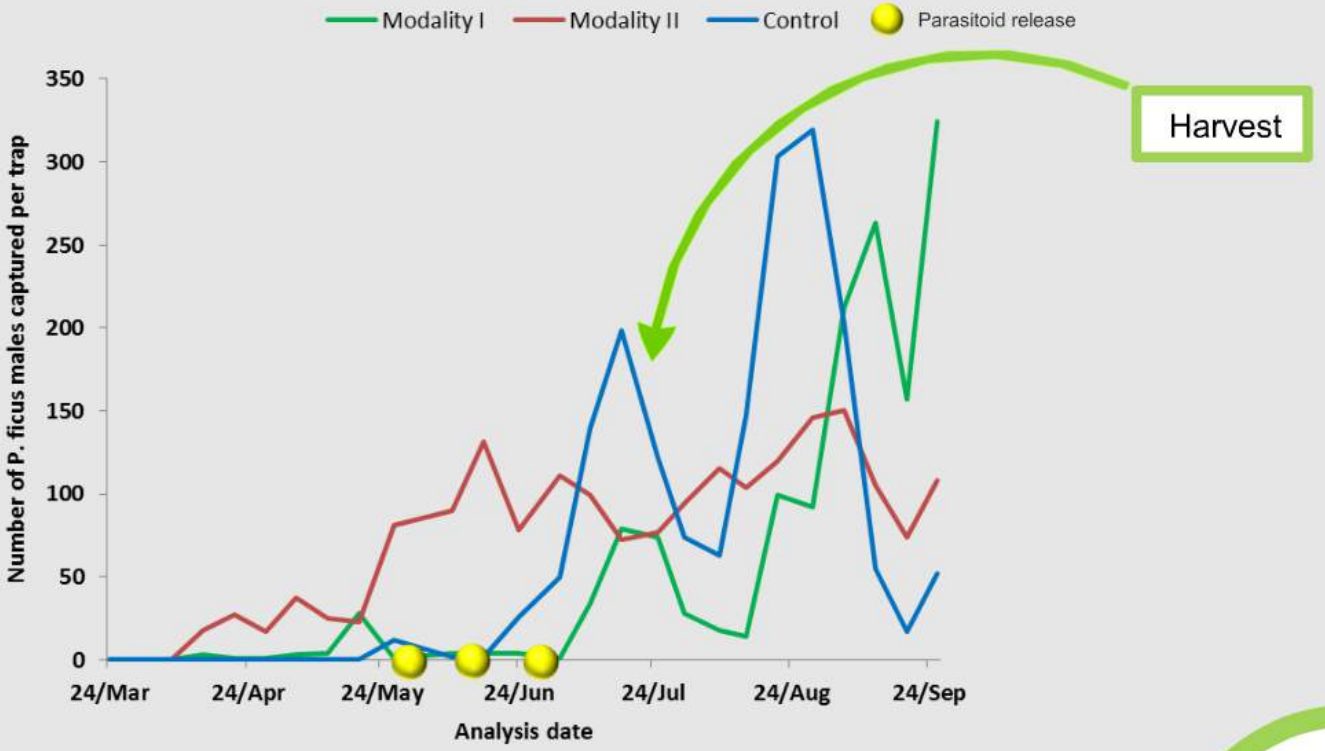
Citrus orchard

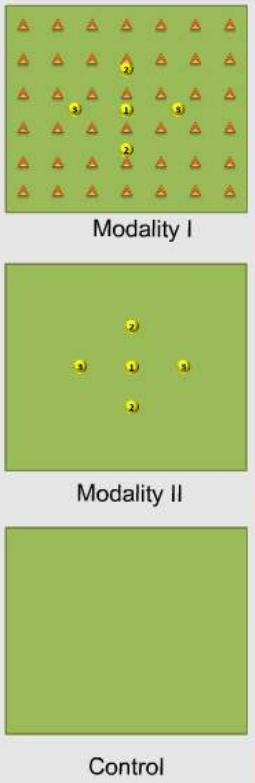
VS

Evidences

P. ficus male flight patterns

P. ficus male flight patterns

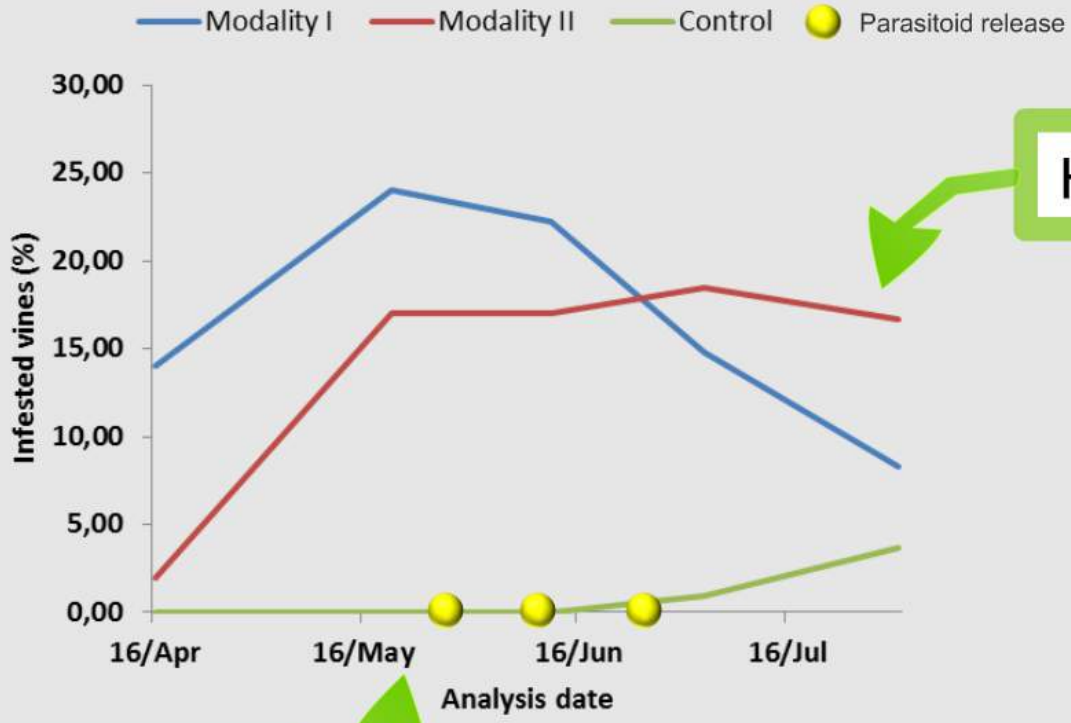




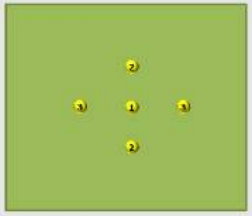
High number of dispensers →

Less captures on monitoring traps

Infestation level



Modality I



Modality II

Control

Harvest

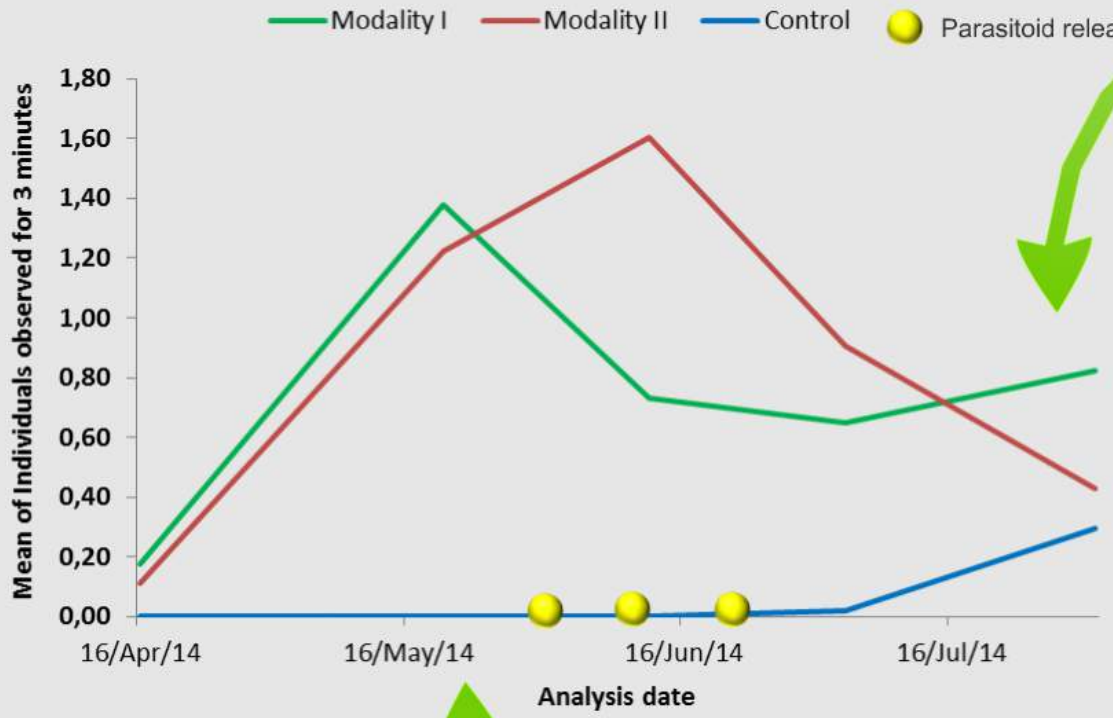
Insecticide application

Insecticide had no effect on populations

Presence of dispensers

Observed density

Density of P. ficus in vines



Harvest

Modality I

Modality II

Control

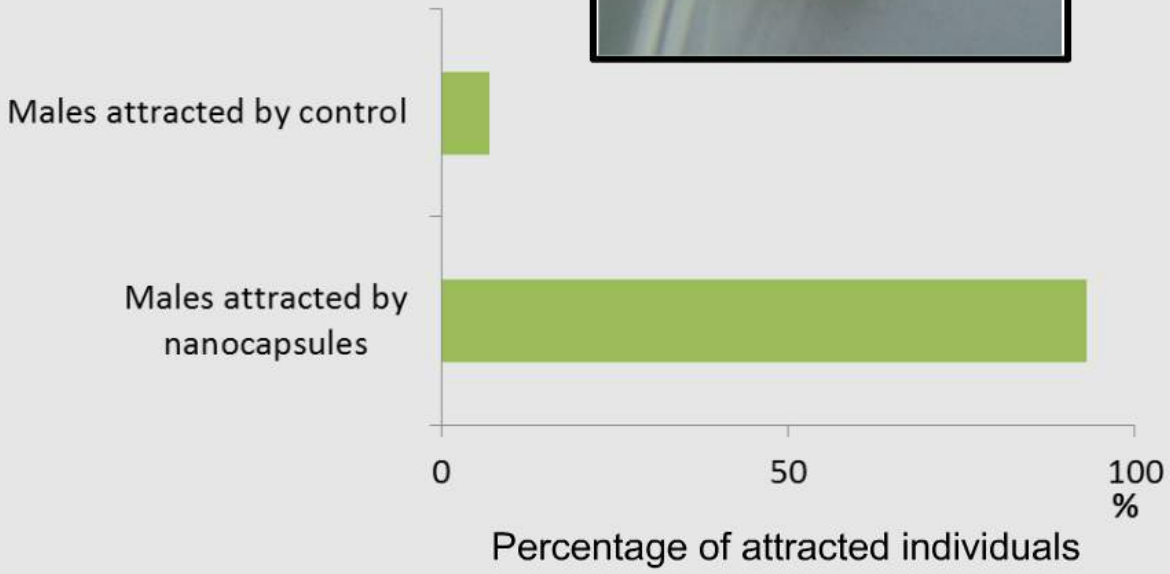
Insecticide application

Dispenser
+
Parasitoid release

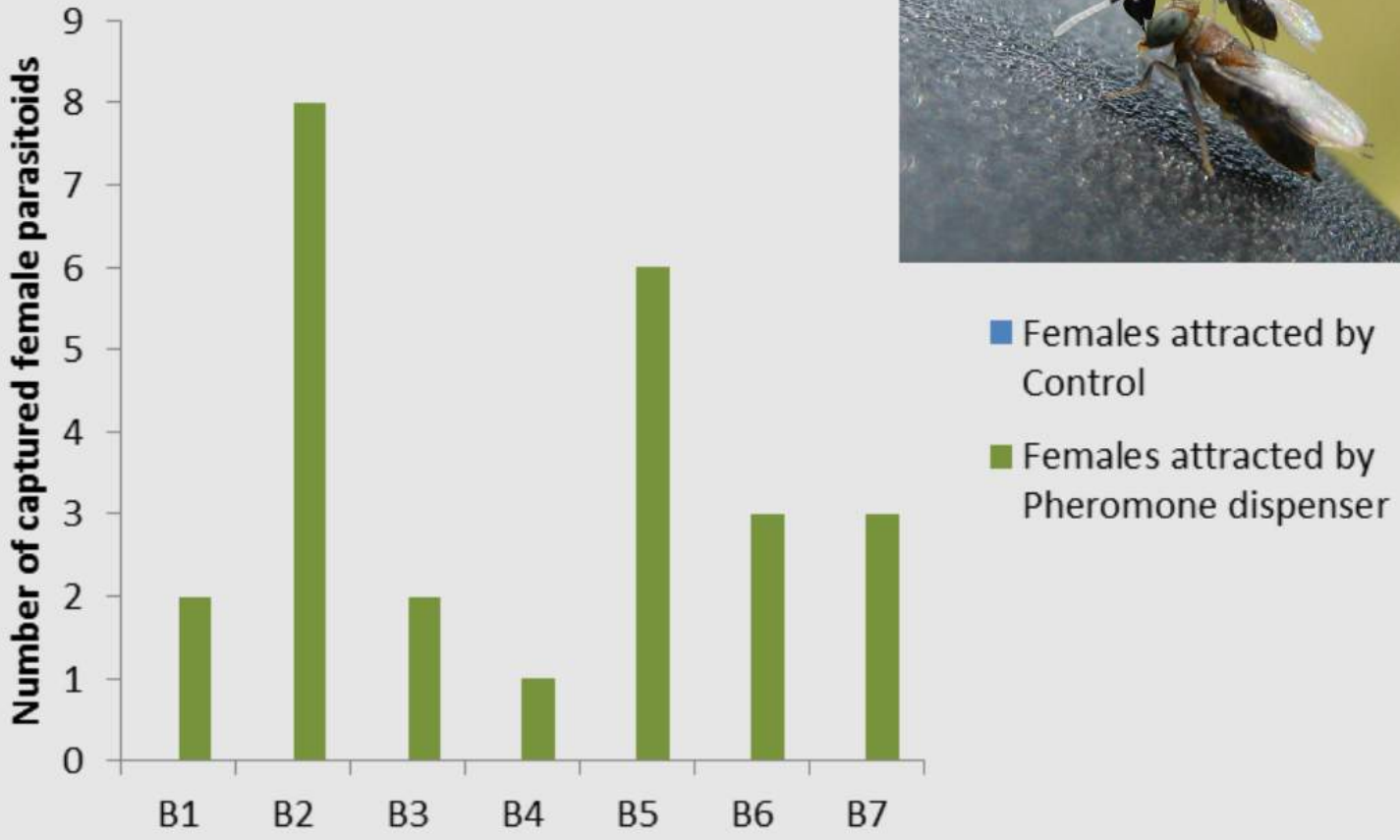
Observed density

Laboratory trials with P. ficus

Males are highly attracted by the nanocapsules

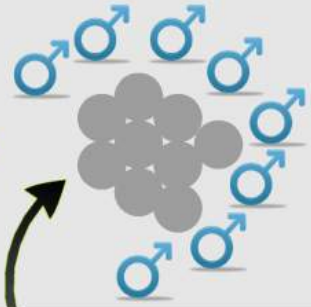


Anagyrus female attraction by P. ficus pheromone



Conclusions

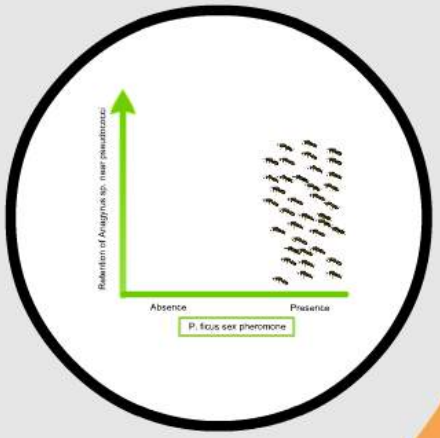
Laboratory trials

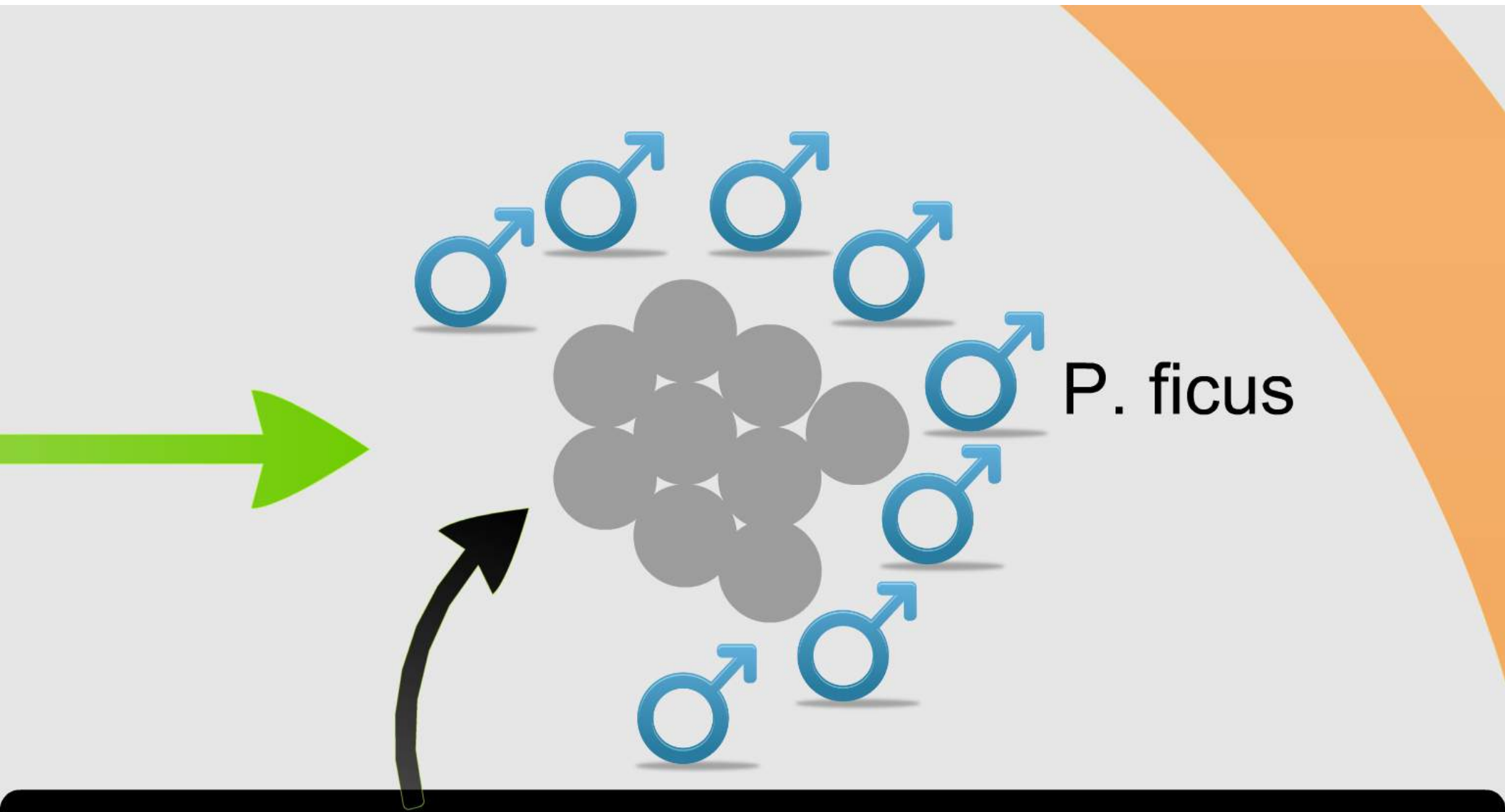


Planococcus ficus pheromone nanocapsules

Vineyards

P. ficus population decrease





Planococcus ficus pheromone nanocapsules


Retention of Anagyrus sp. near pseudococci
Absence
Presence
P. ficus sex pheromone

THANK YOU FOR YOUR ATTENTION

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