

# New nano-developed pheromone lure for *Cydia pomonella* monitoring

Ricardo Petersen-Silva, J. Silva, R. Eira, L. Bonifácio, F. Vieira, C. Frescata



## The Problem



## Results



## The Alternative

Improving the lures



This work was partially funded by project DiPera n° 30235 "SI I&DT Individual  
 UNÃO EUROPEIA  
 Fundo Europeu de Desenvolvimento Regional

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John C. Reynolds

Ricardo Petersen-Silva, J. Silva, R. E.

# The Problem

Ins

Precise and

# Insect Monitoring

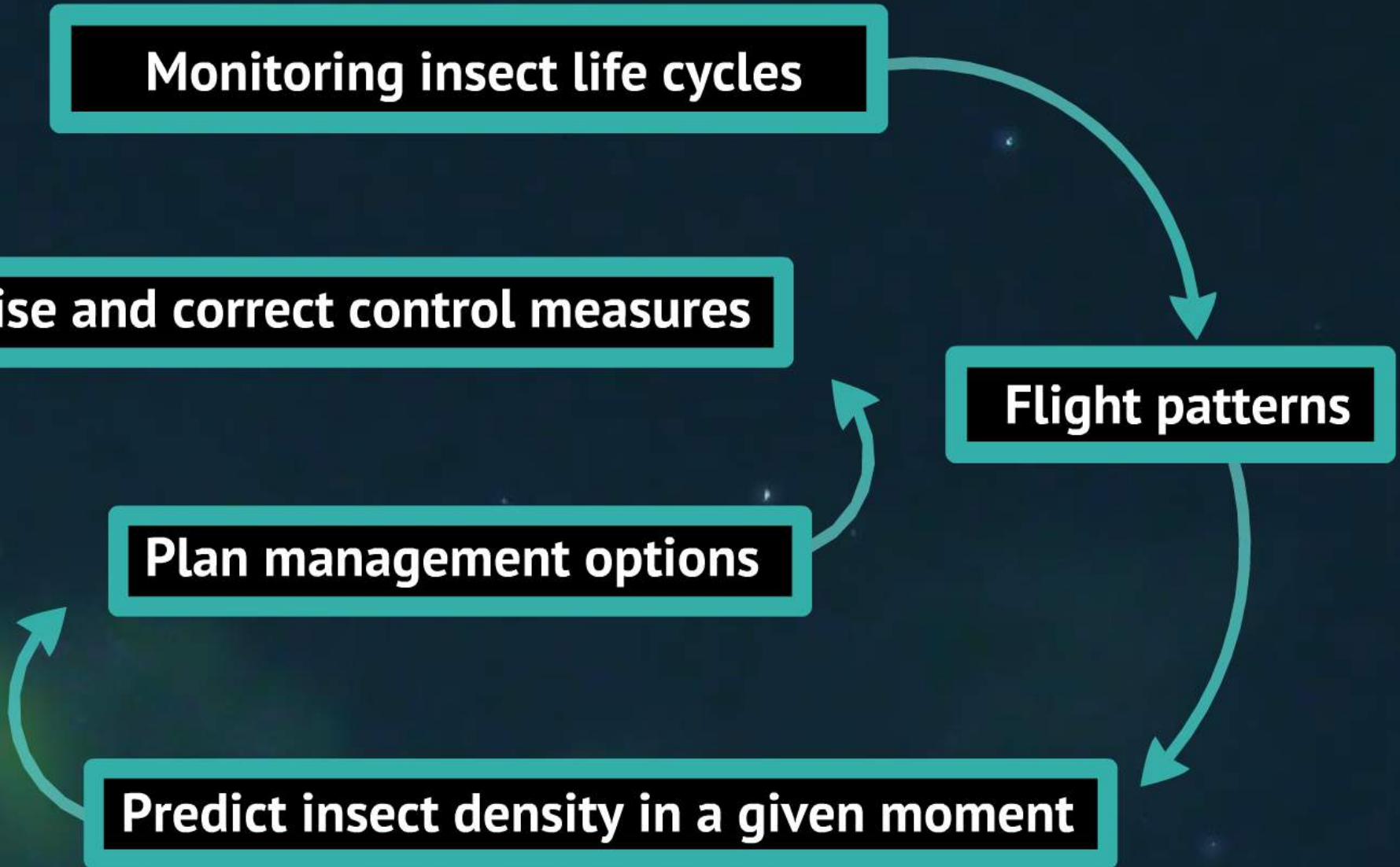
Monitoring insect life cycles

Precise and correct control measures

Plan management options

Predict insect density in a given moment

Flight patterns



# Traditional lures

- Massive initial pheromone release
- Efficacy strongly influenced by temperature variations
- Efficacy strongly influenced by precipitation
- Highly effective only for 3 weeks
- Reduced longevity
- Replacement after 2/3 weeks assure perfect efficacy

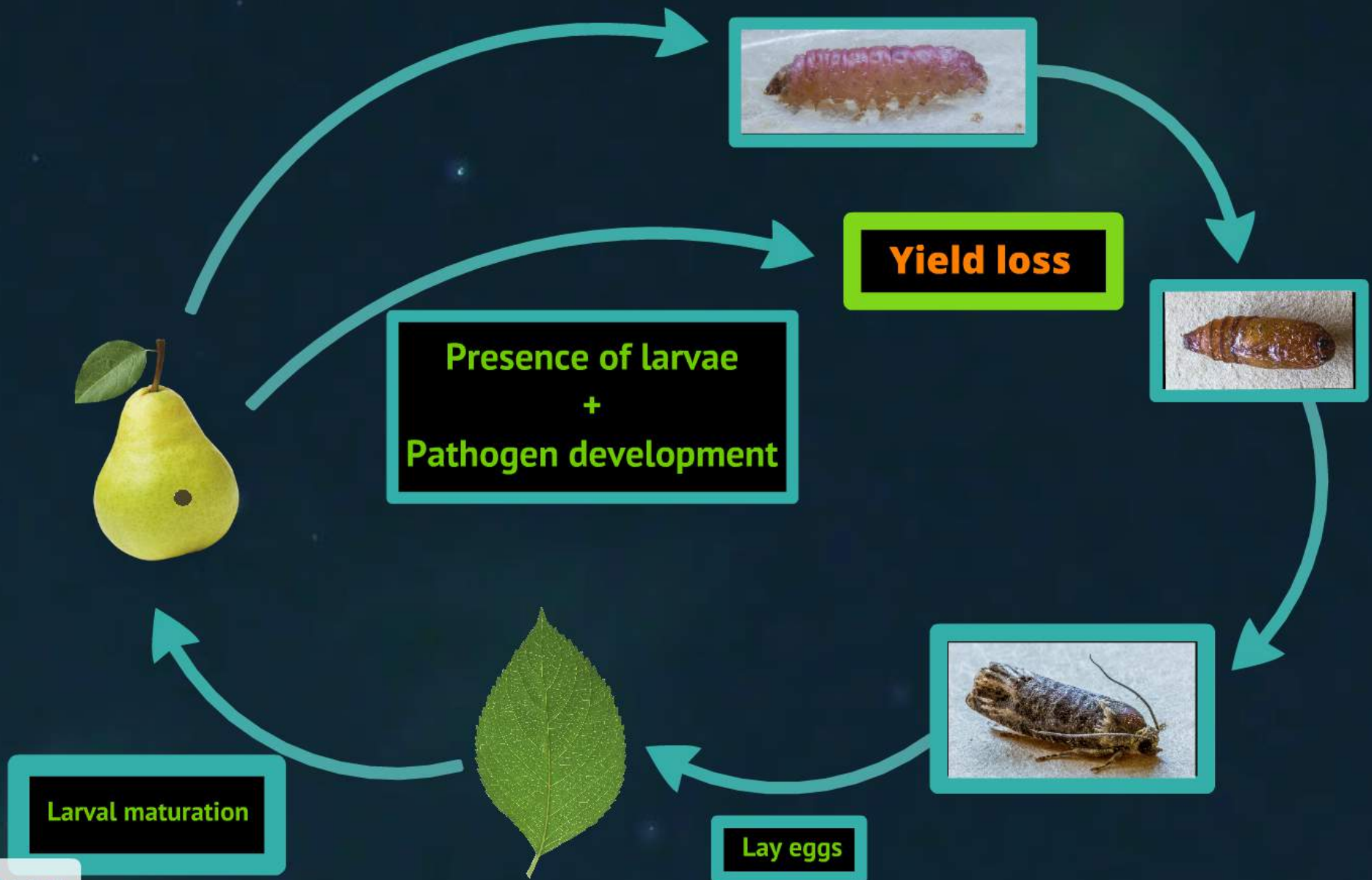


Highly unstable



**Highly unstable**

# Cydia pomonella



# The Alternative

## Improving the lures

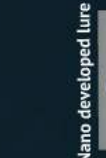
Product Development



Pheromone



Solidifying materials

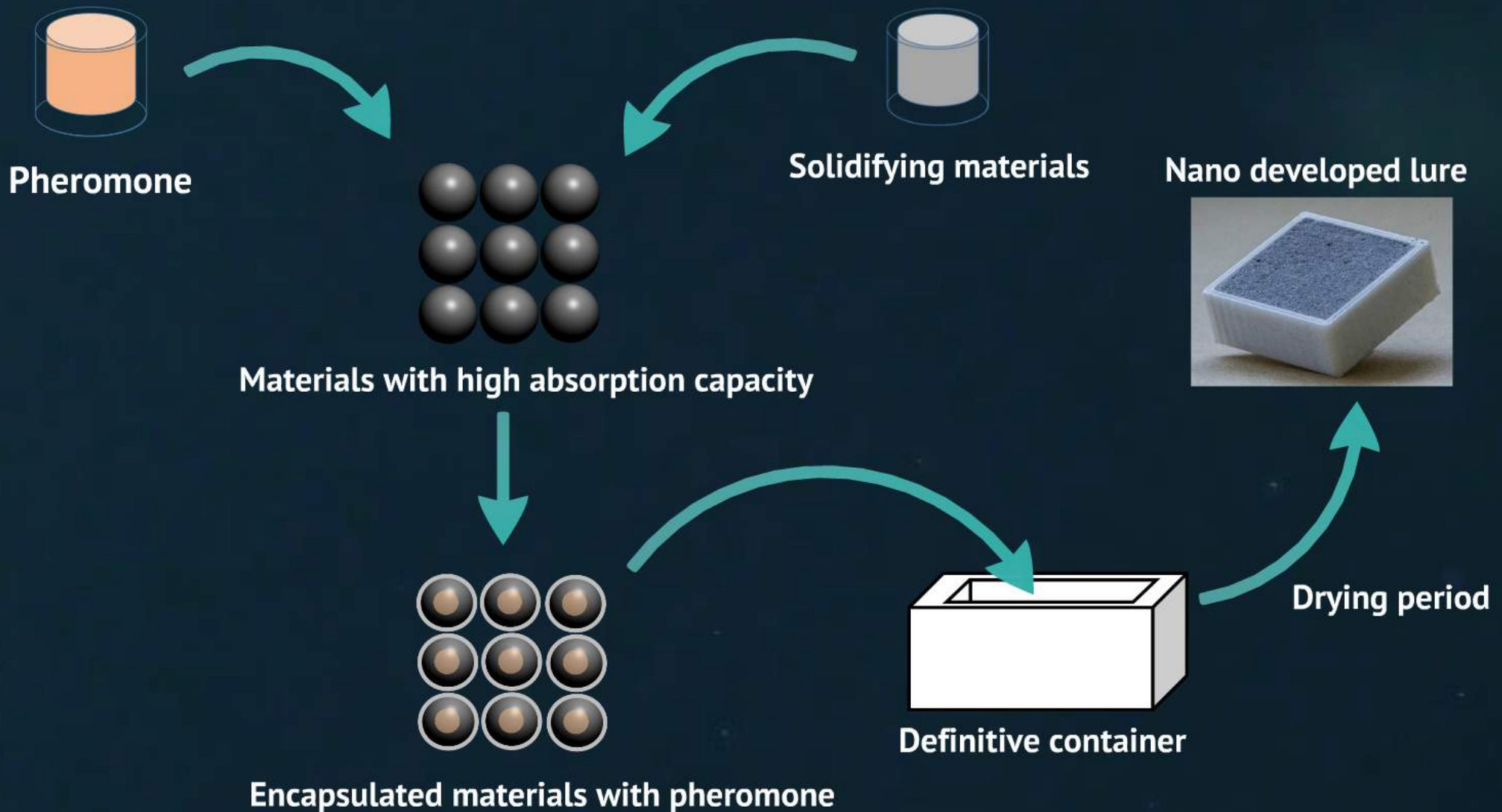


Nano developed lure

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# Product Development



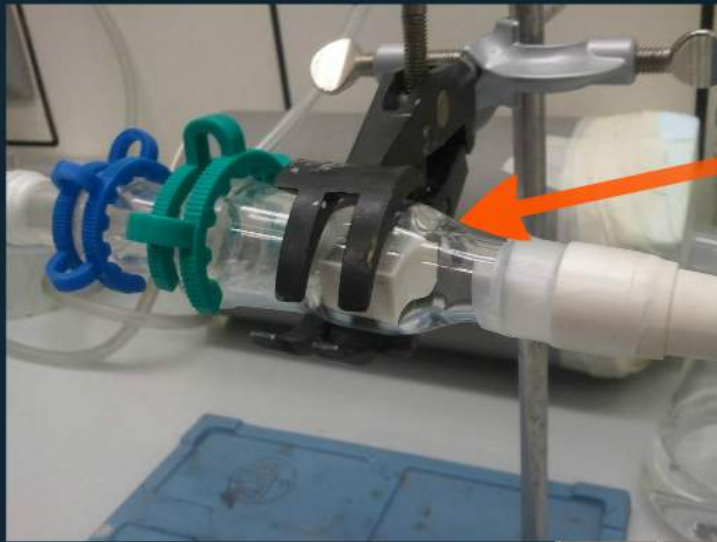
# Testing the new lure

**Kinetic release trials**

**Field trials**

**Wind tunnel trials**

# Kinetic release trials



Lure placed inside a closed recipient



Stream of nitrogen

Drags the pheromone



High purity methanol

Ultraviolet-visible spectroscopy

# Field trials



**Belmonte**

Plot 3



**Alcoentre**

Plot 2



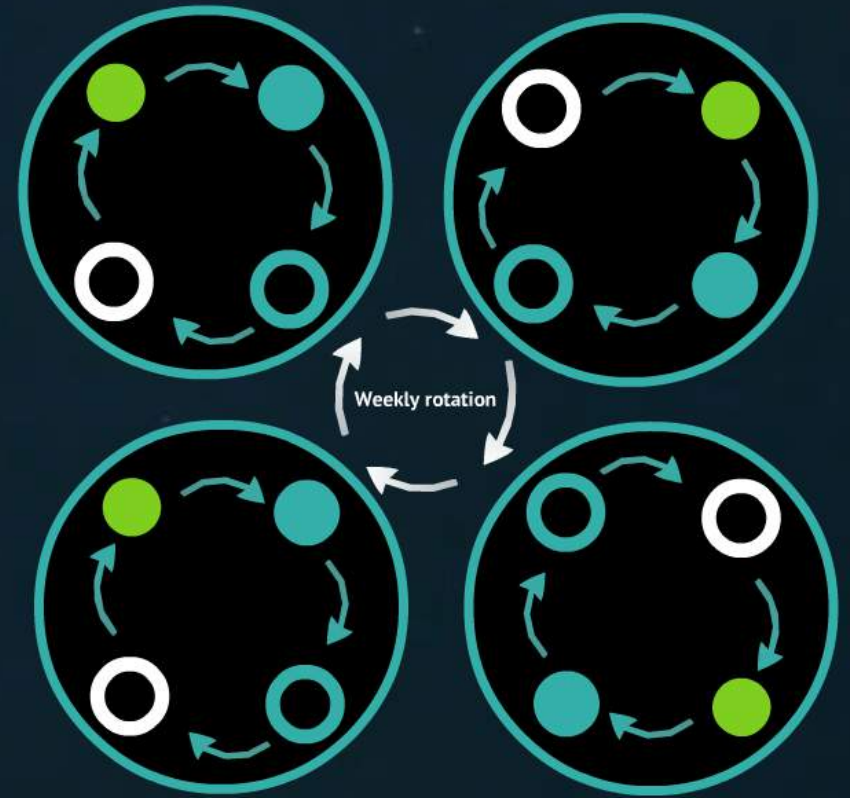
**Dois Portos**

Plot 1



# Field trials

JUNE  AUGUST  
8 Weeks

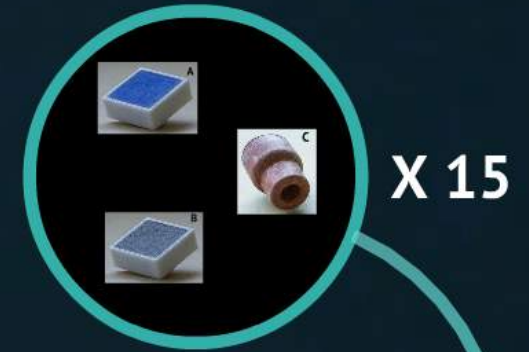
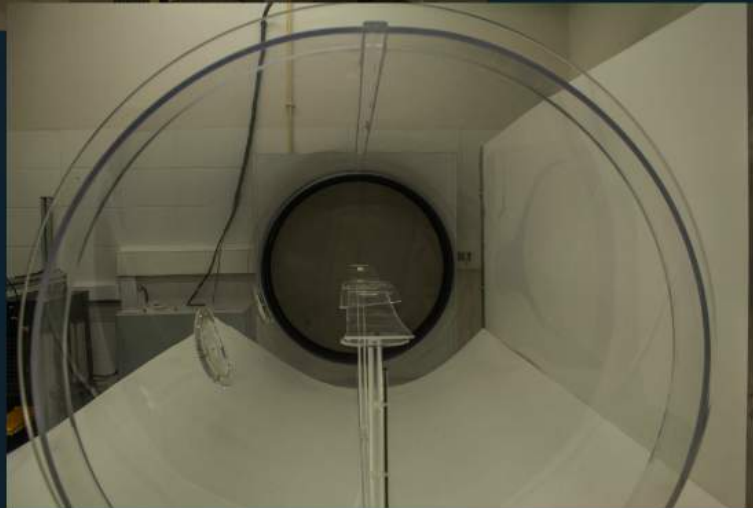


A

B

C

# Wind tunnel trials



45 Individuals

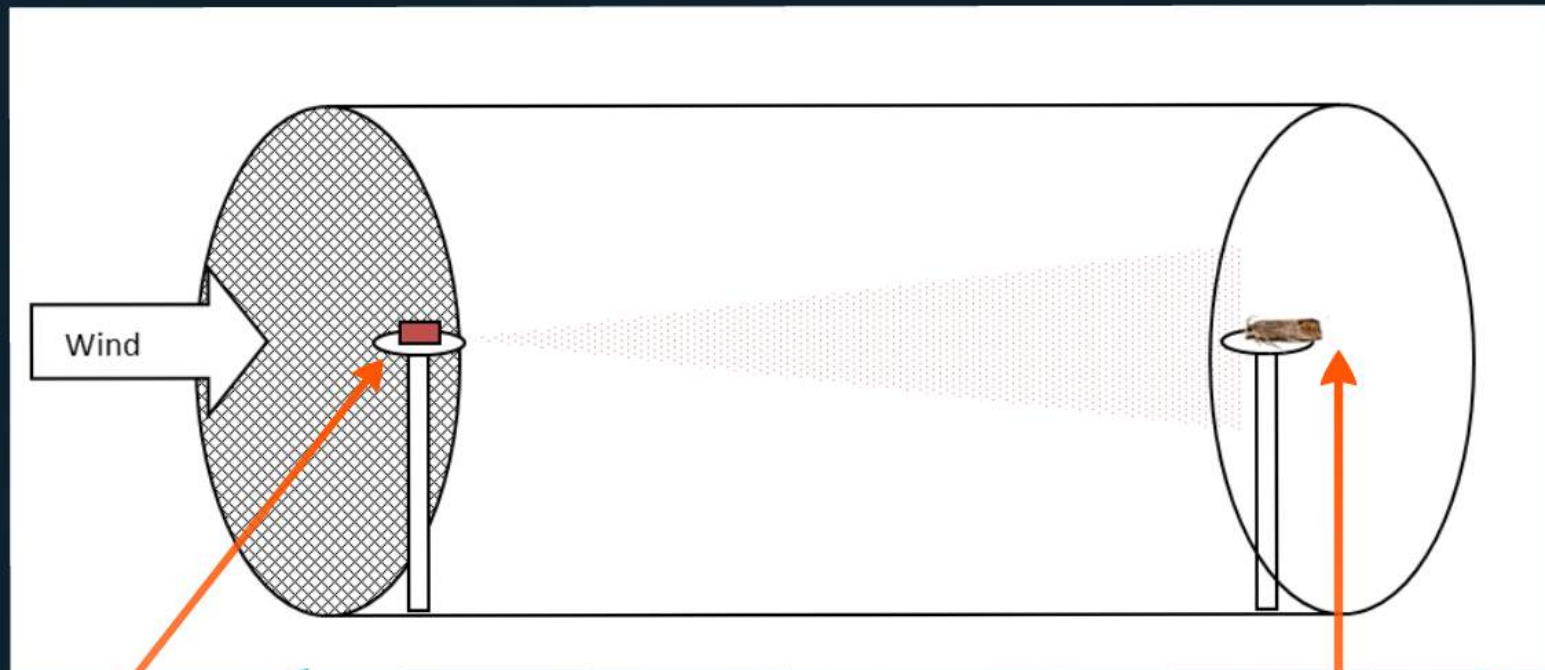


X 9

9 Degradation periods (8 weeks)

# Wind tunnel trials

## Score scheme



30 cm / s



Lure platform

-4 points

-3 points

-2 points

-1 point

0 points

4 points

Adult initial position

25° C

# Results

Pheromone release (ug/h)





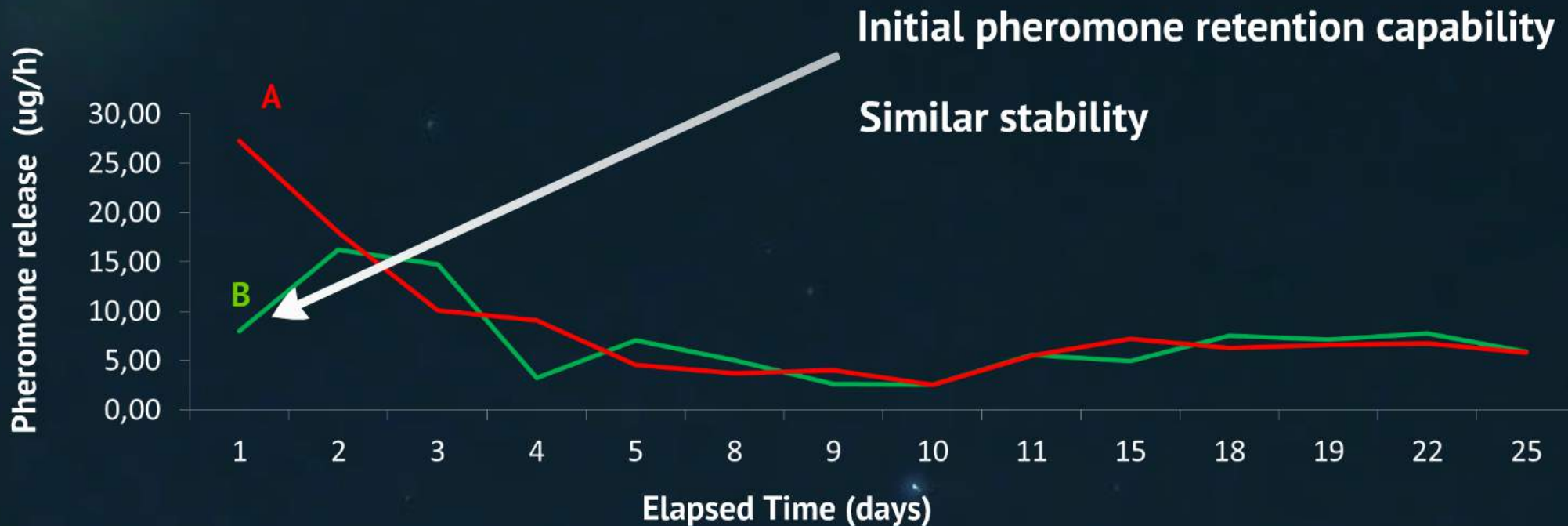
# Kinetic release trials

Developed lures comparison

A



B



# Field trials

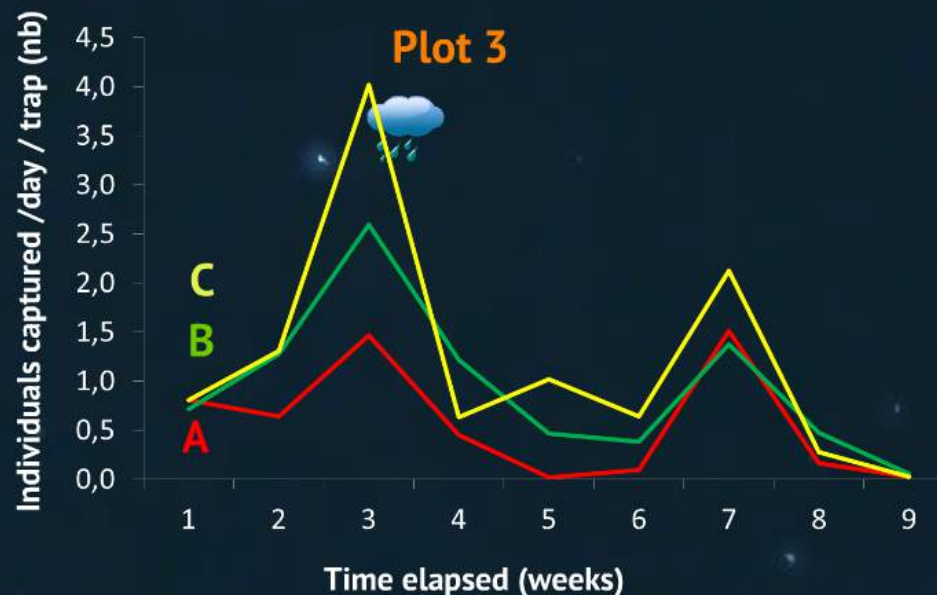
A



B

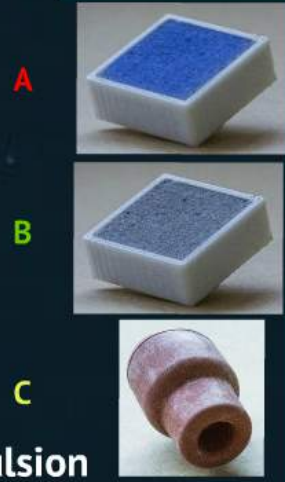
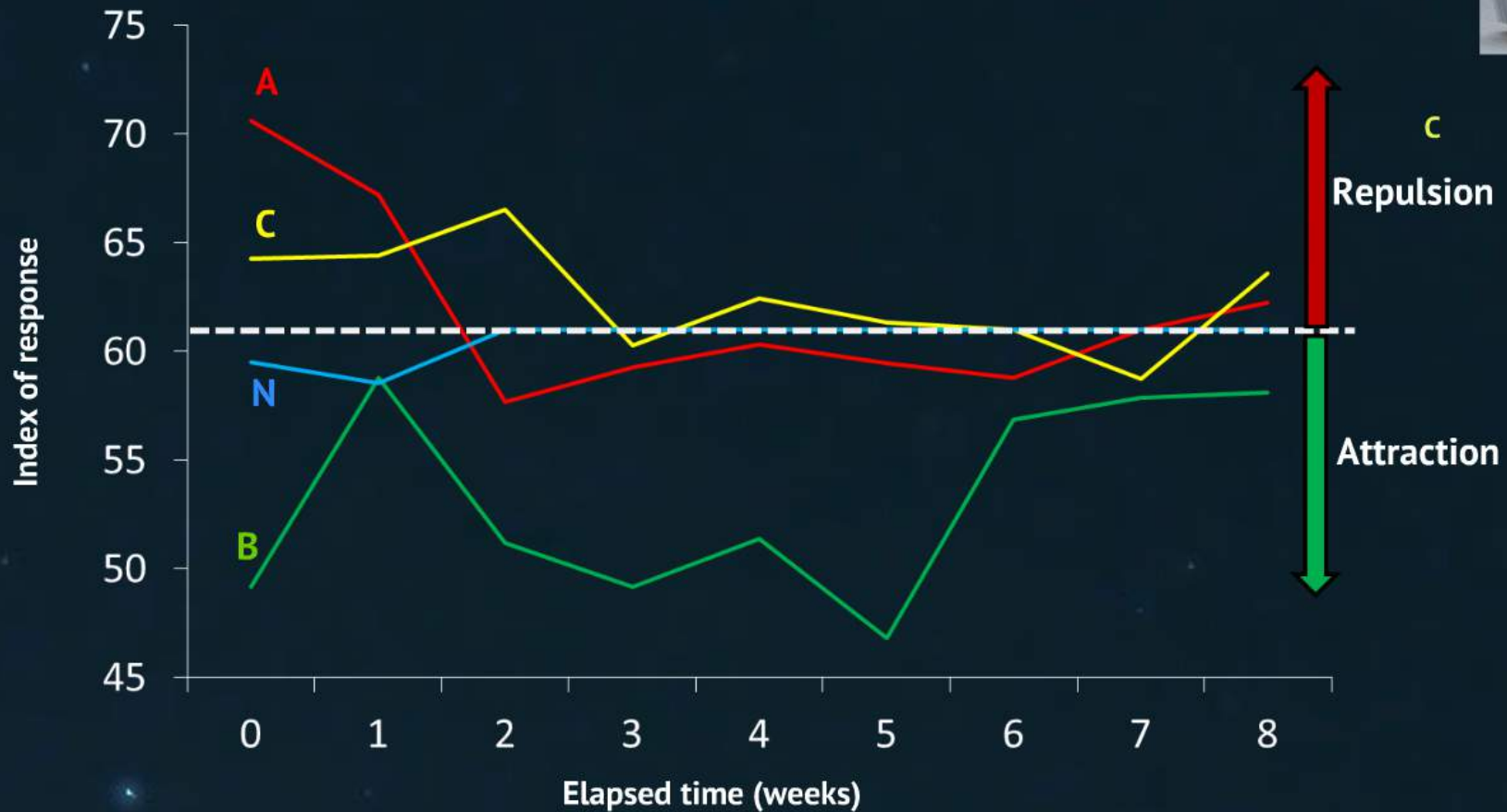


C



- Higher initial pheromone retention capacity
- Less influenced by atmospheric oscillations
- Higher longevity
- Higher stability

# Wind tunnel trials



Higher

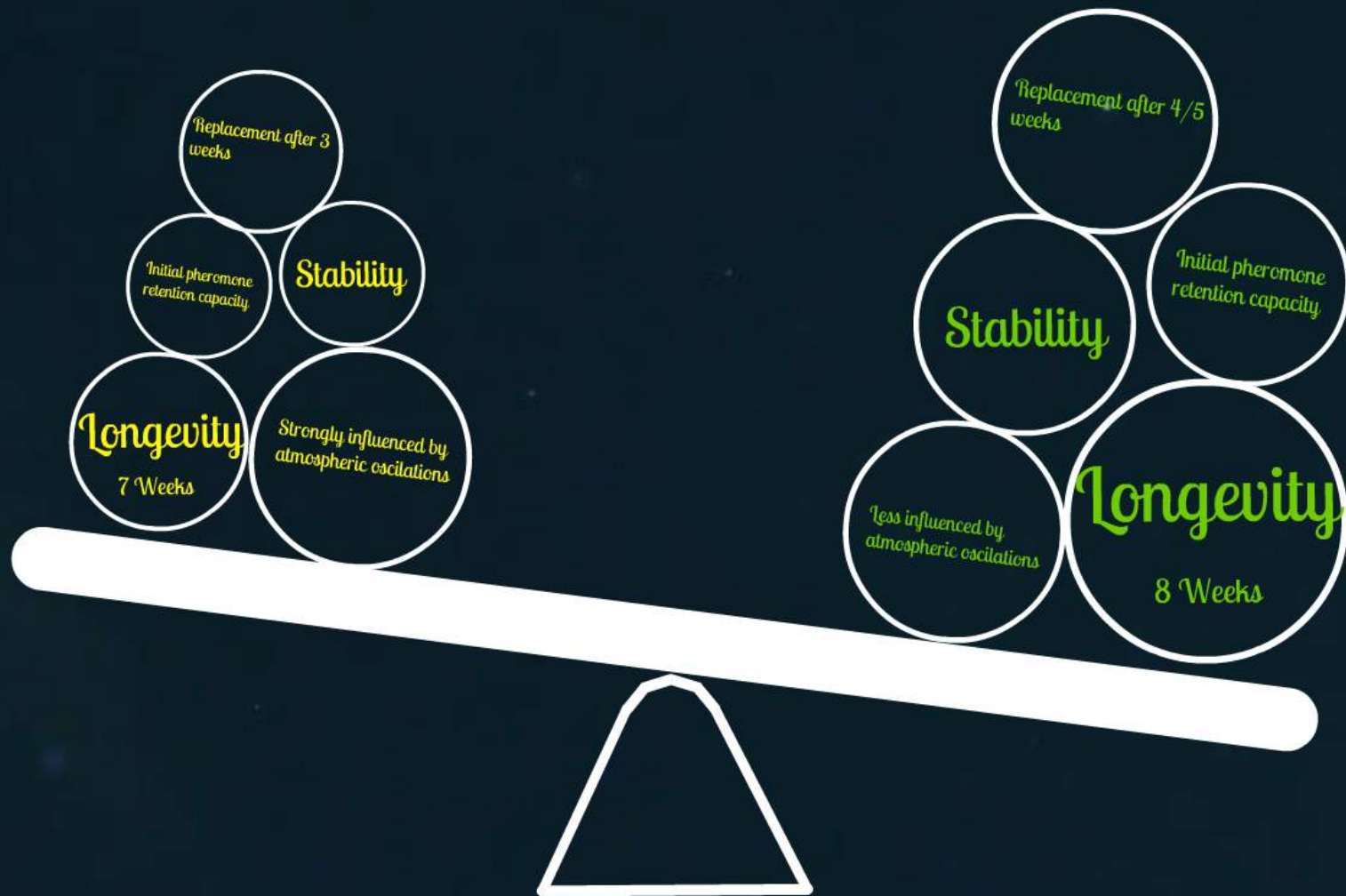


- Initial pheromone retention capacity
- Longevity
- Stability
- Efficiency

# The solution

Characteristics

# Characteristics



Traditional lure

VS.

Lure B



Thank you for your attention