

Working with Pheromones under simulated use set-up. Challenges and considerations

Lorena Halty de Leon, Lauren Quantick, James Ashton
i2L Research UK & i2L Research Spain

Introduction

Pheromones are compounds or mixes of compounds that mediate intraspecific communication amongst members of the same species¹.

Types of pheromones:

Aggregation	Oviposition-deterrent	Sex	Recruitment
Alarm	Home recognition	Trail	Royal

Characteristics:

Species specific	Effective at low concentrations
High volatility	Rapid dissipation

Great for IPM strategies!

Monitoring

Spray timing strategy
Estimation of population density

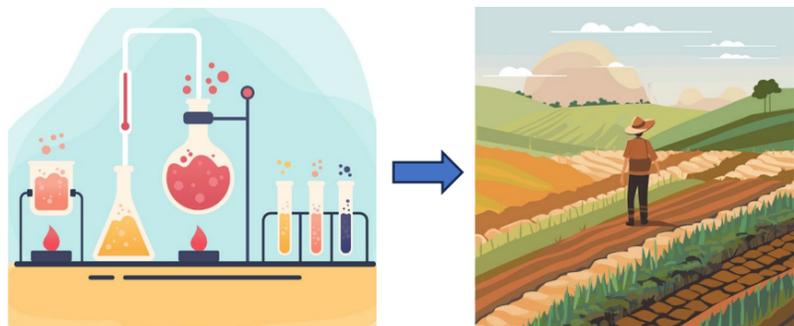
Direct control

Mass trapping
Mating disruption
Attractant
Attract-and-kill
Push-pull

Testing Pheromone based-products

Problem

Pheromone based products are **developed in the lab** under very controlled conditions. However, they are designed **to be used in the field** at higher concentration where many biotic and abiotic factors intervene. This can give contradictory results².



Proposed approach

Efficacy testing under a **simulated-use set-up** could help **smooth** the transition from Lab to Field.

Advantages

- Designed to mimic the practical use situation
- Controlled conditions
- Possibility to introduce variability

Disadvantages

- No standard protocol. Only guidelines for some species.



Challenges & Considerations

Challenge I: The right amount

A too high concentration will confuse/repel insects instead of attracting them

Challenge II: directed airflow

The effective amount of product will be low. A **directed airflow** is necessary to ensure insect can find the odor plume

Challenge III: experimental design

Control traps must be placed next to test traps at a sufficient distance to allow **choosing** by the insect

Challenge IIV: mimic practical situation

For some insect species it might be **crucial** to include their preferred host plant³. Pheromones and plant volatile compounds can create **synergies** that influence insect behaviour

Conclusion

To create accurate and reliable protocols we must consider:

- Characteristics of the **room** to be used
- **Biology** of the target species
- Characteristic of the **compound**
- Relevance of the **host plant**

It will allow to

- ↑ Throughput of the product
- ↑ Speed of product development
- ↓ Costs of testing

Take home message

The experimental design must be tailored to the **system** we are working with

References

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