# Banker Plants in Ornamental Plant Production

Biological Control in Ornamental Plant Production Symposium
San Marcos, California
January 18, 2010

# BIOLOGICAL CONTROL

# Major Efforts

Protected Culture

**Manage Pesticide Resistance**

**Develop Economical Systems**

**Develop Systems for Public**

# Problems-

## Economics

# Problems-

**Availability**

Problems-

# Pesticide Interactions

Problems-

Quality Control

Quality Control

Quality Control

Quality Control

Solution?

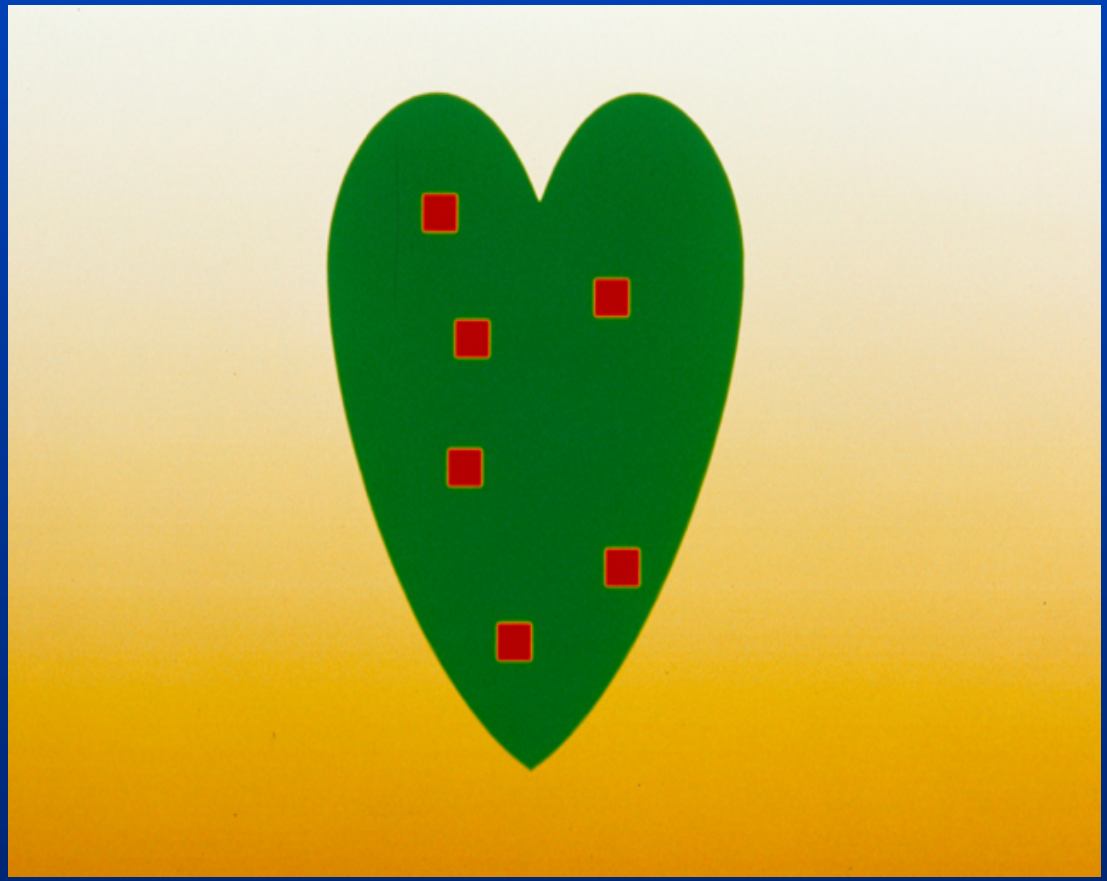
# Modified Banker Plants

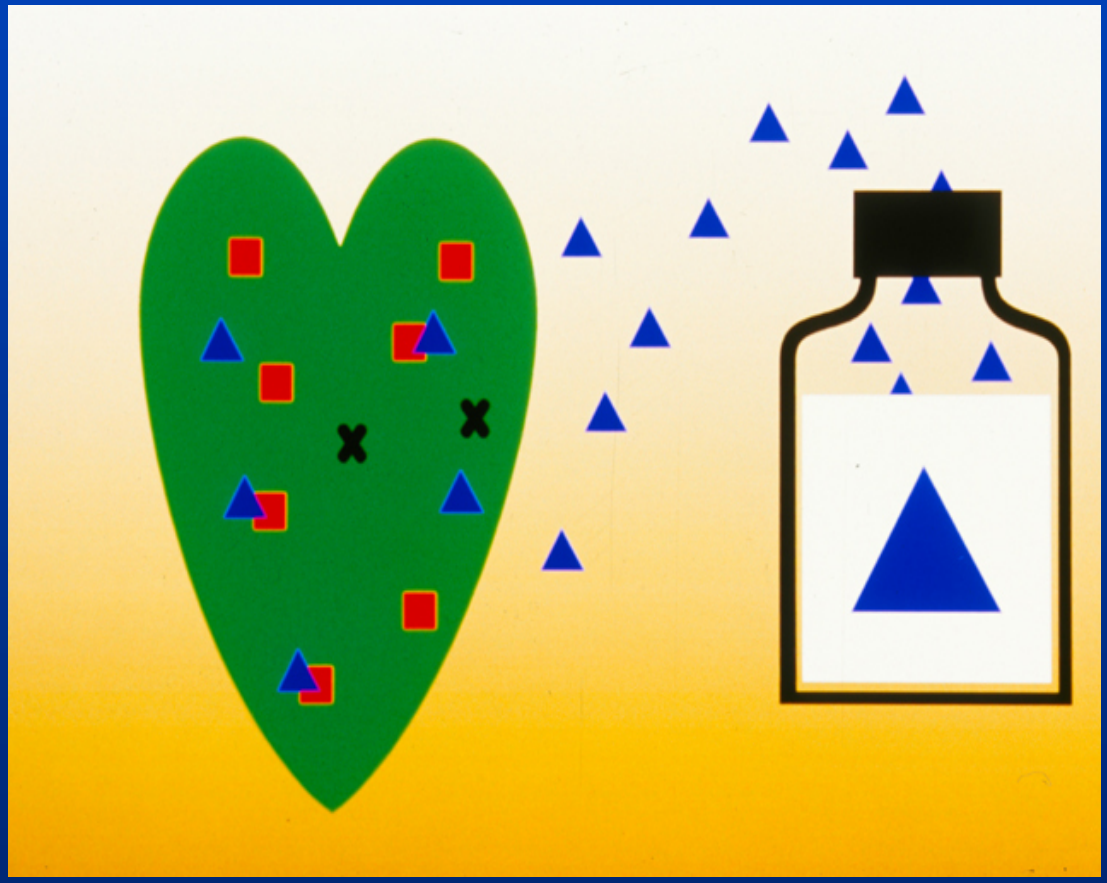
(Open Rearing Systems)

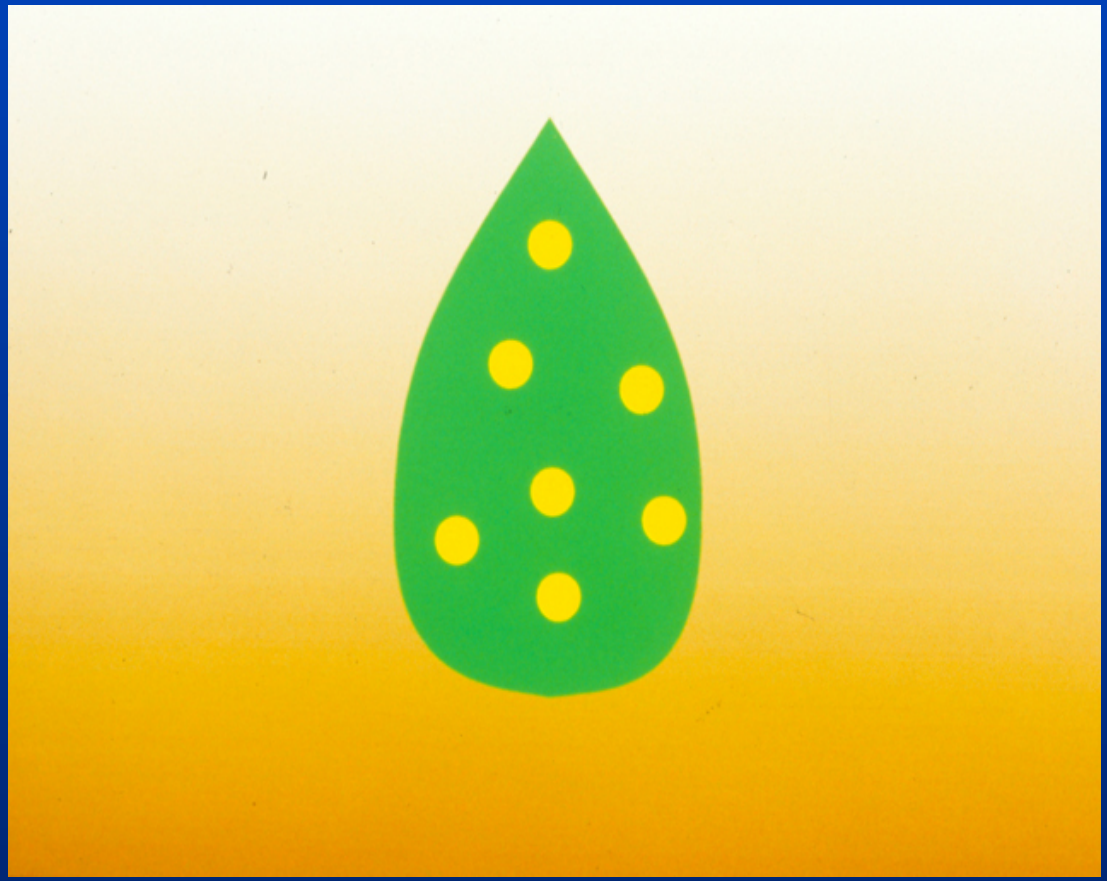
# Modified Banker Plants

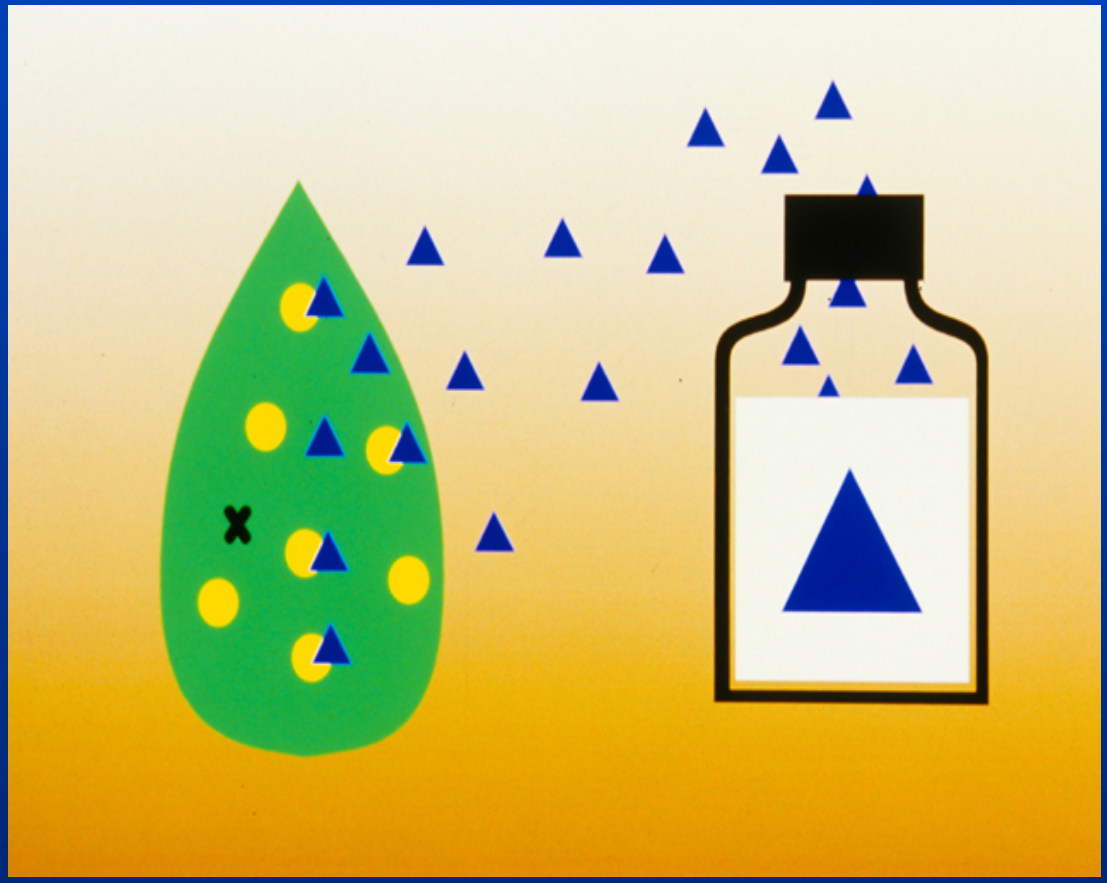
- Used to establish natural enemies
- Used to increase natural enemy numbers
- Used to evaluate quality of natural enemies
- Used to slow PESTICIDE RESISTANCE
- Can be integrated with pesticides if necessary

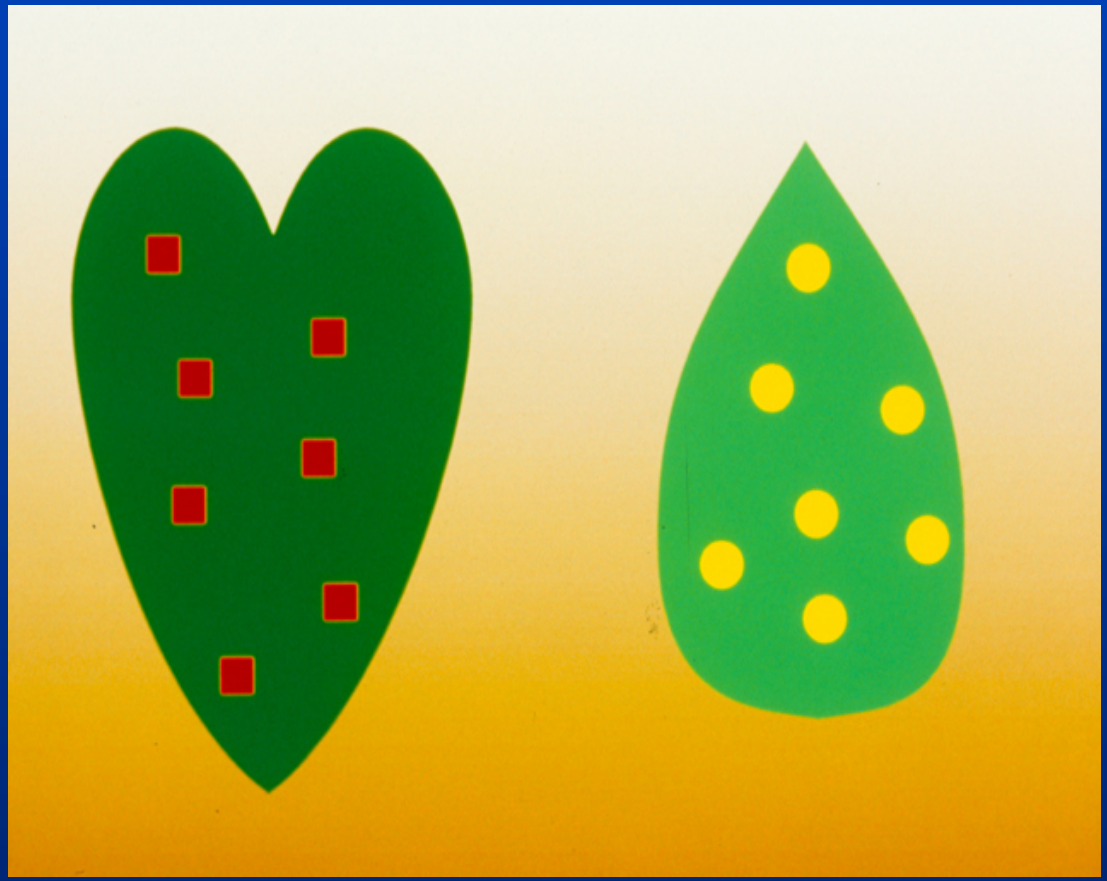
TRAINING!

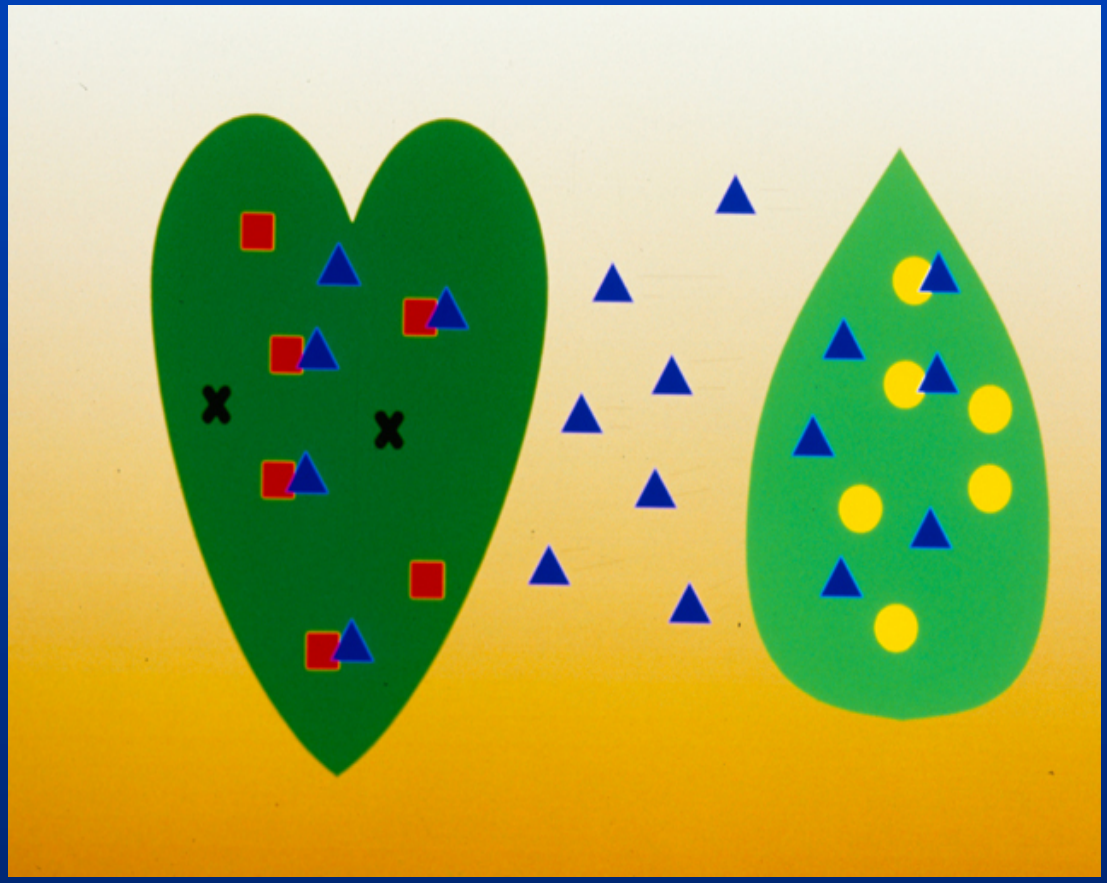


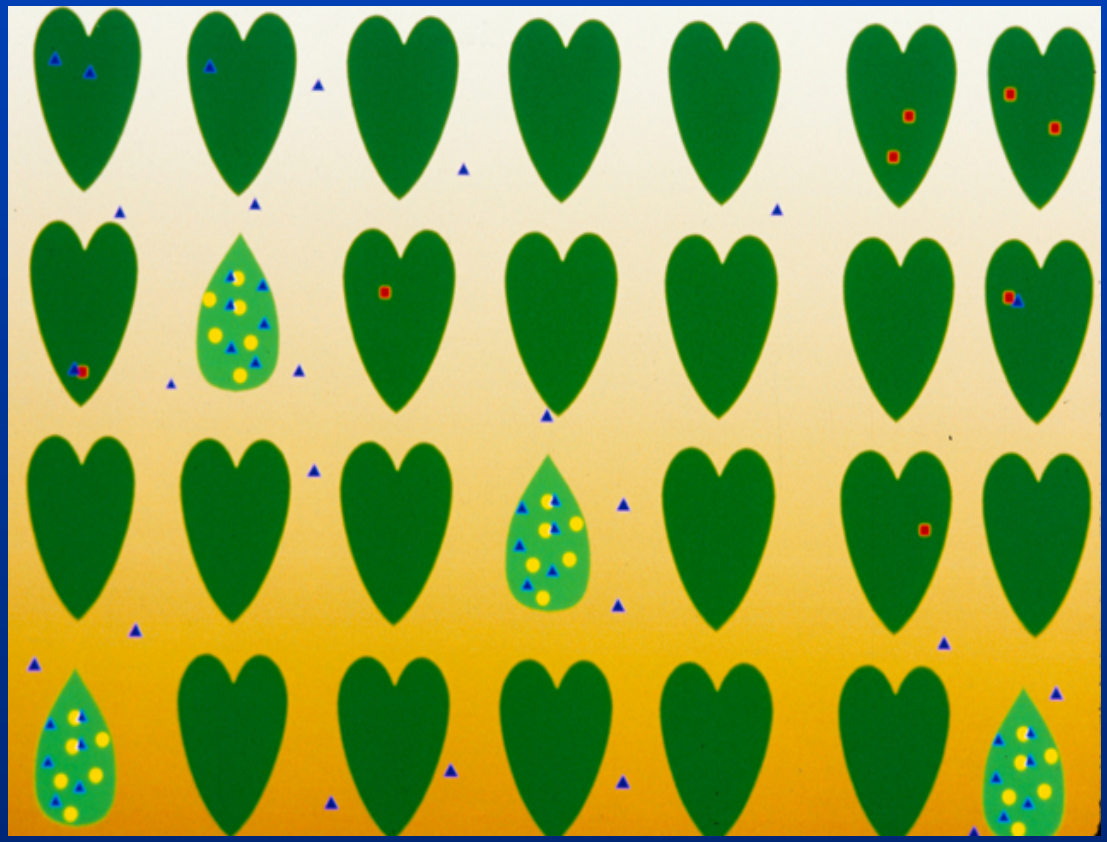












Summary

# Modified Banker Plants

Aphids

Leafminers ?

Mealybugs ?

Mites

Thrips

Whiteflies

# THRIPS

**BP=** Pollen Producing Plants or Grain

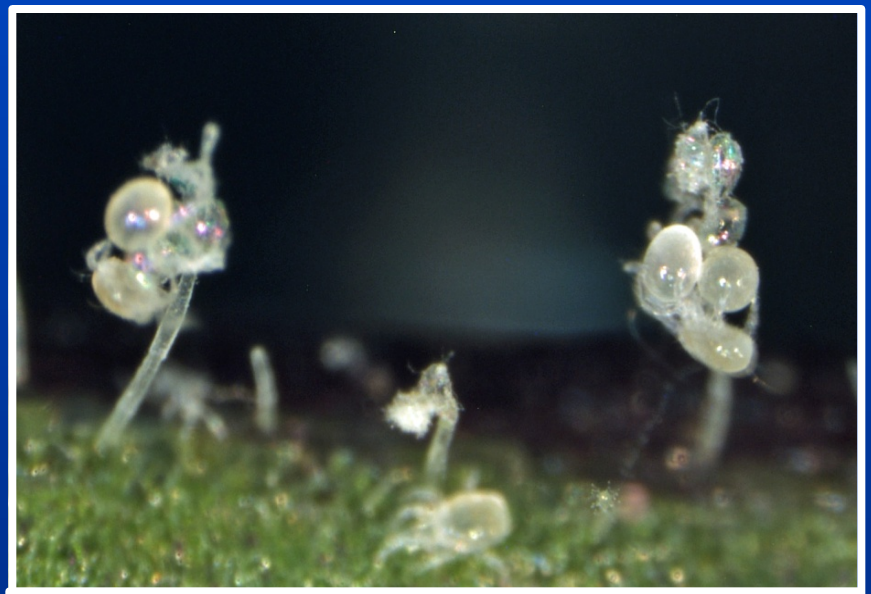
**AH=** Stored Product Mite or Pollen

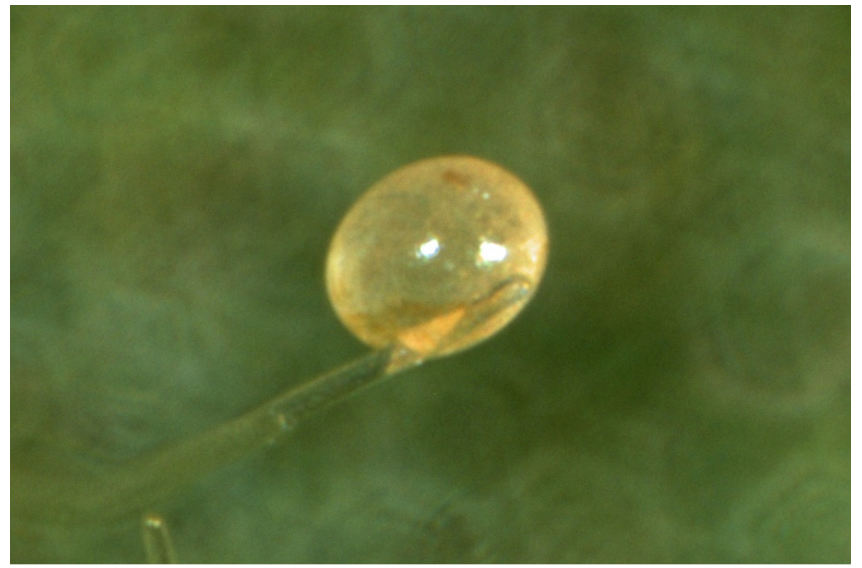
**NE=** *Amblyseius swirskii, A. cucumeris, Orius*

# Ornamental Peppers as Banker Plants

- Extremely attractive in the landscape
- Easy to grow and have edible fruit
- Can predatory mites be sustained on them?

# Predatory mites (*A. swirskii*) eggs (Dogramaci)





# Banker Plant Candidates

Black Pearl

Explosive Ember

Red Missile

Masquerade

# Population buildup of *A. swirskii*


RM=Red Missile;  EE: Explosive Ember;  MA=Masquerade

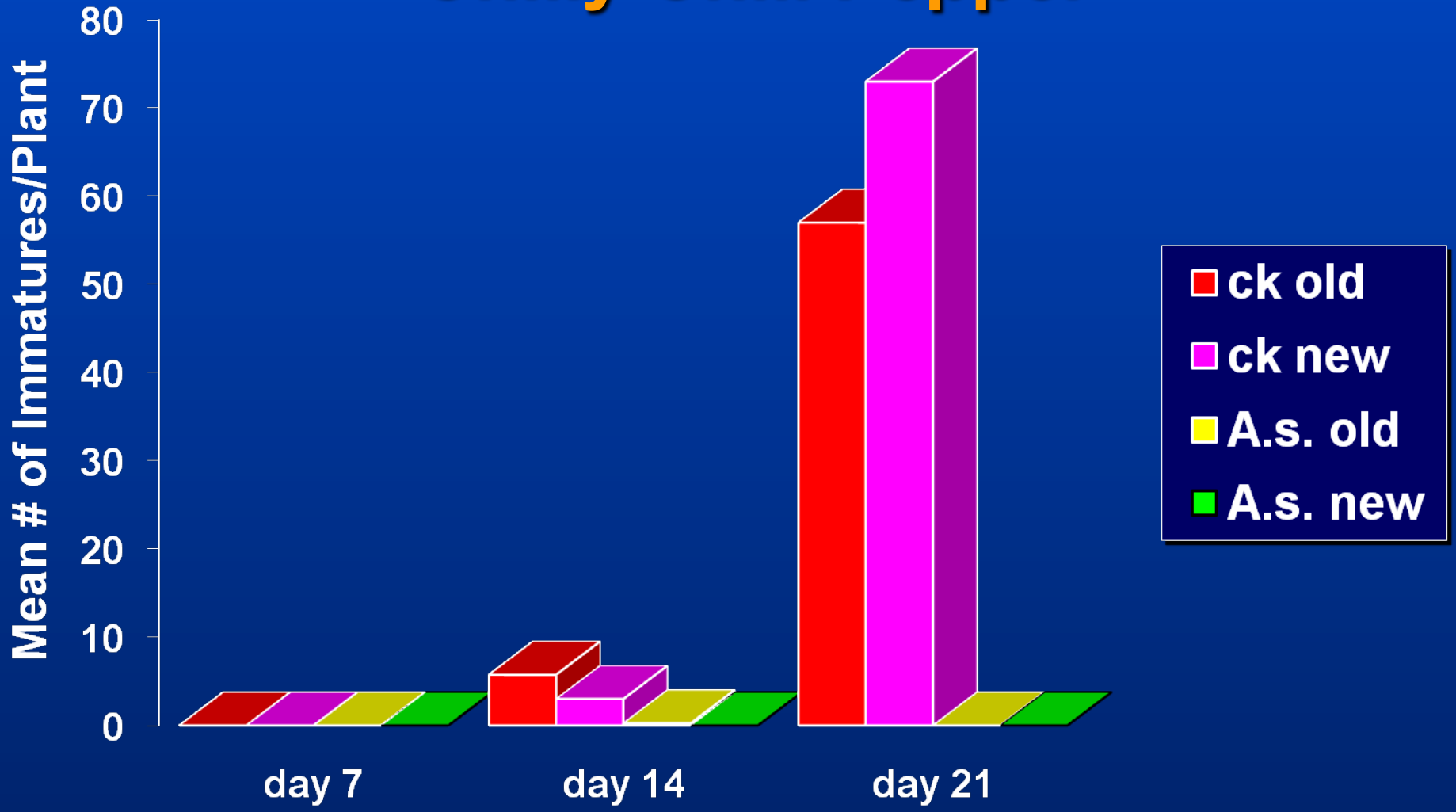
# *Spermacoce verticillata*

# *Larraflower*

# *Spermacoce verticillata*

# *Larraflower*

# Control of Chilli Thrips
# Chilly Chili Pepper




N=20
5 plants/Unit
4 Units/treatment


Control
N. cucumeris
A. swirskii

# Whiteflies

# Bemisia

# *Bemisia* or Silverleaf whitefly OTHERS?

**BP= Papaya**

**AH= Papaya whitefly**

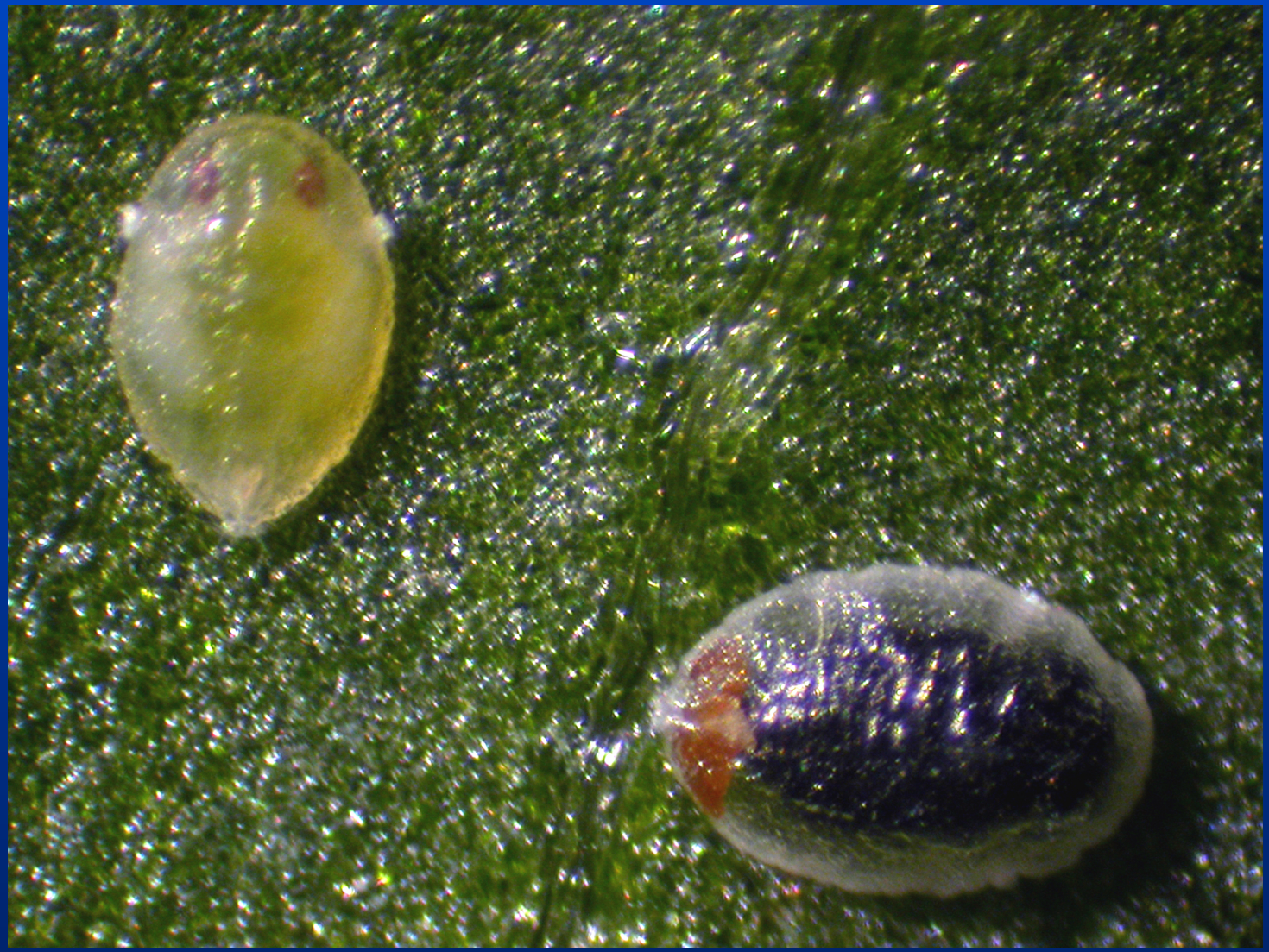
**NE= *Encarsia sophia*, Various beetles and *PFR***


Banker Plant Area
An IPM
(Integrated Pest Management)
initiative from
Parks Pest Control.
For more information, call 824-5484

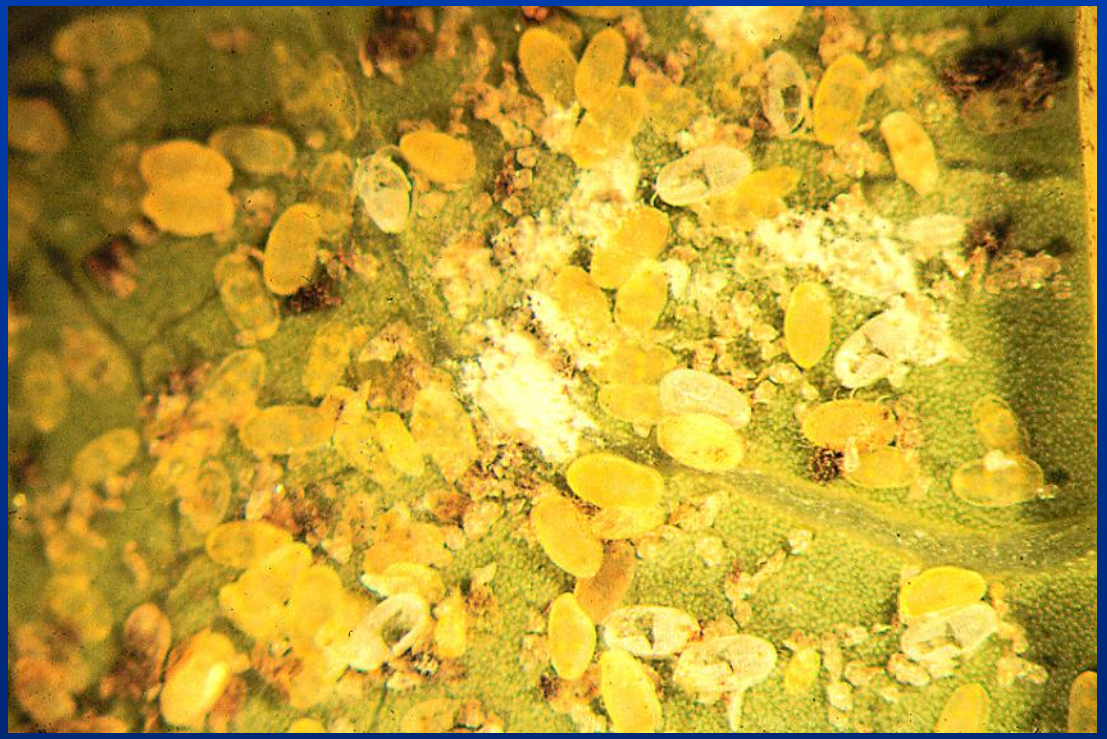
# Papaya Leaf

# *Encarsia sophia*

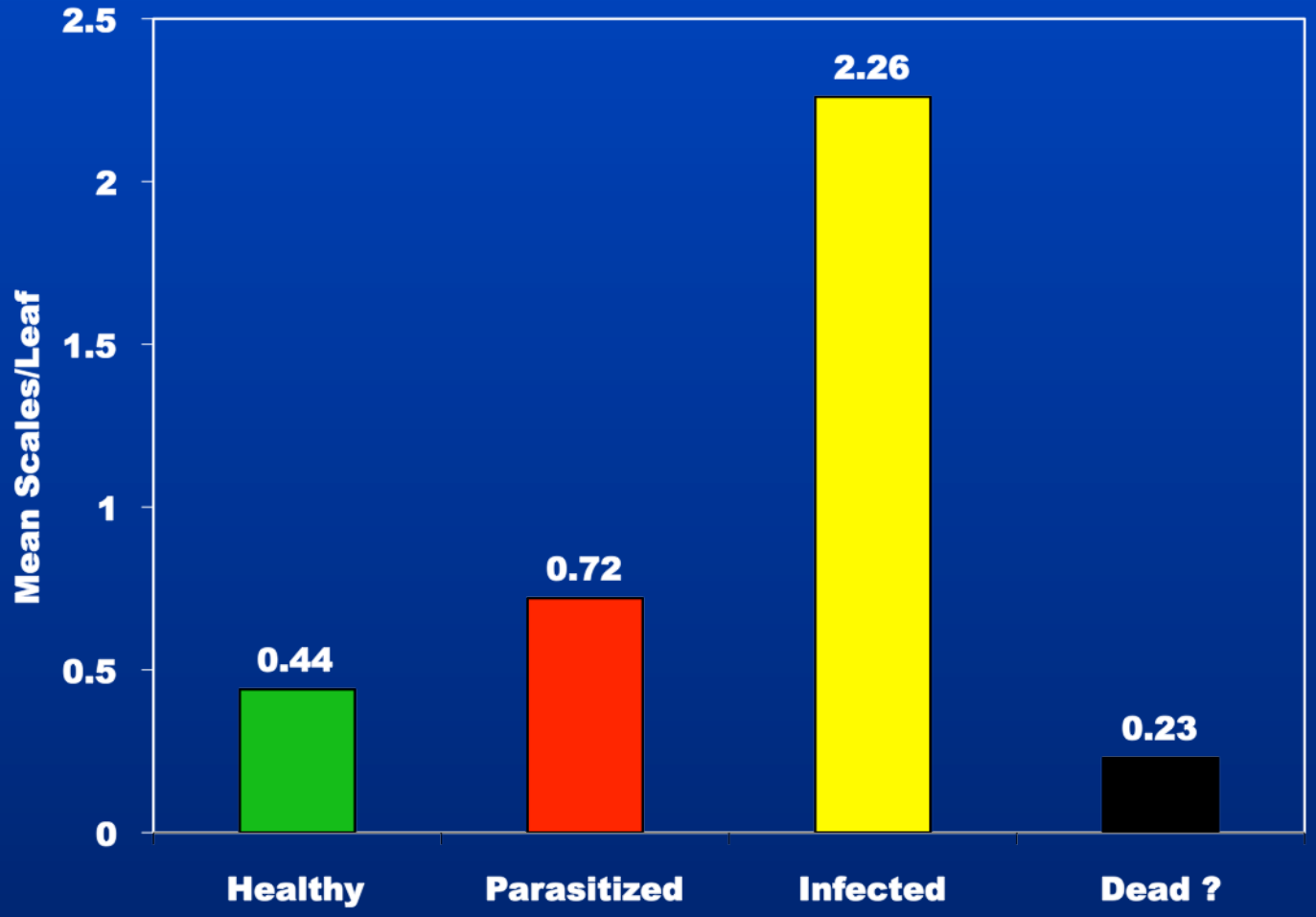
**A wasp that kills whiteflies**



# *Paecilomyces fumosoroseus*
# PFR-97 Apopka



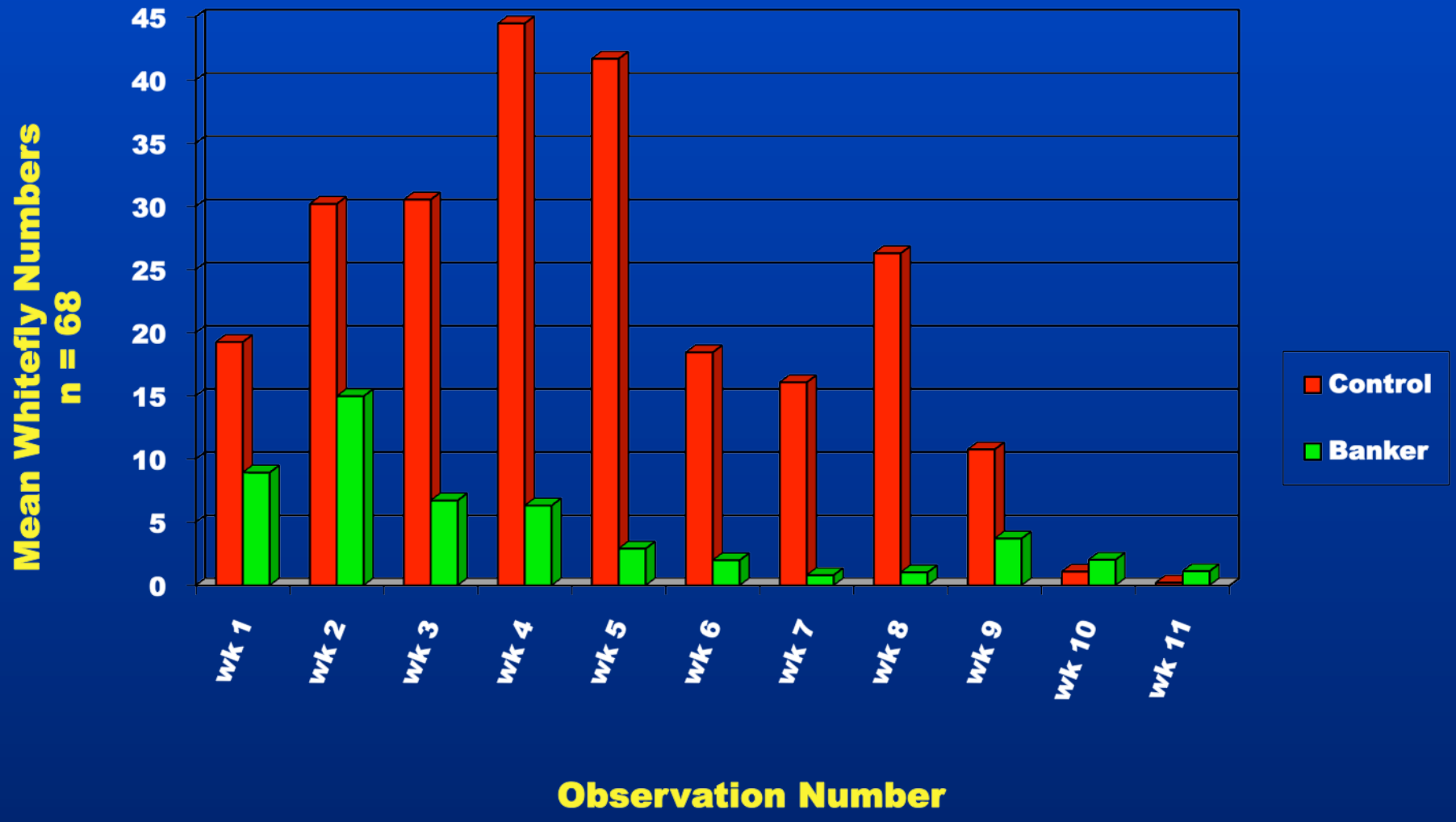
# Poinsettia Stock Plants
# Whitefly Infestation




6 months after introducing one banker plant

# Banker

# Healthy Immature Whiteflies




Control plants treated with Marathon on wks 3,5 and Flagship on wk 6.
Everything with Milstop on wk 10.

# Honeydew

# *Amblyseius swirskii*

**A mite that kills whiteflies, thrips …**


OPPERT
AL SYSTEMS
SWIRSKI-MITE PLUS
week 27 28
0541006P64E

# Swirskii eating a whitefly egg.

# Swirskii eating a whitefly scale.

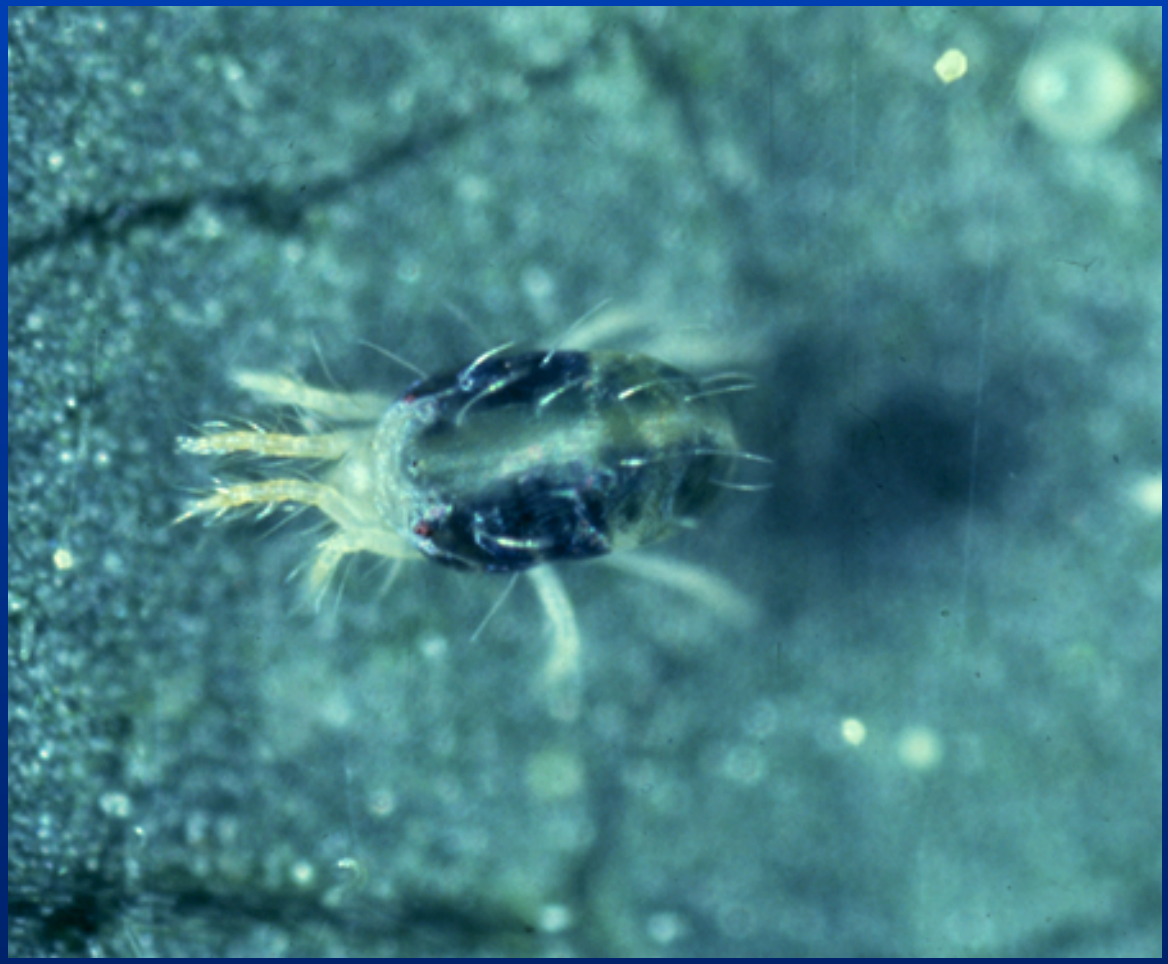
# MITES

**BP= Corn**

**AH= Banks grass mite**

**NE= *Stethorus* spp., *Feltiella acarisuga*, *Scolothrips sexmaculatus*, *Galendromus occidentalis*, *Neoseiulus californicus*, or *Phytoseiulus persimilis***

# *Tetranychus urticae*



# Broad Mite


UC Statewide IPM Project
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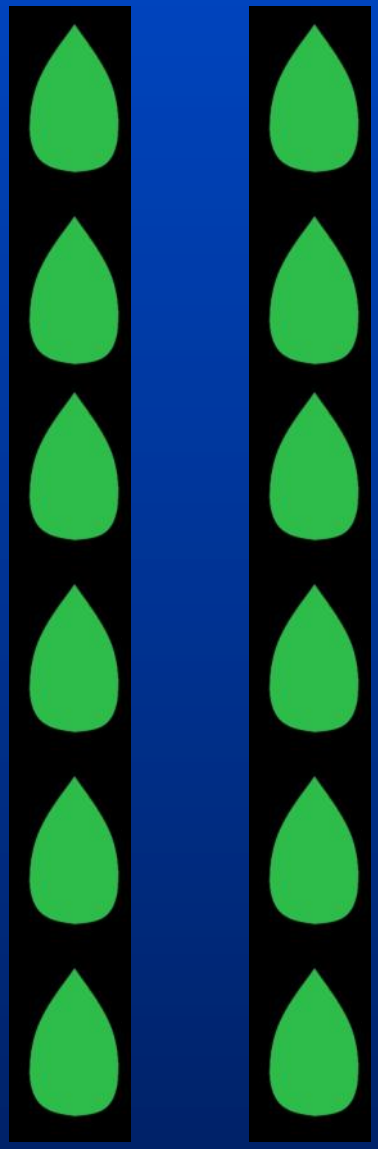
# Broad Mite

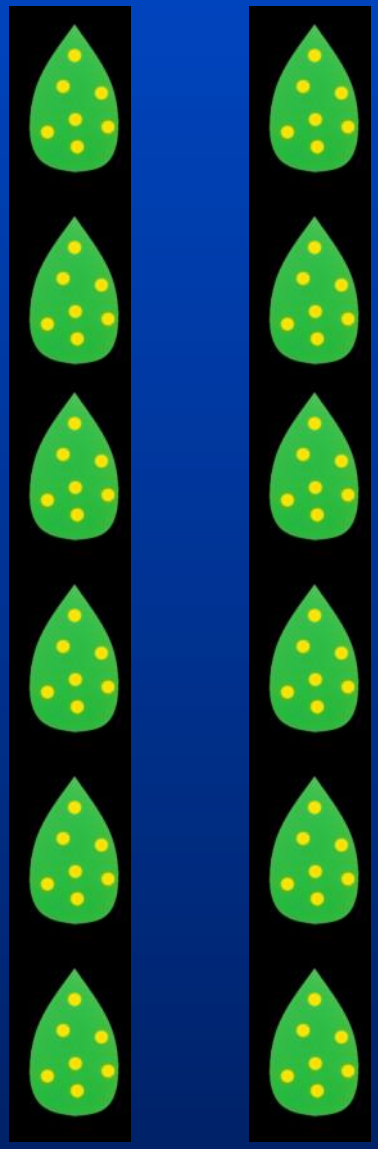
# Mite Programs are Successful!

# Isolation Area 1



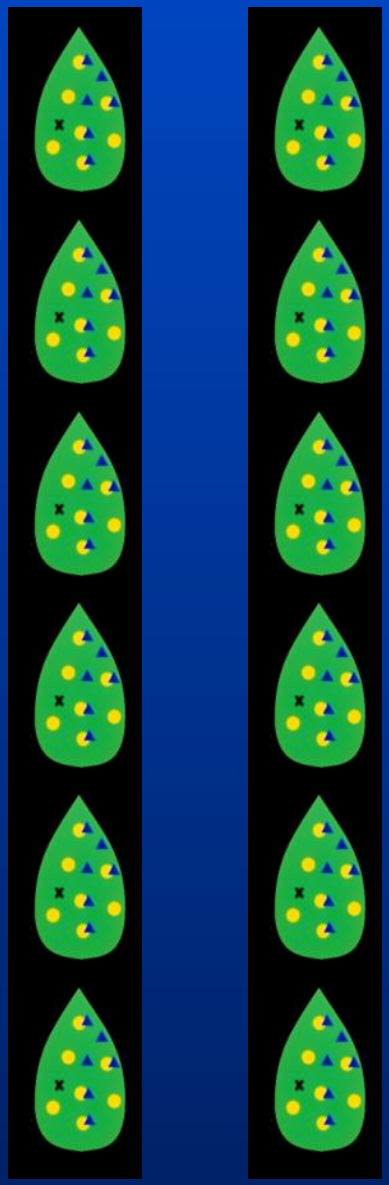
## Clean Host Plants

# Isolation Area 2



## Infested Host Plants

# Isolation Area 3



## Infest with Natural Enemies

# Predators That Can Be Reared Easily

*Feltiella acarisuga*

*Phytoseiulus persimilis*

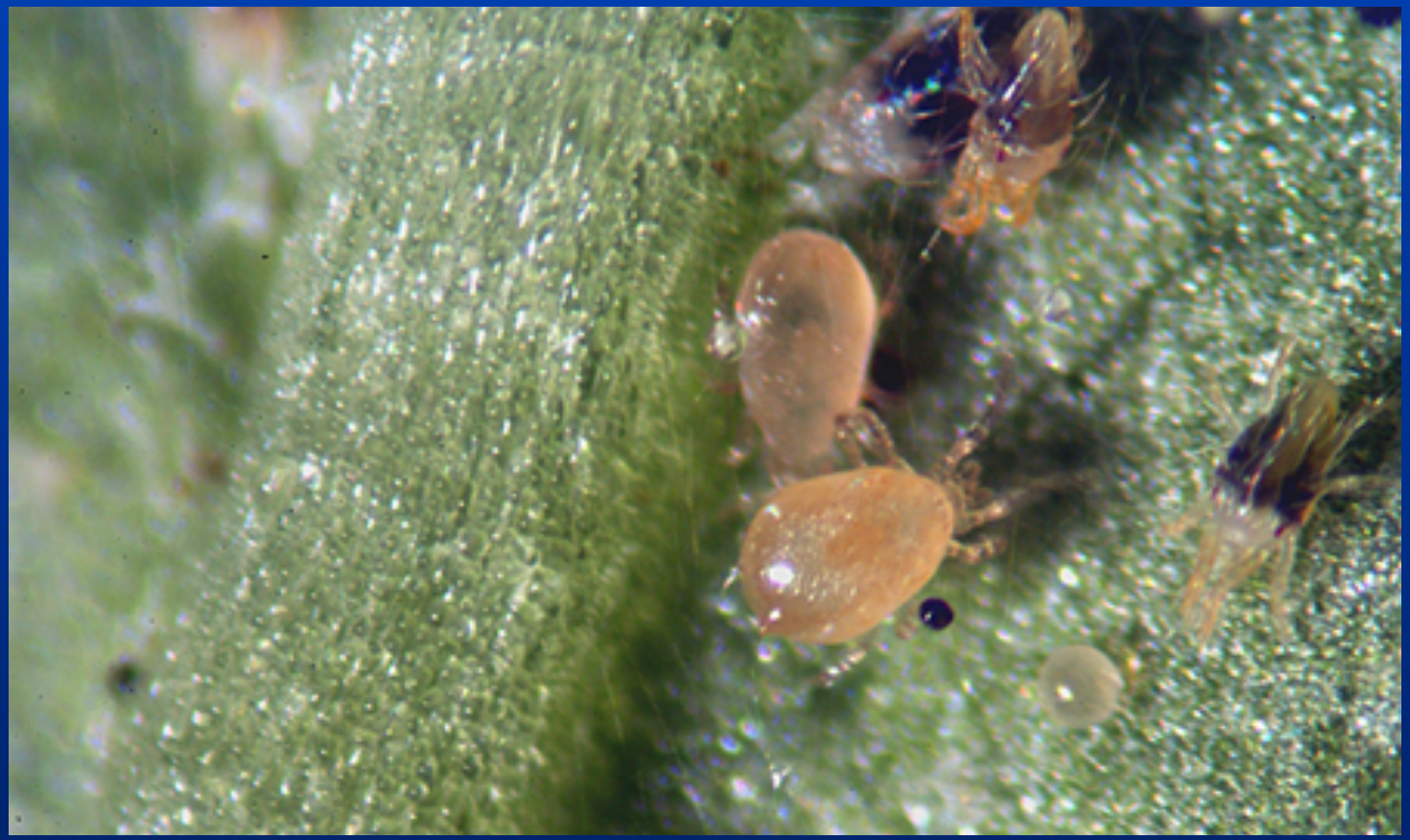
*Phytoseiulus macropilus*

*Neoseiulus californicus*

*Stethorus punctillum*

# *P. persimilis*

# *N. californicus*

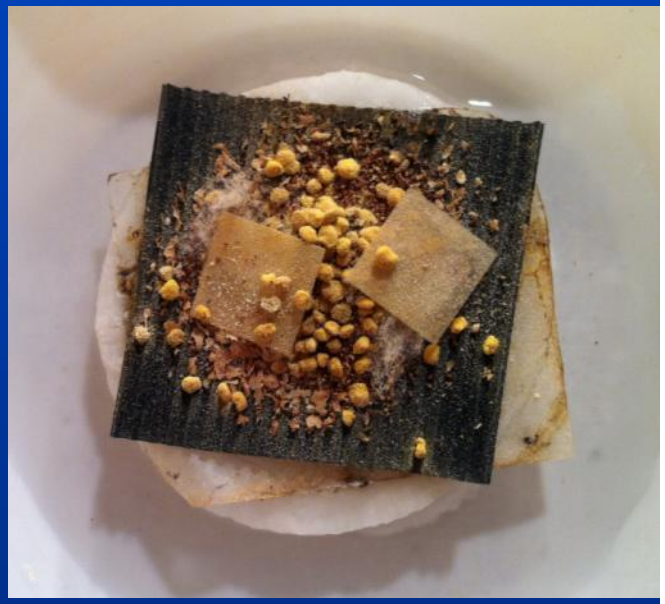


# Countertop Production of Predatory Mites for Public Distribution

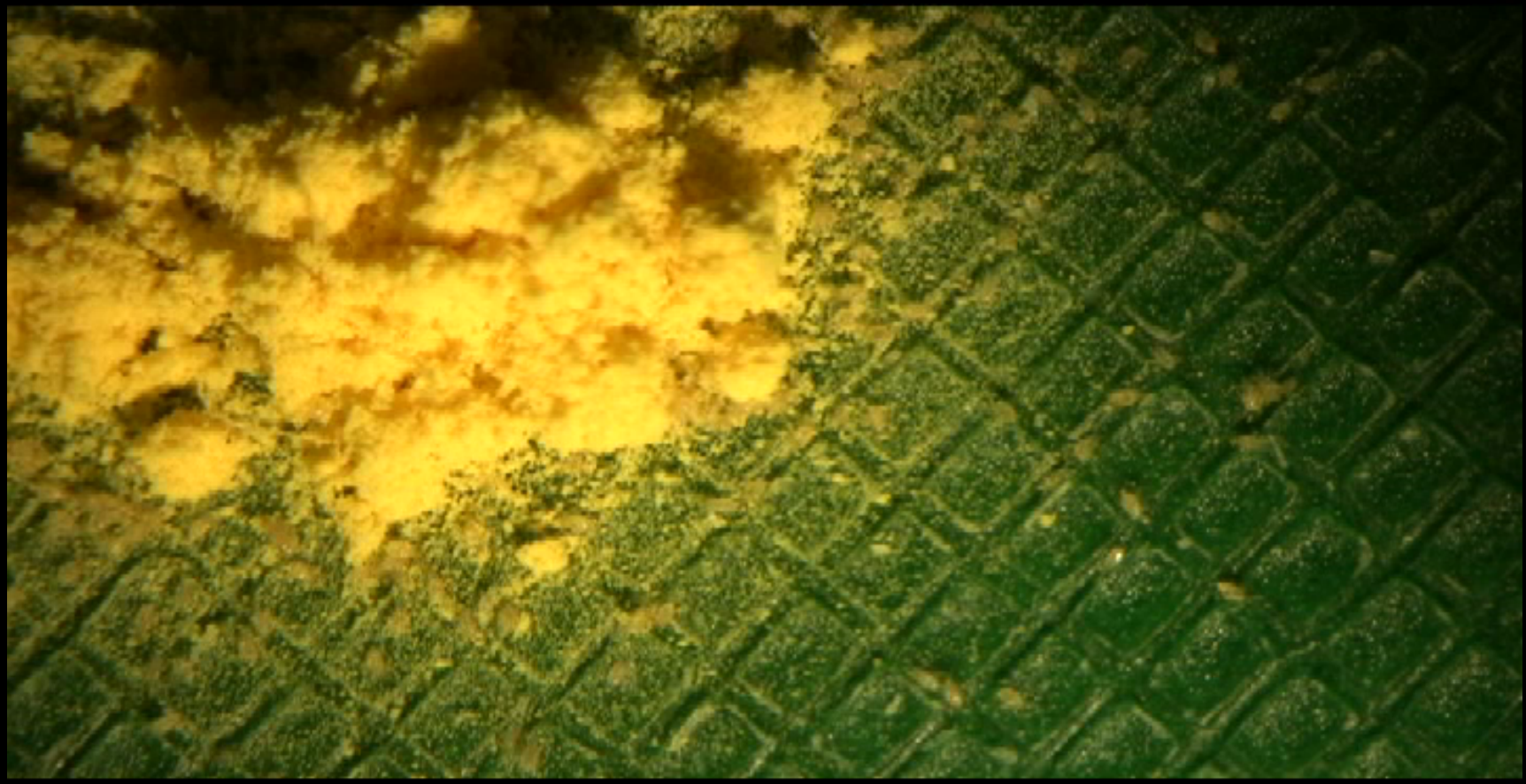
Juanita Popenoe, Bill Schall, Lance Osborne, Sally Scalera, Terry DelValle, Erin Harlow, Stephen Brown , Dan Culbert, Deborah Levulis, Brooke Moffis, Jim Davis, Lloyd Singleton, Carolyn Saft, Karen Stauderman

# Open Container Requirements

- Food
- Moisture
- Places to hide-habitat
- Substrate to lay eggs on
- Moderate temperature and humidity.



# Swirskii rearing on just pollen.




**"Mr. Osborne, may I be excused?
My brain is full."**

# Thank you!

**RESEARCH SUPPORTED BY:**

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