



# Review of Greenhouse Pests and Biocontrol Agents

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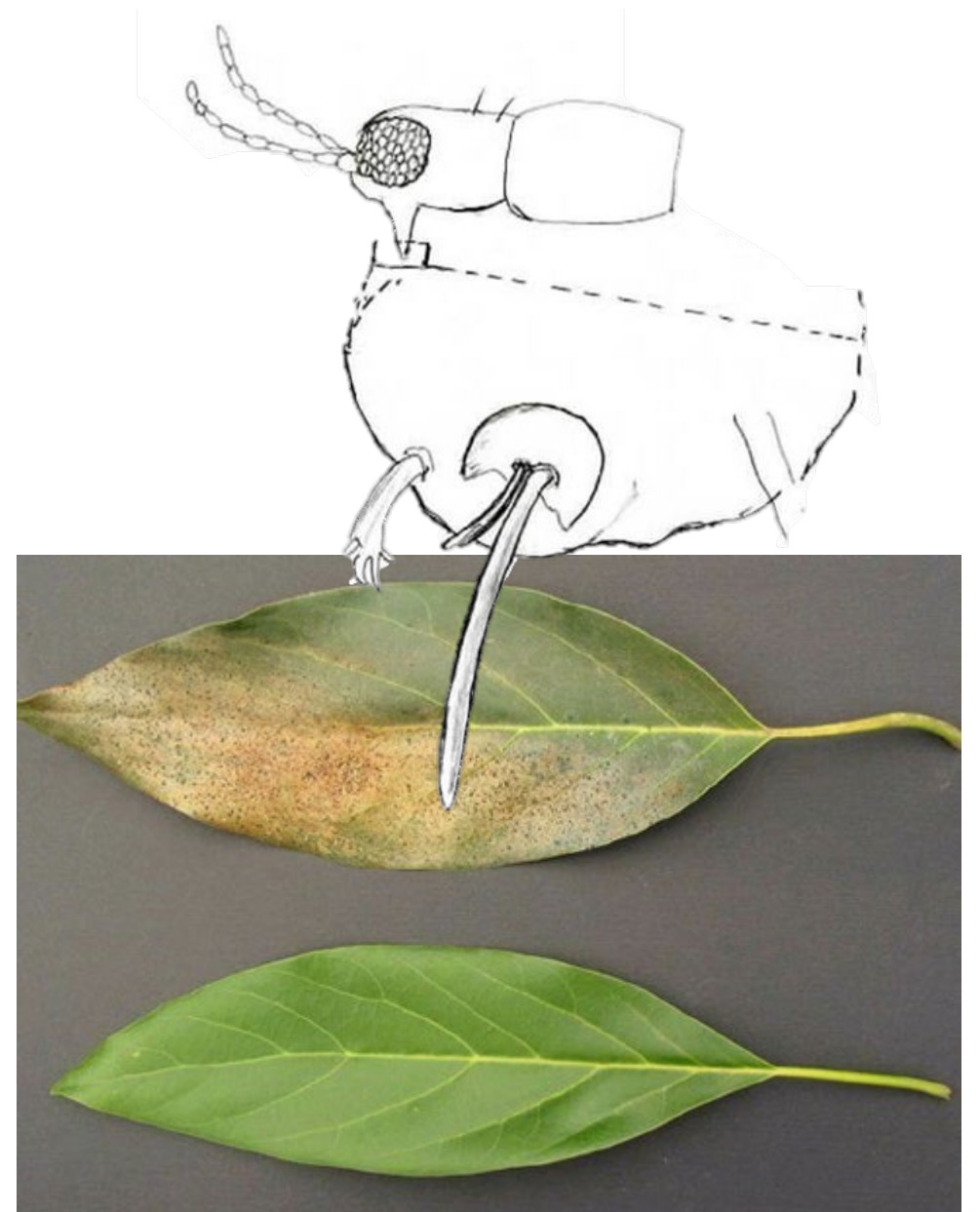
# WHAT WE ARE TALKING ABOUT TODAY

Review a million small pests

Review a million small predators

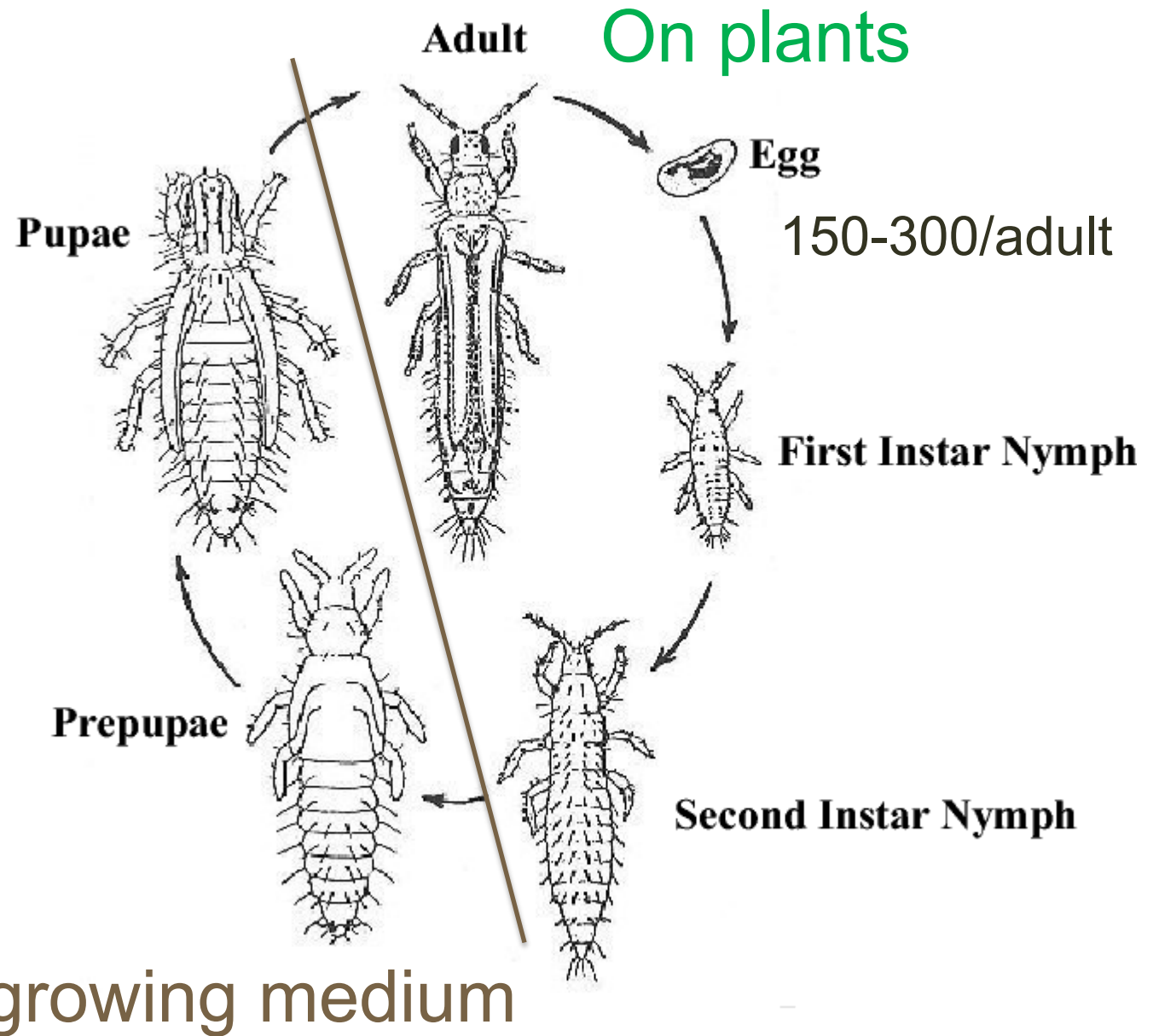
# THRIPS

- Multiple species
- Small
- Fast lifecycle
- Rasping mouthparts
- “Bronzing”, distortion
- Vector viruses



# THRIPS LIFECYCLE

- Depending on species, eggs to adult lifecycle takes ~2 weeks



# WESTERN FLOWER THRIPS

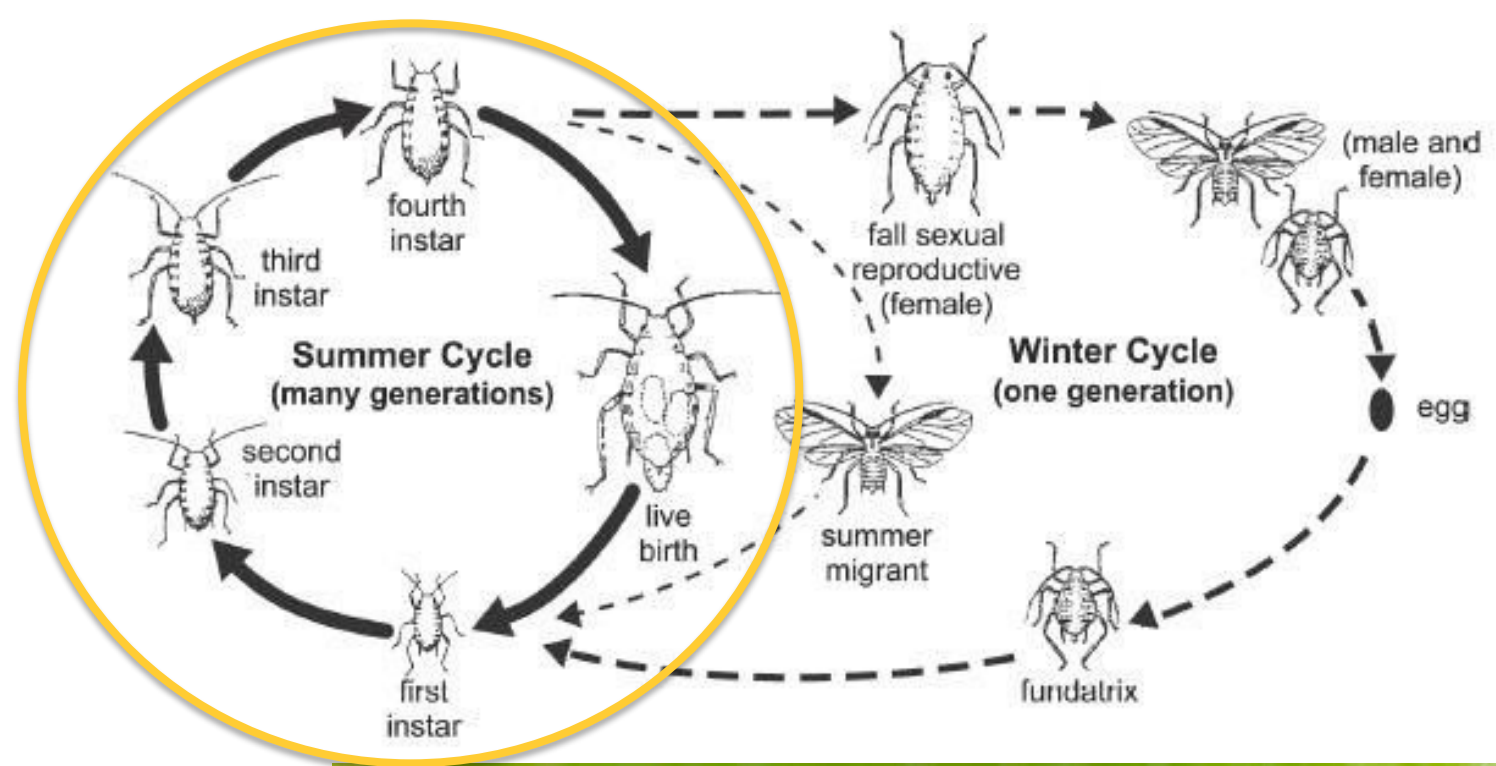
- Yellow
- Vector impatiens spotted wilt virus





# APHIDS

- Many species
- Small
- Fast reproduction
- Feeding damage and honeydew
- Can transmit viruses





Chrysanthemum  
Aphid



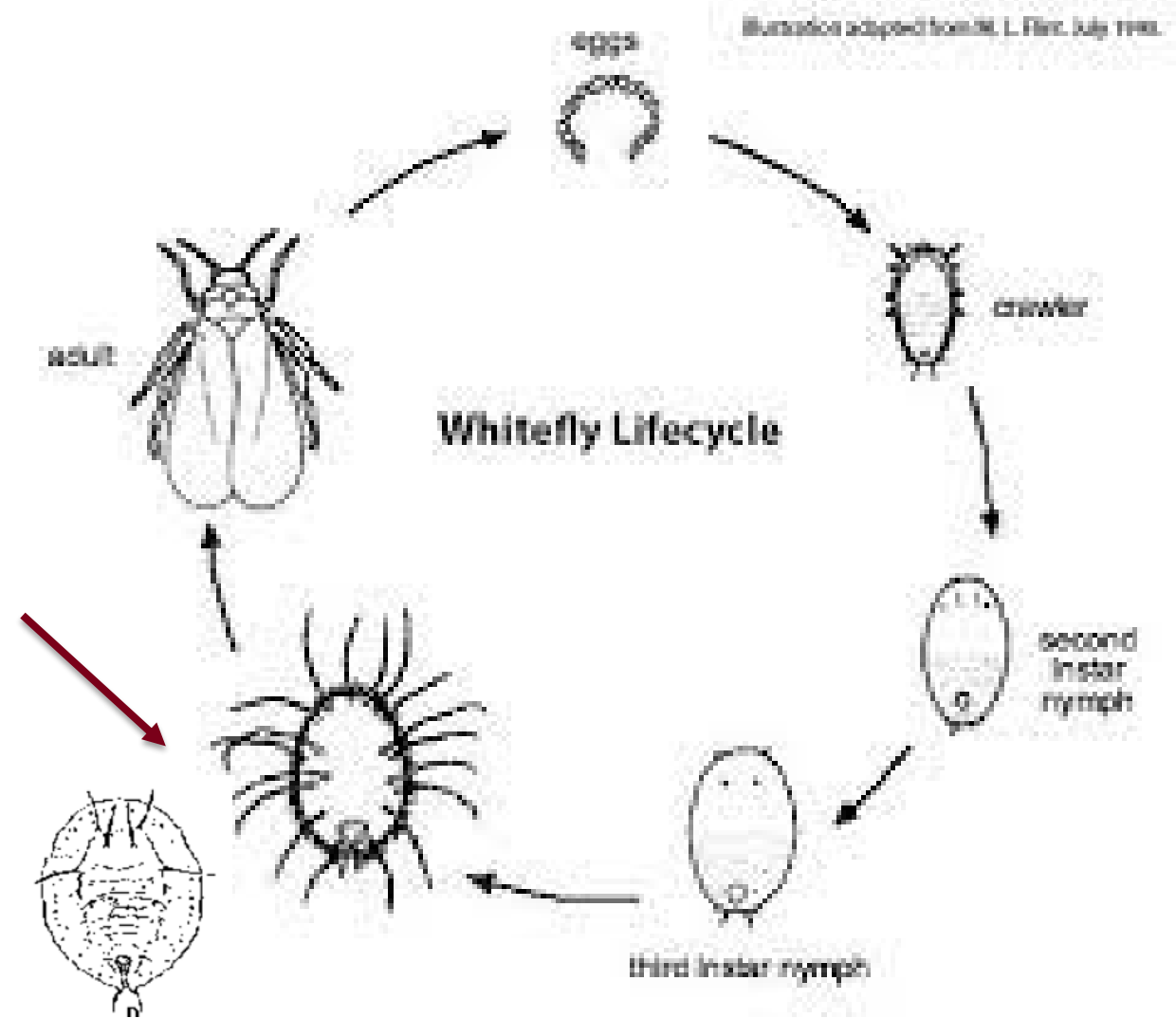
Peach Aphid



Cotton/Melon  
Aphid

# WHITEFLIES

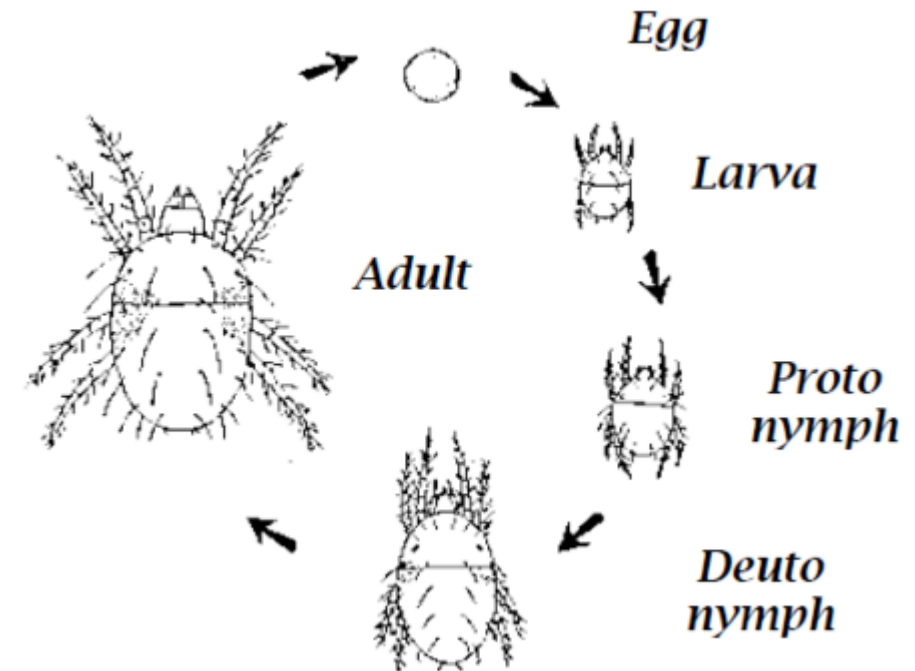
- Adults
- Honeydew, sooty mold
- Can vector some diseases
- Species can be told apart by last nymph instar
- Issue on poinsettia





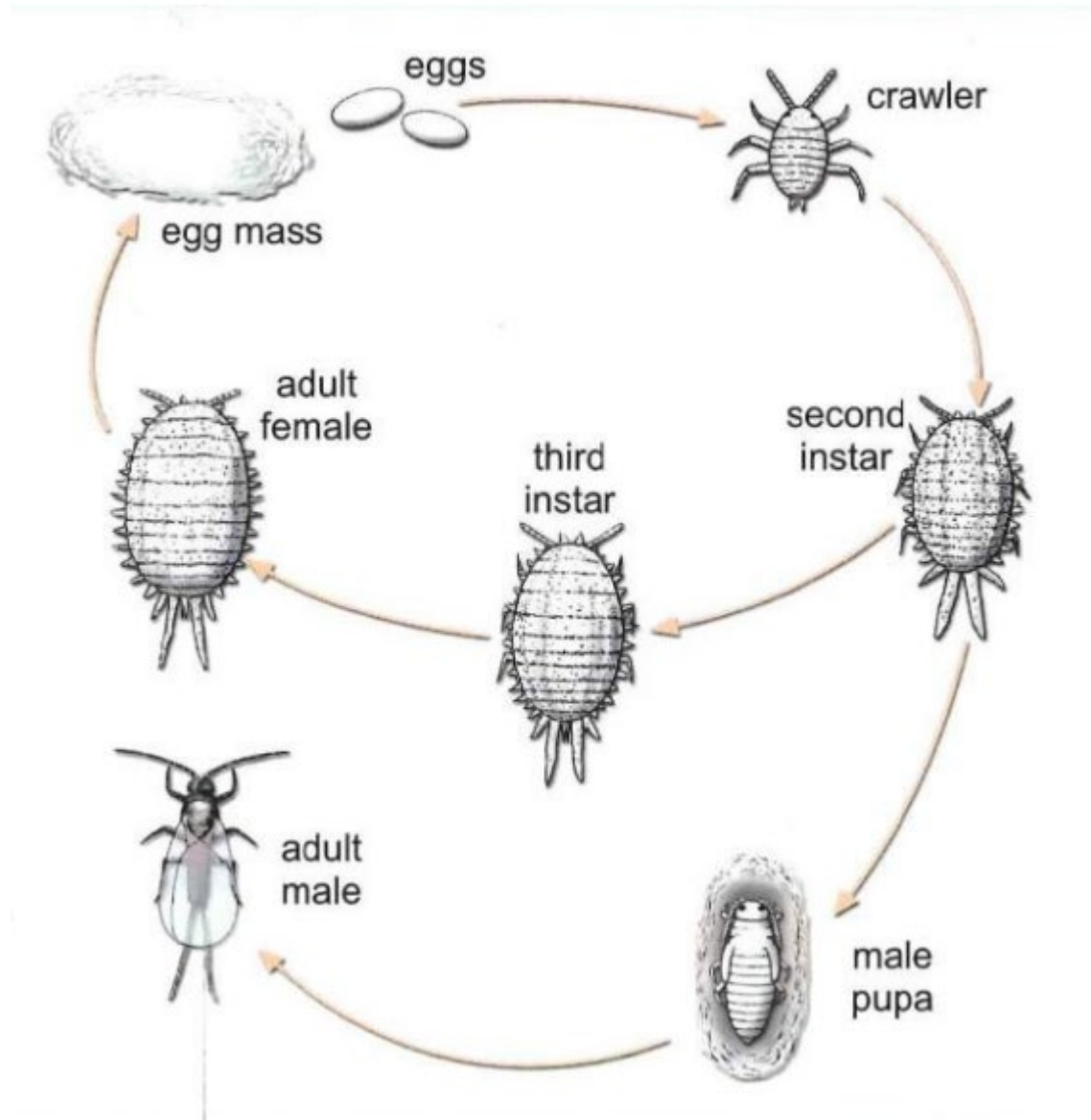
# TWO SPOTTED SPIDER MITES

- Stippling, webs
- Bronzing, yellowing



# MEALYBUGS

- More mobile than other scale insects
- Secrete honeydew





Longtailed Mealybug



Citrus Mealybug



Root Mealybug

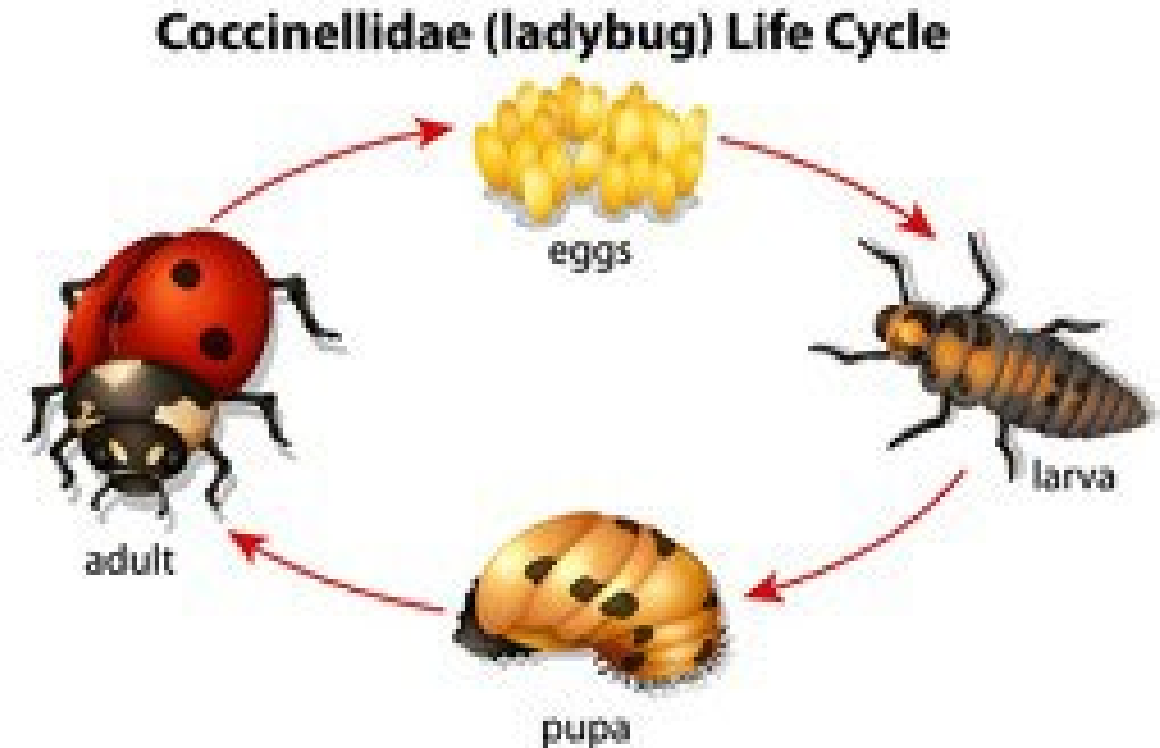
# BIOCONTROL AGENTS

- Predatory and parasitoid insects and mites
- Many individual species available, often target specific pests



# LADYBEETLES

- A couple of species, not all look like a traditional ladybug
- Will see every life stage in crops
- Larval stage is hungriest



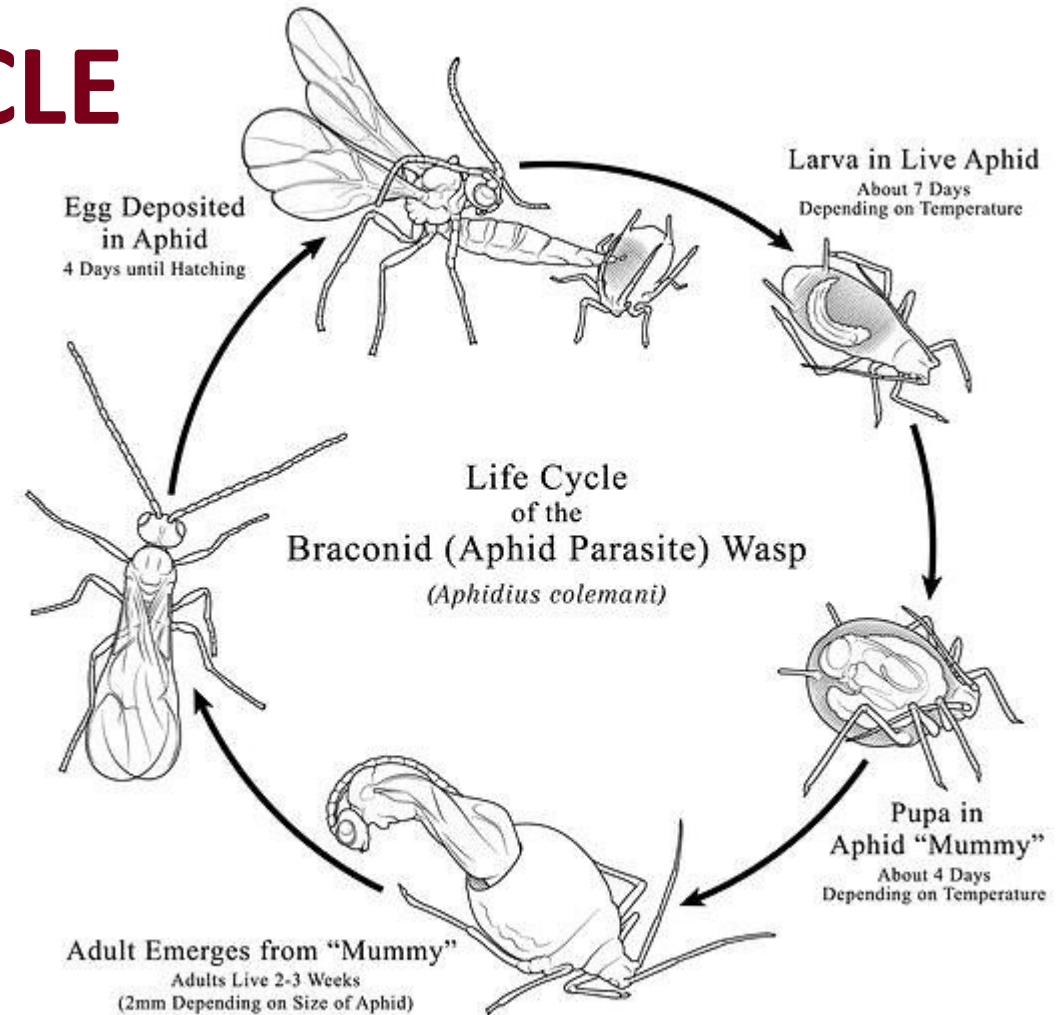


Pieter Bruin



# PARASITOID WASP LIFECYCLE

- Many species that target many pests
- May see adults on flowers
- Can see attacked pests on crops









## Parasitized tomato hornworm with cocoons



## Imported Cabbageworm

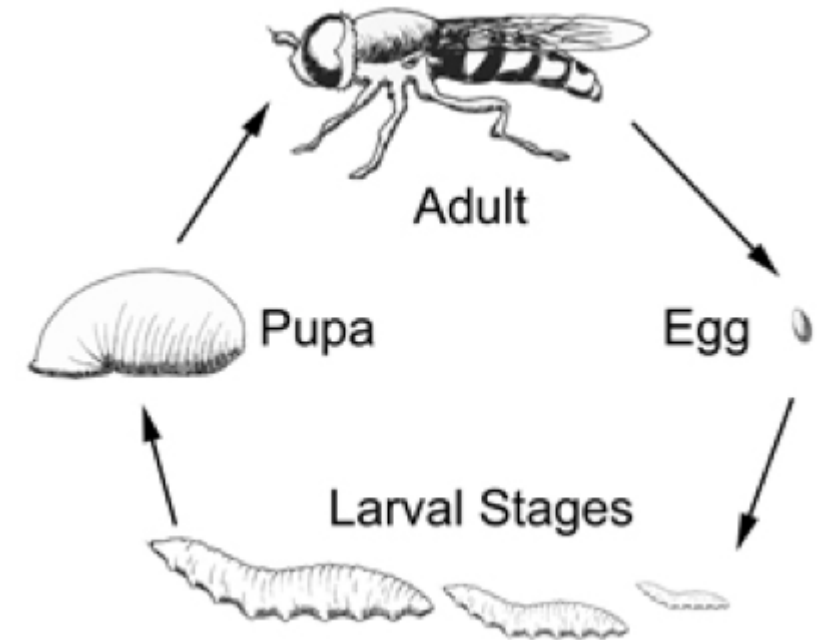


## Aphid "Mummies"



# SYRPHID FLIES

- Adults look like bees
  - “Sweat flies”

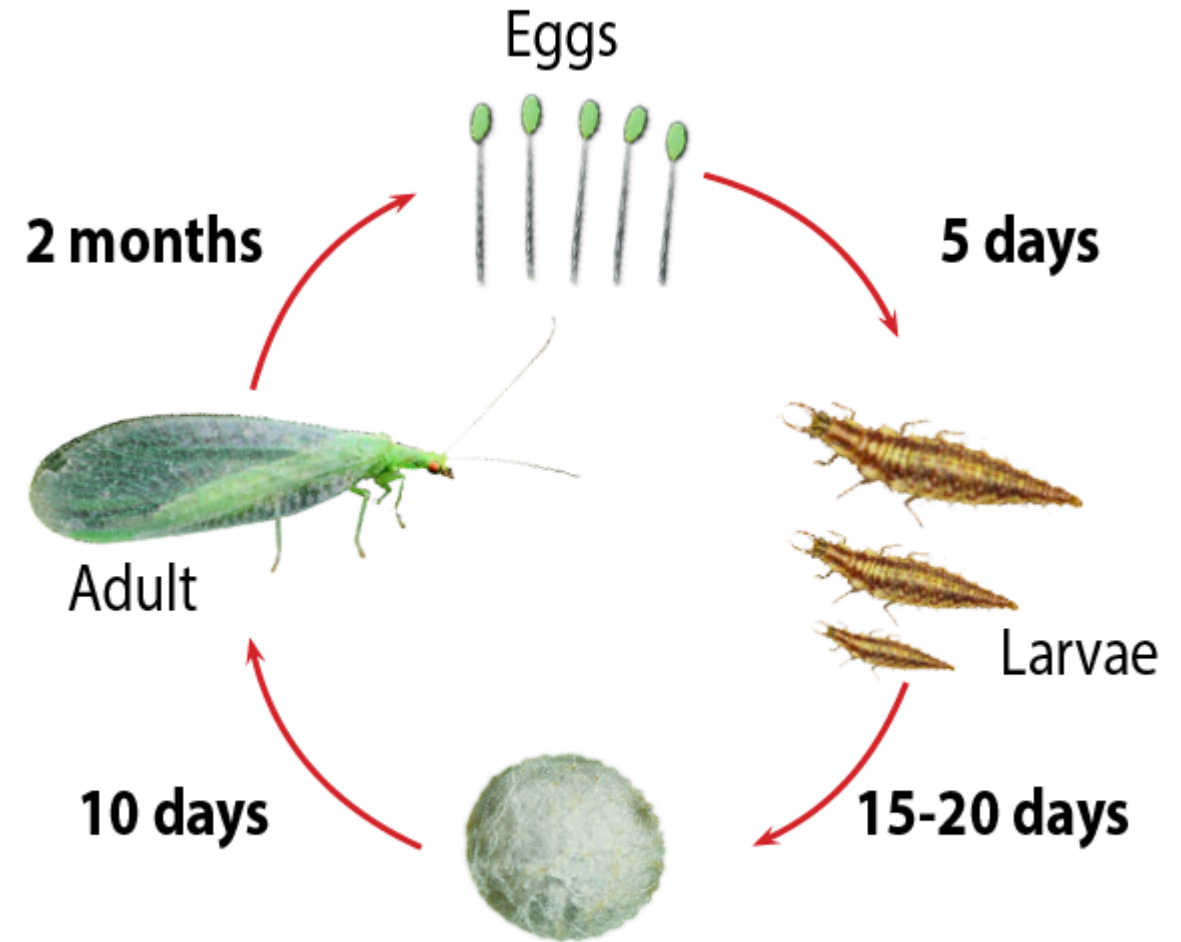






# LACEWING LIFECYCLE

- Can find eggs, larvae, cocoon on crops
- Adults like flowers, lights at night

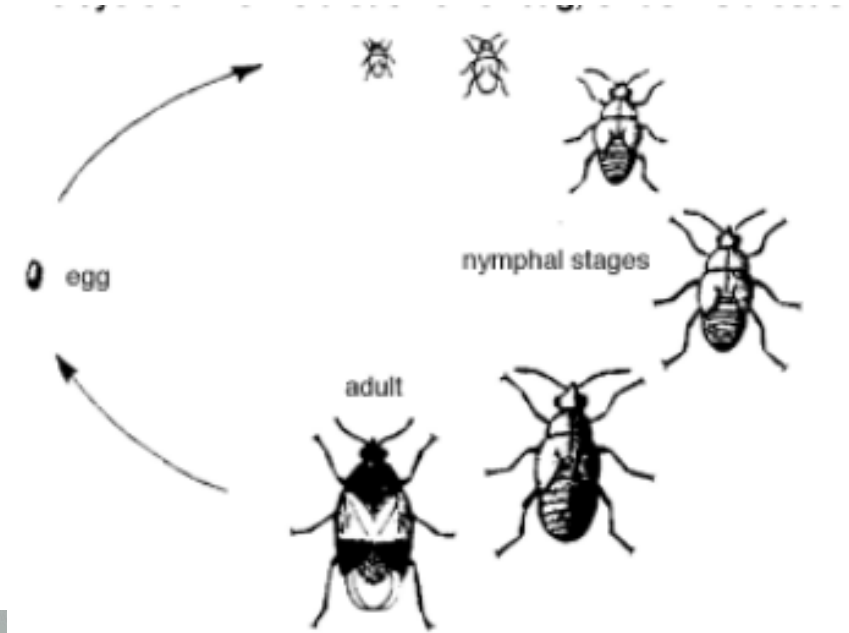






# MINUTE PIRATE BUG

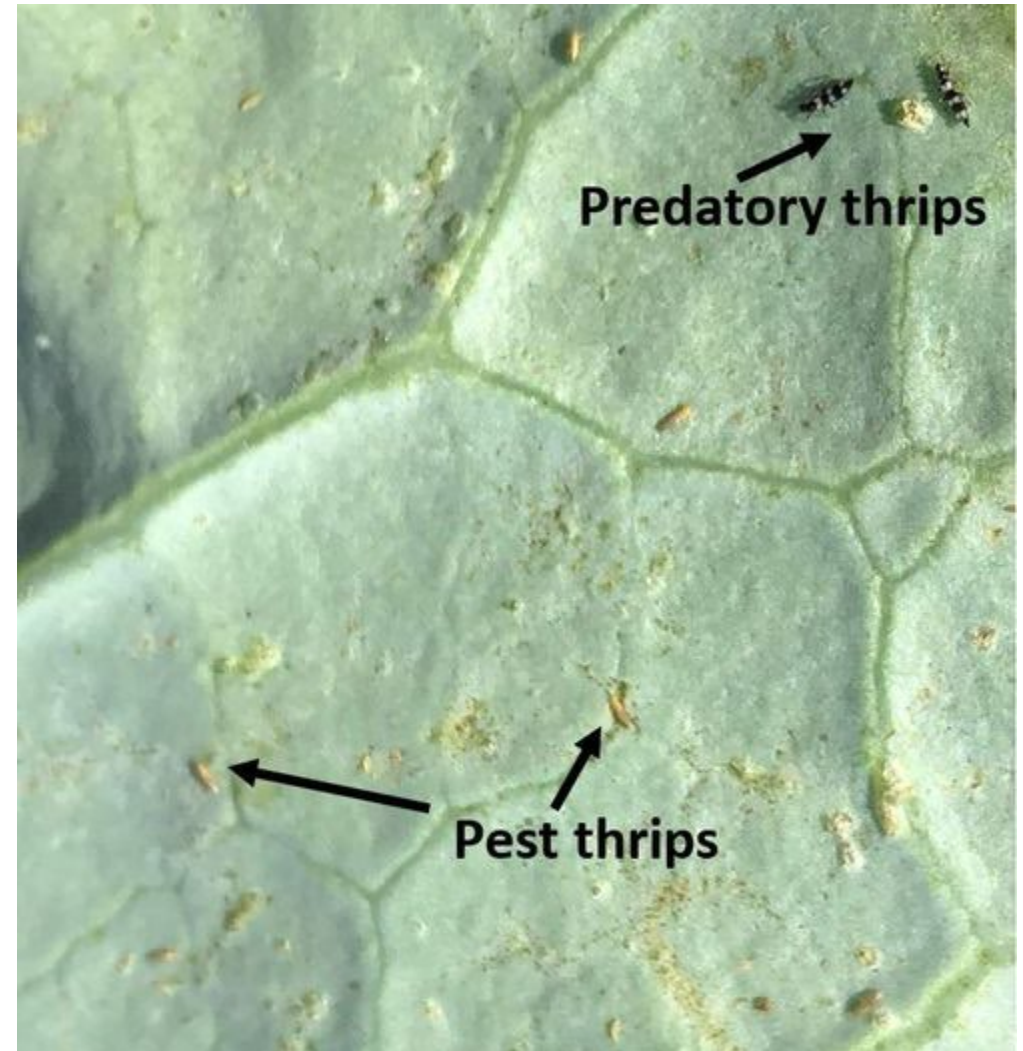
- Adults and immatures are predators
- Very small





# PREDATORY THRIPS

- Often slightly larger, more darkly colored than pest thrips





# PREDATORY MITES

- Different color, behavior than mite pests



# HOW TO MAKE SYSTEMS WORKS

- Understand exact pest species
- Understand extent of pest issues
  - Biocontrol agents need enough to eat
- Understand how biocontrol agents play together



Thank you!  
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