

# Refining IPM Programs for Woolly Apple Aphid Management



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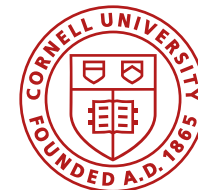
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Cornell AgriTech

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# Overview

- Biology & Life cycle
- Monitoring and Management
- Preliminary Field Trial Results



# Woolly apple aphid (*Eriosoma lanigerum*)

- **Native** to North America
  - First identified in 1842
  - Found in all apple growing regions
  - “American aphid”
- **A weird aphid**
  - Reddish brown-purple
  - Releases solid honeydew– white substance



# WAA: what does it do?

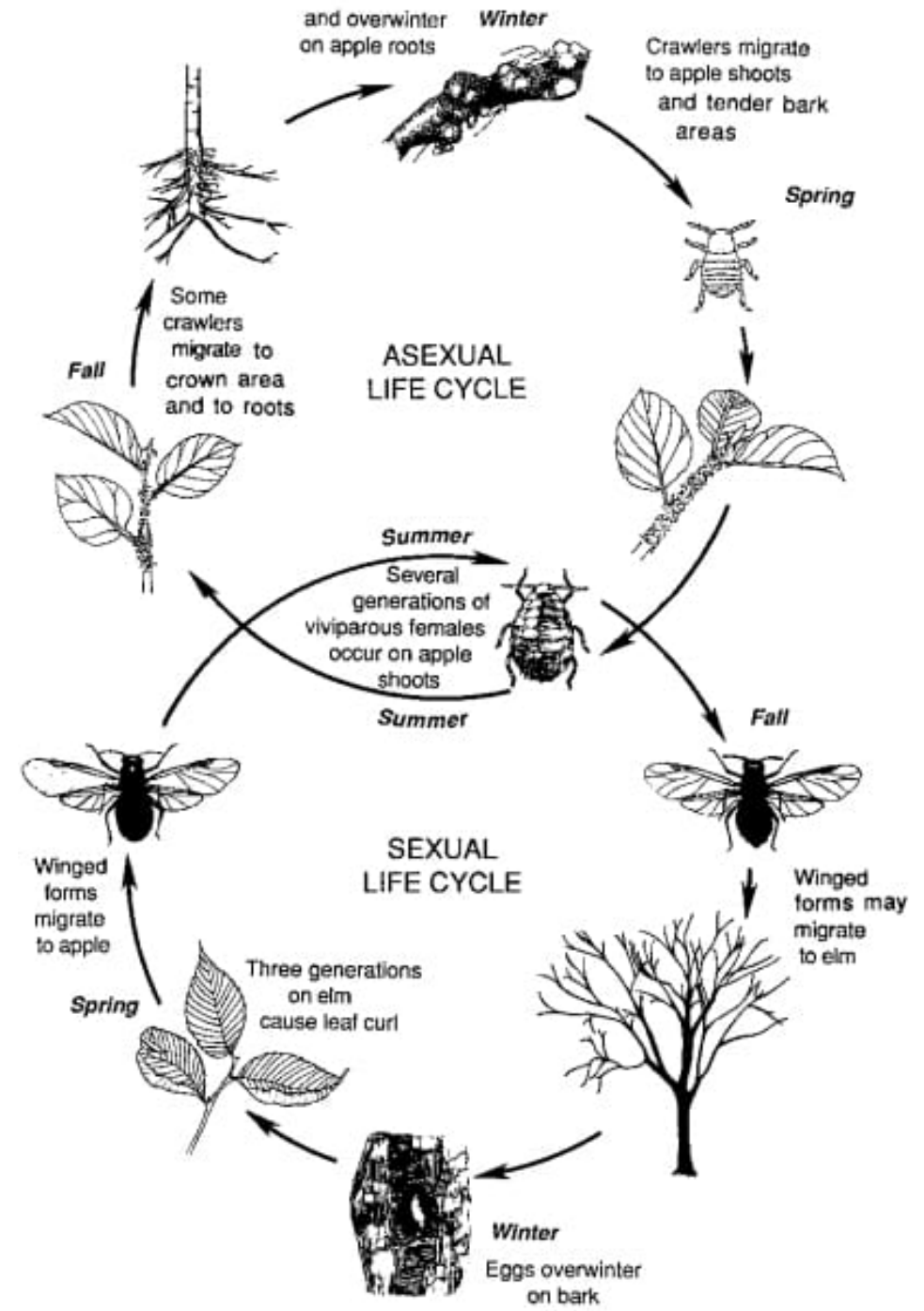
- **WAA attacks almost all parts of the apple – another “weird” trait**
  - Roots
  - Woody aerial parts of the tree such as
    - Shoots
    - Pruning wounds
    - Can be present on fruit on stem or calyx
- **Infestations can hurt tree physiology**
  - **Aerial infestations** can kill nearby fruit and flower buds developing for next year → blind wood with no leaves or flowers/fruit
  - **Root feeding** → root galls → reduced water and nutrient uptake



# WAA Lifecycle

**Asexual lifecycle occurs on apple.**

**Allegedly— sexual lifecycle occurs on elm.**



# Understanding the WAA life cycle for management

- **Goal:** Prevent establishment WAA by catching and eliminating shoot feeding populations.
- Important to catch populations on aerial shoots
  - Physiological damage to the roots is a big concern
  - Infestation will migrate to the roots and cause more long term damage



# Damage if left *untreated* with large populations



# Monitoring for WAA

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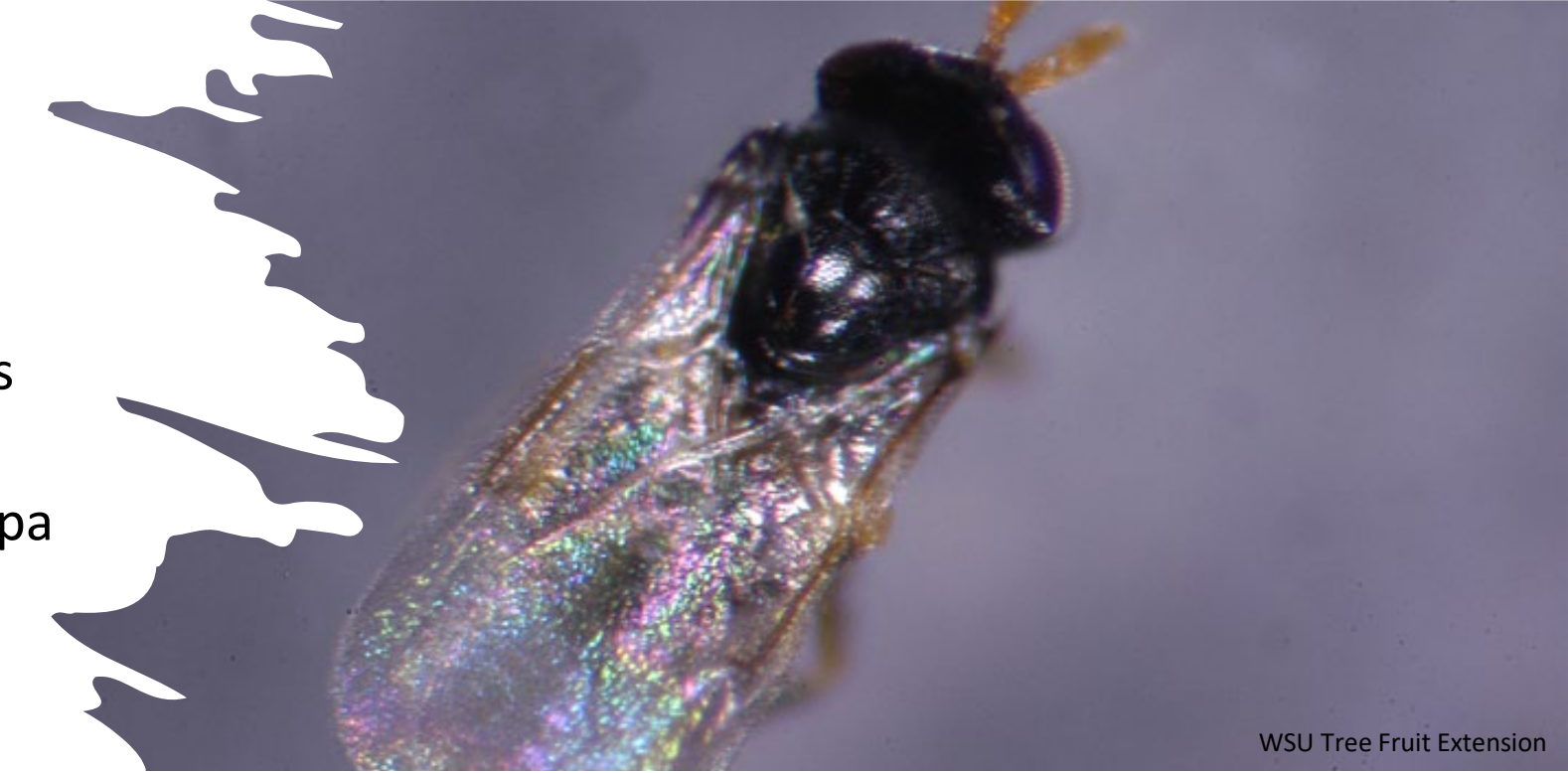
- **Goal:** detection of aphids on shoots
- **Scout:** areas with previous infestation; check perimeter trees; young trees
  - **Mild winter:** start looking *before* mid summer— late may/June
  - If many colonies are in fruiting zone— treatment needed





# Biological control

- *Aphelinus mali* – parasitoid of aphids
- *Overwinters*: full grown larvae or pupa inside a dead WAA
  - *in diapause* from October to March
- *Monitoring*: Look for WAA aphid mummies with circular exit holes
- **2023**: We looked at 1000s of colonies from a single site (commercial orchard)- very very low population.



WSU Tree Fruit Extension



# Insecticide and other treatments

- **Loss of chlorpyrifos** --> no longer one very strong treatment for multiple pests
- **Spray coverage is key to management** with insecticide:
  - 2.5 mph or less
  - Water volume can depend on tree size and density
  - Proper canopy pruning essential on low density, large tree plantings
- Biocontrol can supplement chemical control but not effective enough on its own

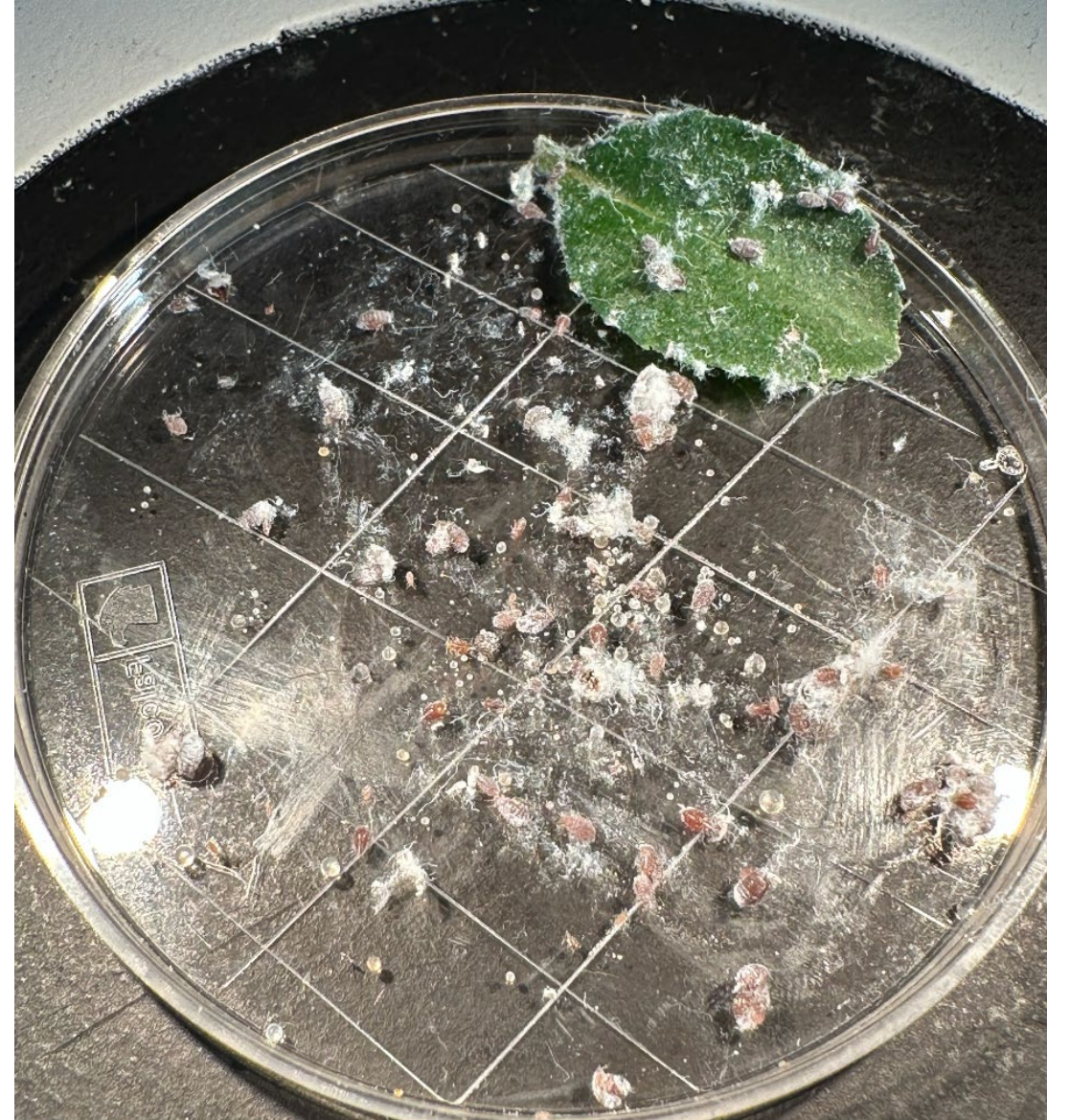


# Treatment options

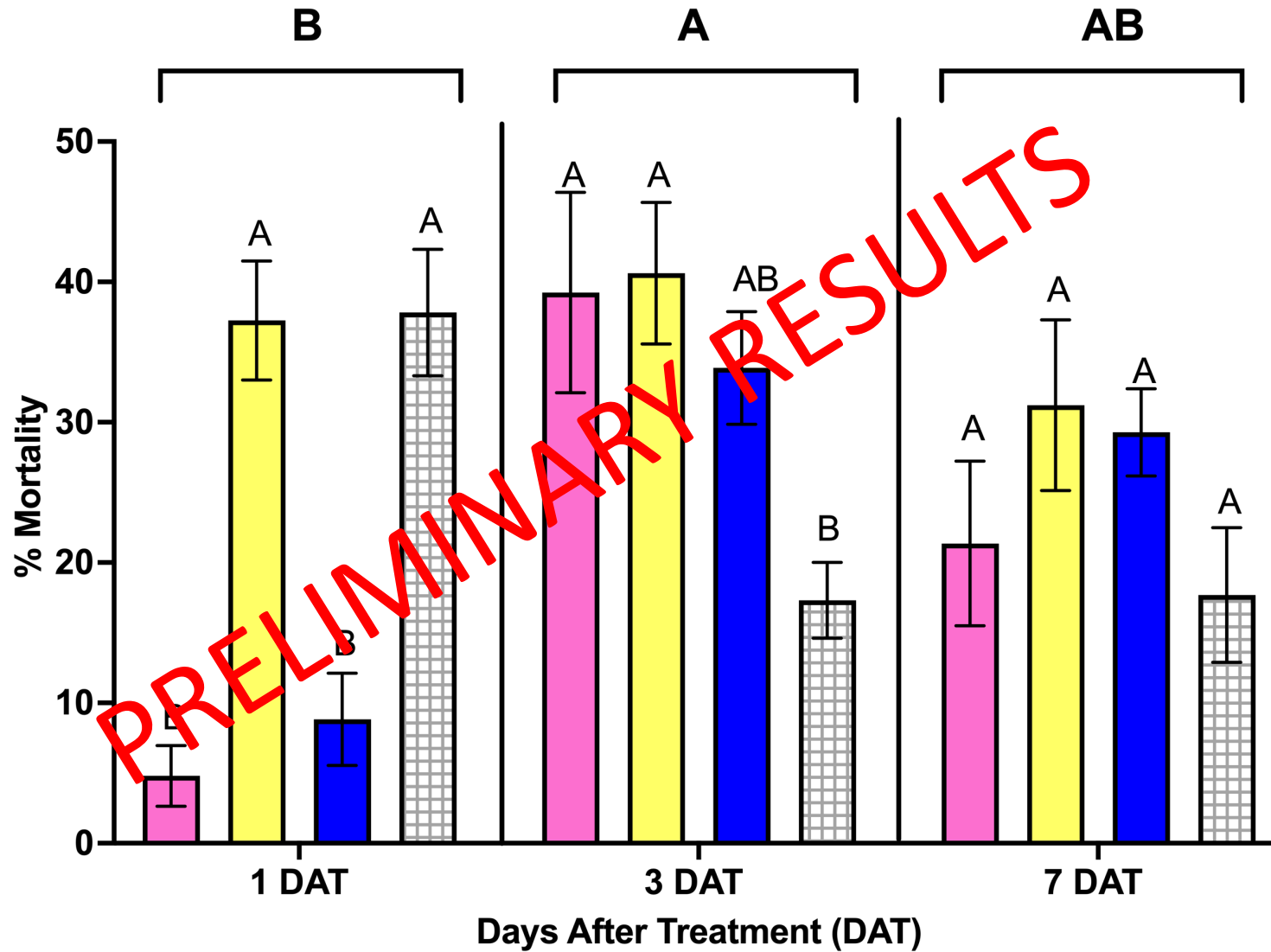
- **Soft insecticides for piercing-sucking insects:**
  - **Movento (Spirotetramat)**- systemic for multiple piercing-sucking pests
  - **AdmirePro & generics (imidacloprid)** (locally systemic for foliar app/whole plant systemic for soil applied\*)
    - soil applied is going to be best for large infestations
    - \*uptake of soil-applied imidacloprid can be interfered with by soil type, more clay = less uptake
  - **Versys/Sefina (Afidopyropen)**– Labeled for WAA Suppression in Pome Fruits
  - ***Diazinon*** –availability unclear for 2024. For large and established populations– organophosphate that can bet detrimental to beneficials; good material if also targeting San Jose Scale

# What do Movento and Sefina look like as recovery products?

- 4 – 8 acre blocks
- Grower's standard application procedure
  - Rears 13' Tower Sprayer
    - 3.8mph
  - Gala on G11, Aztec Fuji on M9
    - 3 X 12 Spacing
- 50 GPA
- **Applied June 22, 2023**
- **Treatments**
  - Movento + 1% Induce
  - Sefina
  - Sefina + 1% Widespread
  - UTC



■ Pink 1- Movento ■ Yellow 2- Versys (Sefina) ■ Blue 3- Versys(Sefina)+Widespread ■ White 4 - UTC



# What might be a worthwhile program to try based on this information?

- **Movento/Imidacloprid** applied **before trees have fully leafed out**
  - more data to come on residuality
  - More information to come on potential for ground applications of imidacloprid (if funded)
- **Sefina** appears to be a good contact product—  
jury is out on: adjuvants, timing
  - The price is right
  - 7 oz/acre, PHI = 7



# What's Next?

- ARDP Proposal in to repeat work to refine WAA recommendations
  - Addressing Water volume
  - Addressing application timing
  - Assessing ground application of imidacloprid
- Working with our colleagues and friends at Reality Research for access to specialized spray equipment