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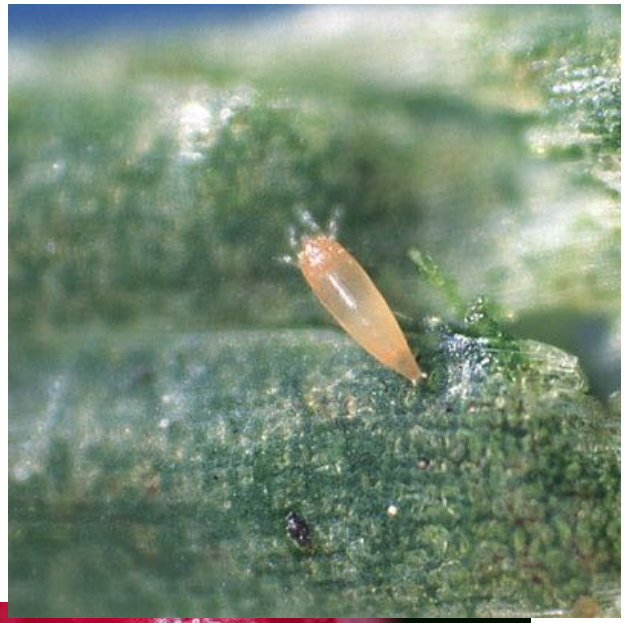
Insect Pest Management for Specialty Crops

Anna D. Howell
Entomologist
UCCE Ventura Co.

Berries

Common Pest

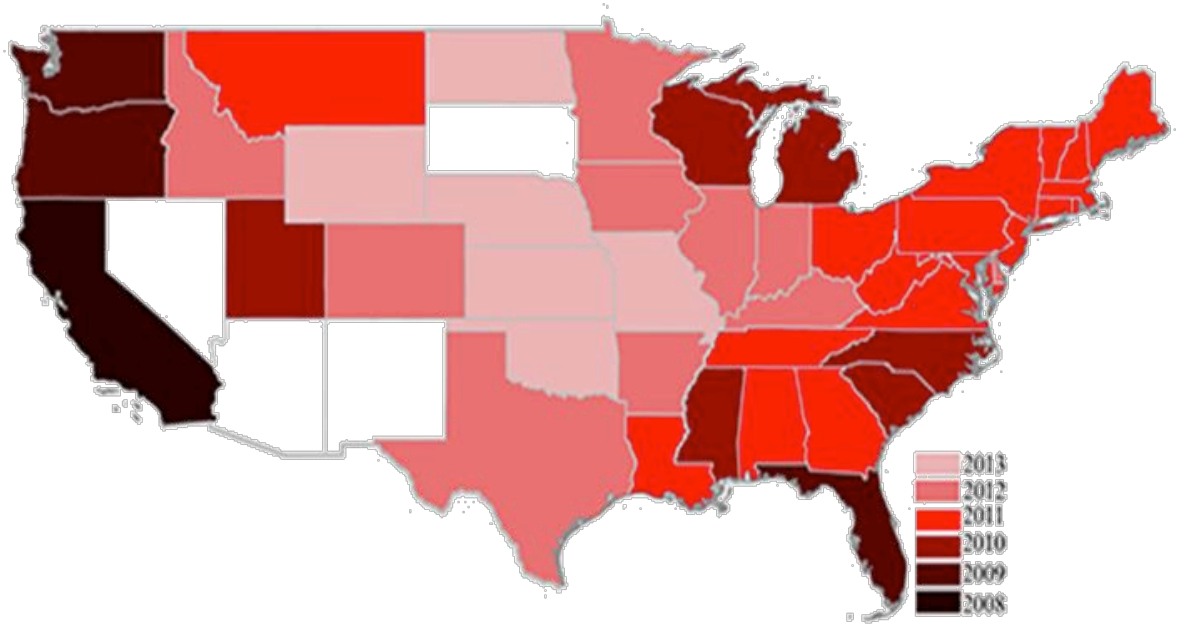
- Spotted Wing Drosophila*
- Thrips*
- Mites
  - Red Berry Mites*
  - Spider Mites



Spotted Wing Drosophila (SWD)

The Basics

- *Drosophila suzukii* (Vinegar fly)
- Vinegar fly (Drosophilidae) NOT a fruit fly (Tephritidae)
- Found in CA in 2008

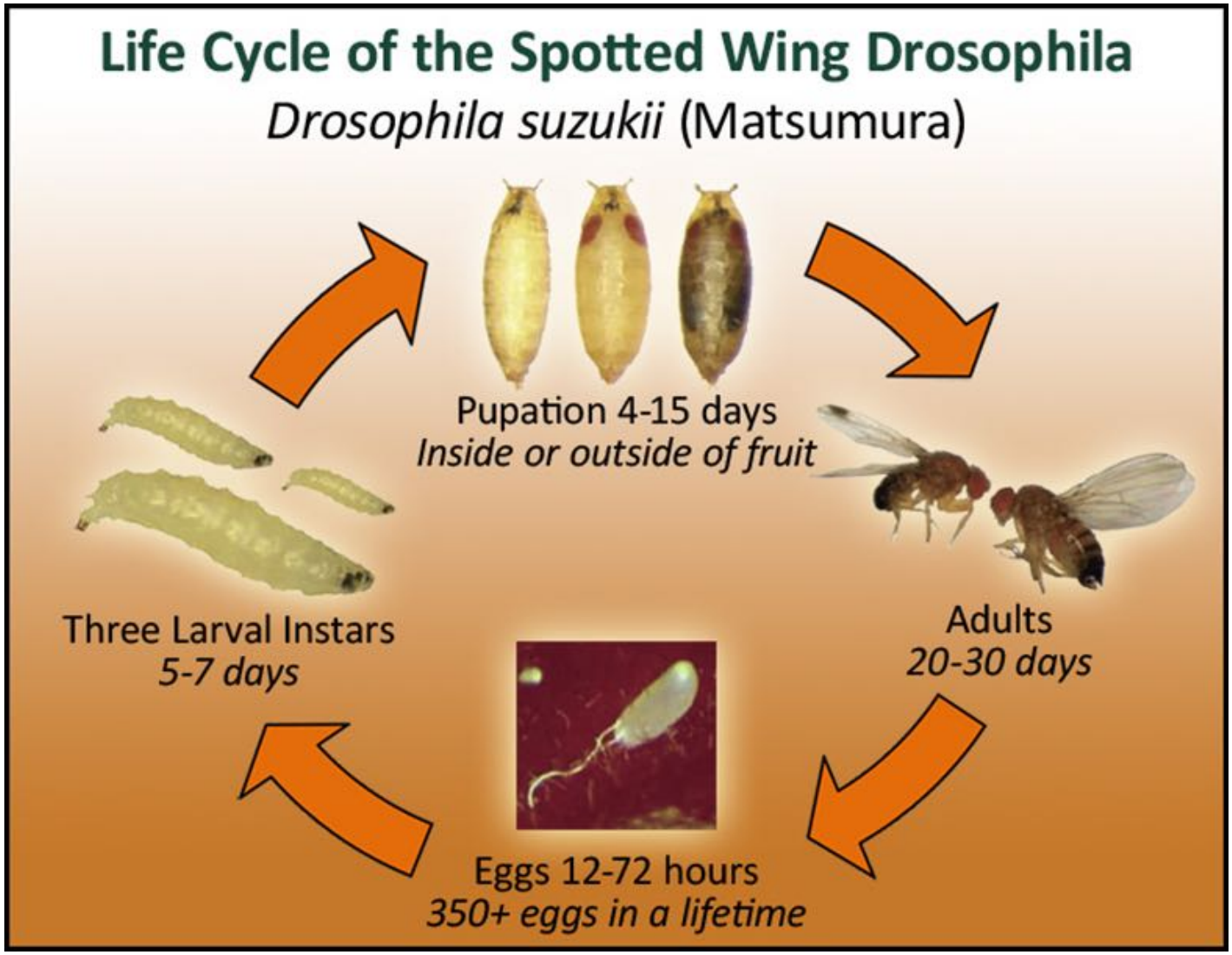


1/8 – 1/16”

Female has a dark serrated ovipositor


Photo by G. Arakelian

Larvae are small (0.13”) “maggots”
Feed inside the fruit. Pupate inside or outside



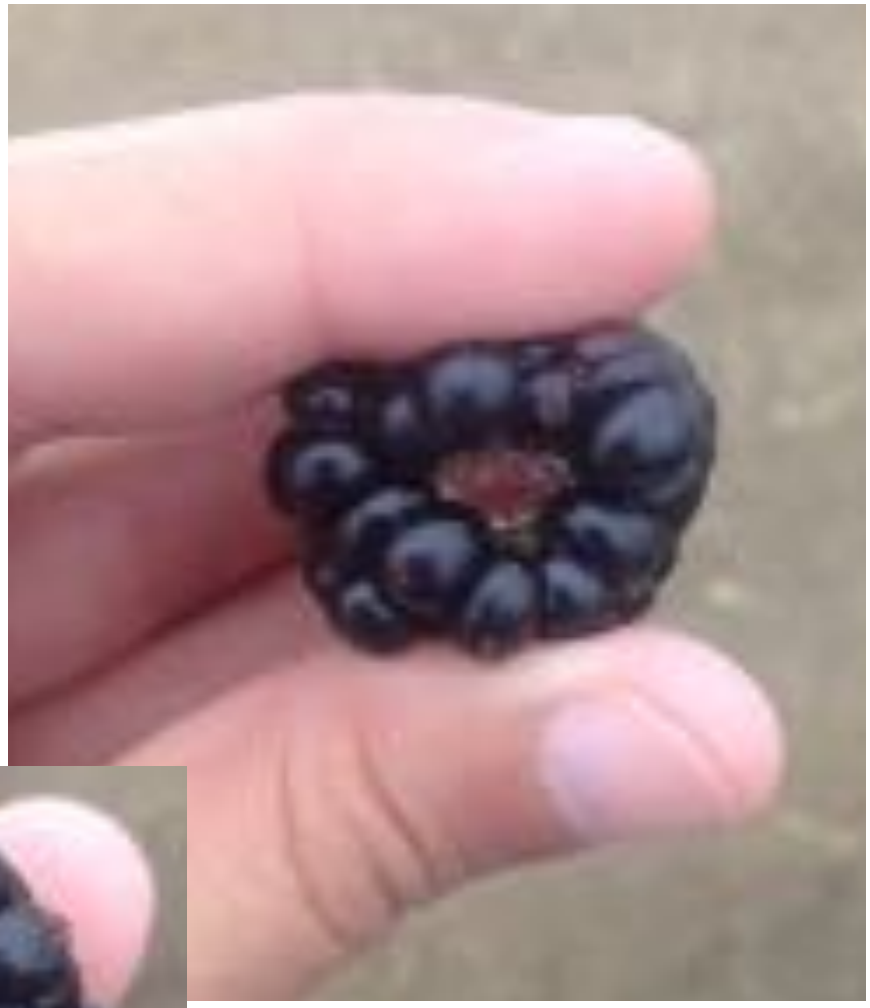
Most active at 60-80 °F

Activity decreases ≥86 °F

10 + generations per year

Damage

- Attacks ripening healthy fruit before harvest
- Larvae feed on the inside causing it to become mushy and brown on the outside
- Can also cause secondary infections
- Fruit with maggots inside is hard to sell
- U-Picks have reported >50% loss



Monitoring

- Apple cider vinegar traps
- Check traps weekly & change out every 2-3 weeks

Management

- No biological control (so far)
- Organic methods: Spinosads
  - Oils do not work
- Conventional: See UCIPM website for chemical control
  - Always consult label for rates and timing restrictions
- Timing is crucial. Need to get adults. Multiple sprays may be required

Prevention

- Sanitation is key to prevention
- Harvest old fruit
- Do Not throw old/bad fruit on the floor
- Keep your fields clean of rotting or overripe fruit.

- Sanitation can decrease populations substantially!!

Thrips


UC Statewide IPM Project
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Identification

Western Flower Thrips

Brown, orange, yellowish

Abdomen extends beyond wings

Frills on wings

Citrus Thrips

All stages are yellowish (pale white/orange)

Abdomen is short & stout

Wings extend beyond abdomen

Damage

- Western Flower Thrips
  - Feed on strawberry and cause scaring on the skin
  - Will also feed on blossoms causing browning of stigmas & anthers
  - Rarely cause damage on coastal blueberry

Damage

- Citrus Thrips
  - Mainly pest in SJV bluberry
  - Feed on growing tip of shoots and leaves
  - Cause stunting, scaring, leaf curling

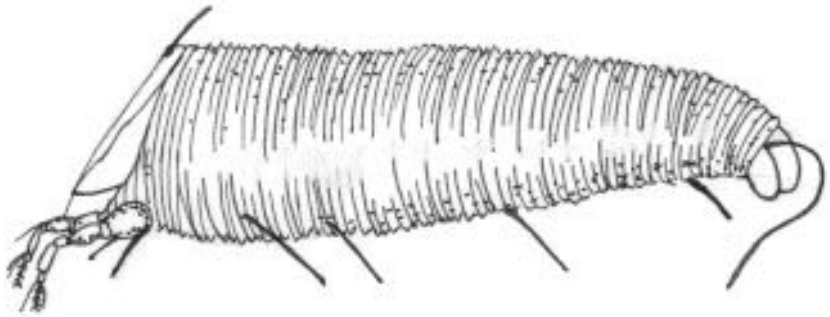
Monitoring

- Beat plants/blossoms and count the number of thrips
  - Sample when cool. Adults active in warmer temps.
  - Strawberry: Treat if >10 thrips per blossom
  - Blueberry: Tap new growth onto dark paper (10+ samples). Treat if you average 25-30 thrips per beat sample

Management

- Minute pirate bugs in strawberry
- Lacewings, predatory mites
- See UCIPM website for chemical control
  - Always consult label for rates and timing restrictions
- Some sprays can disrupt biological control. Only treat if necessary.
- If using a spinosad, timing of spray may change if SWD is present. Try to treat both at the same time.

Redberry Mite



Description

- Eriophyid mite
  - Very small (need 20x handlens)
  - Adult is whitish & wormlike with 2 pairs of legs
  - Overwinter in bud scales or leaf axils and eventually move deep to flower buds into developing drupelets

Damage

- Affected drupelets do not develop correctly
  - Remain hard and red
  - Significant populations can cause economic loss if not treated

Management

- Horticultural Oils (Recommended)
  - Golden Pest Spray Oil (1.2% - 2% v/v)
  - Spray before you see damage
    - 50% flowering and some green fruit appearing
    - Apply 2-3 more times, 10-14 days apart
    - Apply in min. 50 Gallons per acre
  - Always consult the label

Pitahaya

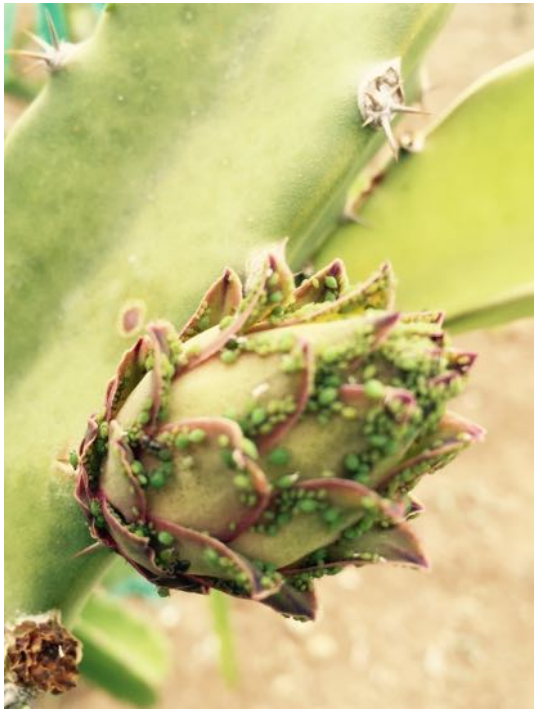
Has little pest problems compared to other major economic crops*…but are not pest free*

Reported Pest

- Mites
- Thrips
- Ants
- Beetles
- Borers (*Diatrea*)
- Hemiptera (many)
- Fruit flies
- Moths
- Slugs

Ants

- Honeydew feeding ants like Argentine ants
- Feed on sap from the fruit & may cause blemishing
- Associated with honeydew secreting scale



Management

- Boric acid bait stations (Gourmet)
  - Sweet bait to attract honeydew feeding ants
  - Follow the label!

Scale Insects (Hemiptera)

Red Scale

Brown Scale

Armored Scale

- 'Scale' can be separated from body, with distinct nipple
- Produce no honeydew
- Inject toxin into plants

Soft Scale

- 'Scale' is part of body, can't be separated
- Protective covering looks homogenous
- Smooth, cottony, waxy covering
- Produce honeydew

- Piercing-sucking mouthparts
- Weakens the plant
- Honeydew producers attracts ants
  - Ants will protect scale insects from natural enemies

Management

- Horticultural oils or soaps
  - Follow label
- Manage ants so natural enemies can control scale
- Crawlers are easier to manage

Mealybugs (Hemiptera)

- Piercing-sucking mouthparts
  - In high populations, can slow growth & cause die-back
- Small soft-bodies insects (0.05-0.2”)
- Have a waxy covering with filaments around the body
- Secrete honeydew
  - Sooty mold
  - Ants

Management

- Waxy coating protects them from insecticides
  - Insecticidal soaps or petroleum oils can break it down
  - Follow label!
- Neem oil
- Pyrethrins
- Manage ants for natural enemies

Management

- Horticultural oils or insecticidal soaps on small larvae
- Spinosads
- Bt for the larvae of Leps
- Pheromone traps/lures

Successful Management

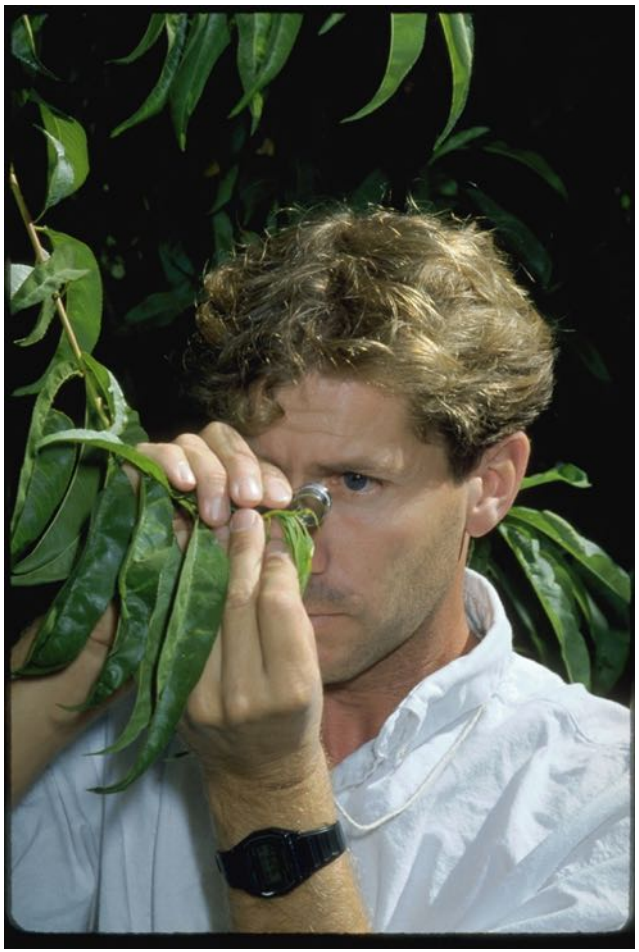
- Prevention

- Prevention

- Prevention

- Be vigilant with monitoring & scouting
  - Will allow you to catch and infestation before it gets out of hand
  - Use direct or indirect sampling methods
    - Sample plants
    - Sticky cards, double sided tape, pheromone traps/lures
- Develop a monitoring program
  - Allows you to determine appropriate control actions
  - Create a history record for that area/crop

- Monitoring program should include:
  - Location & crop
  - Sampling methods used, who sampled, how many plants were inspected
  - Any pest seen, stage, abundance, & damage
  - Other info. You think may help (variety, fertilizers used, irrigation, etc)



- Know your pests, how to control & what stage to best control, lifecycle

- Cultural control
  - Good sanitation
  - Remove weeds in and around the location
  - Keep plants healthy
  - Know what is around

Questions