Flat Mites

What they are, pathogen associations, and management in other countries

Daniel Carrillo, UF/IFAS TREC

- Flat mites = Family Tenuipalpide (891 spp.)
- Genus *Brevipalpus* = 289 spp.
- Mainly in tropical and subtropical areas
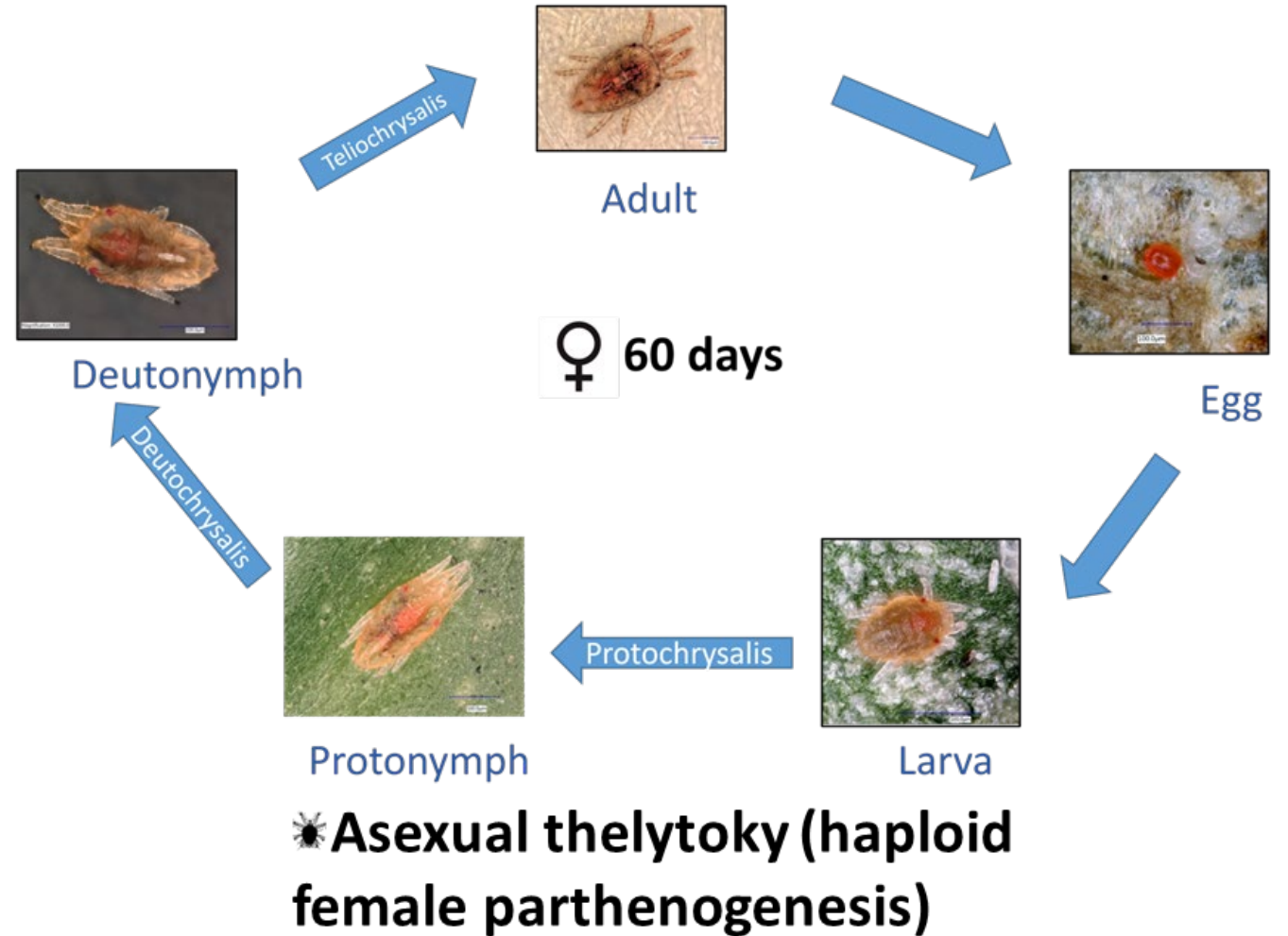- Some species transmit viruses
  - *B. californicus*   **Presumed primary vectors of citrus leprosis**
  - *B. yothersi*
    - *B. obovatus*
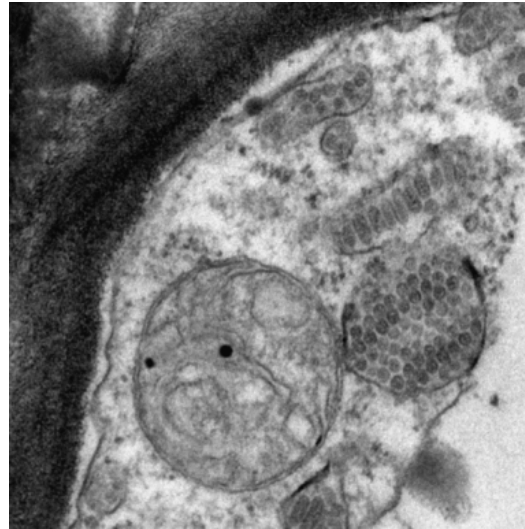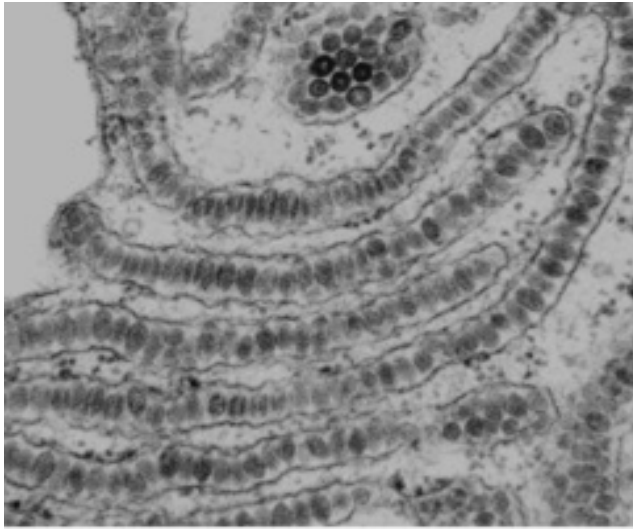   - *B. phoenicis*
    - *B. papayensis*
    - *B. tucuman*

Brevipalpus yothersi

- Long life cycle

- Eggs in crevices of fruit, stems, and lesions

- Larvae - 3 pairs of legs

- Nymphs - 4 pairs of legs

- Adult - flat and relatively long lived

Teliochrysalis → Adult → Egg

♀ 60 days

Deutonymph ← Deutochrysalis ← Protonymph ← Protochrysalis ← Larva

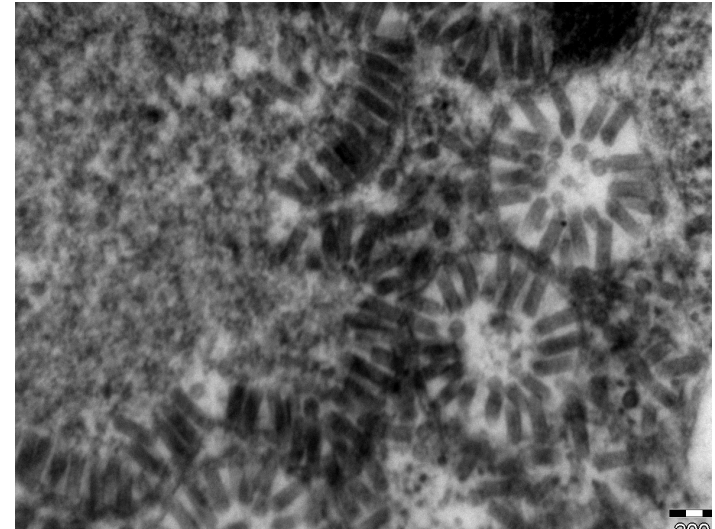🕷 **Asexual thelytoky (haploid female parthenogenesis)**

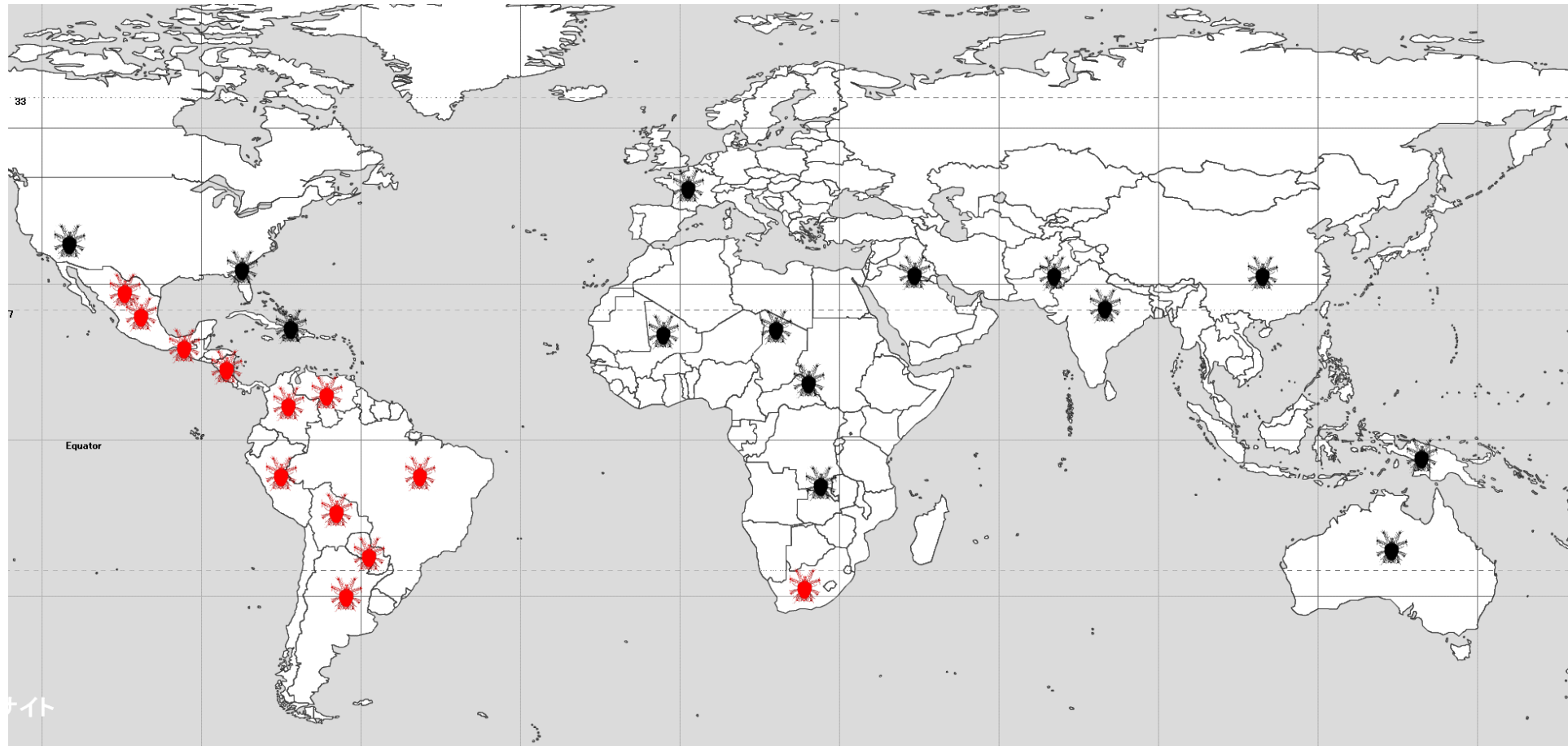# *Brevipalpus* mites and their transmitted viruses

Family: Kitaviridae
Cytoplasmic type: Cilevirus

Family: Rhabdoviridae
Nuclear type: Dichorhavirus

Brevipalpus mites are distributed worldwide

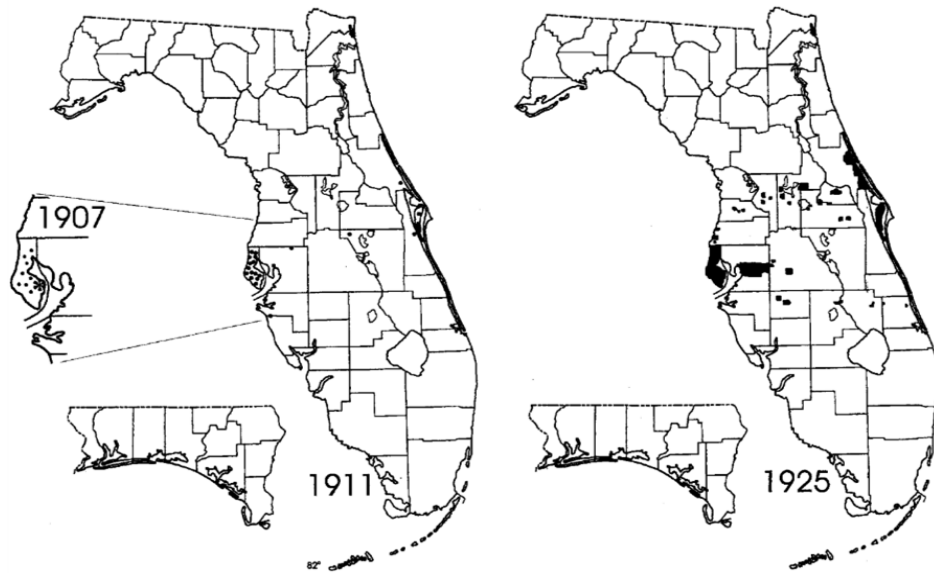**Leprosis is restricted to the Americas & South Africa**

Damage

- Fruit blemishing
- Fruit drop
- Excessive leaf drop
- Dieback of shoots

Citrus leprosis existed and caused major damage in Florida in the late 1800's and early 1900's, causing at the time 50-75% losses by fruit drop

Recently, two of three main viruses known to cause leprosis were found in ornamentals in Florida
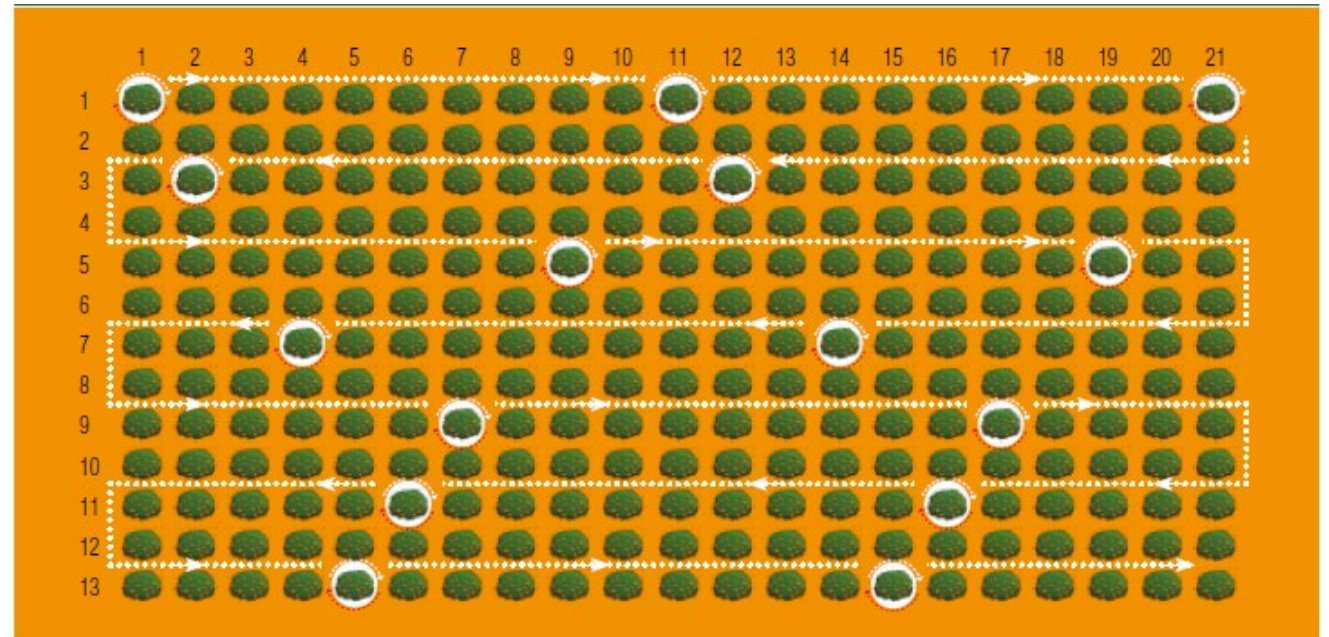
- Two strains of Orchid Fleck Virus (OFV-Orc1 and OFV-Orc2) infecting *Liriope* spp., *Smilax* spp., *Pandanus* sp. and *Aspidistra* spp.

- Hibiscus infecting cilevirus (CiL C2H)
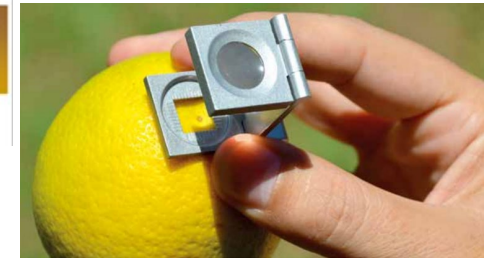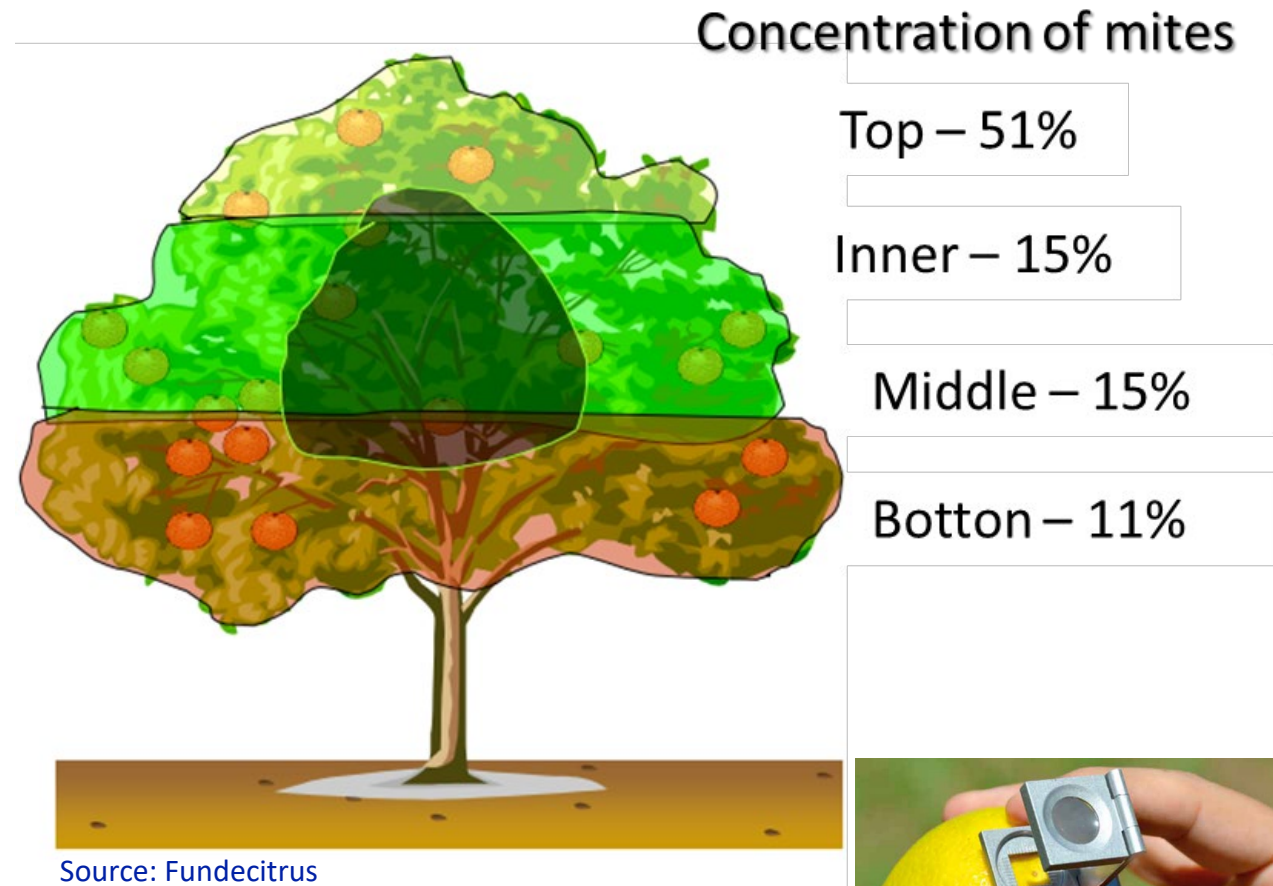
UF|IFAS
UNIVERSITY *of* FLORIDA

Monitoring (Brazil)

- 5% of the plants
- One out of every ten trees in alternate rows
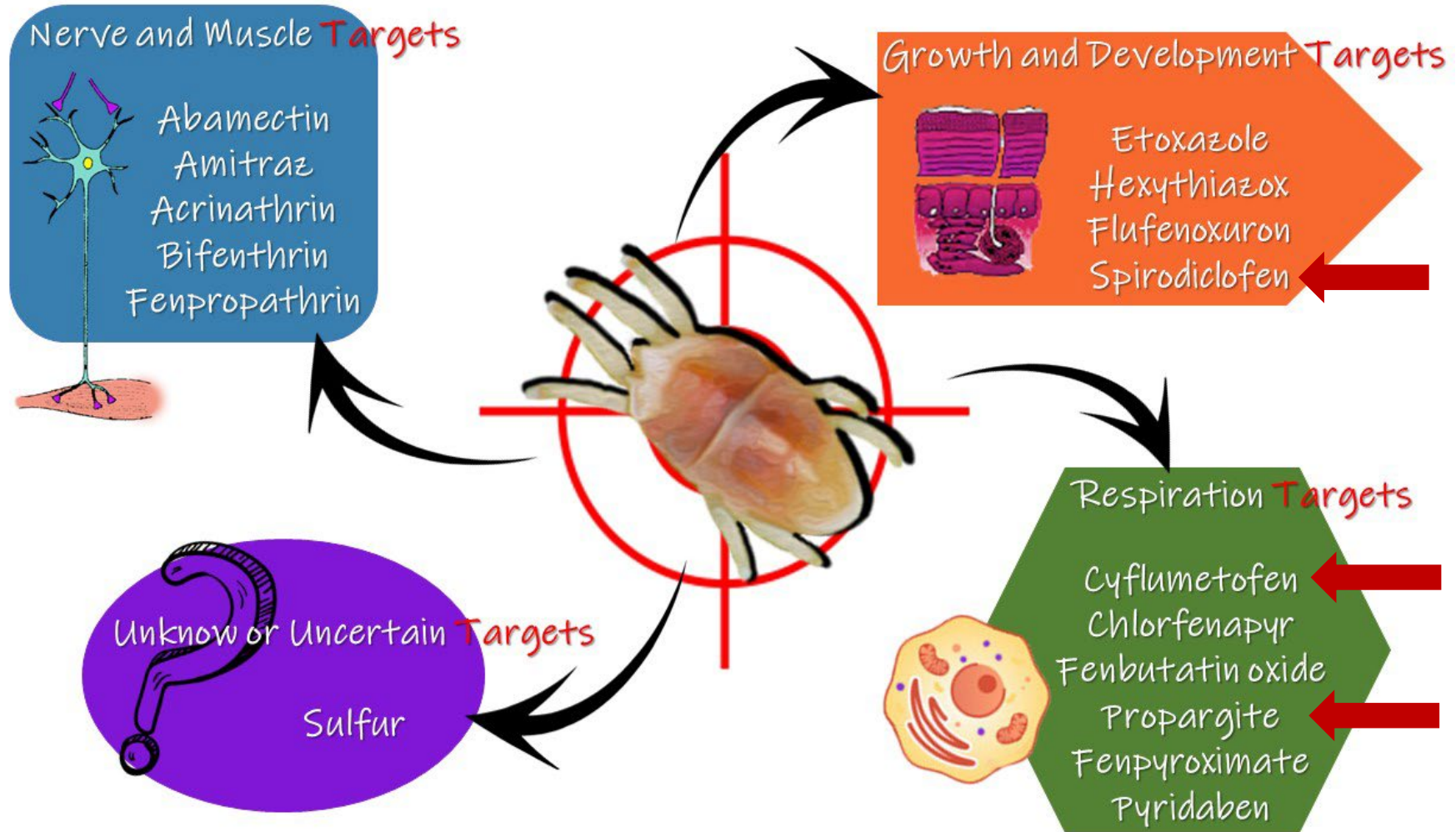- 3 to 5 fruits or branches per plant every 7 to 14 days

Monitoring (Brazil)

- Ripe fruit more than 3 cm in diameter (with scab)

- In the absence of fruit, inspect the branches in the first 30 cm from the tip

- Action threshold: 1 to 5% of the fruits and/or branches have mites

Concentration of mites

Top – 51%

Inner – 15%

Middle – 15%

Botton – 11%

Source: Fundecitrus

UF|IFAS
UNIVERSITY of FLORIDA

Chemical Control (Brazil)

Nerve and Muscle Targets

Abamectin
Amitraz
Acrinathrin
Bifenthrin
Fenpropathrin

Growth and Development Targets

Etoxazole
Hexythiazox
Flufenoxuron
Spirodiclofen

Respiration Targets

Cyflumetofen
Chlorfenapyr
Fenbutatin oxide
Propargite
Fenpyroximate
Pyridaben

Unknow or Uncertain Targets

Sulfur

Cultural Practices

- Reduce dust
- Promote non-host cover crops
- Control citrus scab and scales
- Disinfest harvesting material
- Sanitation (dropped fruit)
- Pruning

UF|IFAS
UNIVERSITY of FLORIDA

Moving forward in Florida

- Identify viruses and vectors

- Design targeted control strategies

- Biological Control

Biological Control 149 (2020) 104330

Contents lists available at ScienceDirect

Biological Control

journal homepage: www.elsevier.com/locate/ybcon

Potential of predatory mites for biological control of *Brevipalpus yothersi* (Acari: Tenuipalpidae)

Poliane S. Argolo[a], Alexandra M. Revynthi[a], Maria A. Canon[a], Marielle M. Berto[a], Daniel Junior Andrade[b], Ismail Döker[c], Amy Roda[d], Daniel Carrillo[a,*]

UF|IFAS
UNIVERSITY of FLORIDA

Questions?

Thank you!