Plant-feeding mite pests

SEM of adult red palm mite, *Raoiella indica*

Photo credit: Gary R. Bauchan, USDA-ARS Electron & Confocal Microscopy Unit
What are mites?

- Very small arthropods usually with **eight** legs
- Usually live in very specialized habitats
- Live on plants, animals, stored products, soil and water
- Some plant-dwelling mites are beneficial, others cause no visible injury to plants, but some are serious plant pests

Photo credit: Lyle Buss, Department of Entomology and Nematology, University of Florida

Predatory *Mexecheles aztercorum* mite eating a phytoseiid mite nymph
Generalized mite anatomy

- Gnathosoma ("head")
- Idiosoma ("body")
- Legs (4 pairs)
- Pedipalps

Photo credit: Gary Bauchan, USDA-ARS, bugwood.org, #5504732
How mites damage plants

• Break cuticle with mouthparts or suck out plant juice
• Transmit pathogens
• Induce malformed plant parts

Shriveled and dead leaves
Malformed leaves

Citrus leprosis virus damage

Photo credit: shriveled and dead leaves – Wikimedia Commons; malformed leaves - Petr Kapitola, State Phytosanitary Administration, Bugwood.org, #4449059; Citrus leprosis - Carlos Amadeu Leite de Oliveira, Universidade Estadual Paulista, Bugwood.org, #0746010
Mite damage to plants

Leaf stippling caused by two-spotted spider mite feeding

Bronzing on citrus rind caused by citrus rust mite feeding

Photo credits: [Left] Whitney Cranshaw, Colorado State University, bugwood.org, #5369738; [Right] Don Ferrin, Louisiana State University Agricultural Center, bugwood.org, #5473733
Mite damage to plants

The false spider mite *Brevipalpus phoenicis* transmits *Citrus leprosis virus*, the cause of citrus leprosis disease.

Photo credit: [Left] Eric Erbe, USDA Agricultural Research Service, bugwood.org, #1355019; [Right] Florida Division of Plant Industry Archive, Florida Department of Agriculture and Consumer Services, bugwood.org, #5260041
Mite damage to plants

Erineum mites cause grape leaves to make galls

Tiny erineum mites live within these galls

Photo credits: [Left] Lesley Ingram, bugwood.org, #5401675; [Right] Jody Fetzer, Hillwood Estate, Museum & Gardens, bugwood.org, #5026068
Generalized mite life cycle

Eggs → Nymphs → Adults

Photo credit: left - Lyle Buss, Department of Entomology and Nematology, University of Florida; right - Jennifer Beard, University of Maryland, bugwood.org, #5503423
Examples of invasive mite pests

• Citrus Hindu mite, *Schizotetranychus hindustanicus*

• Citrus brown mite, *Eutetranychus orientalis*

• Red palm mite, *Raoiella indica*
Citrus Hindu mite
*Schizotetranychus hindustanicus*

- Originally from India, has been reported in Venezuela and Brazil
- Hosts include citrus, sorghum, coconut and neem
- Research on control methods, means of dispersal, and the full host range is ongoing

Photo credit: Barbara Nienstaedt, Instituto de Zoología Agrícola de la Facultad de Agronomía de la Universidad Central de Venezuela, 2007
Citrus Hindu mite
*Schizotetranychus hindustanicus*

- Causes silvery uniform splotches and covers underside of leaf with webbing

Citrus brown mite
*Eutetranychus orientalis*

- Origin not known but major citrus pest in Africa, Europe, Middle East, Asia, and Australia
- Males are triangular and slender, while females are broadly oval

Citrus brown mite
*Eutetranychus orientalis*

- Usually feed on the upperside of the leaf along the midrib then spreading to side veins
- At least 216 hosts, with preference to members of Rutaceae and Fabaceae
- Hosts include:
  - Lemons, mandarins, oranges
  - Pears, peaches, olives, and almonds

Photo credit: Queensland Department of Agriculture, Fisheries and Forestry
Red palm mite
*Raoiella indica*

- Spread to the Caribbean in 2004 and to Florida in 2007
- Feeding on leaves causes severe yellowing, reduced fruit yield
- Dispersed by wind or on infested plant material
- Pest on palms, especially coconut as well as bananas, plantains, gingers, and heliconias
Red palm mite

*Raoiella indica*

Close-up of adult red palm mites

SEM of adult feeding through stomate

Early (top) and advanced (bottom) feeding damage on palm

Feeding damage on banana

Photo credit: Close-up of adult red palm mites: Rita Duncan, University of Florida, entnemdept.ufl.edu; SEM of adult feeding: Gary Bauchan, USDA-ARS Electron & Confocal Microscopy Unit; Early feeding damage on palm: Wikimedia Commons; Advanced feeding damage on palm: Jorge Peña, University of Florida, entnemdept.ufl.edu; Feeding damage on banana: Wikimedia Commons.
Distribution of red palm mite in Florida

Counties with reports of red palm mite detections

Map based on FDACS DPI records.
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