

Introduction to Spider Mite Biology and Ecology

A detailed microscopic image of a spider mite on a green leaf. The mite is positioned in the upper left quadrant, showing its four pairs of legs and its segmented body. The leaf surface is covered in fine, hair-like structures and small, clear droplets, providing a textured background for the mite.

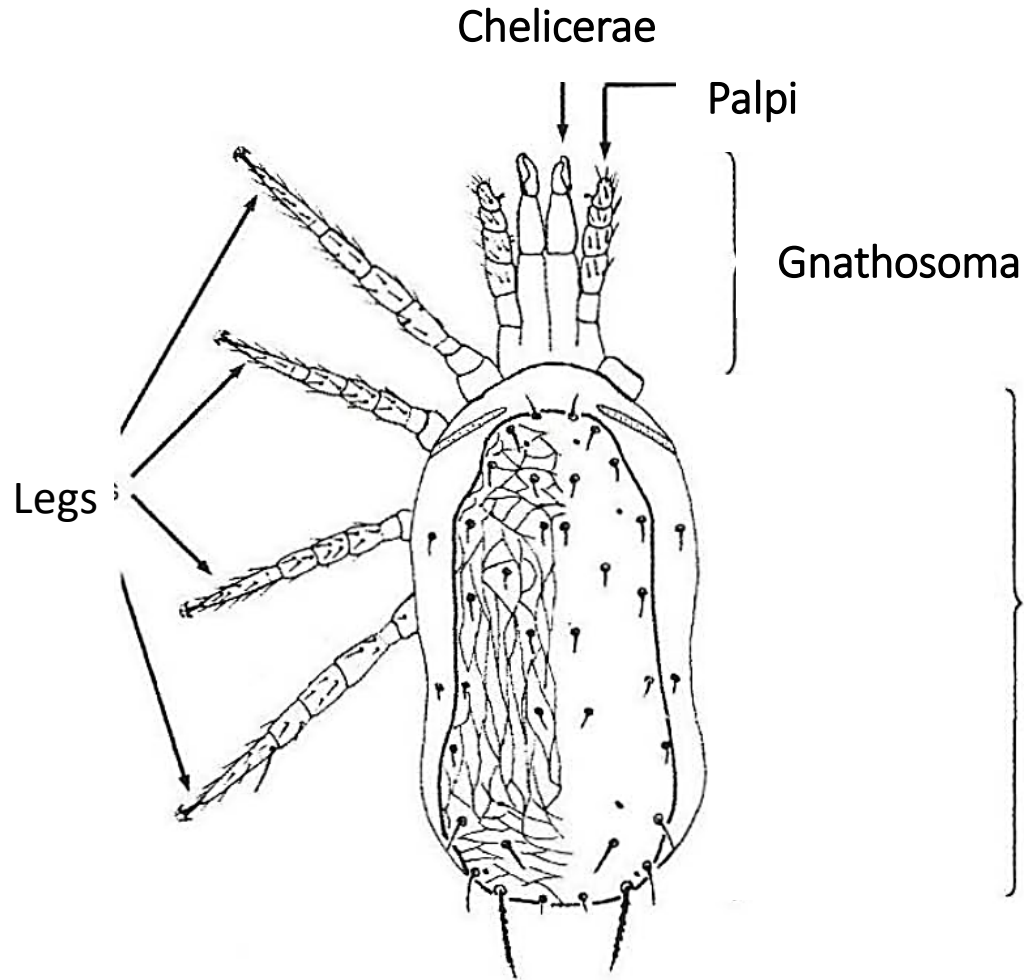
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Paola Villamarin, Maria A. Canon, Livia M.S. Ataide

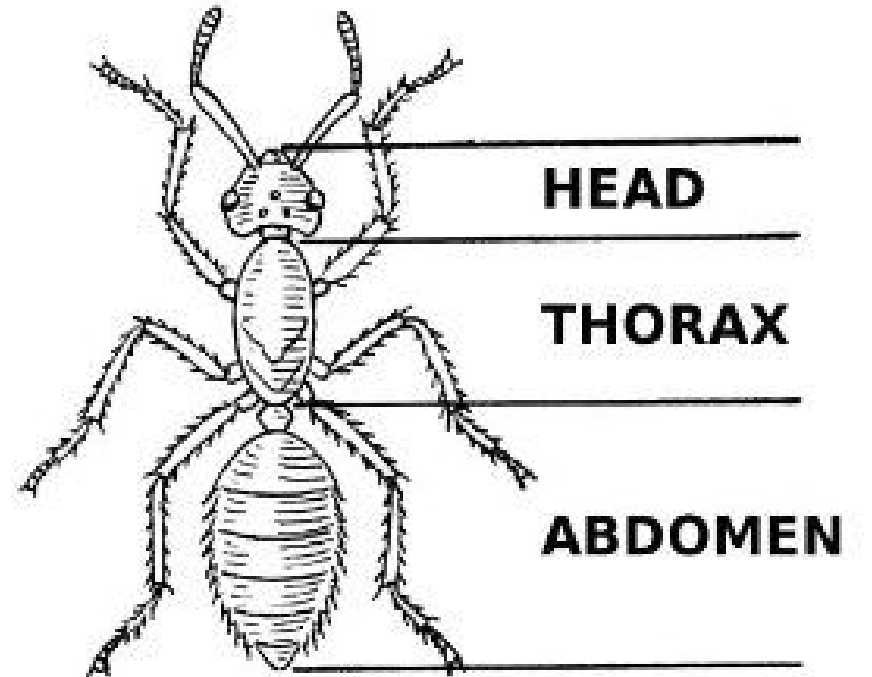
Phytophagous Mites

- Key pests in many agricultural systems
- About 1/3 of pesticides applied to ornamentals are for mite control
 - Prone to pesticide resistance
- Short life cycle
- Most are microscopic

Mites Are Not Insects!



Idiosoma



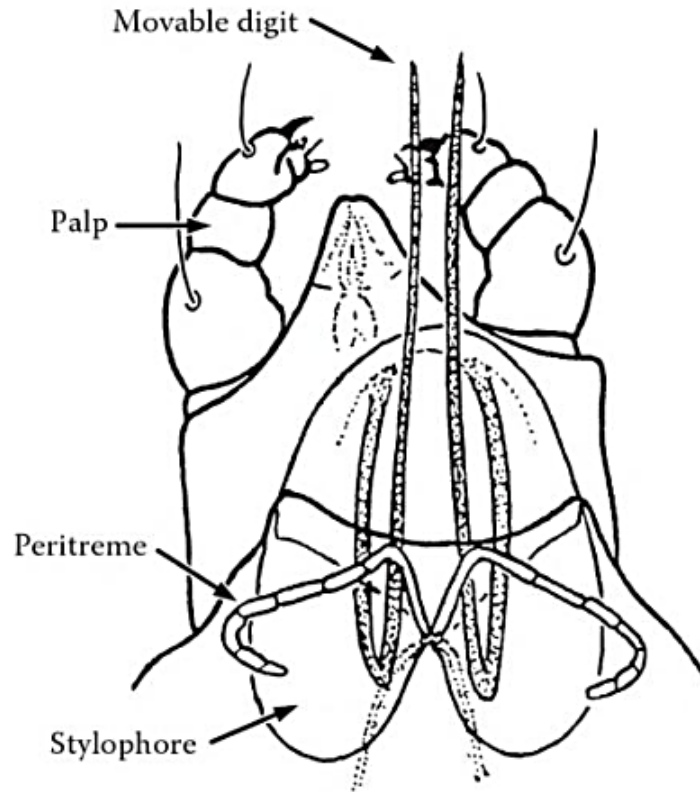
HEAD

THORAX

ABDOMEN

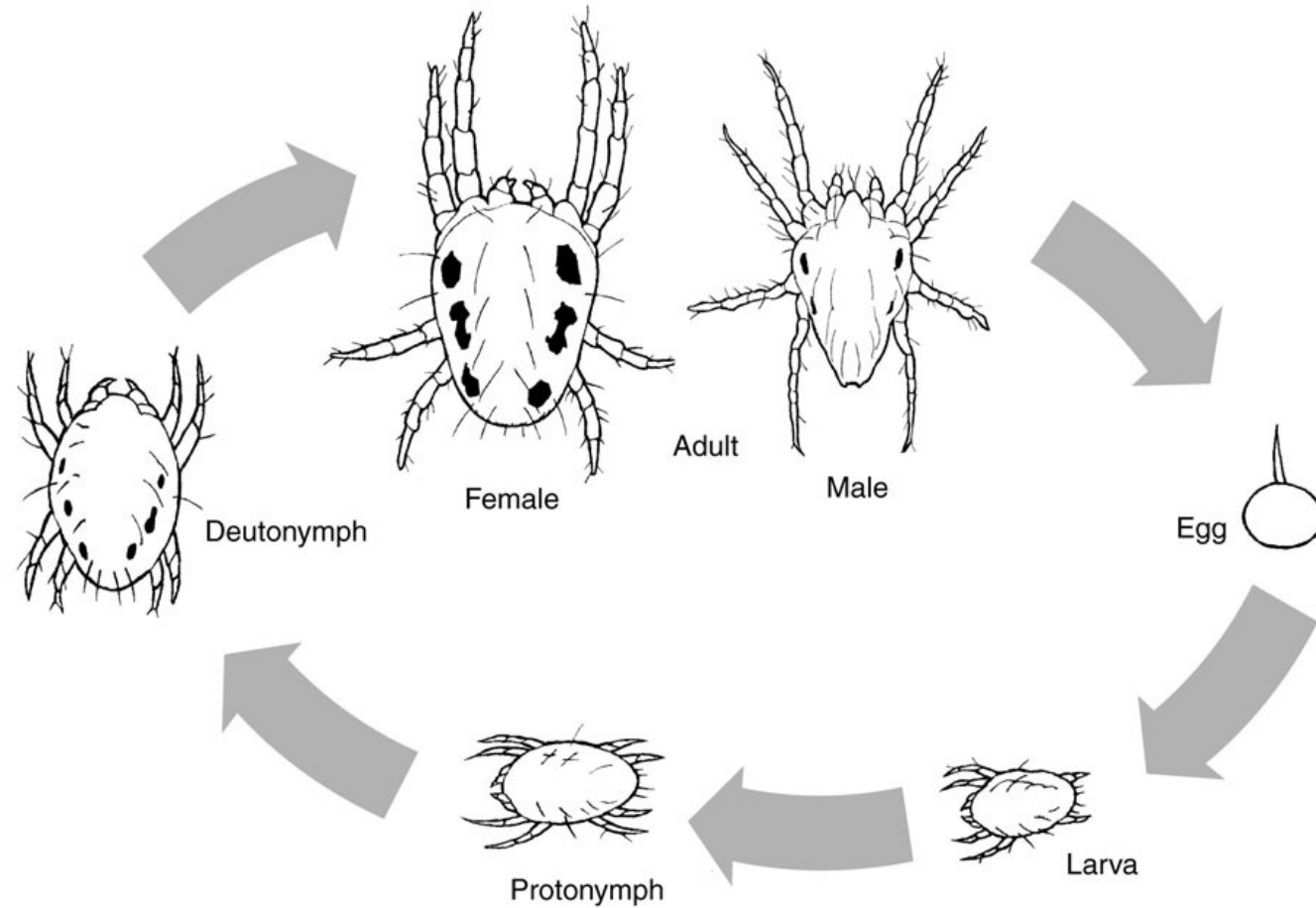
Feeding Behavior of Spider Mites

Piercing-sucking (plant feeders)

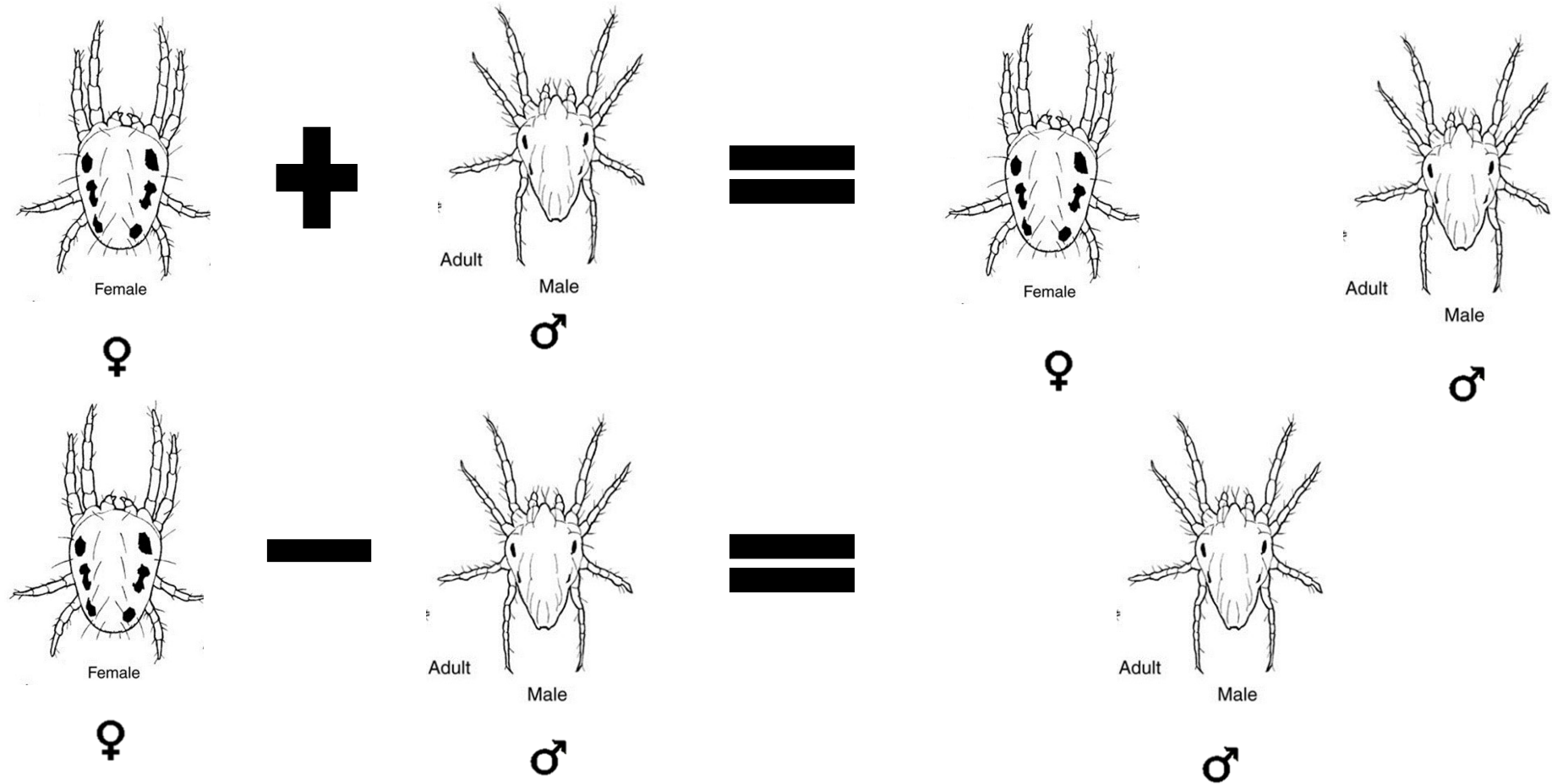


GIF: Urs Wyss and University of Amsterdam

Life Cycle of Spider Mites



Reproductive System of Spider Mites



♂ Arrhenotoky (haploid males and diploid females)

Dispersal

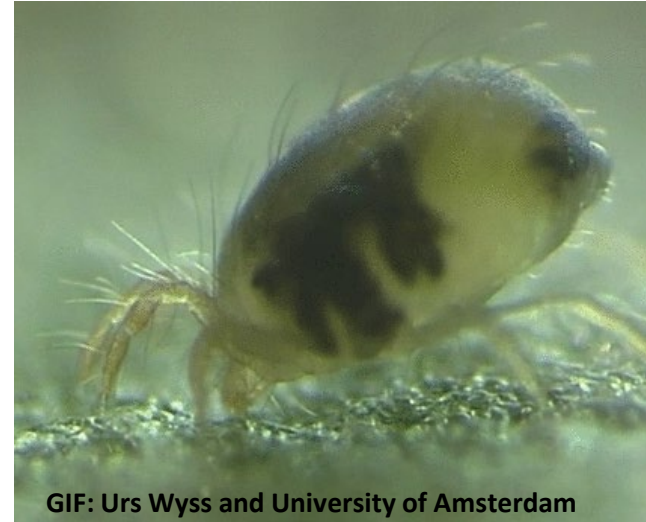
- Active: Ambulatory (walk)
- Passive: Aerial (wind)



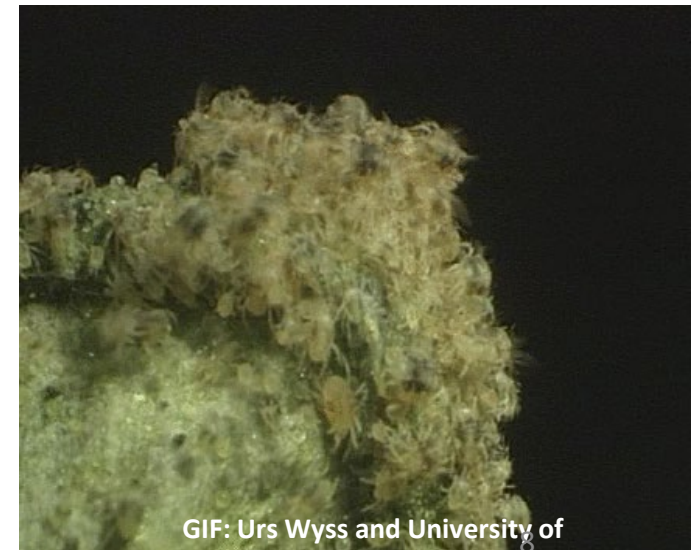
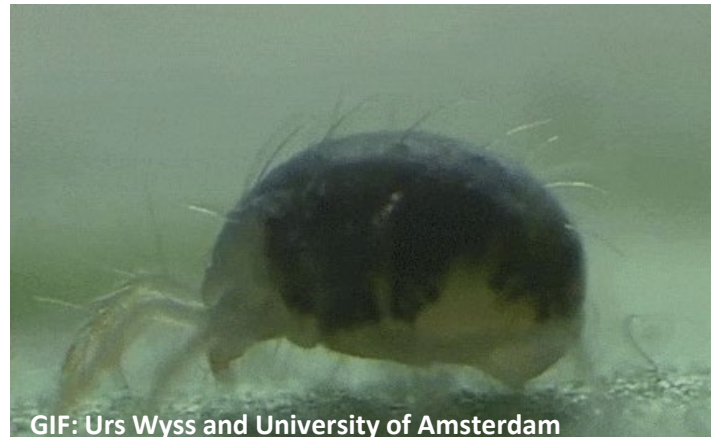
GIF: Urs Wyss and University of Amsterdam

Spider Mites (Tetranychidae)

- Many species (more than 1,200)
- Generally, live on underside of leaves and produce webbing
- Chlorotic spots on the leaves
- Leaves can turn yellow, gray or bronze and lead to defoliation
- Broad host range
- Hot, dry conditions



Two-spotted spider mite
(*Tetranychus urticae*)



Spider Mite Web



Photo: Marielle Berto



GIF: Urs Wyss and University of Amsterdam



Spider Mites on Roses



Spider mite damage on hibiscus

Red spider mites on hibiscus





Glover mite on Lantana



Spider mites on bamboo





Two-spotted spider mite on marigold



Spider mite damage on croton

Important Spider Mite Species for FL



Two-spotted spider mite
(*Tetranychus urticae*)



Glover mite
(*Tetranychus gloveri*)



Avocado red mite
(*Oligonychus yothersi*)



Citrus red spider mite
(*Panonychus citri*)

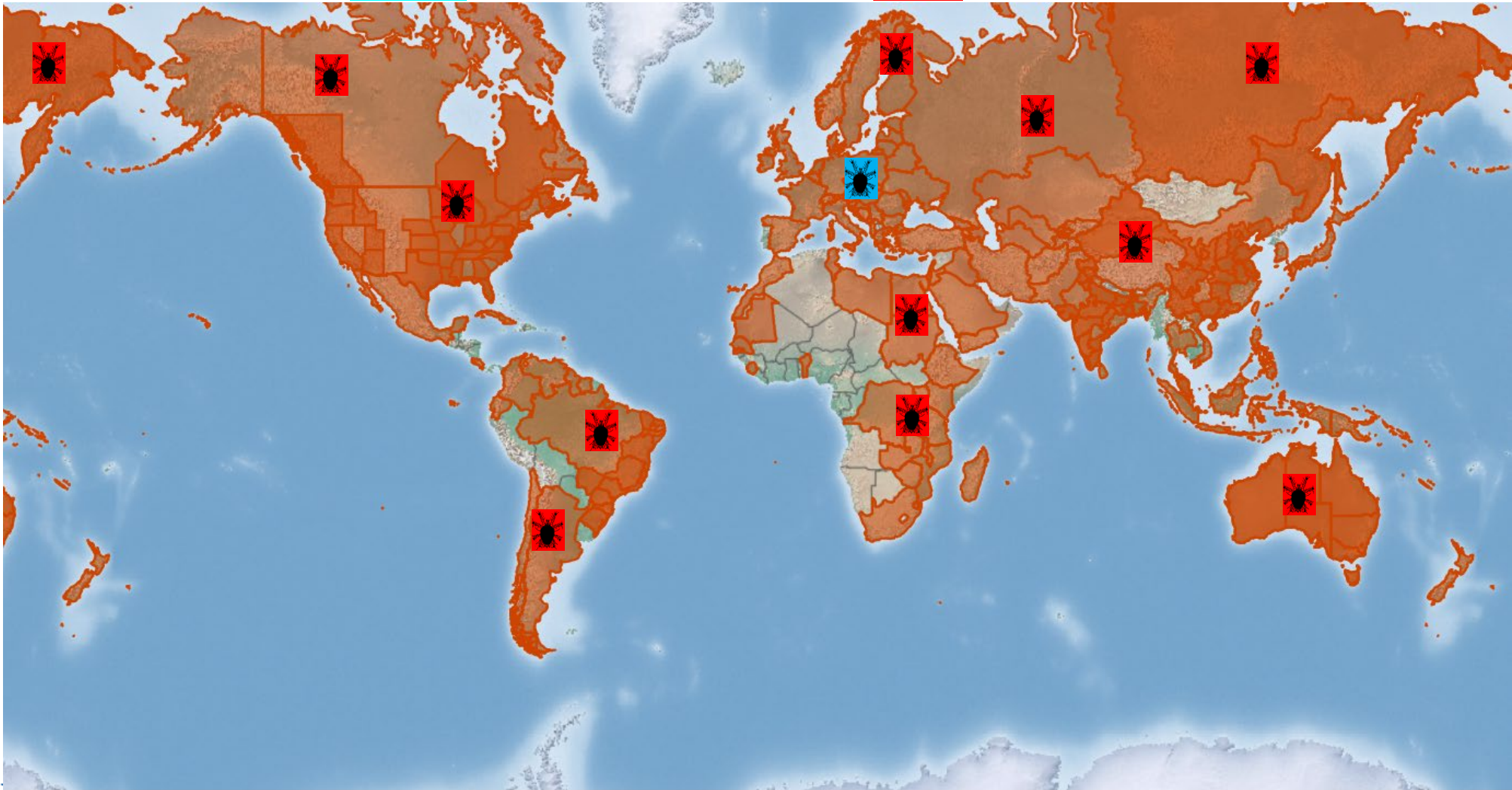
Two-Spotted Spider Mite (TSSM)

- Scientific name: *Tetranychus urticae* Koch
- Model species for research



TSSM Distribution

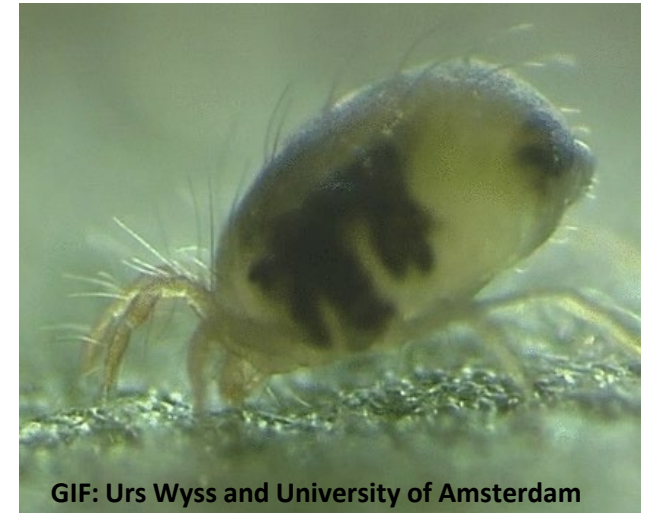
(blue= native range, red= introduced)



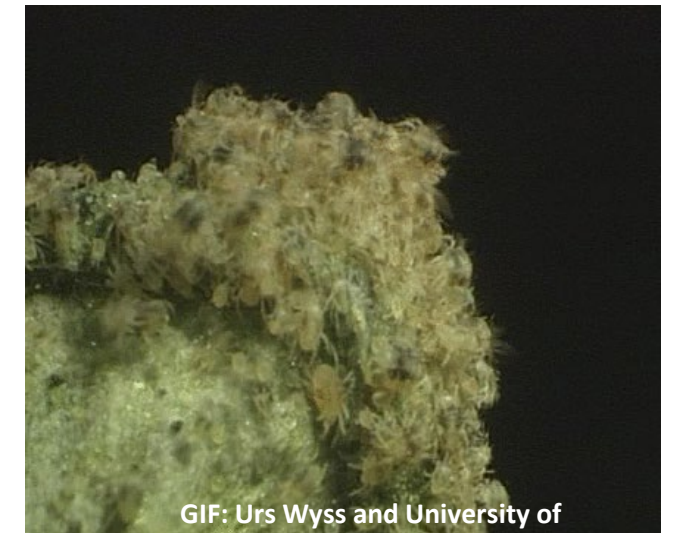
TSSM

Biology & Ecology

- The life cycle: egg, the larva, protonymph and deutonymph, adult
- At 77°F, TSSM completes its development within 2 weeks
- There are many overlapping generations per year
- Eggs hatch in approximately 3 days
- The adult female lives 2-4 weeks



GIF: Urs Wyss and University of Amsterdam



GIF: Urs Wyss and University of

TSSM

Host Associations

- TSSM is one of the most economically important spider mite species
- 1,100 plant species - 140 families
- Fruit, vegetable, and ornamental crops



TSSM Damage

- TSSM causes pale spots to appear on leaves
- In severe infestations, leaves appear bronzed or silvery, become brittle, and may fall prematurely
- Web covers the surfaces of the plant



The Glover Mite

• Scientific name: *Tetranychus gloveri* Banks

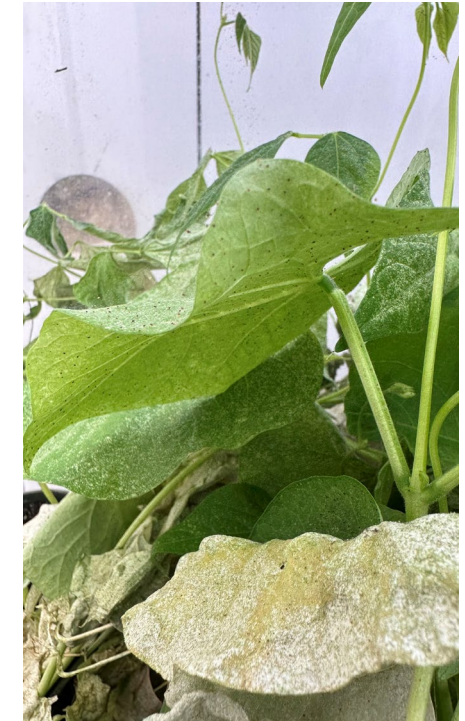


The Glover Mite Distribution



The Glover Mite Biology & Ecology

- Optimal conditions: moderately warm and dry
- ~6 days from egg to adult
- High reproductive rates
- High level of aggregative behavior



The Glover Mite

Host Associations & Damage

• 119 hosts

• Important pest of cotton, celery, beans, eggplant, beetroot, okra

• Causes rusty speckling and blotches on leaves and their eventual death



Banks Grass Mite *Oligonychus pratensis*

Damages drought-stressed turf

Causes grass to turn a bleached straw color, often killing it rapidly



Photo: Colorado State University



Photo: Colorado State University

Clover Mite *Bryobia praetiosa*

- Feeds on many grasses and herbaceous plants
- More information: <https://edis.ifas.ufl.edu/in776>



Spider Mite Scouting and Identification

- Look for the symptoms
- Check the underside of the leaves
- Do not use the color as ID character!
- For species ID, slide mount is needed



Photo: USDA/ARS

- Twospotted Spider Mite, *Tetranychus urticae*
<http://edis.ifas.ufl.edu/pdffiles/IN/IN30700.pdf>
- Clover Mite *Bryobia praetiosa*
<https://edis.ifas.ufl.edu/in776>
- Pest Identification Guide: Two-spotted Spider Mite, *Tetranychus urticae* Koch
<https://edis.ifas.ufl.edu/publication/IN1059?downloadOpen=true>
- Managing Spider Mites in Florida Hops
<https://edis.ifas.ufl.edu/publication/IN1417>



Thank you!

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