

How Insects Injure Plants

- Discolor by sucking plant sap
- Distort by damaging growing tissues
- Lay eggs in plant (Oviposition)
- Defoliate by chewing
- Feed between upper and lower leaf surfaces
- Cut off vascular tissue by feeding in stems
- Transmit disease

Potato Leafhopper Injury

Potato Leafhopper Injury

Potato Leafhopper
Adult and Nymphs



Potato Leafhopper Injury



Leaf Symptoms - Stippling

- Specks of leaf tissue discolored



4-Lined Plant Bug Injury



Adult 4-Lined Plant Bug



Nymph of 4-Lined Plant Bug



Honeylocust Plant Bug



Honeylocust Plant Bug Outbreak



Treatments for Honeylocust Plant Bug



Eastern Ash Plant Bug



Eastern Ash Plant Bug Damage



Tarnished Plant Bug



348-30

Boxelder Bug



Privet Thrips



Thysanoptera - Thrips



Western Flower thrips adult
R. Cloyd



Privet thrips nymph Penn. State. University

Sycamore Lacebug Damage



Lacebug Damage – Leaf underside



Lacebug Excrement



Azalea Lacebug



603-14

Lacebug Eggs



Lacebug Lifecycle

- Deciduous – Winter as adult in leaf litter, one (Hawthorn) to 3 generations (Oak, Sycamore, Hackberry).
- Evergreen – Winter as egg in leaf tissue
Multiple generations

Deciduous Lacebugs

- Alder Lacebug
Alder, Hazel, Elm, Birch
- Basswood Lacebug
Basswood
- Buckeye Lacebug
Buckeye sp.
- Cherry Lacebug
Wild Cherry
- Elm Lacebug
American Elm (only)
- Hawthorn Lacebug
Cotoneaster, Hawthorn,
Quince, Amelanchier, Pyracantha
- Hackberry Lacebug
Hackberry
- Oak Lacebug
Oaks
- Sycamore Lacebug
Sycamore, Ash,
Hickory, Mulberry
- Walnut Lacebug
Butternut, Black Walnut, Linden
- Willow Lacebug
Willow
- Willow and Poplar
Beech, Hop Hornbeam,
- Lacebug
Poplar, Maple, Mountain Ash

Evergreen Lacebugs

- Andromeda Lacebug
Andromeda
- Azalea Lacebug
Azalea
- Rhododendron lacebug
Rhododendron

Which stages are the best targets for insecticides?

Timing is critical for contact insecticides

Fall applications of imidacloprid avoid timing issue

Adults lay eggs that insecticides can't kill



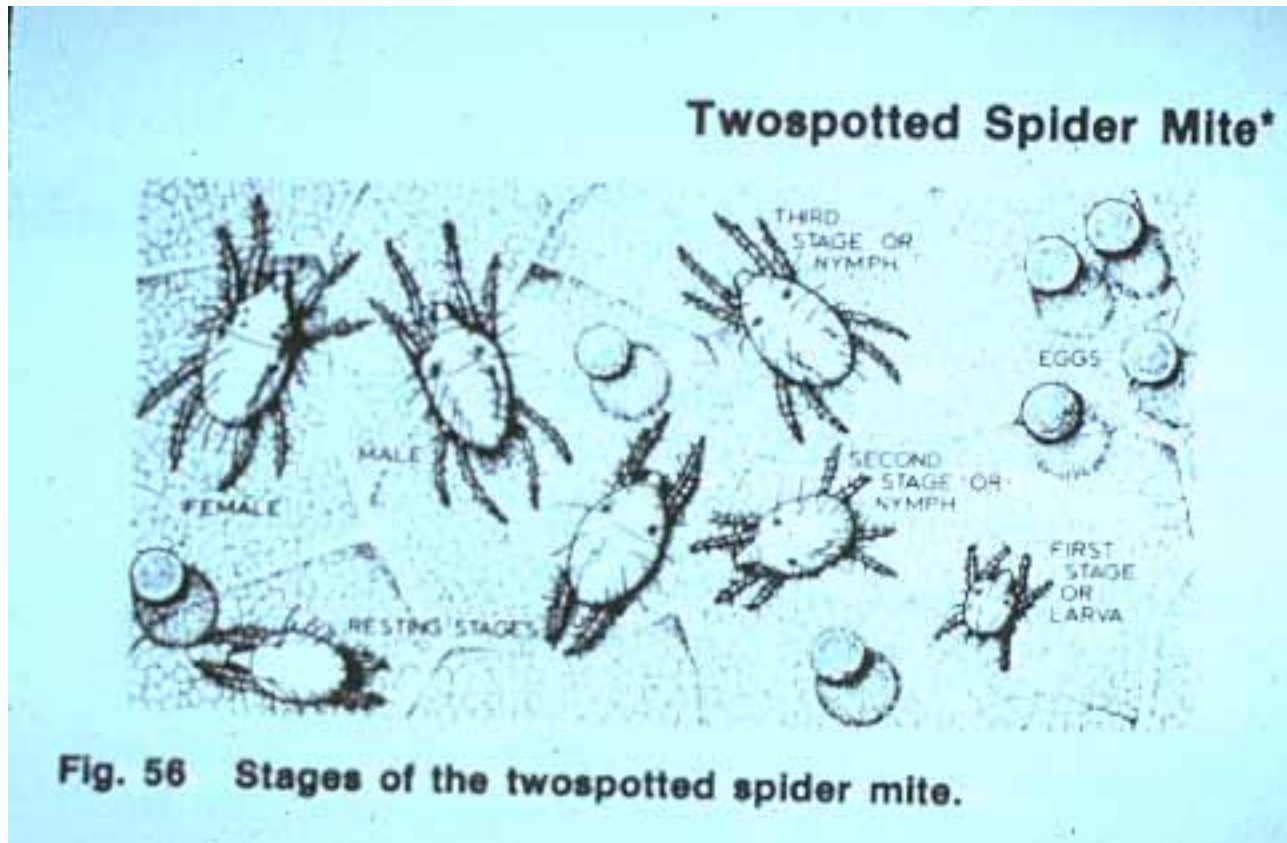
Insecticides can't penetrate eggs



Lacebug Controls

- Foliar Sprays
- Insecticidal Soap, Horticultural Oil
- Pyrethroids
- Fall or spring systemics
- Imidacloprid

Twospotted Spider Mite



Spider Mites

Cool Season $T < 85$ F

- Active in spring and fall when daytime Max Temp is < 85 F
- In summer these mites will go into summer dormancy as eggs
- Eggs will not hatch until daily temperatures cool

Spider Mites

Warm Season Mites $T > 85$ F

- Active in mid-summer when daytime Max Temp is > 85 F.

Spider Mites

Cool Season Day Time Max T <85 F

Species

spruce spider mite

southern red mite

boxwood spider mite

Trees attacked

conifers, spruce, fir, juniper, pine, arborvitae

broad leaf evergreens, holly azalea

boxwoods

Bronzed Injury



Spruce Spider Mite



Stippling on Spruce Needle



G18-29

Spruce Spider Mite and Eggs



Spruce Spider Mites



G18-27

Southern Red Mite



Spider Mites

Warm Season

Day time Max T >85 F

Mite species

two spotted spider mite

honeylocust spider mite

European red mite

Oak red mite

Plants attacked

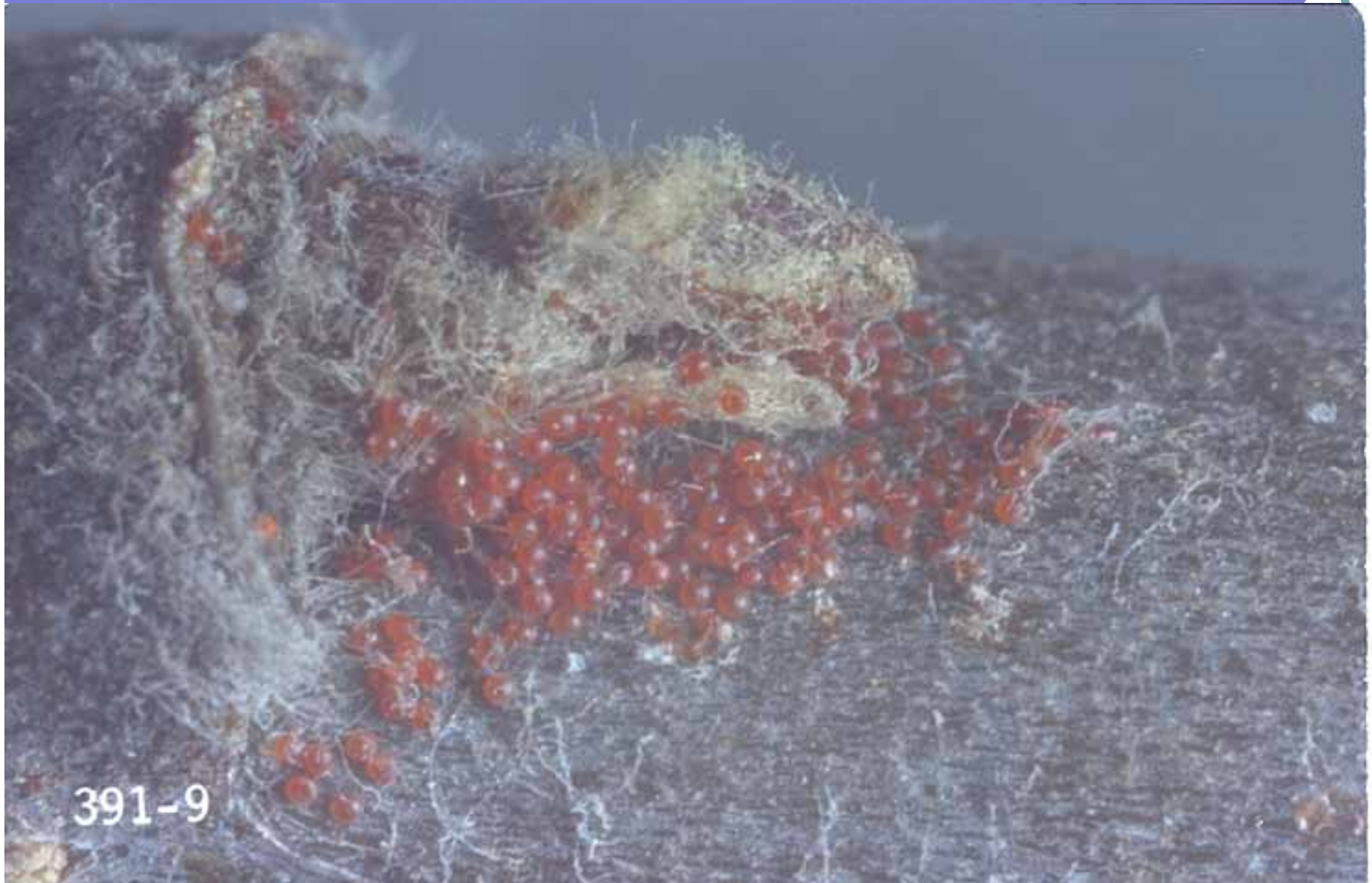
Perennials, flowers, deciduous trees

Honeylocust

Fruit trees, Rosaceous plants

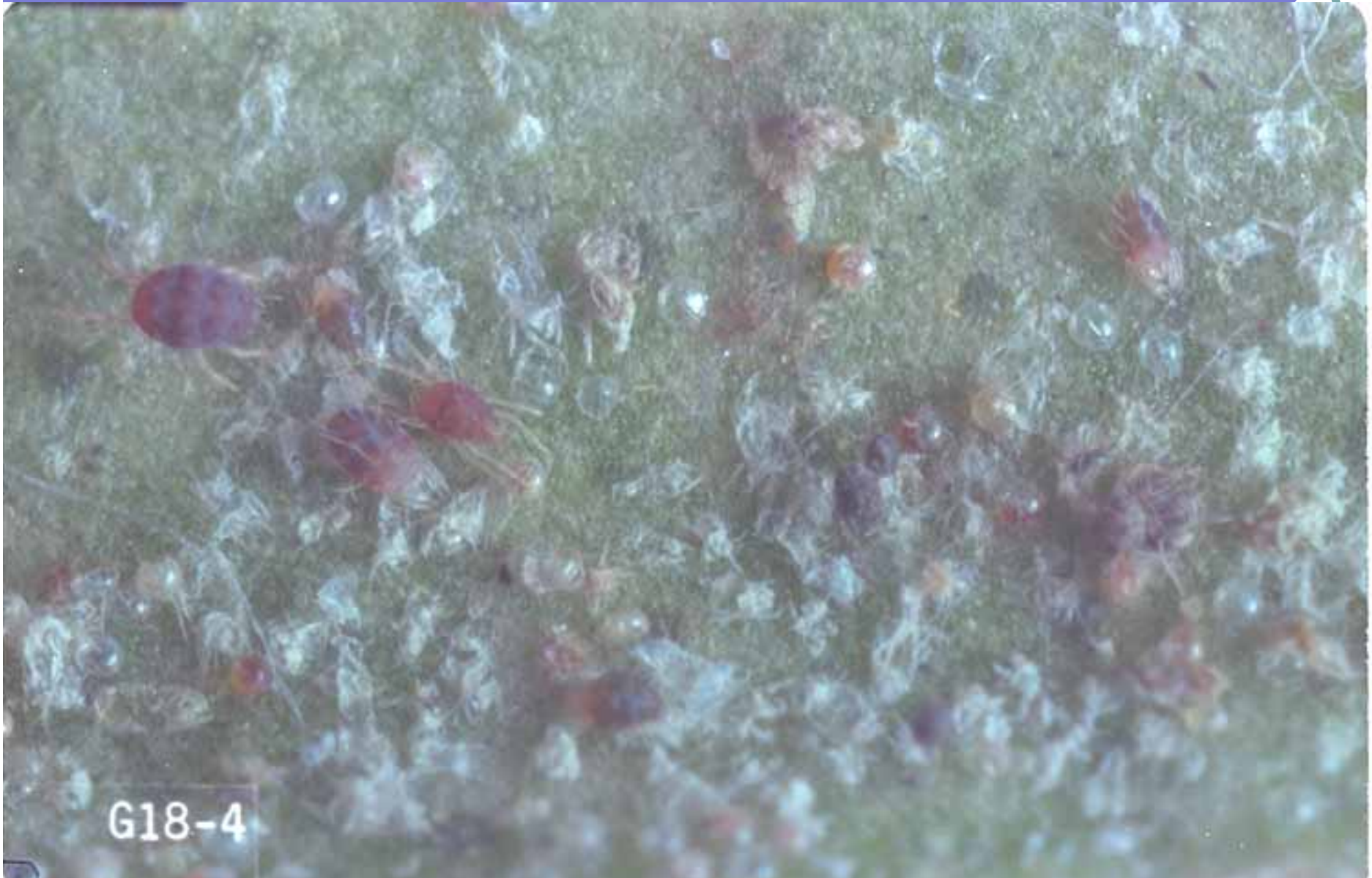
Oaks, maple, birch, chestnut, hickory

Eggs of European Red Mite



391-9

European Red Mite Life Stages

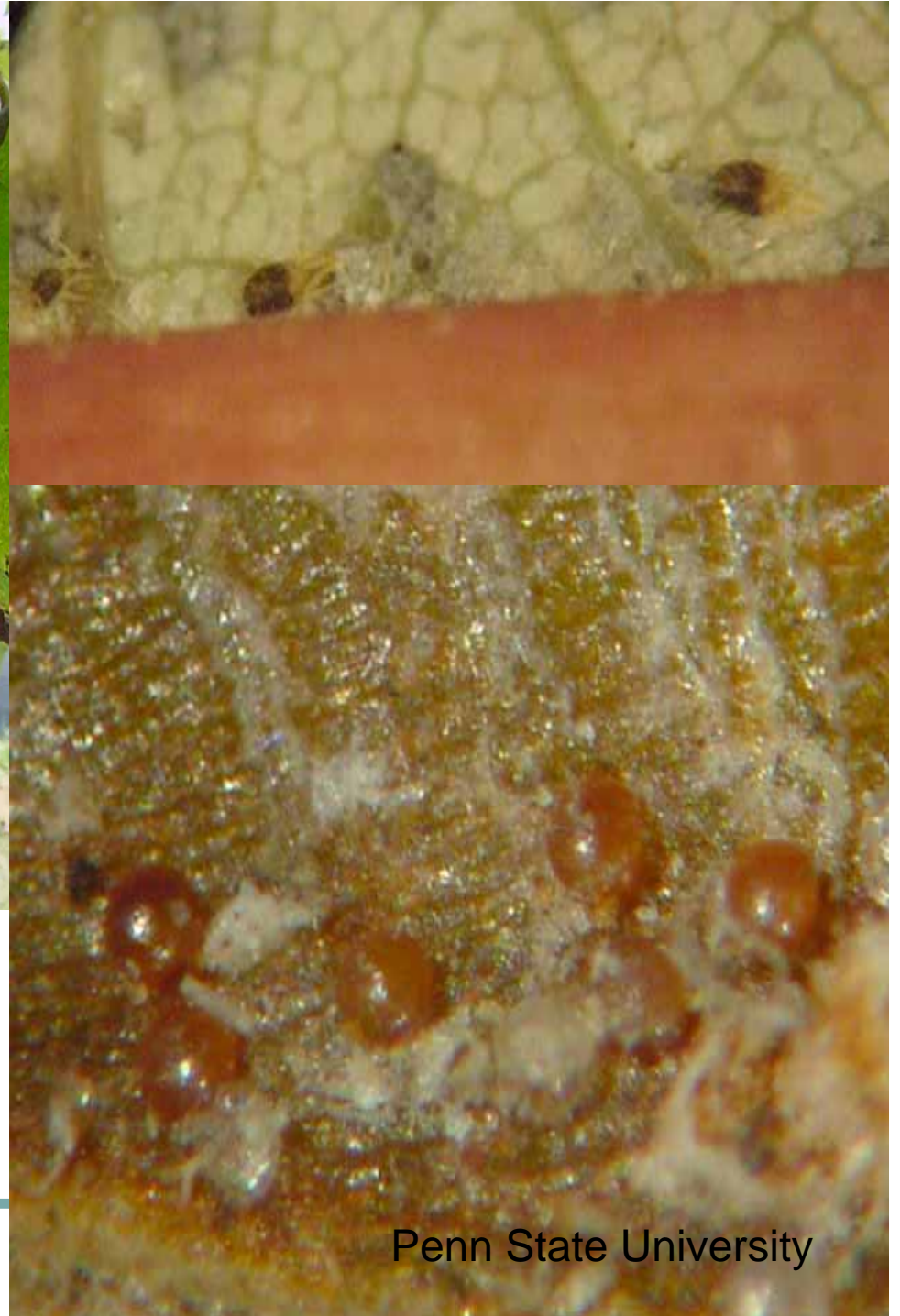


Two Spotted Spider Mite Injury

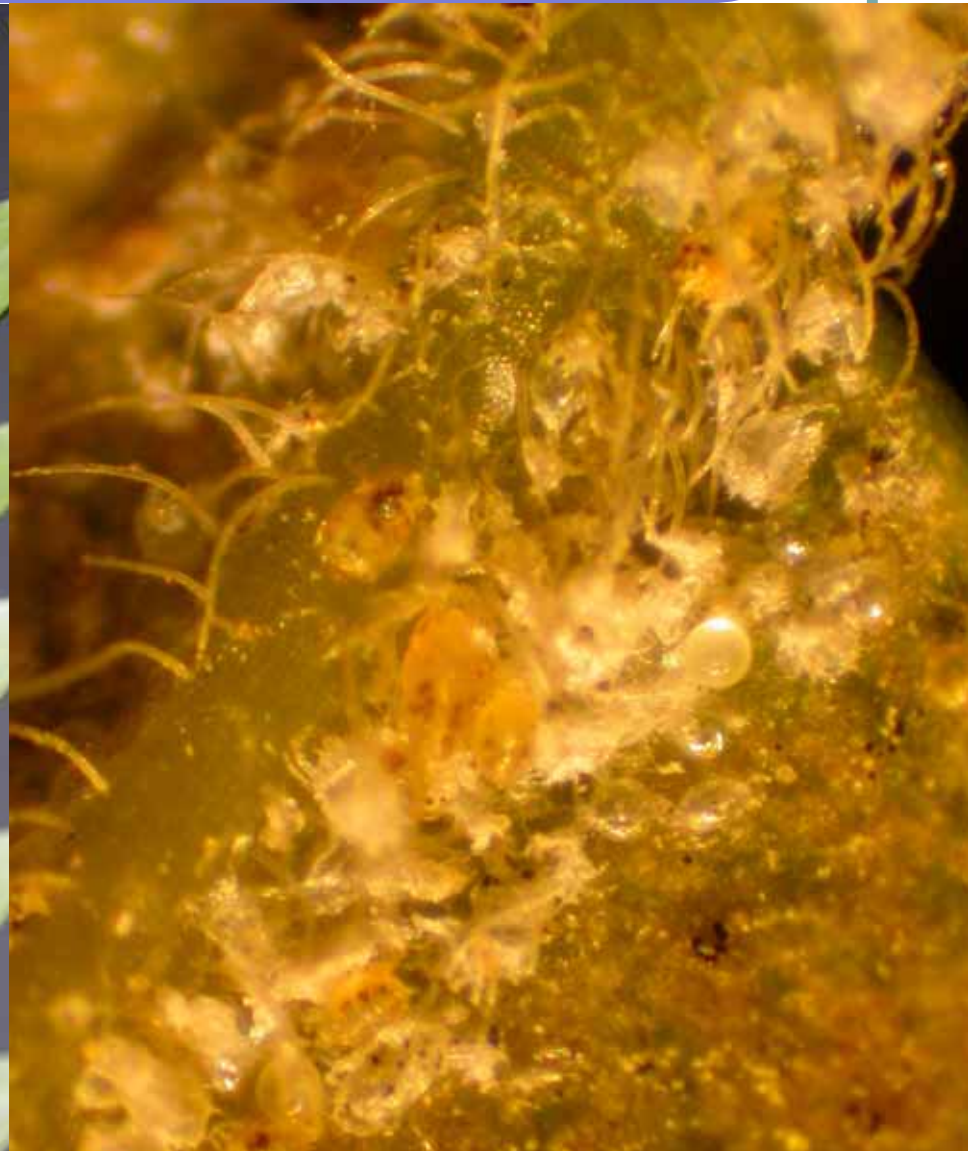




Maple spider mite
on Autumn blaze silver maple



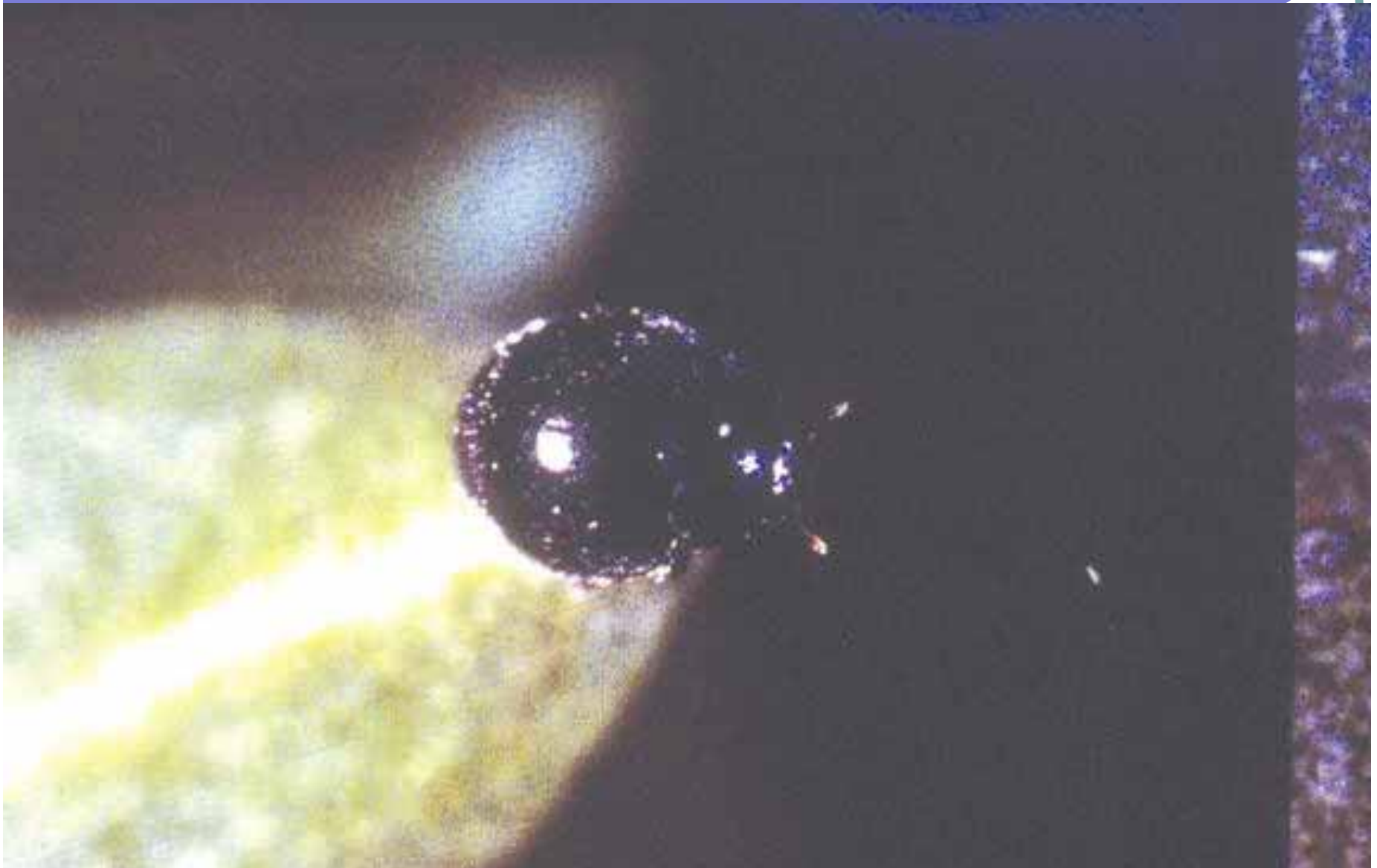
Honeylocust Spider Mites



Honeylocust Spider Mites Favored in Hot and Dusty Locations



Spider Mite Destroyer Adult (Lady Beetle)



Spider Mite Destroyer Larva (Lady Beetle)





Minute Pirate Bug

Green Lacewing Adult



Green Lacewing Larva



Predatory Mite



Rust Mites



Bald Cypress Rust Mite



Spider Mites

- Favored by dry weather
- Have many natural enemies that feed on them
- Produce fine webbing
- Easily blown through the air

- Conserve natural enemies to avoid outbreaks
- Early season use of carbamates, pyrethroids and organophosphates, can cause late season outbreaks.
- Use thresholds when managing early season pests to reduce pesticide applications

Miticides - Effects on Beneficials

Selective, Easy on Beneficials, Long Residual

- Akari, Floramite, Hexygon, Ovation, Pylon, Savey, Shuttle, Tetrasan Vendex,

Short Residual

- Oil, Soap

Rescue Treatments, Not Selective

- Avid, Battle, Sanmite, Scimitar, Talstar, Ultiflora

Miticides that don't kill rust mite prey

- Floramite
- Ovation
- Hexygon

Spider Mite Stages Killed

Eggs and immatures (not adults)

- Avid, Hexygon, Ovation, Savey, Tetrasan, Ultiflora

Mobile Stages Only (not eggs)

- Akari, Joust, Mavrik, Sanmite, Scimitar, Soap, Talstar, Tame

All Stages

- Floramite, Judo, Oil, Pylon, Shuttle, Vendex