

Mites: Identification and management

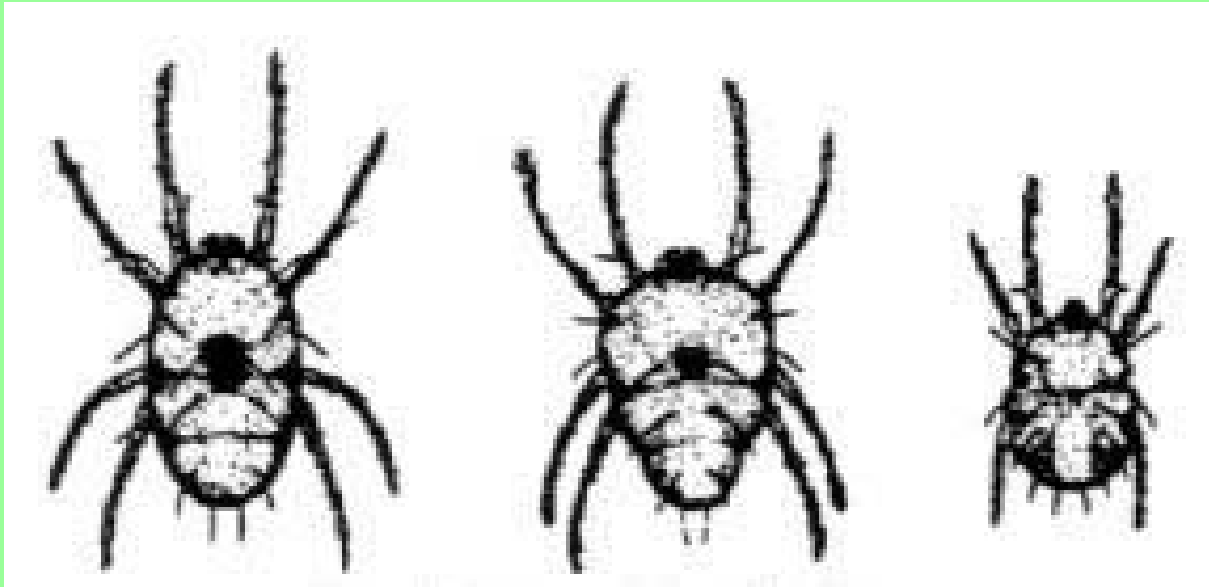


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Mites

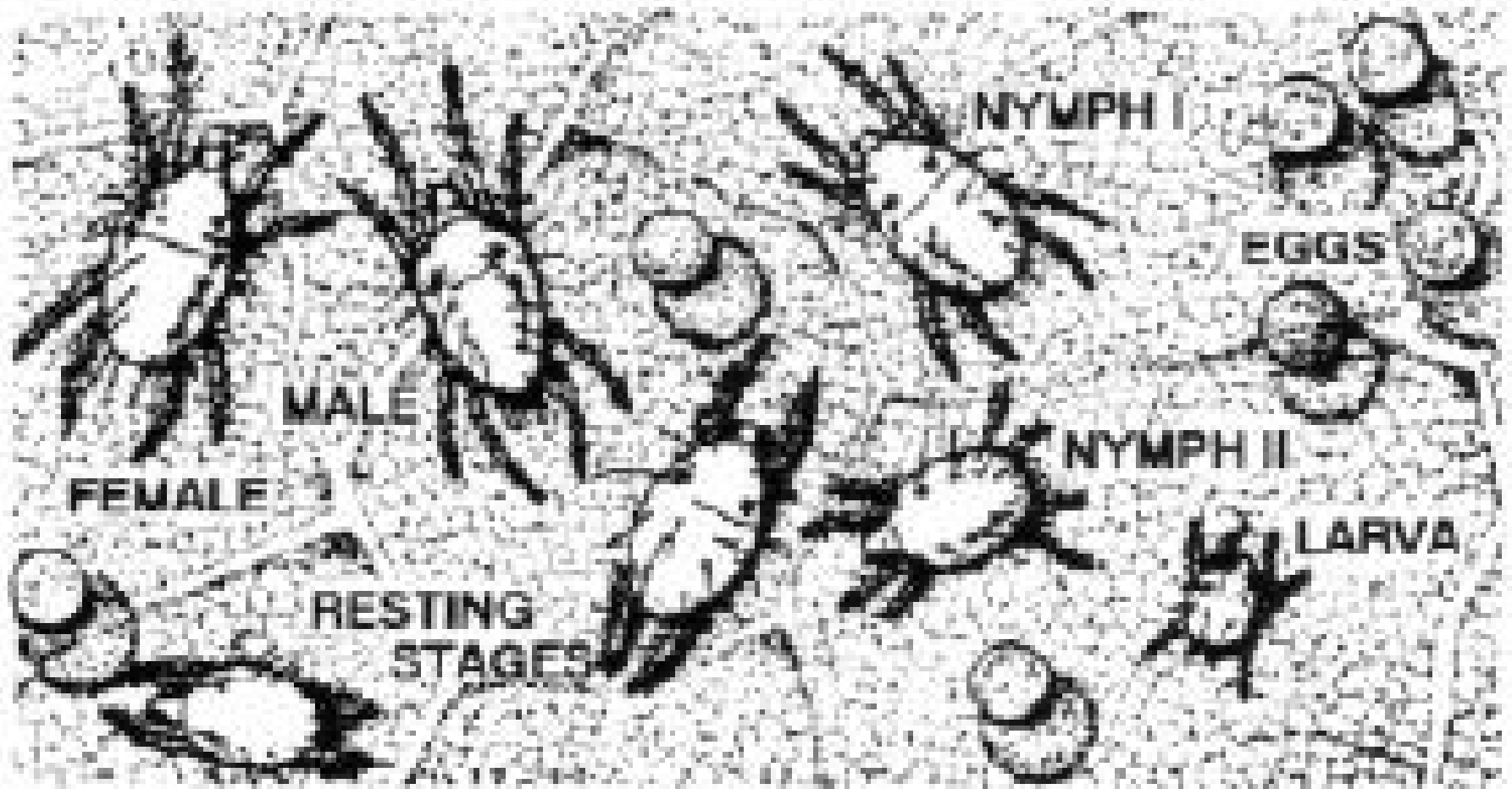
- Egg, larva, protonymph, deutonymph, adult
- Four pairs of legs; three pairs on larva
- 1 body segment
- Chelicerae, fangs like spiders
- Suck cells
- Cause chlorosis; yellowing of foliage
- Transmit disease
- Diagnostics: chlorosis, webbing, rusetting, galls

Mites



- Female: round abdomen
- Male: pointed abdomen
- Larva: 3 pairs of legs

Mite life cycles



Twospotted Spider Mite Stages

Warm/cool season mites

Warm season

- twospotted spider mite
- European red mite
- bulb mite
- gall, rust mite
- cyclamen mite

Cool season

- spruce spider mite
- clover mite

Mites in the greenhouse

Family Tetranychidae:

- twospotted spider mite
- Lewis mite

Family Tarsonemidae:

- cyclamen mite
- broad mite

Family Acaridae:

- bulb mite

Family Eriophyidae:

- gall, rust mite

Mites in the landscape

- **Family Eriophyidae: gall or vagrant mites**
- **Family Tetranychidae: spider mites**
- **Family Tarsonemidae: cyclamen/broad**
- **Family Phytoseiidae: predatory mites**
- **Family Acaridae: bulb mite**
- **Family Oribatidae: soil mites**

Mites in the landscape

Family Eriophyidae: gall or vagrant mites

- ash flower gall mite
- elm eriophyid mite
- hemlock rust mite
- maple spindlegall mite
- maple velvet erineum gall mite

Mites in the landscape

Family Tetranychidae:

- spruce spider mite
- twospotted spider mite
- European red mite
- honeylocust spider mite
- clover mite

Predatory mites

Family Phytoseiidae:

- *Phytoseiulus persimilis*
- *Neoseiulus californium*
- *Hypoaspis miles*
- *Amblyseius cucumbers*
(= *Neoseiulus cucumbers*)

Miticides: Greenhouse

Pesticide (Trade Name)

abamectin (Avid)

bifenthrin (Talstar)

chlorfenapyr (Pylon)

endosulfan (Thiodan)

lambda-cyhalothrin (Scimitar GC)

pyridaben (Sanmite)

Miticides: Landscape

Pesticide (Trade Name)

abamectin (Avid)

bifenthrin (Talstar)

hexythiazox (Hexygon)

lambda-cyhalothrin (Scimitar GC)

pyridaben (Sanmite)

Predators: Minute Pirate Bugs

Orius insidiosus



*Adult insidious flower
bug feeding on spider
mite. J.Ogrodnick*

Family: Anthocoridae (Hemiptera)

Predators: Minute Pirate Bugs

Orius insidiosus



Adult insidious flower bug feeding on spider mite. J.Ogrodnick

Adult Minute Pirate Bugs live for 3 - 4 weeks and lay their eggs in plant tissue. The nymphs emerge in 4 - 5 days and become adults in 7 - 10 days.

Predatory mites: *Phytoseiulus persimilis*



© Photo courtesy
Holt Studies, UK

Family Phytoseiidae
Predatory mites

Predatory mites: *Phytoseiulus persimilis*

spider mites



These predatory mites consume 5-10 pest adults or up to 20 pest eggs/day. When released during a low infestation, spider mites can be controlled within 2-3 weeks. *P. persimilis* need a relative humidity greater than 60% in order to survive, especially in the egg stage. Once the adults' food supply dwindles, *P. persimilis* die.

Predatory mites: *Neoseiulus californium*



© Photo courtesy Holt Studios, UK

Family Phytoseiidae
Predatory mites

Predatory mites: *Neoseiulus californium* spider mites



These predatory mites consume their prey at a leisurely pace of one adult or a few eggs per day; can survive longer under starvation conditions; and need a minimum of 60% humidity and temperatures 60-85 degrees F.

Predatory mites:
Amblyseius cucumbers



Family Phytoseiidae
Predatory mites

Predatory mites: ***Amblyseius cucumbers***



Thrips, cyclamen mite

Release *cucumbers* when thrips populations are low (monitor thrips populations with sticky blue traps), and allow several weeks for the predators to be effective.

Ideal conditions are 66-80 degrees F and a relative humidity of 65-72 %. These predators are most effective from March to November.

Use in conjunction with thrips pupae predator *Hypoaspis* for improved control.

Predatory mites:
Hypoaspis miles



Family Phytoseiidae
Predatory mites

Predatory mites: *Hypoaspis miles*

Bulb mite



The female *Hypoaspis* mites lay their eggs in the soil, which hatch in 1-2 days, and the nymphs and adults feed on the soil-dwelling pests.

Each *Hypoaspis* mite will consume 5-20 prey or eggs per day. They survive by feeding on algae and/ or plant debris when insects aren't available. Their entire life cycle is 7-11 days.

Ash flower gall mite



Family Eriophyidae

Erineum gall or vagrant mites

Male flowers

Persistent through winter

Ash flower gall mite

- **Host:** ash
- **Life history:** female stimulates galls
- **No. gen:** several
- **Overwintering:** females under bark
- **Monitoring:** galls on male flowers
- **Risk:** low
- **BC:** low
- **Biorational pesticides:** abamectin, horticultural oil, insecticidal soap
- **Conventional pesticides:** bifenthrin, carbaryl, deltamethrin, dicofol, fenbutatin oxide, lambda-cyhalothrin

Clover mite



Family Tetranychidae

Spider mites

Turf

Long front legs; webbing in fall

Clover mite

- **Host:** grass
- **Life history:** no males
- **No. gen:** two or more
- **Overwintering:** any stage; bark, walls
- **Monitoring:** brown grass
- **Risk:** low
- **BC:** low
- **Biorational pesticides:** abamectin, bifenazate, clofentazine, hexythiazox, horticultural oil, insecticidal soap
- **Conventional pesticides:** bifenthrin, chlorpyrifos (nursery), deltamethrin, dicofol, fenpropathrin, fenbutatin oxide, lambda-cyhalothrin, pyridaben

Cyclamen mite



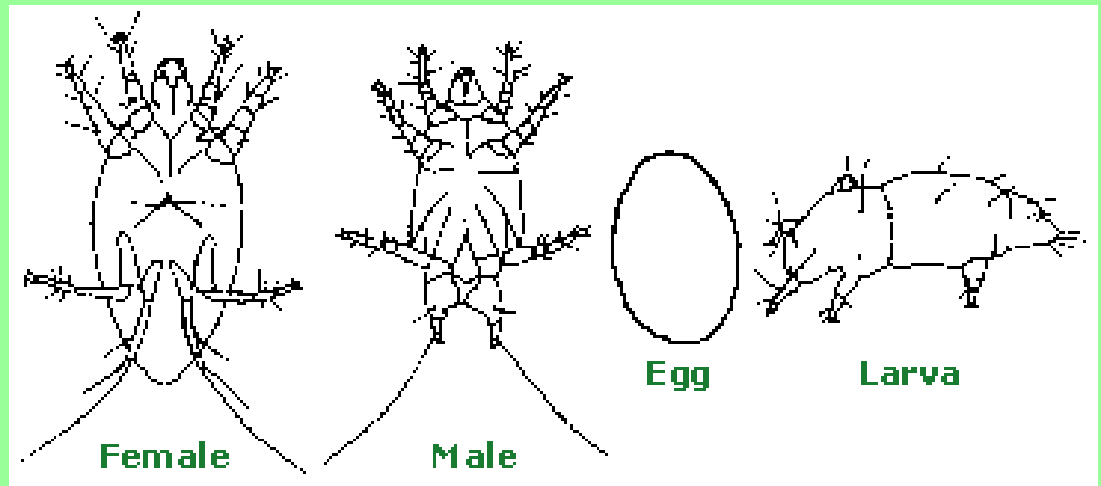
Family Tarsonemidae
Cyclamen mite

Broad mite

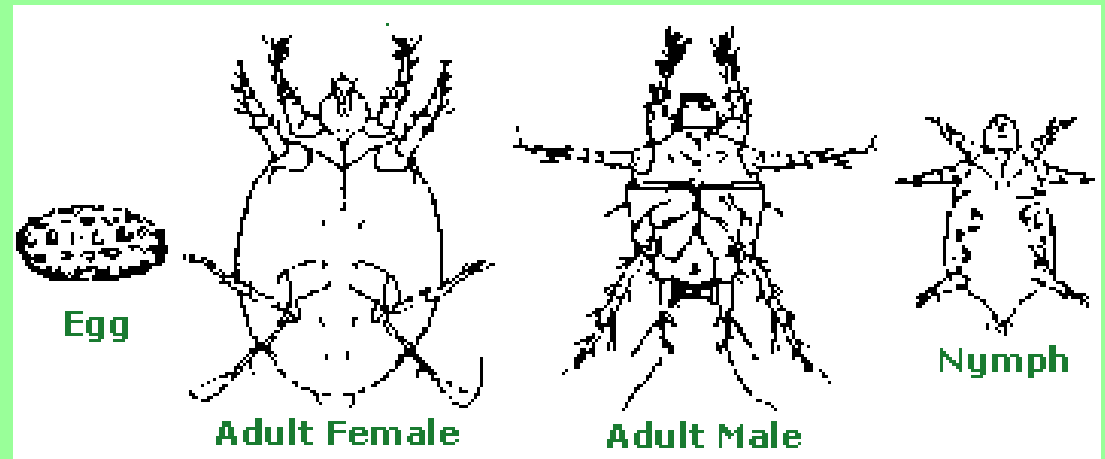


Family Tarsonemidae
Broad mite

**Family
Tarsonemidae
Cyclamen/
broad mite**



**cyclamen mite
90Rh 60F**



**broad mite
90RH 80F**

Cyclamen mite

African violets, ivy, snapdragon, chrysanthemum, cyclamen, delphinium, larkspur, geranium, fuchsia, begonia, petunia, daisy, and azalea.

Broad mite

African violet, ageratum, azalea, begonia, cyclamen, dahlia, gerbera, gloxinia, ivy, jasmine, impatiens, lantana, marigold, peperomia, snapdragon, verbena, and zinnia.

Family Tarsonemidae
Cyclamen/broad mite

Cyclamen mite

- **Host:** GH to landscape, delphiniums
- **Life history:** mites hide in buds/ shoots
- **No. gen:** several
- **Overwintering:** continuous generations
- **Monitoring:** distortion
- **Risk:** high
- **Biorational pesticides:** abamectin, horticultural oil, insecticidal soap
- **Conventional pesticides:** bifenthrin, dicofol, fenbutatin oxide, lambda-cyhalothrin, pyridaben

Broad mite

- **Host:** GH, house plants
- **Life history:** mites hide in buds/ shoots
- **No. gen:** several
- **Overwintering:** continuous, males carry females to new leaves
- **Monitoring:** distortion
- **Risk:** high
- **Biorational pesticides:** abamectin, neem oil, horticultural oil, insecticidal soap
- **Conventional pesticides:** endosulfan, dicofol, pyridaben

Elm eriophyid mite



Family Eriophyidae

Erineum gall or vagrant mites

Gall persistent

Elm eriophyid mite

- **Host:** elm
- **Life history:** female leaf hairs to expand
- **No. gen:** several
- **Overwintering:** females under bark
- **Monitoring:** erineum galls/ felt-like patches on leaves
- **Risk:** low
- **BC:** low
- **Biorational pesticides:** abamectin, horticultural oil, insecticidal soap
- **Conventional pesticides:** bifenthrin, carbaryl, fenbutatin oxide, lambda-cyhalothrin

Eriophyid mite



Family Eriophyidae

Erineum gall or vagrant mites

Gall persistent

Eriophyid mite



Family Eriophyidae

Erineum gall or vagrant mites

Gall persistent

Eriophyid mite

- **Host:** many deciduous trees
- **Life history:** female leaf hairs to expand
- **No. gen:** several
- **Overwintering:** females under bark
- **Monitoring:** erineum galls/ felt-like patches on leaves
- **Risk:** low
- **BC:** low
- **Biorational pesticides:** abamectin, horticultural oil, insecticidal soap
- **Conventional pesticides:** bifenthrin, carbaryl, dicofol, fenbutatin oxide, lambda-cyhalothrin

Honeylocust spider mite



Family Tetranychidae
Spider mites

Honeylocust spider mite



Family Tetranychidae
Spider mites

Honeylocust spider mite

- **Host:** honeylocust
- **Life history:** distorts leaflet
- **No. gen:** several
- **Overwintering:** females under bark
- **Monitoring:** wilting/ drying compound leaves
- **Risk:** low
- **BC:** low
- **Biorational pesticides:** abamectin, bifenazate, clofentazine, hexythiazox, horticultural oil, insecticidal soap
- **Conventional pesticides:** bifenthrin, chlorpyrifos (nursery), deltamethrin, dicofol, fenpropathrin, fenbutatin oxide, lambda-cyhalothrin, pyridaben

European red mite



Family Tetranychidae
Spider mites

European red mite

- **Host:** flowering fruits
- **Life history:** generation 2 weeks
- **No. gen:** several
- **Overwintering:** eggs on bark
- **Monitoring:** stippling damage
- **Risk:** low
- **BC:** high
- **Biorational pesticides:** abamectin, bifenazate, clofentazine, hexythiazox, horticultural oil, insecticidal soap
- **Conventional pesticides:** bifenthrin, chlorpyrifos (nursery), deltamethrin, dicofol, fenpropathrin, fenbutatin oxide, lambda-cyhalothrin, pyridaben

Maple velvet erineum gall mite



Family Eriophyidae

Erineum gall or vagrant mites

Maple velvet erineum gall mite

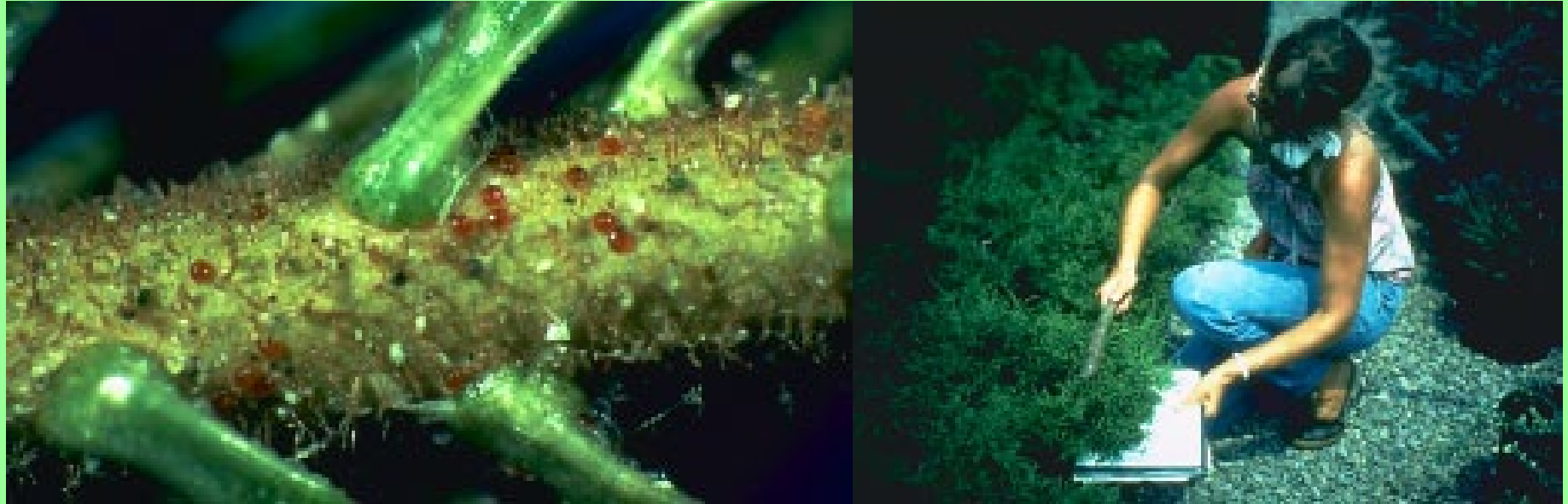
- **Host:** many deciduous trees
- **Life history:** female leaf hairs to expand
- **No. gen:** several
- **Overwintering:** females under bark
- **Monitoring:** erineum galls/ felt-like patches on leaves
- **Risk:** low
- **BC:** low
- **Biorational pesticides:** none
- **Conventional pesticides:** carbaryl

Spruce Spider mite



Family Tetranychidae
Spider mites

Spruce Spider mite



Family Tetranychidae
Spider mites

Spruce spider mite

- **Host:** arborvitae, spruce, juniper, yew
- **Life history:** damage in May
- **No. gen:** several
- **Overwintering:** reddish eggs on bark
- **Monitoring:** stippling damage
- **Risk:** medium
- **BC:** high
- **Biorational pesticides:** abamectin, bifenazate, clofentazine, hexythiazox, horticultural oil, insecticidal soap
- **Conventional pesticides:** bifenthrin, chlorpyrifos (nursery), deltamethrin, dicofol, fenpropathrin, fenbutatin oxide, lambda-cyhalothrin, pyridaben

Twospotted spider mite



Family Tetranychidae
Spider mite

Twospotted spider mite

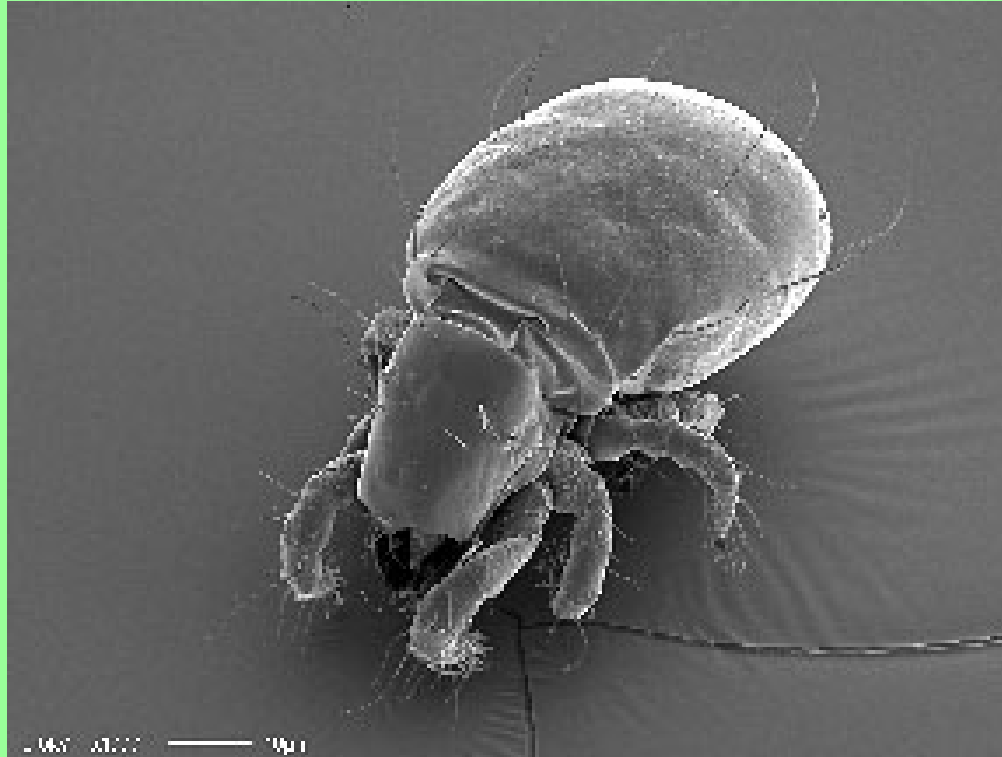


Family Tetranychidae
Spider mites

Twospotted spider mite

- **Host:** many trees, perennials, annuals
- **Life history:** damage in June
- **No. gen:** several
- **Overwintering:** adults in leaf litter, grass
- **Monitoring:** stippling damage, webbing
- **Risk:** medium
- **BC:** high
- **Biorational pesticides:** abamectin, bifenazate, clofentazine, hexythiazox, horticultural oil, insecticidal soap
- **Conventional pesticides:** bifenthrin, chlorpyrifos (nursery), deltamethrin, dicofol, fenpropathrin, fenbutatin oxide, lambda-cyhalothrin, pyridaben

Oribatid mite



Family Oribatidae
Oribatid mites

Oribatid mite

- **Host: soil**
- **Life history: decomposition**
- **No. gen: several**
- **Overwintering: adults in soil**
- **Monitoring: none**
- **Risk: none**
- **Pesticides: control not necessary**