

Tips for Scouting Herbaceous Perennials Insects and Mites

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Greenhouse Pests

- Aphids
- Caterpillars
- Fungus Gnats
- Mites
- Thrips
- Whiteflies

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Nursery Pests

- Aphids
- Beetles
- Caterpillars
- Lacebugs
- Leafhoppers
- Mites
- Sawflies
- Weevils



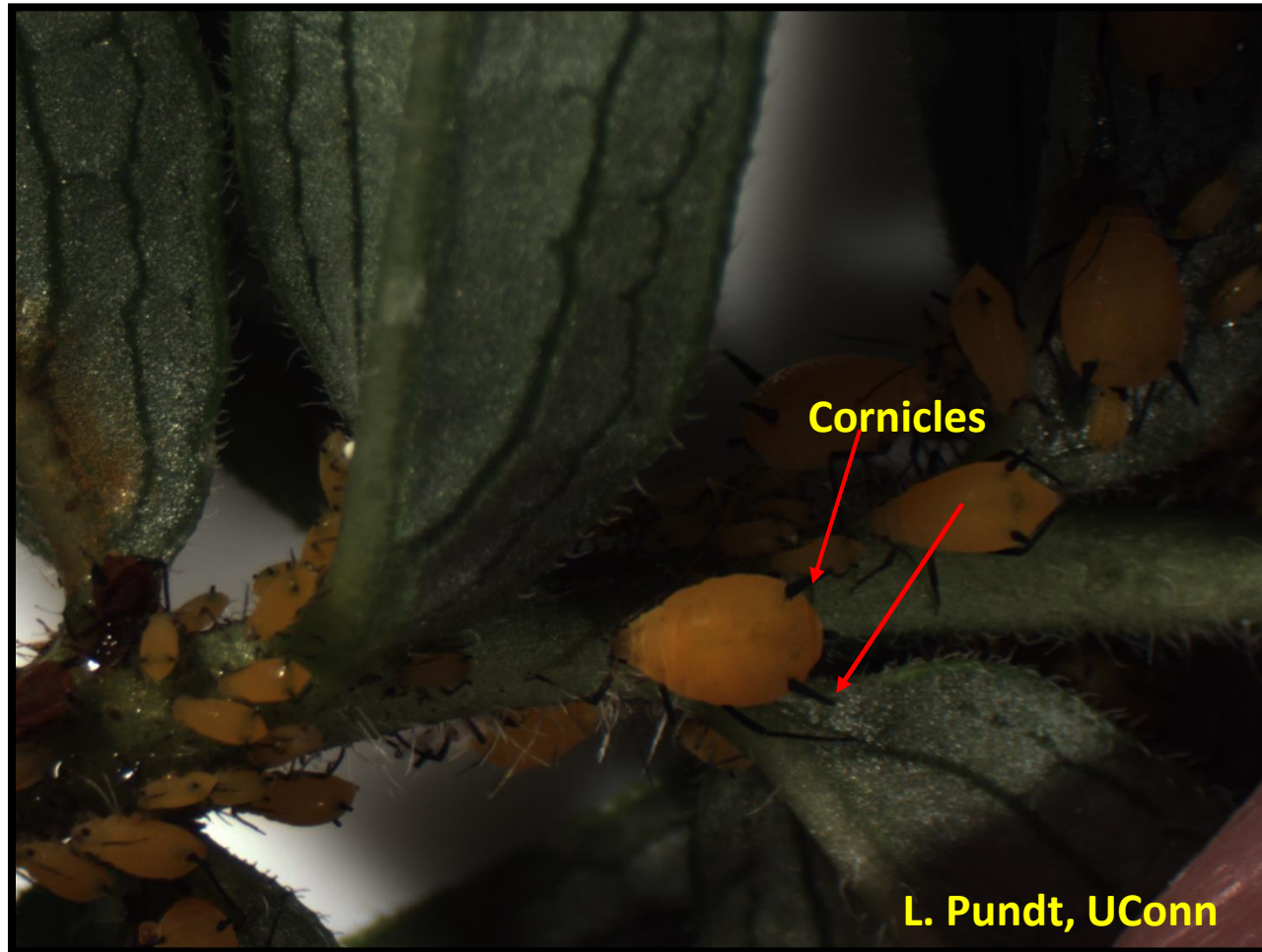
Scouting for Aphids

- **Yellow sticky cards will only trap winged adults, visual inspection is needed.**
- **Wide host range for some, narrow host range for others.**
- **Look for wingless aphids on the young tender growth. Some key hosts include: *Acanthus, Achillea, Alcea, Asclepias, Aster, Bellis, Dianthus, Digitalis, Heuchera, Helianthus, Helleborus, Hibiscus, Monarda, Papaver, Oleander, Phlox, Primula, Rudbeckia, Salvia, Sedum, Veronica, Viola***
- **White, cast skins, shiny honeydew, sooty mold and the presence of ants are signs of aphids.**
- **Identification to species is needed to release host specific parasitic wasps.**

A Few Aphids

- **Foxglove Aphids**
- **Green peach Aphids**
- **Melon Aphids**
- **Milkweed Aphids**
- **Potato Aphids**
- **Root Aphids**
- **Some are also very specific to certain perennials such as lupine aphids, milkweed aphids, sedum aphids, etc.**

Aphids



Look for cornicles (“tailpipes”) at the end of the abdomen.

Foxglove Aphids



Shiny light green foxglove aphids on Foxglove (*Digitalis*).

Foxglove Aphids



Look on the underside of the lowermost leaves.

Foxglove Aphid



D. Gilrein, Cornell

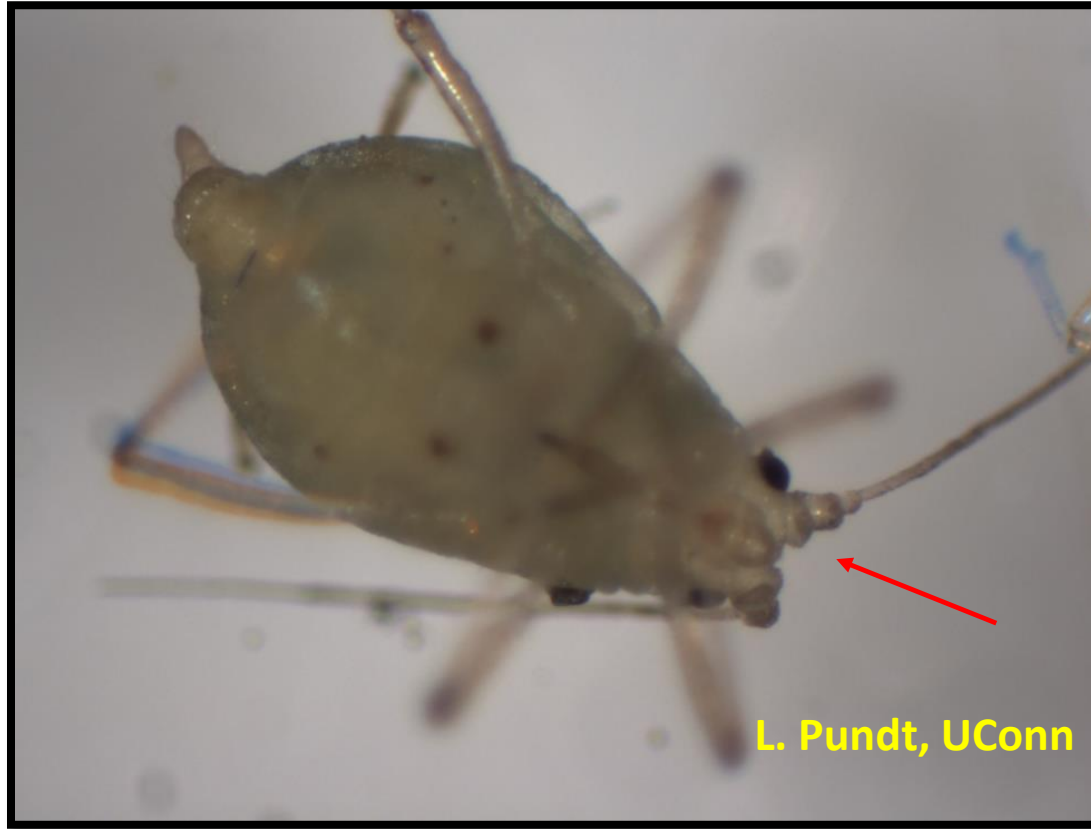
Shiny light yellowish green aphid with dark green patches at the base of the cornicles with black markings on legs & antennae.

Green Peach Aphid



Light green aphid with cornicles slightly darker than body with black tips.

Green Peach Aphid



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Look for a pronounced indentation between the base of the antennae, with protusions that aim toward each other.

Melon Aphids



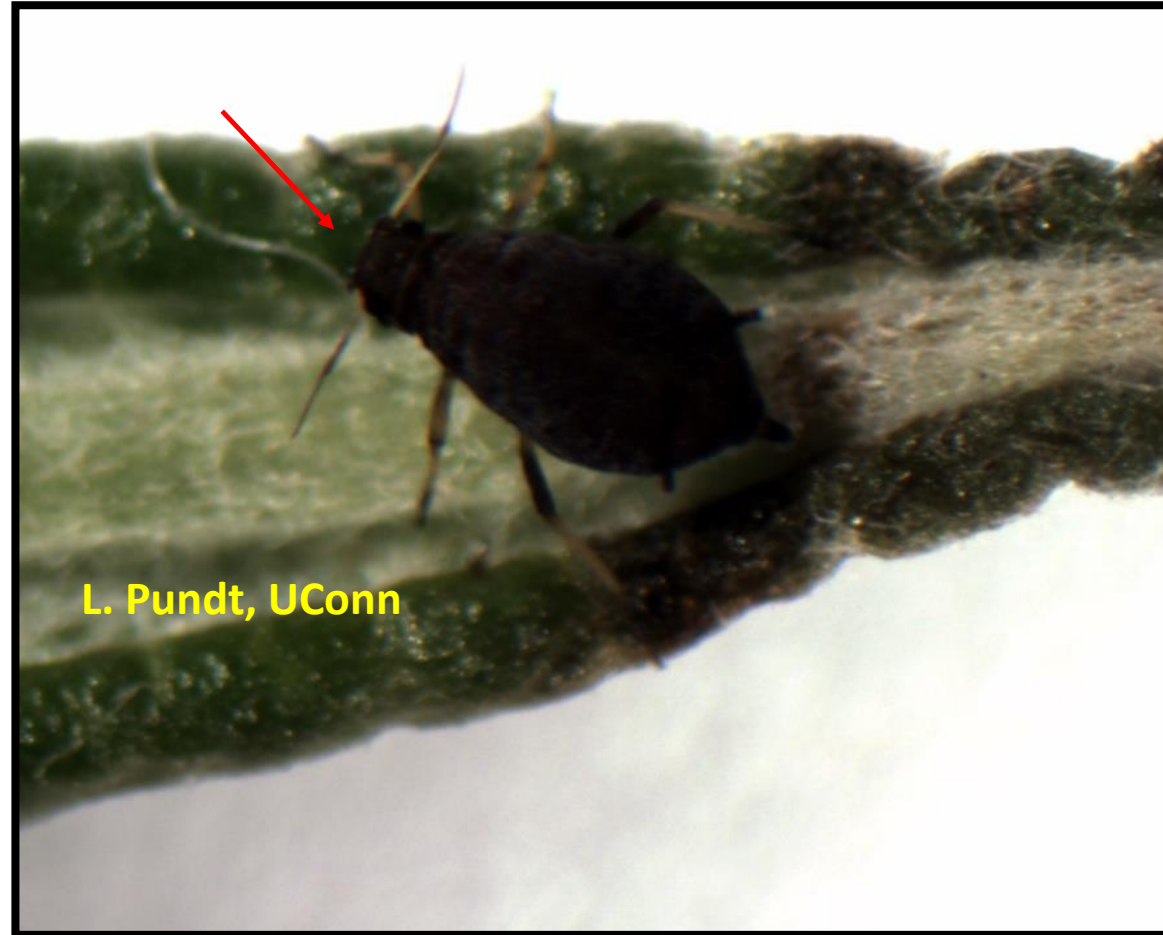
**Light green, dark green to yellow to dark olive
melon aphids found on underside of leaf.**

Melon Aphids



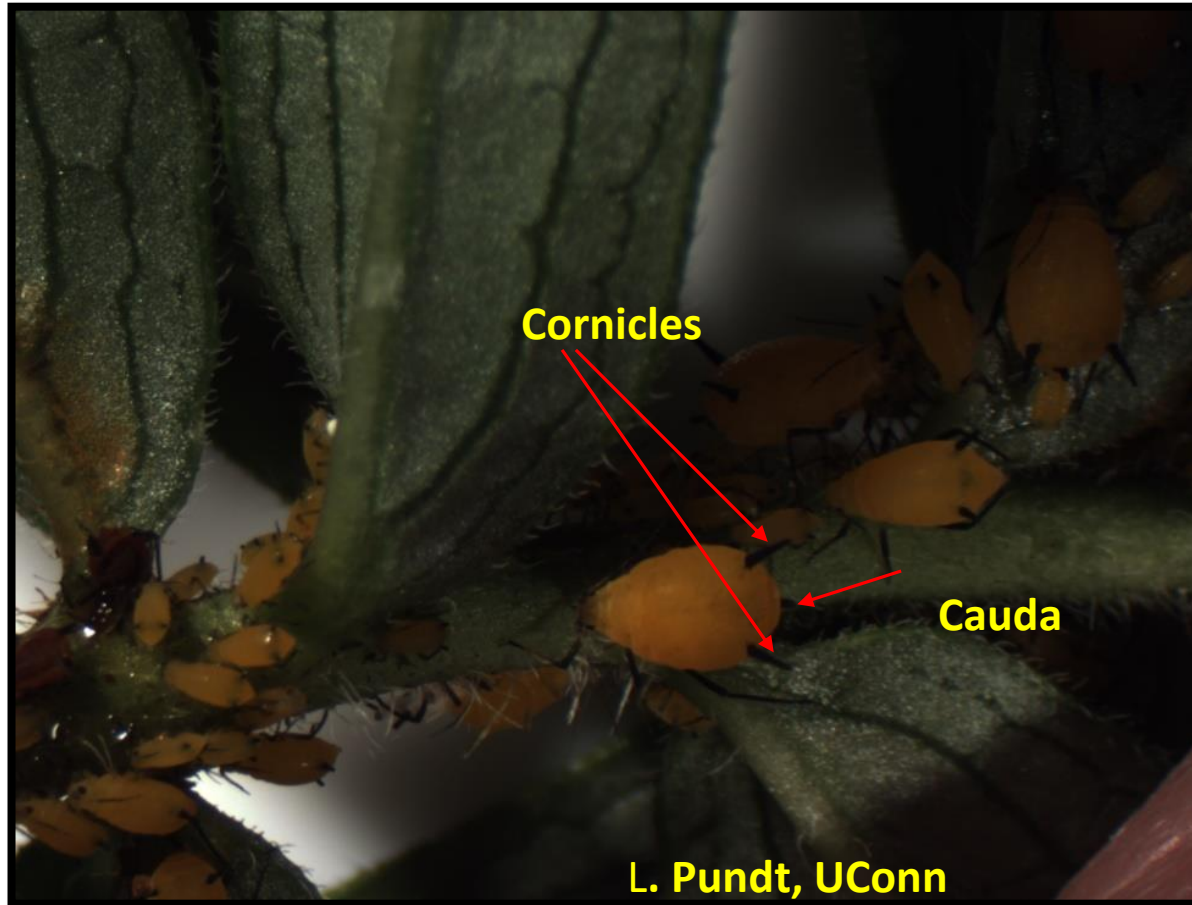
Light or dark green to yellow to dark olive melon aphids have short, entirely black cornicles.

Melon Aphid



Between the antennae, the top of the head lacks the indentation found in green peach aphids.

Oleander or Milkweed Aphids



Oleander Aphids are bright yellow with black antennae, legs, cornicles and cauda.

Potato Aphid



The potato aphid is green or pink, with a darker stripe down its back. Antennae are longer than their bodies, with long, black tipped cylindrical cornicles.

Aphid Mummy



Parasitic wasp larvae (*Aphidius sp.*) have parasitized the swollen brown aphid (on the left) known as “aphid mummies”.

Root Aphids



Root aphids (*Pemphigus* sp.) are covered with whitish wax. With magnification, look closely for their reduced cornicles, that look like rings. Look for on *Aster*, *Coreopsis*, *Lysimachia*, *Sedum*, *Veronica*...

Scouting for Beetles

- **During weekly plant inspections, look for chewed leaves, or pinholes from flea beetle feeding.**
- **Beetles are a large group of insects characterized by hardened forewings.**
- **Both adults and larvae have chewing mouthparts that can cause damage to a wide range of plants.**
- **Most are a problem in outdoor production yards.**

Leaf feeding Beetles

- **Coreopsis Beetles**
- **Lily Leaf Beetles**

Coreopsis Beetle Damage



Do not confuse with feeding damage from Black Vine Weevil adults.

Lily Leaf Beetle Adult



The bright scarlet lily leaf beetle adult has black legs & antennae and is about $\frac{1}{4}$ inch long.

Lily Leaf Beetle Eggs



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Reddish-orange eggs (1- 2 mm. long) are laid in irregular lines on *Lilium* leaves.

Lily Leaf Beetle Larvae



Larvae cover themselves in their own excrement, called a “ fecal shield” which acts as a defense mechanism against predator species.

Lily Leaf Beetle Larvae



Larvae resemble slugs with swollen orange, brown, yellowish or greenish bodies & black heads. Larvae tend to cause more damage than adults.

Scarab Beetles

- **Asiatic Garden Beetles**
- **Japanese Beetles**
- **Oriental Beetles**

Asiatic Garden Beetle



Adults hide during the day in cool, moist areas (in the soil) and feed at night on *Aquilegia*, *Aster*, *Chrysanthemum*, *Dahlia*, *Delphinium*, *Heuchera*, *Phlox*, *Physostegia*, *Rudbeckia*, *Salvia*...

Japanese Beetle Adults



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Adult beetles have a metallic-green thorax and head with copper colored hardened wings (elytra).

Japanese Beetle Feeding Damage



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Adults feed on plant tissue between the veins causing “skeletonization”.

Oriental Beetles



Adults feed much less than Japanese Beetle Adults.

Scouting for Black Vine Weevils

- Look for adult feeding damage in late spring and summer.
- Adults are active at night or during cloudy, overcast days. They hide during the day under containers and in mulches.
- Examine roots and crowns at base of plant for signs of larvae feeding in the fall.
- Key hosts include *Astilbe*, *Bergenia*, *Epimedium*, *Helleborus*, *Heuchera*, *Heucherella*, *Hosta*, *Phlox*, *Primula*, *Tricytris*, *Saxifraga*, *Sedum*, *Tiarella*, *Tricrytis*

Black Vine Weevil Adult Damage



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C-shaped notching along leaf edge on *Tricyrtis*.

Black Vine Weevil Adult



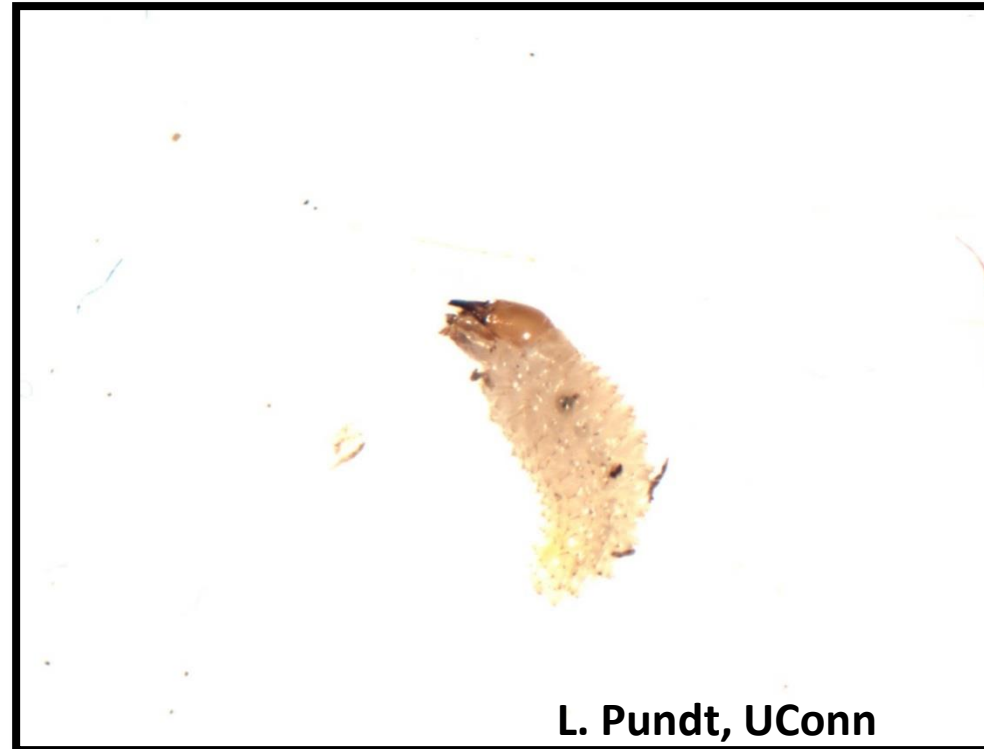
Adults are dark black, about ½ inch long with patches of yellowish hairs on their wing covers (elytra) that are fused together so they cannot fly.

Black Vine Weevil Larval Damage



Black vine weevil larvae bore into base of susceptible perennials such as *Heuchera* sp.

Black Vine Weevil Larva



Black vine weevil larvae are legless white grubs with brown heads. They are typically “C”-shaped with rows of gold-colored setae (hairs) that are visible on their body (up to 5/8 inch long.) They overwinter as larvae.

Borers

- **European Corn Borers**
- **Iris Borers**

European Corn Borer Adults



Adults are $\frac{3}{4}$ inch long and may move into herbaceous perennials from nearby cornfields. Pheromone traps are used to monitor their flight activity in sweet corn. Check Vegetable Pest Messages to help you time pesticide applications.

European Corn Borer Larva



The light brown or pinkish grey larva, up to 1 inch long, has a distinct black head capsule and dark brown spots on each segment of its abdomen.

Key hosts include *Chrysanthemum*, *Dahlia*, *Heliopsis*, *Leucanthemum*...

Iris Borer



Larvae are pale pink with a distinct brown head and up to 1 ½ inches long when mature. They feed at the base of leaves and hollow out the iris rhizomes.

Scouting for Caterpillars

- **Inspect plants for signs of feeding damage and caterpillar frass or droppings.**
- **Start plant inspections when adults are flying.**
- **When scouting, check plants closest to greenhouse openings where adults may enter, especially areas closest to vegetable fields or weedy areas.**

Caterpillars

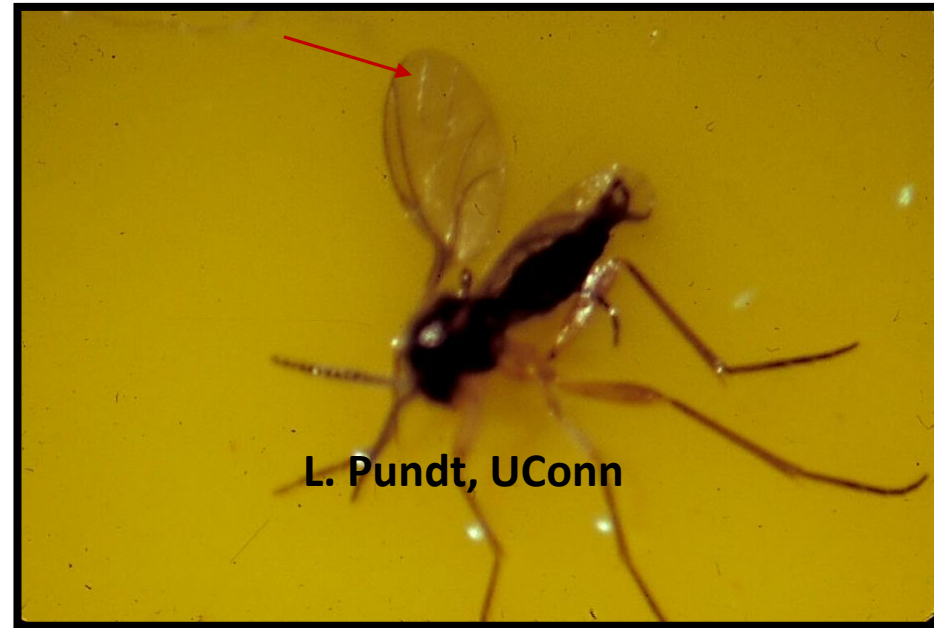


Fecal droppings help distinguish caterpillar feeding damage from slug damage.

Scouting for Fungus Gnats

- Use yellow sticky cards (horizontal placement is best or vertical placement near growing media to attract winged adults).
- Use potato chunks or slices to monitor for larvae. Check potato after two days.
- Look for larval feeding damage on young seedlings especially in propagation houses.
- Fungus gnats have a wide host range. Plants with succulent stems such as *Sedum* are especially susceptible to injury.
- Younger plants are more prone to damage than older plants.

Fungus Gnat Adult



Adult fungus gnats are mosquito-like in body shape, with long legs, a clear pair of wings, & long beaded antennae. Look for distinct Y pattern on the wings.

Fungus Gnat Damage



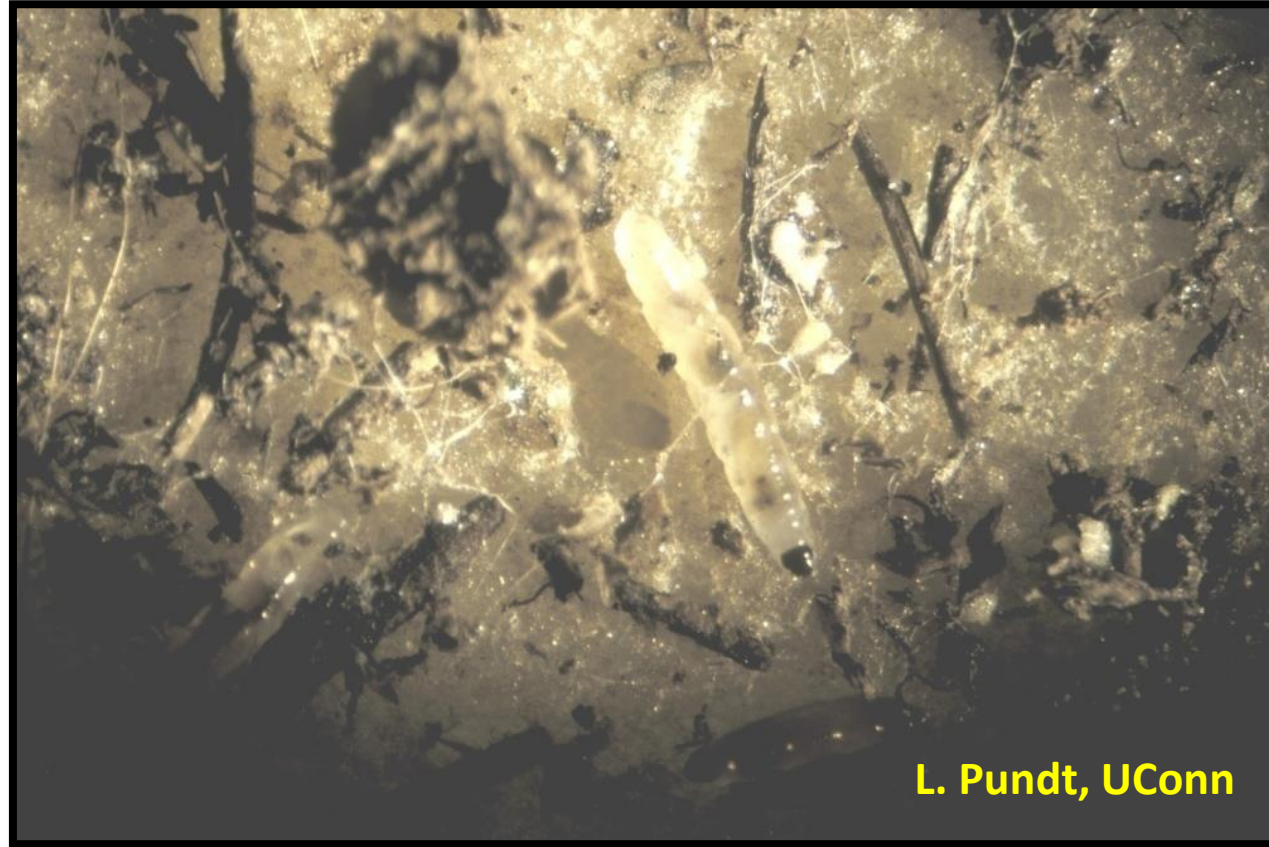
As fungus gnat larvae feed upon developing callus tissue, they delay rooting and destroyed these succulent *Sedum* cuttings.

Fungus Gnat Damage



Fungus gnat larvae bore into stems and crown causing wilting and dieback.

Fungus Gnat Larva



Use potato slices to monitor for black headed larvae.

Plant Bugs

- **Chrysanthemum Lace Bugs**
- **Garden Fleahoppers**
- **Fourlined Plant Bugs**

Chrysanthemum Lace bugs



Adult lace bugs on New England Aster. Look for black tar-like droppings to distinguish from spider mite damage on *Aster*, *Chrysanthemum*, *Helianthus*, *Rudbeckia*, *Solidago*

Garden Fleahopper Damage



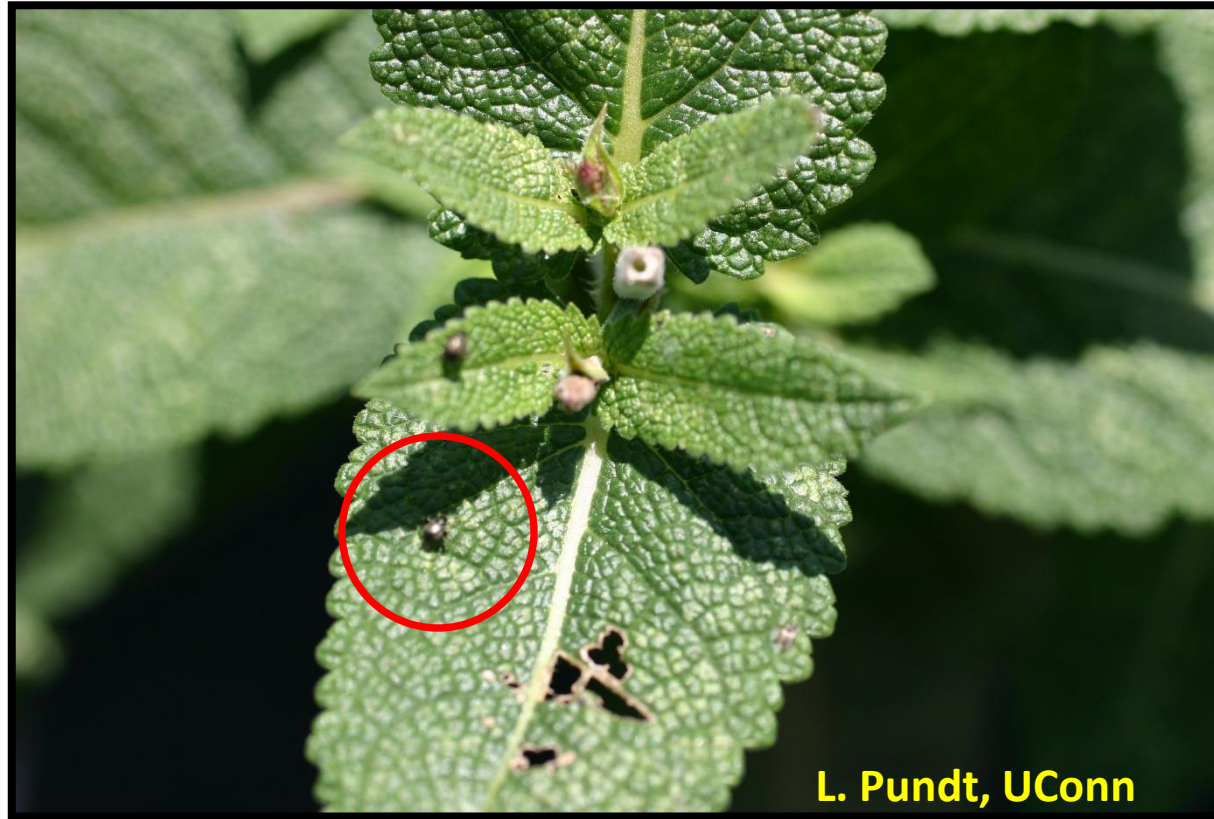
Resembles spider mite feeding damage. Look for dark fecal spots and presence of garden flea hoppers. Much less common than spider mite feeding damage.

Garden Fleahopper



Look for bright green garden fleahopper immature nymphs on the underside of leaves.

Garden Fleahopper Adult



The small (1/12 inch long) shiny, black adults with enlarged hind legs hop when disturbed.

Fourlined Plant Bug Feeding Damage



Feeding damage from fourlined plant bug resembles a leaf spot disease.

Fourlined Plant Bugs



Fourlined plant bug adult and feeding damage on ornamental catmint.

Fourlined Plant Bug Nymphs



Bright red plant bug nymphs.

Scouting for Leafminers

- Leafminer adults resemble houseflies but have yellow bands on their abdomen. Look for adults on yellow sticky cards.
- Females create small punctures in leaves with their egg-laying device (ovipositor).
- Leafminers can be larvae of flies, moths, sawflies or beetles.
- Look for serpentine (winding) mines on *Aconitum*, *Aquilegia*, *Chrysanthemum*, *Delphinium*, *Gypsophila*, *Hemerocallis* and *Veronica*....

Leafminers



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Leafminer adults may be wasps, flies, moth or beetles. They can be confused with shore flies but are often more brightly colored. Look for the white specks from their egg laying punctures on this *Polemonium* foliage.

Leafminers



As larvae feed between the upper and lower surfaces of leaves, winding or serpentine mines develop.

Scouting for Leafhoppers

- Use yellow sticky cards to trap fast moving adults.
- Immature leafhopper nymphs move sideways and can be found on the underside of the leaves.
- Damage resembles spider mite feeding injury.
- Look for on *Alcea, Astilbe, Baptisa, Dahlia, Gaura, Hibiscus, Lavandula, Lupinus, Nepeta ...*

Aster Leafhopper



Adult aster leafhoppers have six black spots on their head and are yellowish-green wedge shaped insects tapered at their rear. Catch these fast moving insects on sticky cards to see these identifying characteristics.

Leafhoppers



Potato leafhopper injury to *Astilbe*. Note the v-shaped edge burn “hopperburn”.

Leafhoppers



Look for Leafhopper immature nymphs on underside of leaf. White stippling or flecking could be confused with spider mite damage

Leafhoppers



Close-up immature leafhopper nymph on underside of leaf.

Leafhoppers



Wedge-shaped leafhopper adult on *Baptisa*.

Mites

- **Broad mites**
- **Bulb mites**
- **Cyclamen mites**
- **Two spotted spider mites**

Scouting for Broad Mites

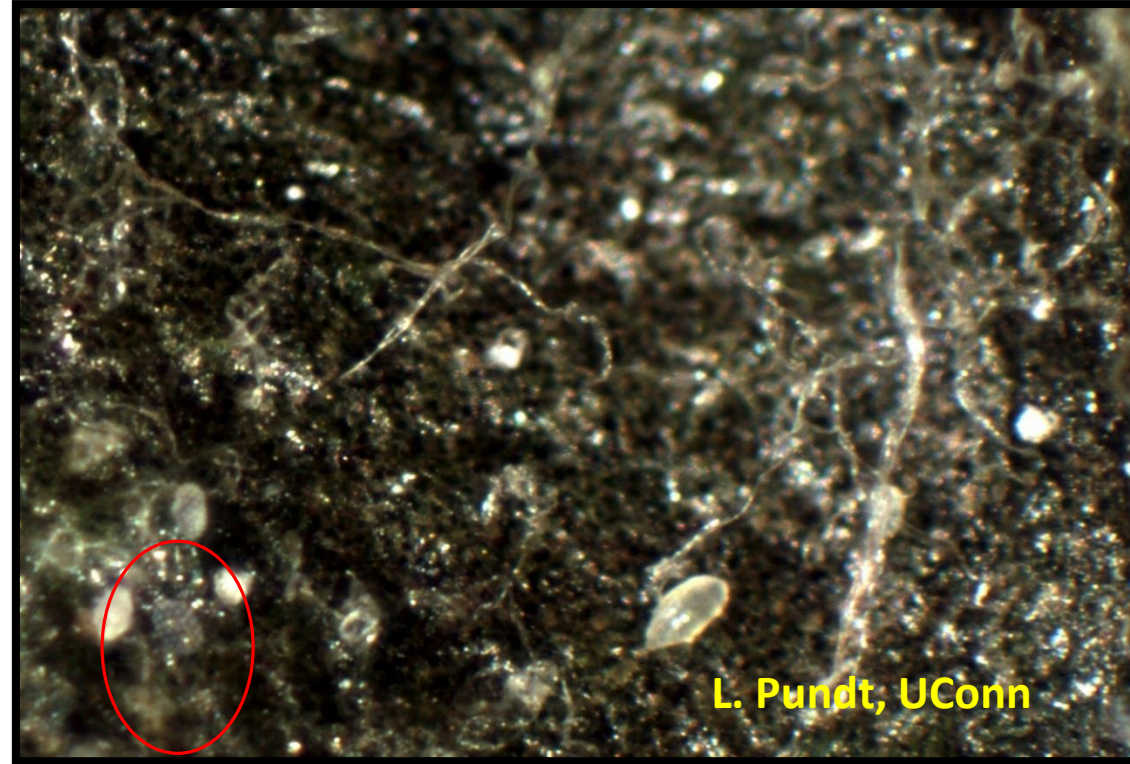
- **Look for characteristic damage (leaf edges curling downward, bronzing on underside of leaves, distorted flowers and buds).**
- **Some key hosts include *Delphinium*, *Lamium*, *Salvia*...**
- **Microscopic examination is often needed to see the broad mites and their eggs.**

Broad mites



Symptoms include downward leaf curling and leaf elongation. Broad mites are best viewed under a microscope.

Broad Mites



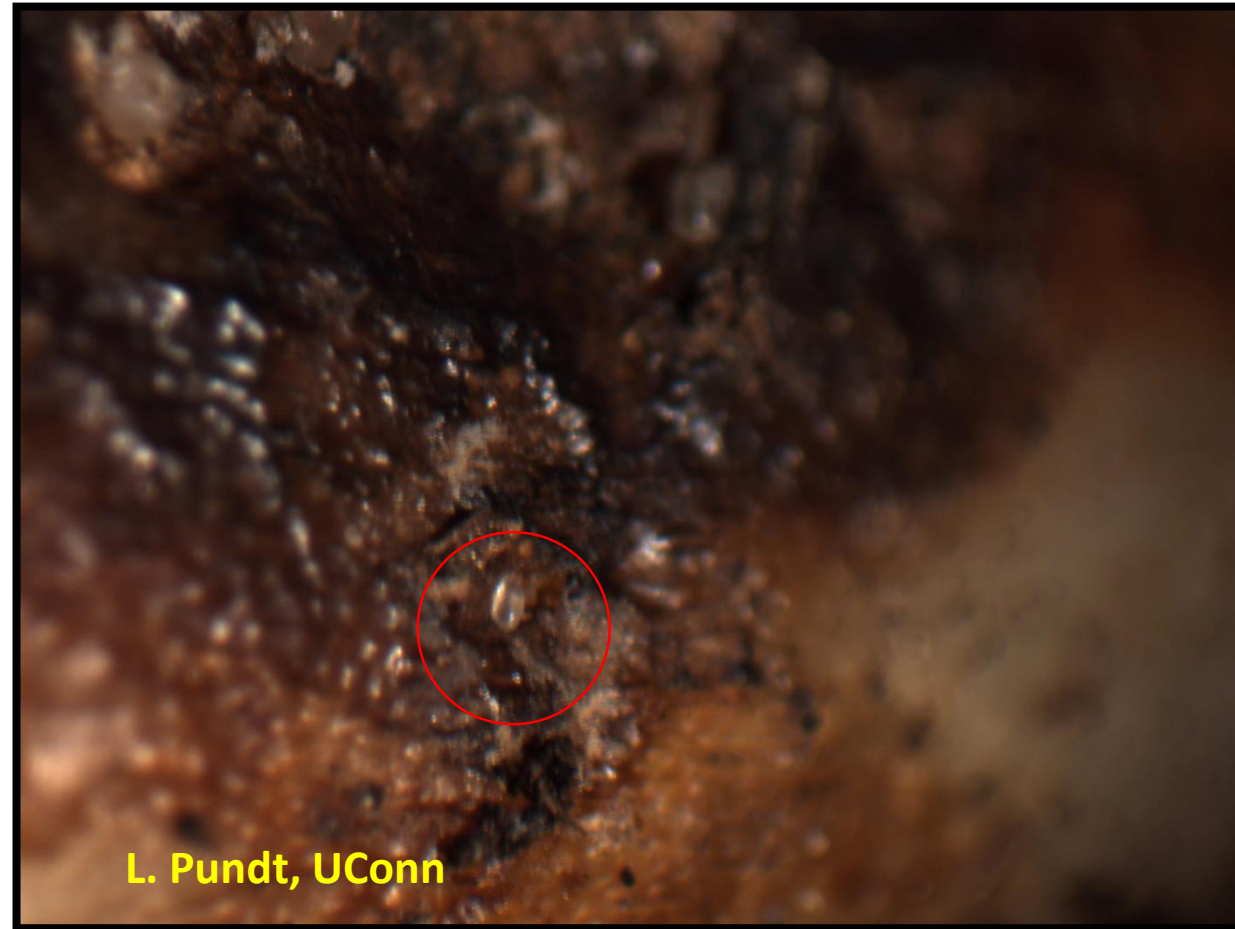
Use a dissecting microscope to look for the very small, broad mites on the underside of leaves. The elliptical, translucent, colorless eggs are covered with whitish bumps.

Bulb mite damage



Bulb mites feeding within decaying tissue of a *Lilium* bulb.

Bulb Mites



Close-up of the small, 1/50 to 1/25th inch long bulb mite under magnification. This shiny white to translucent mite has short reddish-orange legs.

Cyclamen Mites

- Look for signs of damage on *Aconitum*, *Clematis*, *Delphinium*, & *Dahlia*.
- Symptoms include inward curling of leaves, puckering and crinkling. Pitlike depressions may develop.
- Flower buds may be blackened and not open.
- Examination under a microscope is needed to see the small mite which is only 1/100 of an inch long.

Cyclamen Mite Damage



Blackening and death of new growth.

Cyclamen Mite Damage



Cyclamen mite infestations blackens *Delphinium* buds.

Scouting for Spider Mites

- **Visual inspection is needed as the wingless mites will not be found on sticky cards.**
- **Look on underside of leaves along the leaf vein.**
- **Wide host range. *Alcea, Aquilegia, Baptisa, Buddleia, Campanula, Delphinium, Filipendula, Gaillardia, Hemerocallis, Hydrangea, Iris, Lamium, Lavatera, Monarda, Nepeta, Papaver, Phlox, Potentilla, Primula, Rudbeckia, Scabiosa, Thalictrum, Verbena, Viola....***

Two Spotted Spider Mite damage



**Two-spotted spider mite injury to *Buddlei*.
White flecking or stippling of the foliage develops
at feeding sites as a result of loss of cell contents.**

Two Spider Spider Mite Damage



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Bronzing or reddish discoloration can develop as infestation progresses.

Two Spotted Spider Mites



Look on the underside of leaves, especially along the leaf vein for the two spotted spider mites.

Two Spotted Spider Mites

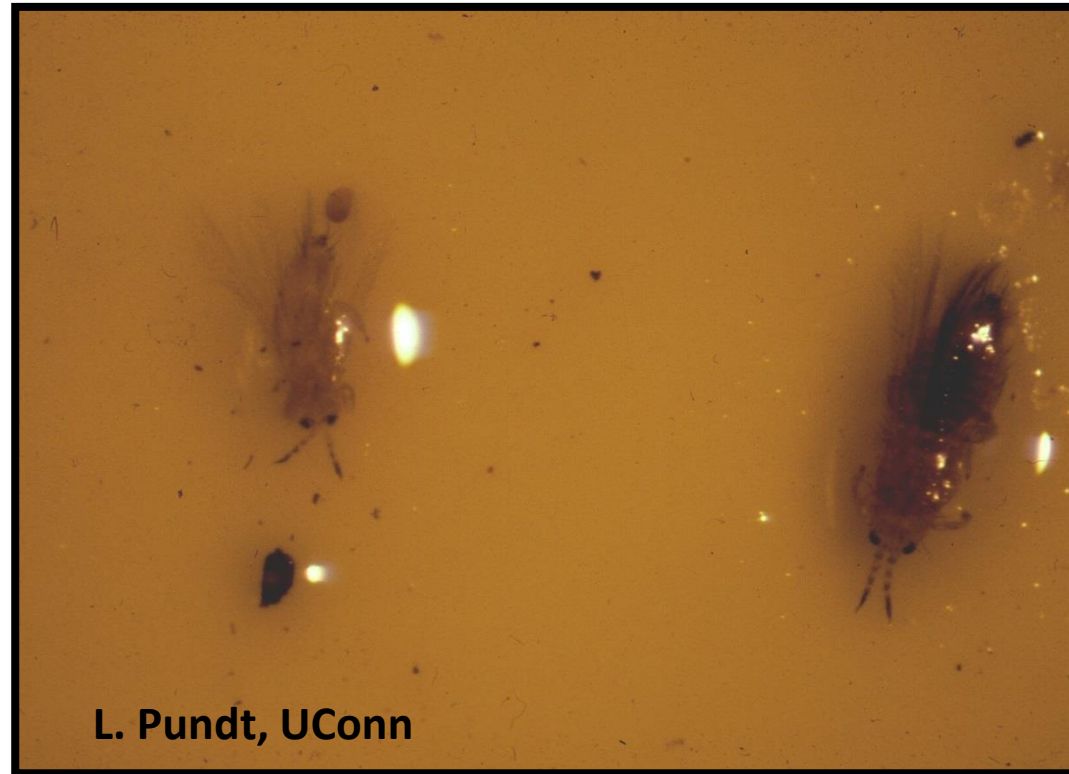


Spider mite infestation progressing with more bronzing and feeding damage on *Baptisa*.

Scouting for thrips

- **Yellow sticky cards are needed to detect early infestations of adults, especially in greenhouses.**
- **Look for thrips and their feeding damage (white scarring, distorted growth, small fecal spots).**
- **Tap foliage over a sheet of white paper to see the small thrips.**
- **Wide host range. *Alcea, Asclepias, Aster, Campanula, Centurea, Chrysanthemum, Coreopsis, Crocosmia, Digitalis, Echinacea, Eupatorium, Lamium, Lupinus, Malva, Monarda, Penstemon, Platycodon, Polemonium, Phlox, Rudbeckia, Tanacetum.....***
- **Many weed hosts, especially those with yellow flowers.**

Adult Thrips



The smaller, male western flower thrips on left and larger female thrips on right. Look for fringed wings, antennae and red eyes to distinguish from grains of peat moss.

Thrips



White scars and fecal droppings from thrips feeding. You can gently blow into the flower heads to agitate thrips making them easier to see.

Thrips



White scarring from thrips feeding on *Lupinus*.

Thrips



Thrips feeding damage to *Asclepias*. Leaves become distorted as thrips feed within buds and white scars develop as they feed upon expanded tissue.

Thrips



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Yellow, wingless thrips larvae on the underside of leaves.

Thrips larvae



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Wingless thrips larva on underside of leaf. Note red eyes.

Adult thrips



Scouting for Slugs & Snails

- **Slugs feed at night on a wide range of plants especially where there is abundant moisture.**
- **Look for holes in leaves and stems and shiny mucous-like slime trails.**
- **Slugs hide during the day and emerge at night to feed.**
- **Inspect areas under containers and damp areas in greenhouse.**
- **Inspect incoming plugs for snails.**

Slugs



As slugs feed, by rasping the plant surface with numerous fine teeth, they leave irregular holes in leaves.

Snails



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Inspect incoming plant shipments for snails.

A few others

Grasshopper Nymphs



Grasshopper nymphs feeding upon *Monarda*.

Shore Flies – A Nuisance Pest



Eliminate algae, their food source.

Spittlebugs – a cosmetic concern



Mass of protective foam surrounding spittlebug nymphs that helps them stay moist during hot, sunny conditions and protect them from predators.