Tips for Scouting
Herbaceous Perennials
Insects and Mites

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Greenhouse Pests
- Aphids
- Caterpillars
- Fungus Gnats
- Mites
- Thrips
- Whiteflies
Nursery Pests

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

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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.

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Foxglove Aphids

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

Look on the underside of the lowermost leaves.
Foxglove Aphid

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

Look for a pronounced indentation between the base of the antennae, with protrusions 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.

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Melon Aphid

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

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Oleander or Milkweed Aphids

Oleander Aphids are bright yellow with black antennae, legs, cornicles and cauda.
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.
Parasitic wasp larvae (*Aphidius sp.*) have parasitized the swollen brown aphid (on the left) known as “aphid mummies”.

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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.
The bright scarlet lily leaf beetle adult has black legs & antennae and is about ¼ inch long.
Lily Leaf Beetle Eggs

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.

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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

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

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, Tricyrtis* ....
Black Vine Weevil Adult Damage

C-shaped notching along leaf edge on *Tricyrtis*.
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 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 ¾ 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.
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.

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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.

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

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* ...
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”.

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

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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 injury to *Buddleia*. White flecking or stippling of the foliage develops at feeding sites as a result of loss of cell contents.
Two Spider Spider Mite Damage

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*. 

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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*. 

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Thrips feeding damage to *Asclepias*. Leaves become distorted as thrips feed within buds and white scars develop as they feed upon expanded tissue.
Yellow, wingless thrips larvae on the underside of leaves.
Thrips larvae

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

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

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.