

# Monitoring for Key Pests During the Greenhouse Production of Perennials

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*Leanne Pundt*  
*Extension Educator*  
*Commercial Horticulture*

**G**reenhouse growers are interested in adding herbaceous perennials to their product mix. As researchers learn more about the flowering requirements of specific perennials, growers may soon be able to bring more species to flower at specific dates. This type of cultural information is likely to increase spring sales of perennials even more, since gardeners are more likely to buy plants in flower. Growers planning on growing and marketing perennials need to become familiar with pest problems and control options.

Following are some of the key pests of herbaceous perennials. This list is based upon a review of the available literature with added input from growers. As such, it is not meant to be an exhaustive listing but, rather, a beginning guide to monitoring greenhouse-grown perennials. For simplicity sake, frequently only the genus name is included because of the large number of cultivars and species. For more detailed information, consult the references listed at the end of the article.

## ***Damping Off***

***Botrytis sp., Pythium sp. and Rhizoctonia sp.***

### **Host Plants**

*Adenophora, Campanula carpatica, Chrysanthemum, Echinacea, Lavatera, Lavandula hidicote, Salvia, Scabiosa* and many others.

### **Monitoring**

Monitor seed flats weekly for poor seed emergence (pre-emergence damping off). Look for circular area as fungus advances from a point of infection. Look for small water-soaked spots on the emerging shoot (hypocotyl) before seedling collapses. May see cottony web-like mycelium due to *Rhizoctonia sp.*

## Damage Symptoms

Seedlings fail to emerge (pre-emergence damping off) or seedlings collapse and are killed (postemergence damping off). Seedlings that escape infection may later develop root rots or blight. Do not confuse with injury due to hot irrigation water, overfertilization, low temperatures, drought or chemical injury.

## IPM Options

Purchase high-quality seed. Grow seedlings on raised benches and avoid crowded seed flats. Avoid excessive irrigation. Have adequate air pore space in the mix to discourage *Pythium*. Closely monitor pH and soluble salt levels. Use clean hose nozzles and avoid water splash. Promote vigorous seedling growth. Spot treat with selected fungicide.

## Fungus Gnat

*Bradysia sp. or Sciara sp.*

## Host Plant

Adults are attracted to decaying plant tissue (fungi are a food source) and potting mixes with immature composts (less than six months old). Larvae may be particularly damaging on *Ballerana*, *Dianthus*, *Dicentra spectabilis*, *Geranium (Cranesbill)*, *Heuchera*, *Lobelia Scabiosa*, *Sedum* and others.

## Monitoring

Use yellow sticky cards to monitor for adults. Place cards just above soil surface. (Horizontal placement will attract more adults.) Use potato slices (1.5" long by 1") to monitor for larvae, especially during cool, overcast weather. Examine daily. Monitor young cuttings and developing roots for signs of feeding injury

## Damage Symptoms

The first two generations are the most damaging during crop production. Fungus gnat larvae may bore into stems of succulent cuttings and feed on tender young roots. Fungus gnats may play a role in the transmission of *Botrytis sp.*, *Cylindrocladium sp.*, *Pythium sp.*, *Thielaviopsis sp.*, *Sclerotinia sp.* and *Verticillium sp.*

## IPM Options

Avoid standing water, soil debris and organic matter on the floor. Remove weeds. Treat early before damaging populations develop. Control options: *Bacillus thuringiensis* subsp. *israelensis* (Gnatrol). Insect parasitic nematodes *Steinernema feltiae*. (X-gnat or Scanmask). Check viability of nematodes before treatment.

## **Green Peach Aphid**

### ***Myzus persicae***

#### **Host Plants**

*Aster, Chrysanthemum, Dahlia, Delphinium, Dianthus, Myosotis, Gaillardia, Iris, Papaver, Primula, Sedum, Verbena, Viola* and assorted herbs.

#### **Monitoring**

Overwinters as black shiny eggs on *Prunus sp.* outdoors. Place yellow sticky cards near doors and vents to detect winged adults. Inspect incoming plants on underside of leaves and buds for small, (1/14"-long) aphid that is pale green or yellow to pink in color. Colonies tend to be on the tip of new growth.

#### **Damage Symptoms**

Tender, new growth is distorted and deformed. Honeydew and sooty mold reduce aesthetic appearance of plant. Green peach aphid is reported to transmit more than 150 viruses including common mosaic virus, tobacco, tomato, lettuce, dahlia and canna mosaic virus.

#### **IPM Options**

Eliminate weed hosts. Control pest early, before crop flowers. Systemic materials (ie. Marathon 1G) tend to be more effective than nonsystemic materials. Insect-killing fungi *Beauveria bassiana* (Naturalis O or Mycotrol WP).

## **Greenhouse Whitefly**

### ***Trialeurodes vaporariorum***

#### **Host Plants**

*Aquilegia, Astilbe, Chrysanthemum, Dicentra, Hibiscus, Lavandula, Lupinus, Malva, Mentha sp., Primula, Salvia, Rudbeckia* and assorted herbs.

#### **Monitoring**

Use yellow sticky cards to monitor for adult whiteflies. Look for powdery-white adults (1/16" long) on underside of uppermost foliage. Wings are held flat over their body. Older (3rd and 4th) instar immatures are found on the lowermost leaves. GHWF pupae are white with parallel sides.

#### **Damage Symptoms**

When high populations develop, honeydew and sooty mold will reduce aesthetic appearance of plants. May reduce vigor of

plants with defoliation and stunting. Sooty mold may lead to chlorotic yellowing of foliage.

### **IPM Options**

Remove weeds and “pet plants”. Thorough spray coverage is needed to underside of leaves. If using insect growth regulators, use indicator plants to assess treatment effectiveness.

*Beauvaria bassiana* (Naturalis 0 or Mycotrol WP) Marathon 1 G.

## **Impatiens Necrotic Spot Virus (INSV)**

### **Home Plants**

*Anemone, Aquilegia, Aster, Campanula, Centaurea, Chrysanthemum x superbum, Coreopsis, Dahlia, Delphinium, Dianthus, Gaillardia, Lobelia, Lychnis chalcedonica, Lupinus, Malva, Mentha, Oenothera, Paeonia, Papaver, Penstemon, Phlox drummondii, Primula, Verbena* and others.

### **Monitoring**

Symptoms highly variable depending upon host plant or cultivar. Use fava bean or petunia indicator plants to detect if thrips are carrying the virus. Monitor Western Flower Thrips (WFT) populations with yellow or blue sticky cards. Use Q-TSPA kits (AgDia) to determine if thrips or plants are infected.

### **Damage Symptoms**

Plants are weakened with reduced vigor and may die. Infected herbaceous perennials may potentially serve as a reservoir for the virus to spread by thrips to other landscape plants. Additional thrips species reported to feed on perennials include onion thrips, iris thrips, flower thrips, gladious thrips and hollyhock thrips.

### **IPM Options**

No control. Destroy infected plants. In greenhouse, begin a strict sanitation and thrips monitoring program.

## **Melon or Cotton Aphid**

### ***Aphis gossypii***

### **Host Plants**

*Althea, Aquilegia, Chrysanthemum, Echinops, Helianthus, Heliotropium, Hibiscus, Iris, Lythrum, Monarda, Papaver, Penstemon, Primula. Found on closely related weed species including Asclepias, Eupatorium, Trollius, Sedum and Verbena.*

## **Monitoring**

Rely primarily on plant inspection. Scout weekly, early in the crop, before flowering. Closely inspect overwintered perennials in the coldframe before they are introduced into the greenhouse. Melon aphids are smaller (1/16") than green peach aphids and are greenish-yellow to dark green in color. They have "tailpipes" darker than the rest of their body.

## **Damage Symptoms**

Leaves may become deformed, plants stunted with discoloration of foliage. Stems may die back and plants wilt. Honeydew, sooty mold and shed skins may be unsightly.

## **IPM Options**

Eliminate weed hosts. Apply nonsystemic materials before flowers open. Insecticidal soap, insecticidal soap and Orthene, or insecticidal soap and Mavrik. If using insect growth regulators, use indicator plants to assess treatment effectiveness. (Two applications may be needed.) Marathon 1 G

## **Western Flower Thrips** *Frankliniella occidentalis*

### **Host Plants**

Wide host range. Some key hosts may include *Aster*, *Campanula*, *Chrysanthemum*, *Coreopsis*, *Digitalis*, *Eupatorium*, *Lamium*, *Lupinus*, *Platycodon*, *Rudbeckia*, *Sedum* and others.

### **Monitoring**

Use yellow or blue sticky cards to monitor for adult thrips. Check cards weekly to track population levels and to evaluate treatment effectiveness. Inspect and quarantine incoming plants for signs of thrips larvae or adults (five to seven days). Tap foliage over white sheet of paper to look for slender insects (1/25" in length).

### **Damage Symptoms**

Tender young growth is distorted and cupped. Expanded leaves have silvery areas with black fecal spots. Flowers are blasted or streaked as thrips feed on pollen. Most efficient thrips vector of INSV.

### **IPM Options**

Remove weeds inside greenhouse and maintain a 10- to 20-ft. weed-free barrier outside. Remove crop debris and cull piles.

Early detection is needed. Three spray applications every three to five days with thorough coverage is needed to reduce population levels.

## References

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