Northeast

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Floriculture IPM Notes

May 2007 A publication of Rutgers and Cornell Cooperative Extension Vol. 17, No 5

Current Situation

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Foxglove aphids have been found feeding on verbena, petunia, salvia, and calibrachoa. Look for foxglove aphids on curled and distorted foliage, often near the tips, and aphid cast skins. Only a few foxglove aphids need to be present in order for the curling and distortion to occur. **Green peach aphids** were found infesting calibrachoa, ivy geranium, ipomoea, and petunia. To manage, treat with any of the neonicotinoid insecticides (e.g., Marathon/Benefit, TriStar, Aria – do not apply to pansy or viola, Celero, Safari, and Flagship; note that Celero, Safari and Flagship are not registered in NY), most of which are labeled as sprays or media drenches. (TriStar and Aria are the exceptions and can only be applied as sprays). Insecticidal soap can also work well if coverage is good. Other options include Endeavor, Orthene TTO (only labeled for a very few crops), Avid, and the various pyrethroids (Tame, Talstar Nursery Flowable, Astro, Decathlon, Scimitar GC). The pyrethroids may not work as well for green peach and melon aphid. The foliage distorted as a result of foxglove aphids will remain, unless pruned off, but new foliage will emerge normally. If plants infested by foxglove aphids will be moved into the landscape immediately, treatment may not be necessary.

Damage from foxglove aphid. Photo Dan Gilrein

Some problem areas with high populations of **fungus gnats** have been seen. Skeletonized foliage, a result of feeding injury, was seen on foliage on the surface of the growing media. Stunted young plants were also observed. To manage, avoid keeping the media wet, and if plants highly susceptible to feeding injury are present treat with an appropriate insecticide. Options include insect growth regulators (such as Adept, Citation, Distance, Azatin, or Ornazin), or neonicotinoids (such as Marathon, TriStar, Safari or Flagship, remember that Safari and Flagship are not approved for use in NY) applied as drench or 'sprench'. Other options include DuraGuard and Enstar, or biological controls such as beneficial nematode products (such as Nemasys, Scanmask, or NemaShield) and Gnatrol (*Bacillus thuringiensis* var. *israelensis*). Generally, fungus gnats will not be a problem once the plants are moved into the landscape.

Cases of **impatiens necrotic spot virus (INSV)** continue to be reported. This month, lobelia, African violet, and a few samples of impatiens tested positive for INSV. Verbena, diascia, and coleus tested positive earlier this spring. Remove infected plants and keep a close eye on your thrips populations if INSV symptoms are seen in your ranges.

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Thrips populations were heavy in South Jersey greenhouses with weekly sticky card counts reaching 100 or more in several locations. Infestations were observed on dracaena, petunia, lobelia, New Guinea impatiens, and verbena. Monitor populations with sticky cards and don't let the population get out of hand! Be sure to check hanging baskets where higher temperatures can enhance population buildup. Thrips can quickly spread INSV and will become increasingly difficult to manage as the temperature increases and as more plants are in bloom in the greenhouse. Options for management include Conserve, Mesurol, or Orthene TTO. *Beauveria bassiana* products (such as BotaniGuard and Naturalis L), and sprays of Avid, TriStar or Marathon II can provide suppression.

Infestations of **twospotted spider mite** were seen on hibiscus, mandevilla, ipomoea, New Guinea impatiens, dahlias, and geranium. Populations have been building with the recent heat. Watch for chlorotic foliage or foliage with a stippled or mottled appearance, which can be associated with leaf drop in severe cases. Often spider mite infestations can mimic nutritional deficiencies, so make sure to inspect off-looking leaves. Look on the undersides of leaves for evidence of mites – mites, eggs, cast skins, or webbing – magnification might be necessary. Water-stressed plants are more likely to be damaged by spider mites, so make sure irrigation is adequate. Chemical options include Ovation, Hexagon, and TetraSan, if the mites are spotted early. For a faster knockdown, Floramite, Sanmite or Akari, Avid, Pylon, Judo (in NY: a SLN label is needed, indoor use only, check product bulletin for expanded list of sensitive plants), or Kelthane, Mavrik, Talstar, or Scimitar GC are options. M-Pede, horticultural oil, or Triact 70 are low residual products also labeled for spider mite management.

Leafminers were found on asters. The problem was not serious, but gives an early warning to monitor fall garden mums, which have occasionally suffered heavy damage. The most commonly encountered species are *Liriomyza trifolii* (serpentine leafminer) and *L. sativae* (vegetable leafminer), but there are several other species that may be found on asters and other plants. Pedestal and various translaminar insecticides including Avid, Citation, Safari, Marathon, and Conserve can be used for management. Serpentine leafminer was a serious pest about 20 years ago, notoriously for its resistance to many insecticides, so it bears watching. Mums and gerbera were among the common hosts. A tiny parasitoid wasp, *Diglyphyus begini*, has been used for biological control with good results.

Leafminer damage on aster. Photo Steven K. Rettke

Whiteflies were found on hibiscus that did not respond to the usual chemicals. While it is suspicious, this population has not yet been confirmed to be the Q biotype. Be wary of stubborn whitefly populations that are not responding to chemicals such as Distance and Marathon, the Q biotype might be the culprit. Contact your local extension agent for identification and management recommendations.

Pythium root rot, caused by *Pythium irregulare*, was found on snapdragons**.** Plants were wilted despite moist media, and roots were poorly developed and rotted. Also, New Guinea impatiens were found with Pythium root and crown rot caused by *Pythium torulosum*. Fungicides such as Banrot and Subdue MAXX are commonly used for *Pythium* management. Other options include: Stature, Alude, Aliette, and Terrazole or Truban.

Symptoms of Pythium root and crown rot on New Guinea impatiens, caused by *Pythium torulosum.*
Image: Jim Willmott

Powdery mildew was seen on tarragon and rosemary. To manage powdery mildew on ornamental plants, rotate a strobilurin fungicide (e.g, Compass, Cygnus, Heritage, Insignia) with a DMI fungicide (e.g., Strike, Eagle, Terraguard), a thiophanate-methyl material (e.g., Cleary's 3336, OHP 6672), or a chlorothalonil material (e.g., Daconil, Echo). Note that Eagle and Cygnus are *not* registered for use on Long Island. Managing powdery mildew on herbs is largely a matter of good plant spacing, air movement, and humidity management. For powdery mildew management on herbs, sprays of materials such as Milstop, Rhapsody, or horticultural oil can provide some benefit.

Downy mildews were reported on bracteantha, coleus, and impatiens in the northeast. Treat with appropriate fungicides on a weekly rotation, especially when the weather is favorable for downy mildew – cool temperatures and high humidity. Apply a systemic such as Aliette, Stature DM, or a strobilurin fungicide (Compass, Heritage, Insignia, Cygnus; Cygnus is not labeled for LI), and rotate the systemic with a mancozeb material (such as Protect or Dithane) or a copper material.

Phyllosticta leaf spot and **Alternaria leaf spot** were seen on impatiens. See the following article by Margery Daughtrey on tips on how to identify and manage these leaf spots as well as downy mildew, INSV, and bacterial leaf spot – other common leaf spot diseases found on impatiens.

What Can Go Wrong With Impatiens (*Impatiens wallerana*) Leaves

Margery Daughtrey, Cornell University

Impatiens are tops for consumers with shady yards, but also a top food choice for some of the greenhouse pathogens! Although they are not the only popular bedding plant with multiple potential problems, for most crops it's pretty simple to tell their foliar problems apart. On geraniums, you can tell the rust from the bacterial blight. On pansies, you can tell the powdery mildew from the Colletotrichum leaf spot. With impatiens, though, it can be really tough to know what you're dealing with when spots show up.

Spot #1: These appear on the leaves, sometimes as simple little black spots, but the spots will vary in size. Another favorite guise is a black semicircle at the leaf edge. Or zonate spots with tan centers and black edges. Or black veins. Or stunted new growth. Along with the black spotting, there are some little white scratchy marks on the foliage. Sometimes the leaves have distorted outlines. And gee, some of the other plants in the greenhouse are looking funny too—the begonias have yellow mottling, and a few of the verbenas have a light

yellow mosaic in the leaves. And there are little round brown spots on the coleus. Adding all these things up together, along with noticing a lot of very tiny, very narrow insects on your yellow sticky cards, should let you know that you are facing **impatiens necrotic spot virus, INSV**. This is a virus carried by the winged adult Western flower thrips, which can transmit the virus if it has grown up on (that is, had its larval stages on) a plant infected by INSV. It is fairly appropriate that this virus has been named after impatiens, as this is the crop that it is most capable of ruining. Because thrips populations tend to get out of control when growers are distracted by spring shipping, plants often suddenly develop spots right at the time baskets are ready for sale. Keep monitoring for thrips and making control treatments if needed—remember that populations will surge with spring warmth.

INSV in semicircle on leaf margin. Other spots may occur across the leaf surface and will vary in size. Photo Margery Daughtrey

Spot #2: These appear on the leaves, and are also noticed often on the unopened flower buds and sometimes on stems. They are all about the same size, roughly 1/8 in. in diameter. The spots may be at the edge of the leaf, but they also occur scattered across the leaf surface. They are round, and have a light tan center, but they cause a lot of aesthetic damage to the leaf because they often have a rim of reddish or purple pigment. This coloration is actually from the plant, a sign of its self-defense against the pathogen — pigments are mobilized to the site of the

Alternaria leaf spot are small, mostly round and occur scattered across the leaf surface. Photo: Margery Daughtrey

invasion. With a microscope or a hand lens, you can sometimes see sporulation at the center of these lesions, looking like a patch of sparse, scraggly fuzz. The spores on the lesions are produced in chains, and are in the shape of cavemen's clubs if you magnify them enough to tell. This is the **Alternaria leaf spot of impatiens**, a problem that can be seed borne. If you detect it early enough, roguing out the plants with the problem can stop the spread to adjacent plants. The splashing of overhead watering can spread the spores to nearby plants. A range of fungicides including chlorothalonil (e.g. Daconil), iprodione (e.g. Chipco 26019, 26GT) and coppers will work against *Alternaria*; thiophanate methyl (in Cleary 3336, OHP 6672 etc) does not work against this disease.

Spot #3: These show on the leaves, and are larger than Spot #2 (Alternaria leaf spot), but as large as some of the largest of Spot #1 (INSV). They are tan, and have concentric rings within them, indicating that small spots grew, and grew, and grew. At the center of the spots, you may see (with a hand lens) a scattering of round dark bodies that are spore cases (pycnidia) for the fungus. This disease is **Phyllosticta leaf spot**, which we have seen on New Guinea impatiens before, but which has occurred on *Impatiens wallerana* this season. Very little is known about this disease on impatiens, but restricting the leaf wetness periods and using standard anti-leaf spot fungicides should be effective for control, when coupled with roguing out the plants obviously

diseased. Most leaf spot-countering fungicides (see fungicides discussed in previous paragraph) will help against *Phyllosticta*, including the thiophanate-methyls (3336, 6672, etc) that does not have control action against *Alternaria*. Keeping foliage dry is an important

Phyllosticta leaf spot is relatively large with tan centers and small black fruiting bodies. Photo Margery Daughtrey

control tactic.

Spot #4: These tend to happen on the foliage early in the season. They can occur anywhere on the leaves, but they are much more likely to show up at the leaf edges. They are of various sizes, but often show as semicircular spots on the leaf margin. The spots can show some pigment at their rims, but often show none, and tend to be somewhat transparent at their centers. These are the symptoms of **bacterial leaf spot**, caused by *Pseudomonas* species. Bacterial leaf spots on impatiens tend to appear early in the growing season, before the Alternaria leaf spot has enough warmth to create symptoms. Wet foliage is needed for either the bacteria or the fungi to infect. As a preventative measure, keep the foliage as dry as possible, and use sprays of a copper material to reduce disease spread if bacterial spotting appears. Copper is also effective against the fungal leaf spots caused by *Alternaria* and *Phyllosticta* species.

Spot #5: These show following periods of high humidity, and look very different from the other spots described in this article. The leaf develops a light yellowish speckling, similar to the look of a leaf that has spider mites feeding on the underside. Only by turning the leaf over will the culprit be brought into view: not mites at all, but a snowy white coating of **downy mildew**! Another symptom that may accompany the mite-like aspect of downy mildew injury is downward leaf curling. This disease, although known on native plants in the United States, has only been found in the greenhouse trade for just a few years. We know very little about it, but reports to date indicate that it is dispelled by summer heat. This downy mildew remains a threat during the spring production season, usually when weather is favorable to its development. Fungicides effective on other downy mildews will presumably work against this disease of impatiens: start with a mancozeb or a copper to kill sporangia and protect plant surfaces against new infections. In the category of systemic action, which is best used in rotation with contact materials, the new fungicides Fenstop and Stature DM have shown excellent results in our trials against coleus downy mildew. Strobilurins such as Heritage, Compass and Insignia will reduce downy mildew, as will phophorous acids such as Aliette and Alude.

Downy mildew symptoms are subtle at first – resembling spider mite injury.

Fuzzy white sporulation of the downy mildew pathogen on underside of impatiens leaf. Image Margery Daughtrey

Phyllosticta leaf spot on New Guinea impatiens
Photo Jim Willmott

This publication contains pesticide recommendations. Changes in pesticide regulations occur frequently and human errors are possible. Some materials mentioned may no longer be available, and some uses may no longer be legal. All pesticides distributed, sold or applied in New York or New Jersey must be registered with the New York State DEC or New Jersey DEP. Questions concerning the legality and registration status for pesticide use should be directed to the appropriate Cooperative Extension Specialist or your regional DEP or DEC office. **READ THE LABEL BEFORE APPLYING ANY PESTICIDE.**

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