



Greenhouse TPM/IPM Weekly Report
University of Maryland Cooperative Extension
Central Maryland Research and Education Center

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April 27, 2007

<p>High Tunnel Conference and Tour May 31, 2007 Montgomery County Extension Office, Derwood Farmhouse Flowers and Plants, Brookeville For more information: 301-596-9413</p>	<p>Chesapeake Green Interiorscape Conference May 18, 2007 Brookside Gardens, Wheaton, Maryland For more information: 410-823-8684</p>
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Celosia

We saw celosia plants with very similar spotting on the leaves at two operations this week. The spots were small, evenly distributed, and were found only on the upper surface of the leaves. One of the samples, *Celosia cristata* 'Castle Mix,' was submitted to the Plant Diagnostic Clinic. Ethel Dutky found no fungal structures or bacteria associated with the spots, and the spots did not increase in size in the lab. Ethel concluded that this is some sort of spray injury.



Leaf spots on celosia

Gerbera

We visited a greenhouse this week that was having a variety of problems with their gerbera daisies. We found weeds, thrips injury, and aphids.



Winged aphids on bloom



Oxalis weeds growing in pots



Thrips streaking damage

Scouting Reports

We are seeing two-spotted spider mites on mandevilla vine, sweet potato vine, and gardenia in greenhouses this week. Scouts should also be monitoring scaveola and verbena for mites.

Control: Akari, Floramite, Avid, Pylon, horticultural oil

Aphids were found on gerbera, vinca vine, nicotiana, and primrose this week. Growers should also be monitoring snapdragons, verbena, and salvia for aphids.

Control: Endeavor, Safari, Marathon, TriStar, Flagship



Two-spotted spider mite on mandevilla



Stippling damage on 'Maragrite' sweet potato



Green peach aphids on vinca vine

Rudbeckia

We had Rudbeckia samples in the lab this week with *Botrytis* and fungus gnats. The fungus gnats were feeding on the lower leaves laying on the surface of the soil.

Fungus gnats can be a problem if the substrate moisture level remains high. Fungus gnat adults have been found to spread diseases like *Pythium* through the greenhouse.

Monitoring:

Check for presence of larvae of fungus gnats by using potato disks placed on the surface of the substrate. Check the underside of the potato disk at least twice a week looking for presence of the larvae.



Fungus gnat damage on rudbeckia

Control: **Bti** sold under the name Gnatrol can be applied. It is recommended that you make three applications at 7 -14 day intervals if using Gnatrol. The label recommends that the first application be made at a higher rate follow by two additional applications at lower rates. **Distance** applied as a soil drench give excellent long term control of fungus gnats. Distance is an Insect growth regulator that prevents larvae from maturing. The kill is not quick but very effective.

Entomopathogenic nematodes- we have had excellent success using the beneficial nematode, *Steinernma feltiae*, applied as soil drenches to control fungus gnats.

Overhead watering and tight plant spacing both contribute to increased incidence of *Botrytis* in the greenhouse. *Botrytis* can invade the plant directly through unwounded plant parts, especially flowers or through wounds such as the stubs left when plants are pinched. Any areas of damaged tissue can be easily invaded by *Botrytis*. The *Botrytis* fungus requires a film of water on plant surfaces to germinate and infect the plant. This film of water must remain on the plant surface for several hours. Any cultural practice that prevents continuous periods of leaf wetness will help prevent *Botrytis* infection.



Rudbeckia infected with Botrytis

Some cultural recommendations include:

- 1- Installation of Horizontal Air Flow fans (HAF fans) to circulate the air in the greenhouse and prevent accumulation of humid air around the plants.
- 2 - Use of trickle or ebb and flood irrigation, so foliage is kept dry.
- 3 - Vent the warm, moist air at sunset and then heat the colder outside air that is taken in. This will reduce air humidity overnight.
- 4 – Repair dripping faucets and correct drainage so there are no puddles in the production area.

Sanitation is essential to keep *Botrytis* under control because the fungus can produce a huge amount of infective spores on debris. These spores are moved around the greenhouse and settle out onto plant surfaces where they can wait several weeks for a film of water to enable infection. Control weeds and remove plant debris from production areas. Groom plants to remove fallen flowers and dead foliage.

Control: Fungicides may be used to combat Botrytis under conditions that are conducive for disease. Foliar sprays of Decree or chlorothalonil or mancozeb or coppers such as Phyton 27 are useful.

Fertility Management: Getting the Blues with Aluminum Sulfate

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Aluminum is the causal agent of the blue color in hydrangea sepals. Aluminum sulfate is typically used to create the blue color in the sepals of specific hydrangea species like *H. macrophylla*. The sulfate is useful for acidifying the soil which makes the aluminum more available.



When growing *H. macrophylla* in soils, the addition of aluminum sulfate may or may not be necessary and this depends on whether aluminum is already present in the soil. If you are managing hydrangeas for blue color, get the soil tested first for pH and aluminum. If aluminum is present, merely manipulating the soil pH to between 5.0 and 5.5 will make soil aluminum available and produce blue color sepals. However if aluminum is not present in the soil, or if you are growing hydrangea in soilless potting media like pine bark and peat (which lacks aluminum), then adding aluminum sulfate is necessary to achieve the blue color.

Hydrangeas are particularly aluminum tolerant and may use the pigment complex to sequester the metal. Be aware that aluminum is very toxic to plants, so keep it away from other plantings that you manage. Additionally, aluminum sulfate has a high salt index. So, when using aluminum sulfate on containerized hydrangeas, it is important to frequently monitor your EC and pH, before application and especially during the first week after application.

Oedema

We are seeing Oedema on ivy geranium and kalanchoe this week. Oedema occurs during cool, cloudy weather when the soil is moist and warm. During these periods plants can take in large amounts of water without transpiring it. Pimple-like blisters appear as the cells swell with water. The cells will eventually burst and leave corky lesions on the leaf surface. Oedema does not generally have a negative impact on the health of the plants, but it can greatly reduce their marketability. Solution – don't overwater during overcast, cool periods.



Oedema on ivy geranium



Oedema on kalanchoe

Black vine weevil

One Baltimore county grower is finding black vine weevil grubs in their astilbe crop. The grubs are small, white legless larvae in the root zone of susceptible plants. Susceptible plants include: taxus yews, rhododendrons, astilbe, heuchera, hosta, sedums, toad lily, and bergenia. There are only adult females present with no males. The adult females will notch the edge of leaf foliage in June through September. Last year we had the first report of black vine weevil adults in our June 16 report.

Control: Soil applications of imidacloprid to control larvae for the landscape. We have conducted trials using Hb strains of entomopathogenic nematodes applied as a soil drench to Astilbe and Heuchera growing in soilless substrate. We had good control levels. Work in Connecticut has shown that Talstar applied to soilless substrate also gave excellent control of black vine weevil larvae.

