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

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High Tunnel Conference and Tour	**Chesapeake Green Interiorscape Conference**
May 31, 2007	**May 18, 2007**
Montgomery County Extension Office, Derwood	Brookside Gardens, Wheaton, Maryland
Farmhouse Flowers and Plants, Brookeville	For more information:
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Leaf Smut on Gaillardia

John Speaker and Beth Stang of Speaker's Gardens submitted a gaillardia sample from a greenhouse to the Plant Diagnostic Clinic this week that had pale, circular spots on the leaves. Ethel Dutky identified it as leaf smut (*Entolyma polysporum*). This fungal disease is one of the "white smuts". Microscopic examination of the leaf tissues in the pale spots found it packed with thick walled spherical ustilospores. Several species of *Entyloma* infect annuals and perennials. This particular species infects gaillardia, senecio, golden glow (Rudbeckia), sylphium, and sunflower. Extended wet weather conditions are required for the disease to infect and spread. Hot, dry weather is inhibitory. This disease seldom spreads in the landscape in the mid-Atlantic region.

Management: Infective spores are produced on the spots, so sanitation help to can reduce further spread. A broad spectrum protectant fungicide such as Daconil Ultrex (chlorothalonil) or Cleary's Protect TO (mancozeb) will prevent secondary infections. A systemic such as Heritage (azoxystrobin), Compass (trifloxystrobin), or Contrast (flutolanil) could be used in rotation.

Photo by John Speaker

Pylon

We had a call on whether Pylon was labeled for use in greenhouses for thrips control. I checked with Olympic Chemical and they said they had a federal label for thrips control, but their early work was at a high rate. They are trying lower rates and will include this on the new label. I asked Jeff Dobbs of Olympic Chemical Company to send us a write-up on the status of the new label…more on this in next week's report.

Scouting Reports
This week scouts are finding aphids on verbena 'Plum Magic', calibrachoa, and fuchsia. There was some wasp parasitism occurring on the fuchsia as shown in the photo on the left. Thrips are showing up on gerbera and impatiens. *Botrytis* is being seen on scented geraniums, snapdragons, basil, and eucalyptus.

Aphids on fuchsia

Aphid mummy on fuchsia

Downy Mildew on Coleus
Coleus samples with large necrotic lesions and curled leaves were submitted to the Plant Diagnostic Clinic this week. Ethel Dutky identified this as a downy mildew in the genus *Peronospora* (species unknown). This is a new downy mildew, first seen in 2006. The species and host range has not yet been determined. It can also infect basil, and possibly many other plants in the mint family. The foliage of the coleus may appear pale green or yellowish, emerging leaves can be small or discolored, plants can be stunted, and severely infected plants will drop their leaves. The fungus can be inside leaves and stems that exhibit no symptoms. Downy mildew grows entirely inside the plant, with only the sporangiophores and sporangia (spores) protruding outside the plant, always on the lower leaf surface. Clusters of sporangia are tan in color. Gray, white fuzz on the undersides of the leaves is characteristic of downy mildew. Do not confuse these symptoms with *Botrytis* or powdery mildew which can also cause gray or white fuzzy growth on leaves.

Management: Downy mildew spreads rapidly under wet, humid conditions. Reduce leaf wetness to less than 6 hours and keep the relative humidity below 85%. Do not place discarded plants in compost pile. The fungus survives as resistant spores in soil and plant debris for years. Protectant fungicides such as mancozeb (Cleary's Protect TO, Fore, Manzate, Spectro 90) and chlorothalonil (Daconil Ultrex) are effective to protect uninfected plants, but will not be very useful once symptoms are seen. Once symptoms appear, a systemic fungicide should be applied.

The fungicide Stature (mancozeb plus dimethomorph) is the best choice for cleaning up infected plants. Heritage (azoxystrobin), Compass (trifloxystrobin), and Quadris (azoxystrobin) are also registered and could be used in rotation.

Weeds in the Greenhouse

As it gets busy it is easy to forget about weeds growing under the benches. Look around the greenhouse floors and make sure that weeds are being taken out – either by hand weeding or with labeled contact herbicides. Round-up is a non-selective material that can be used when the greenhouse is empty of plants. Finale, Scythe, Reward and Envoy are nonselective contact herbicides that burns back tops of weeds but not the root system. When the weeds are pulled up make sure they are bagged and removed from the greenhouse. These weeds serve as a reservoir for spider mites and insect pests that can spread disease in your greenhouse. Several of these weeds serve as potential inoculum source for virus vectored by aphids and western flower thrips. Weeds such as bitter cress (*Barrarea vulgaris)*, sorrel (*Oxalis)*, chickweed (*(Stellaria media)* and groundivy (*Glechoma hederacea)* are weeds that aphids, whitefly and thrips will feed on in the greenhouse.

Controls for weeds: Glyphosate (empty greenhouse), Diquat (below bench), Fatty acid (Scythe), Clethodim (Envoy)

Some weeds commonly found in greenhouses…

Horseweed or Marestail

Common Groundsel

Hairy Bittercress

Sowthistle with Powdery Mildew

Shepherd's Purse

Oxalis