



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

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Downy Mildew

John Speaker reported seeing heavy infections of downy mildew on rudbeckia and veronica. Here are some downy mildew tips from Karen Rane, Director of the University of Maryland Plant Diagnostic Lab:



Downy Mildew on Rudbeckia

- There are several species of downy mildew fungi, most having a limited host range. For example, the rose downy mildew does not infect coleus, and vice versa. However, environmental conditions favorable for infection and spread (cool and moist) are similar for all species.
- Symptoms include yellow to brown discolored areas on foliage, curling of leaves, leaf drop, distortion of new growth, and stunting of infected plant.
- Look for white to gray, fuzzy fungal growth on the undersides of discolored leaf lesions (visible with a hand lens).
- Examine newly purchased plants for symptoms – downy mildew can come into a greenhouse on infected plants.
- Discard ALL infected plants (including stock plants) – it is very difficult to cure a plant of this disease. Place infected plants in bags for discarding right from the bench, to avoid spreading the fungus when plants are carried through the greenhouse.
- A combination of protectant and systemic fungicides (tank mix or rotation) is needed for maximum disease control and resistance management. Mancozeb products provide excellent protection. Remember, thorough coverage of the foliage is important when using protectant fungicides.

- Effective systemic fungicides include Stature, FenStop, Subdue Maxx (as soil drench, used only once in production cycle to avoid resistance development), strobilurins, and Aliette. Different downy mildews appear to vary in their sensitivity to specific systemic fungicides – for example, some reports indicate Aliette may not be as effective as Stature in managing coleus downy mildew.
- Downy mildew fungi survive in host plant tissue, but not on greenhouse surfaces or in the soil. Standard sanitation practices should effectively remove inoculum of downy mildew from a greenhouse that contained infected plants.
- Starting with new stock plants each year for vegetatively propagated crops (like coleus) will also help reduce the chances of downy mildew infections.

Four-lined Plant Bugs

We are just at the end of the activity of four-lined plant bug. Steve Sullivan found these adults with heavy damage on viburnum. The plant bugs inject a toxin that discolors foliage. They attack mints, spirea, rudbeckia, phlox and many others. Fortunately the damaged foliage will drop off and control is not necessary.



Four-lined Plant Bug on Viburnum

Comments

Geri Cashion from EcoSolutions, Inc. emailed us noting that Aria from FMC is as an aphicide for chrysanthemum aphid. She noted that it is a very effective greenhouse product that is systemic and has NO toxicity to beneficials at all. When she was with FMC she did the development work on flonicamid, the a.i., and was pleased with the efficacy and lack of impact to non-targets.

Fluoride Toxicity

John Speaker of Speaker's Gardens discovered fluoride toxicity on vinca this week. The tips of the leaves (especially on the white variety) were turning yellow and necrotic. The danger level for fluoride is around 1.0 ppm. The irrigation water at this site tested between 1.75- 1.85 ppm. The symptoms were seen after the very first watering.



Fluoride Toxicity on Vinca

NOx Gas

We received a call from a grower last week who was having problems with their zonal geraniums. The flower stalks were barely above the foliage and the blooms were failing to open. We sent this photo to Will Healy at Ball International who told us that these were classic symptoms of a NOx (mono nitrogen oxide) gas leak.



NOx Gas Damage on Geranium

There is a meter available to test for NOx gas leaks in greenhouses- check with your local heating and cooling company. At this time of year you can just turn the heat off until the leak can be repaired.

These geraniums also had very small, yellow leaves. Those symptoms, however, were caused by extremely low fertility levels- calcium in particular. Will recommended applying 600 ppm of a 14-14-14 or 15-0-15 fertilizer until the EC was up to 1.0, and then using a 20-10-20 to expand the foliage.

White Mold

We are continuing to see Sclerotinia blight on more greenhouse crops this week including torenia and dahlia. Since our first report of this disease in the April 11, 2008 greenhouse IPM alert, John Speaker has seen it in 25 different greenhouse operations all across the state. So far, we have also reported it on: petunia, lobelia, zinnia, marigold, vinca, impatiens, and gazania.



White Mold on Gazania Daisy

Monitoring: Look for wilting symptoms associated with white, cottony strands of mycelium on the lower stem. About 8 days after the mycelium appears, black fruiting bodies of the fungus called sclerotia will form. This disease is promoted by cool, wet weather.

So, as it gets hotter and drier, the white mycelium will disappear. However, the thick-walled sclerotia, which are very resistant to environmental extremes, can remain in the soil for several years.

Scouting Reports

We are seeing two-spotted spider mites on New Guinea impatiens; thrips on gloxinia and marigold; smut on gaillardia; aphids on bletilla, annual blue salvia, and chrysanthemum; rust and whiteflies on hollyhock; leafminers on cleome and columbine; powdery mildew on phlox, wax begonias, and euphorbia; and herbicide injury on clematis and salvia.

John Speaker has reported a large increase of *Xanthomonas* on geraniums. We are also seeing a leaf spot on lavender caused by *Xanthomonas campestris*. Karen Rane is not sure of the pathovar, but she says that it's not the same *Xanthomonas* that infects geranium.



Leafminer Damage on Cleome



Powdery Mildew on Begonia



Aphids on Annual Blue Salvia



Aphids on Chrysanthemum



Thrips Damage on Gloxinia



Thrips on Gloxinia



Mites on New Guinea Impatiens



Herbicide Injury on Clematis



***Xanthomonas* on Geranium**



***Xanthomonas* on Lavender**

Upcoming Programs

Procrastinators' Pesticide Recertification Conference

June 6, 2008

Montgomery College, Germantown

For more information contact: Chuck Schuster at 301-590-2807 or cfs@umd.edu

IPM for Nurseries and Landscapes

June 11, 2008

Allegheny College of Maryland, Cumberland

For more information contact: Derrick Bender at 301-724-3320 or dbender@umd.edu

Procrastinators' Pesticide Recertification Conference- Eastern Shore

June 13, 2008

Wye Research and Education Center, Queenstown

For more information contact: Ginny Rosenkranz at 410-749-6141 or rosnkrnz@umd.edu