



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

From: Stanton Gill, Extension Specialist – IPM for Greenhouse and Nurseries, CMREC, University of Maryland Cooperative Extension
Karen Rane, Extension Specialist, Director of the Plant Diagnostic Clinic, University of Maryland Cooperative Extension
Suzanne Klick, Technician, CMREC, University of Maryland Cooperative Extension

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Thrips Are Out and Running

We have had reports that thrips are out and very active in June. If you are growing double impatiens, marigolds, sunflowers, verbena, and dracaena spikes and you have thrips they will find you. The best advice is to sell the plants soon and get them out of the greenhouse. Get rid of other plants in the greenhouse that serve as an epicenter for the thrips. If you are going to spray realize you may kill a number of thrips but may miss the ones hiding in the flowers, especially the double flowering plants. Lack of contact with the insecticide is a big factor in lack of control. The other challenge with control is that the thrips are reproducing so quickly they rapidly replace their fallen comrades.



Control Thrips... as much as possible

Try to rotate your chemicals used for thrips control. Here are some materials to try in rotation: Overture, Pylon (low rate for low populations – high rate for large populations), Mesurool (long REI), Azatin or Aza-Direct, Avid, and Conserve.

Continue Watching Out for Downy Mildew

Cool, wet weather of the past few weeks has been favorable for the development of downy mildew on coleus. Symptoms on leaves range from small brown blotches to angular brown lesions to distortion and defoliation, depending on cultivar. Symptoms of downy mildew can mimic symptoms of Botrytis blight, drought stress or nutritional problems, so it's important to get a confirmed diagnosis if you suspect downy mildew. The photo shows symptoms on



Helichrysum. Growers can expect to find this disease in seed and vegetatively propagated types

of coleus. John Speaker, IPM Scout, noted that he usually find it in vegetatively grown coleus first. If it shows up there it will spread to seed grown coleus.

The fungus reproduces via specialized spores called sporangia. If you examine the undersides of the foliage you may sometimes see the gray colored sporangia on the underside of the coleus leaves. In some instances, these sporangia may be few in number and very difficult to see without the help of a microscope. Other times, the sporangia are produced in high numbers and form a fine carpet of grayish fuzz on the underside of the leaf that is obvious to the naked eye. It is best to look for these sporangia when the greenhouse environment is humid and damp.

Downy Mildew Control: Check all incoming coleus plants and cuttings for symptoms of the disease. Cultural practices that reduce humidity in the crop (increased air circulation, increased plant spacing) can help reduce spread of the disease. Discard infected plants by placing in plastic bags before carrying them out of the greenhouse to avoid spreading sporangia during plant removal. An effective protectant fungicide program includes rotating between Stature (dimethomorph), Fenstop (fenamidone), and mancozeb products (such as Protect DF). After the crop is finished, remove plant debris and wipe down surfaces with a greenhouse disinfectant. If you've had a problem with coleus downy mildew, make sure to discard any coleus stock plants to keep the disease from surviving in your operation until your next crop.

Aphid Control – Results in Maryland

Many growers found that vegetable transplants were a big seller for their operations in 2009. With the poor economy an increasing number of customers decided to put in vegetable and herb gardens. Tomato, eggplant, pepper, basil, and salvia are usually the plants that aphids can build up rapidly, especially during warm, humid springs.

Background on the Greenhouse Involved with Banker Plants

For this greenhouse biocontrol project we worked with Sharp at Waterford Farm Greenhouses in Brookeville, Maryland. This operation produces plants with minimal pesticide input. They sell most of the plants retail, but some are sold wholesale. They grow a mix of vegetable transplants and bedding plants in 2", 4" and gallon pots.

As part of their biocontrol effort they applied soil drenches of entomopathogenic nematodes, *Steinernema feltiae*, in April and repeated the application four weeks later to keep fungus gnat larval populations under control. The two applications kept fungus gnats at minimal levels even though we experienced extended rainy periods in April and May in Maryland.

Aphids were a key pest on their herbs, vegetable transplants and bedding plants in 2007 and 2008. The plants most heavily infested with aphids included salvias, zinnias, peppers, cucumbers, melons, basil, celery, and snapdragons. The owner, Denise Sharp, read about using banker plants and parasite releases and asked us to work with her in evaluating the efficacy of this biocontrol method. In previous years, melon aphid, *Aphis gossypii*, and green peach aphid, *Myzus persicae*, were the two species encountered in the greenhouse. She contacted IPM Labs in Locke, New York to supply bird cherry oat aphid, *Rhopalosiphum padi*. This aphid feeds on grain crops and does not infest broadleaf vegetable transplants, herbs or bedding plants.

If you are thinking of trying biological control of aphids plan to start your barley plants in February or March and get the bird cherry oat aphid population established early. The important thing is to get the parasitic wasps established early in the season. Denise purchased barley seed from a farm supply store and started the seedling in 8” pots. The owners built a caged area at the end of their greenhouse to grow barley plants where bird cherry oat aphids were introduced to the young barley plants. When the barley plants were 4 – 5” tall they had IPM Labs send the bird cherry oat aphids to their greenhouse. Banker plant plugs cost approx \$15- \$20 for a tray of 16. Usually it takes about three weeks for aphid populations to build before setting out the barley plants.

The idea is to build up a population of bird cherry oat aphids on the barley plants first and then take the barley plants in the pots out of the screened area and introduce the parasites into the greenhouse. The barley plants were grown in a screened chamber so parasites could not infest the aphids being introduced to the plants and crash the population. The concept is to keep a steady supply of bird cherry oat aphids reproducing on the barley plants. When you remove the barley plants from the caged chamber there should be a good supply of aphids for the parasites to establish on. Eight pots of barley with established populations of bird cherry oat aphids were placed under and on the benches in the 3000 ft² greenhouse. The owner placed a layer of Vaseline on the outer lip of the pots so ants could not enter the pots and tend the aphids and defend the aphids from the parasitoids.



Cage set up for barley plants



Aphid damage on gomphrena



Parasitized aphid and potato aphids

Five hundred *Aphidius colemani*, a parasitic wasp, were released on 8 plants. *A. colemani* was selected because it is proven to infest green peach aphid and melon aphid. Another parasitic wasp, *Aphidius matricariae*, is commercially available and works well on melon aphid but is not as effective on green peach aphid. *Aphidius ervi* can be released to control potato aphid, *Macrosiphum euphoribiae*, and foxglove aphid, *Aulacorthum solani*. Since most growers don't have the time or expertise to distinguish between the different species of aphids it would be wise to order both *Aphidius colemani* and *Aphidius ervi*. This way you are covering most of the possibilities of aphid species in your greenhouse.

We monitored the greenhouse each week from April through early June. Normally the grower had problems with aphids on salvia, peppers and zinnias and snapdragon. These plants remained clean of aphids during the period we monitored. On June 3rd we found low aphids on calendula, borage, and gomphrena. The borage had the heaviest population of aphids, 4 – 6 per leaf. On examination under a dissecting microscope we found the borage was infested with potato aphid. It would have been useful to have released *Aphidius ervi* to control this aphid species. The aphids on the calendula plants were green peach aphids and the majority was parasitized. The calendula plants were ranked in very saleable condition.

Growth Regulator is Labeled for use on Vegetable Transplants

I asked Joyce Latimer of Virginia Tech if there were any plant growth regulators labeled for use on vegetable transplants. She said that Sumagic is labeled for use on tomatoes, eggplant, tomatillos and peppers. The label says 2 – 10 ppm (.52 to 2.6 oz/gallon of water).

Plastic Bags on their Way Out?

The District of Columbia voted unanimously on June 2nd to assess a 5 cent tax on paper and plastic bags to try to discourage their use. They are trying to promote use of reusable shopping bags. It must be voted on again before it becomes law but it is a sign of the times. Don't be surprised if counties in Maryland start looking at this tax.

Upcoming Programs

Energy Tour for the Commercial Green Industry, June 23, 2009

Location: Sites in Howard and Frederick Counties

Contact: Suzanne Klick, 301-596-9413

Cut Flower Farm Tour, July 27, 2009

Location: Farmhouse Flowers and Plants (Brookeville) and Plantmasters (Laytonsville)

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