Let’s Start With the Good News
Most growers are reporting lower than normal insect activity in greenhouse crops this season. A few people are finding aphids but they really have not exploded yet. Stay with this temporary happy thought because everything else this season seems to be challenging to say the least. Another bit of good news, aphids, when they do show up, will not spread Tobacco Mosaic Virus. Beyond this I am running out of really good news to report this week.

Tobacco Mosaic Virus in Petunia
In recent weeks, many growers have received notice from suppliers of the unintentional distribution of petunia cuttings infected with Tobacco Mosaic Virus (TMV). This virus poses a potential threat to a number of common greenhouse crops, including calibrachoa, verbena, tomato and pepper. Currently, we have only confirmed TMV in petunia, but growers need to be aware of how to minimize the spread of this disease in their crops.

Symptoms associated with this current outbreak in petunia include stunted plants, leaf distortion and leaf mottle (Figures 1 and 2). However, in some cases infected plants show little or no symptoms. Mottling or streaking of the flowers can also develop in TMV-infected petunias.

An important characteristic of TMV is the incredible stability of the virus particles. Most plant viruses must survive in living plant cells, and become inactivated and unable to cause disease if those plant cells die. TMV is very different – the virus can survive for months or even years in dry infected plant tissue, on pots, benches, plant labels and tools. TMV does not require an insect vector like many plant viruses – TMV virus particles are...
easily transmitted by mechanical means. Any action that breaks small leaf hairs or causes wounding on infected plants exposes infected plant sap, and this sap will infect other plants if introduced through small wounds. This means that leaves of healthy plants that rub against TMV infected plants can easily become infected, and workers can easily get infected plant sap on their hands through transplanting, removing dead leaves, spacing or pinching, which can spread the virus throughout a crop. Virus particles can be transferred to surfaces like benches, pots and doorknobs from sap-contaminated hands, and then be picked up by the next worker who touches that surface. Even hitting infected plants with a watering wand can transfer infected sap onto the nozzle and potentially spread the virus to uninfected plants. Remember – ANY action that can break plant hairs and move infected sap can potentially spread this virus!

Important Points About TMV

• Any action that breaks small leaf hairs or causes wounding on infected plants exposes infected plant sap, and this sap will infect other plants if introduced through small wounds.

• Removing infected plants from the greenhouse needs to be done carefully. Workers should wear gloves and bag plants (pots and flats included) at the greenhouse bench. The bags should be closed and carried out of the greenhouse and discarded. Workers performing this task should not re-enter any greenhouse that day to avoid spreading the virus on their clothing.

• There are several strains of TMV and the strains differ somewhat in host range. The strain in this current outbreak has not yet been identified, and once this occurs we should be able to provide better information on likely crops that could become infected.

Carefully inspect all incoming plants for symptoms of virus infection, and isolate any that show symptoms. Don’t forget to closely scout your current crops for symptoms as well, in case TMV was introduced to the greenhouse earlier this year before the outbreak was recognized. Contact your local diagnostic laboratory and get a diagnosis of suspicious-looking plants, or use a test kit for TMV detection. One such test is the TMV ImmunoStrip produced by Agdia, Inc. (www.agdia.com).

If you have TMV infected petunias, what should you do? First, contact your supplier, salesperson or broker to get the latest information from the industry. All infected plants should be removed, including pots, media and plant residues from the infected plants. Many growers choose to remove plants adjacent to confirmed infected plants, since leaves of adjacent plants may have touched the infected plants. This operation should be done carefully - workers should wear gloves and bag plants (pots and flats included) at the greenhouse bench. The bags should be closed and carried out of the greenhouse and discarded. Workers performing this task should not re-enter any greenhouse that day to avoid spreading the virus on their clothing. Some growers have chosen to discard all petunias in suspect shipments – liners, trays and any transplanted mixed pots, regardless of symptom development. Others have decided to discard liner trays that have not been transplanted, but are holding on to the mixed pots, keeping them strictly isolated from other plantings and avoiding any handling of these plants. These growers plan to rogue out pots if/when symptoms appear. Do not pinch or shear these plants – growth regulators should be used to manage height and growth. Check with your supplier for specific recommendations.

Figure 3: Flat containing some TMV infected petunias. Note stunting, leaf distortion and mottling.
Photo: Margery Daughtrey, Cornell University
It takes some time (up to 3 weeks in some reports) for symptoms to develop after infection occurs, so it is possible to have TMV infected plants remain after roguing operations. To minimize the spread of the virus to uninfected petunias, sanitation is critical. A solution of 10% (weight/volume) nonfat dry milk (NFDM) has been shown to significantly reduce transmission of TMV in studies on tobacco, and industry specialists are recommending spraying this solution on petunias prior to transplanting or handling. Plants must be thoroughly wet; adding a wetting agent like Capsil to the milk solution can help. The solution must be wet to be effective so it may need to be re-applied during the transplant operation. Workers should wear gloves, and change them as often as possible, or alternatively, dip the gloves in 10% NFDM periodically to inactivate TMV on the gloves. One research report published in the journal Plant Disease by Lewandowski et.al in 2010 demonstrated that a 20% NFDM solution was very effective in disinfesting tools contaminated with TMV, as was a 10% bleach solution (this is hard on tools, though, and must be freshly made every few hours). Other greenhouse disinfectants showed some efficacy in this test, but less than NFDM or bleach solutions. After the crop is finished, the greenhouse surfaces should be thoroughly cleaned.

Keep a close eye on other bedding plants that may have come in contact with infected petunias. If a petunia in a mixed pot develops virus symptoms, it is safest to discard the entire pot, with all the plants and potting mix, rather than pull out the one symptomatic plant and replace it. Remember, the more you handle infected plants, the greater the chances for TMV to spread through the greenhouse.

There are several strains of TMV and the strains differ somewhat in host range. The strain in this current outbreak has not yet been identified, and once this occurs we should be able to provide better information on likely crops that could become infected. For more information, talk to your sales representatives and extension specialists, and check out the publication by Nora Catlin of Cornell University on the E-Gro website: http://e-gro.org/pdf/3-15.pdf. We will keep you posted in this newsletter as more information is available.

Plants Left Out in the Cold: Shipping Problems
As we traveled about to the different greenhouses in Maryland this week we heard repeated stories about shipping problems. Plant shipments have been delayed at airports and plant material sat in holding areas where they sustained cold injury. This situation happens every year, but this year with the extended cold period it is happening more often. We have had several reports of UPS and FedEx shipments where the delivery person left the plant boxes in front of a gate or outside a building and the growers did not see the shipment until the end of the day after the plants suffered cold injury. Some growers receiving plugs shipped in boxes received them upside down and all of the plugs are in the bottom of the box which is aggravating to growers. Some people are putting netting on the plug trays, but damage to plug tip growth sometimes occurs. Plug growers are still searching for the perfect way to ship plugs without damage occurring during shipping. Trying to grow the exact size plug that fits snuggly in the shipping box is the best so far, but this method involves very exact growing techniques.

Some suppliers are delaying sending plant material if it is predicted to be very cold on the shipping week. The last 3 weeks have been cold, regularly resulting in delayed shipments of plant material. Growers are developing ulcers while waiting for plant material.

Add to this situation, heating costs are ridiculously high this January and February so everyone that has plant material are paying high costs to grow crops this year. Each year of growing is challenging, but it seems this winter has been the perfect storm scenario. Surely, it can only get better from here on out.
Energy Grant Program

There is money available for Energy Efficiency Improvements in Agriculture. If you are a nursery or greenhouse operation then you may be able to obtain funds to improve your energy efficiency. You will need to act before March 14 for your application and must start the improvement by June of 2014. This leaves about a month to get in your application. It cannot hurt to apply if you want to take advantage of this funding source. The Maryland Energy Administration is sponsoring this program. Farms and businesses in the agriculture sector may apply. Examples include dairy, orchard, poultry/egg, greenhouse, nurseries, vegetable, animal, vineyard, grain dryer, processor, sawmill, and aquaculture. If you are uncertain about your eligibility, contact MEA’s subcontractor EnSave at (800) 732-1399 in order to see if your business is eligible. The 2014 Kathleen A.P. Mathias Agriculture Energy Efficiency Program will award grants ranging from $25,000 to $200,000 to assist with the costs of installing energy efficient technologies in farms and agricultural businesses.

Applications are due March 14, 2014.

This year’s program will:
• fund energy efficiency projects with at least 20% energy savings, and
• provide grants to cover up to 50% of the cost of energy efficiency upgrades after all other incentives have been applied.

Energy efficiency measures must be installed before October 31, 2014. Technical assistance is available to help applicants estimate their project’s energy savings, and to answer general application questions. Further program details are available on the program website: http://energy.maryland.gov/Business/MathiasAg14.htm

Operator Certification (FTC) for Writing Nursery Nutrient Management Plans on April 9th, 2014

Central Maryland Research and Education Center, 11975-A Homewood Road, Ellicott City, MD 21042

Nursery Operator Certification (FTC) for writing nursery nutrient management plans will be offered to growers who are interested in attaining Farmer Training Certification for writing nutrient management plans. This training program will assist you in writing a nutrient management plan for your nursery or greenhouse operation. You must write a nursery nutrient management plan if you use fertilizers and you gross $2500 of over per year in sales. With this certification, you will be able to sign-off and submit your own plan and annual implementation reports.

Each program consists of a Training Day and an Exam/Signoff Day. The Training Day consists of learning the plan-writing process. After the Training Day you have about 5 weeks to study the Nursery Nutrient Management Training Manual and develop your plan. The Exam/Signoff Day will be for taking the exam and going over your newly developed plan (or renewing your old plan). The process is relatively simple for small (low-risk) operations, so if your operation size is less than 5 acres, we would strongly encourage you to think about becoming a certified operator. If your operation is larger than 5 acres, we still encourage you to become a certified operator even though the nutrient management process may be a little more complicated. Drs. John Lea-Cox and Andrew Ristvey will be happy to help you write your nutrient management plan.

The first day of the program will be April 9, 2014 at Central Maryland Research and Education Center. We have tentatively scheduled the Exam/Signoff Day for May 12th at Maryland Department of Agriculture in Annapolis, MD (that day may change to either the 13th or 14th depending on attendee’s schedules). After passing the exam, you will be able to “sign off” on your plan and submit it.

To express your interest in taking this training, please contact Mike Webster, Maryland Department of Agriculture at (410) 841-5957. State that it is for Nursery FTC. Call Andrew Ristvey (410) 827-8056 x113 for directions to the Central Maryland Research and Education Center or for any other questions.
Upcoming Programs

Go to http://www.extension.umd.edu/ipm/conferences

**MGGA Field Day**
June 19, 2014 (afternoon through early evening)
Location: Tidal Creek Growers, Davidsonville, MD
Details will be posted when available

**Greenhouse Biocontrol Conference**
July 24, 2014
Location to be determined (tentatively set for Annapolis)

**Stormwater Management Program**
August 20 and 21, 2014

**TWO Locations:**
August 20 - Montgomery County Extension Office, Derwood, MD
August 21 - Robinson Nature Center, Columbia, MD
Details will be posted when available