

The University of Maryland Extension Agriculture and Natural Resources Profitability Impact Team proudly presents this bi-weekly publication for the commercial vegetable and fruit industry.

Volume 4 Issue 3 May 9, 2013

Field Observations from Southern Maryland

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Spring Observations from WyeREC

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Vegetables:

- ✓ Transplanting of warm season crops is in full swing, with wet weather holding back progress.
- ✓ Asparagus harvest is well underway as well. Pest problems have been minimal so far.
- ✓ Timber Rot, caused by the pathogen *Sclerotinia sclerotiorum* has been observed on tomatoes and some ornamentals. *Sclerotinia* crown and stem blight, can be found in many clover cover crop plantings as well.
- ✓ Seed maggots have been a problem on some earlier planted crops, and adult flies are active in many fields over the last 2 weeks.

May 8 2013



Fruit:

- ✓ Strawberry harvest began last week and is expected to pick up as warm weather returns.
- ✓ Blueberries are flowering, or past flowering. Southern Maryland is experiencing a high population of fall canker worms, and these caterpillars have been observed feeding in blueberry fields, particularly those in close proximity to wood edges.
- ✓ Grapes have 3-5 inches of new shoot growth. Most vineyards should have received their first fungicide spray with the critical fungicide sprays at bloom needed soon.

May 8 2013

Strawberry Plasticulture System

First harvest of Chandlers will begin this week, two weeks later than in 2012. Virus infected plants continue to be smaller in size with older leaves turning red.

In our research plots, plant material from a different plant supplier than where our Chandler plants were grown, have bacterial leaf spot (*Xanthomonas(ALS)* or *Acidovorax*). Previously, spots were only seen on older strawberry leaves and are now seen on new leaves. Cool wet weather promotes bacterial infections. The use of floating row covers and/or over-head irrigation for frost protection can also promote this disease. In severe infections, bacterial leaf spot also affects the fruit cap (calyx). The caps may have a blackened appearance if they have not had an opportunity to dry out, and after a dry spell may be described as brown rather than black. This is the symptom that often gets people's attention as the fruit becomes unsalable. The use of weekly copper sprays can help limit bacterial infections. Monitor plants for copper toxicity, which will appear as a general reddening or purpling of the leaves and may appear if more than four or five sprays are used. Avoid applications when temperatures are warm (higher than the mid-70s).

Recent research data from Clemson University, who are investigating Gray mold resistance to various fungicide chemistries, suggest that Switch and Fontelis are two products with no resistance issues thus far. Switch can be used alone, but Fontelis should be combined with Captan when used. These products should be rotated and never used more than twice per season. Ideal conditions for Gray mold development are

24 hours of continuous wetness and temperatures between 59 and 77f. Applications of the above products work best if applied prior to or just after these ideal conditions for Gray mold. If drier conditions prevail, Captan can be used alone.

Vegetable Crop Insects

By Joanne Whalen,
DE Extension IPM Specialist
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Strawberry Perennial Matted-Row System

Bloom should be well under way. Protection for Gray mold begins with fungicide sprays at 10% bloom and again at Full bloom. Always read, understand and follow the pesticide label. Newer pesticide chemistries can be more effective if used properly. However, if used improperly, pathogens can develop resistance to these products. I think there may be different issues with Gray mold resistance in perennial beds than the annual system. Because we replant annually with the plasticulture system, fungicide usage in the plant nursery may have an influence on fungicide resistance once this plants make it into our fields. Reports of products that had little associated resistance last year, are coming back resistant this year even though materials may not have been used in the field. Clemson University is accepting samples for resistance analysis. Call me (410-827-7388) about details if you would like to submit samples.

Tree Fruits Peach

Cool conditions after bloom should help with final fruit size. Cool conditions also buy us a little extra time for thinning operations. Start thinning the earliest harvested varieties first.

Shuck fall is nearly complete. Scab spray programs should be in progress.

Tree Fruits Apple

Bloom is nearly complete in the varieties we have here at WyeREC. Warmer weather and persistent wet weather this week increases the chance of a FireBlight infection event if blooms are still present. Strep sprays may be required on susceptible varieties.

2013 Strawberry Twilight Meeting

Wednesday May 29th

6:00 – 8:00 PM

Wye Research and Education Center
211 Farm Lane
Queenstown MD



The 2013 Strawberry Twilight Meeting at the Wye Research and Education Center will be held Wednesday, May 29, 2013 from 6:00-8:00 PM, rain or shine, at the Farm Operations Complex, 211 Farm Lane, Queenstown, MD. Directional signs will be posted.

We hope you can join us for an informative evening. Pre-registration is not necessary. Refreshments will be served.

For additional program information, contact Mike Newell at 410-827-7388 or mnewell@umd.edu.

If you need special assistance to attend this program, please contact Debby Dant at 410-827-8056 or ddant@umd.edu.

Melons

As soon as plants are set in the field, be sure to scout for aphids and cucumber beetles. Low levels of aphids can be found in the earliest transplanted fields. When sampling for aphids be sure to watch for beneficial insects as well since they can help to crash aphid populations. As a general guideline, a treatment should be applied for aphids when 20% of the plants are infested, with at least 5 aphids per leaf.

Potatoes

Low levels of the first emerged Colorado potato beetle adults continue to be found in fields where an at planting insecticide was not used. A treatment should not be needed for adults until you find 25 beetles per 50 plants and defoliation has reached the 10% level.

Snap Beans

Be sure to sample all seedling stage fields for leafhopper and thrips activity. The thrips threshold is 5-6 per leaflet and the leafhopper threshold is 5 per sweep. If both insects are present, the threshold for each should be reduced by $\frac{1}{3}$.

Sweet Corn

Be sure to scout emerged fields for cutworms and flea beetles. As a general guideline, treatments should be applied for cutworms if you find 3% cut plants or 10% leaf feeding. In order to get an accurate estimate of flea beetle populations, fields should be scouted mid-day when beetles are active. A treatment will be needed if 5% of the plants are infested with beetles.

Spotted Wing Drosophila (SWD) Monitoring Will Begin Soon

By Joanne Whalen,
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Spotted Wing Drosophila continues to pose a serious threat to small fruit grown in our region. I plan to start trapping by mid-May in a few blueberry and grape locations. As you will see on the following links, researchers working with this insect are now recommending using yeast and sugar baits versus apple cider vinegar in traps. Traps only give an idea of the presence or absence of SWD in an area, but are not good predictors of population sizes and trap captures do not always occur before fruit infestation. Therefore, preventative spray programs are being recommended in states to our south. They are recommending that growers time treatments to host susceptibility (ripening,

meaning fruit that is beginning to color, and ripe fruit) rather than to trap captures. Please see the following link from North Carolina for more information on monitoring and management:
<http://strawberries.ces.ncsu.edu/2013/04/more-on-spotted-wing-drosophila-monitoring-how-many-traps-should-growers-use/>.

Spotted Winged Drosophila (SWD) & Brown Marmorated Stink Bug (BSMB) Report

By Bryan Butler

Senior Agent, Carroll County & Mid-Maryland Tree Fruit
Agent, UME

Spotted Wing Drosophila (SWD)

Well as usual for our State the spring of 2013 in certainly not like the spring of 2012 was. We are certainly well behind last year's crop progress at this point but more than likely it will be full on summer by this time this article is published. Hopefully you have placed your Spotted Wing Drosophila (SWD) traps in your strawberries. Traps should be placed at ground level. Make sure to check them weekly as the fruit is beginning to ripen. Hopefully you will not be finding much but be aware that it is possible that larvae can be found in fruit before adults have been detected in the crop because we are monitoring for adult males and SWD overwinters as a bred female. The traps are simply not that good at detecting SWD so I feel it would be a good idea to periodically check some ripening fruit for larval activity. In the field, fruit can be pulled apart and checked for larvae during harvest. If you would like to look at a larger sample you can crush the fruit in a plastic freezer bag, and adding a 1:16 solution of salt to water (1/4 cup salt to 4 cups water). The white larvae will float to the surface of the water after about 15 minutes, while the fruit will sink. SWD larvae are very small (about 1/8" long when full-sized), white, and have no obvious head.

Brown Marmorated Stink Bug (BMSB)

As for Brown Marmorated Stink Bug (BMSB) the new lure developed by the USDA that is being tested right now appears to have great potential to catch BMSB. They have been erratically moving out from overwintering sites for the past several weeks, but the big push hasn't hit as of the May 8th. It will be important to watch crops like peaches for early season activity and remember they will be moving into the perimeter of planting so really be on the lookout on edges of orchards and fields. Last year the first large incursion into tree fruit was the third week of May so it is important to be ready. It is anyone's guess how this season will unfold but having some products on hand that are effective on BMSB would be a good idea so they can be added to your pest management programs as needed. Experts are predicting a big year for BMSB so be prepared for a long season.

Garlic Problems.....Again

Jerry Brust, IPM Vegetable Specialist

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Last year at about this same time there were calls from growers about their garlic plantings turning yellow and wilting (fig. 1). When dug up the bulbs were often times blackened and rotting with some or much of the basal plate or roots missing (fig. 2). The calls are coming in again this year with the same complaint and unfortunately, the same problems—bulb mites and garlic bloat nematode.

Bulb mites are a problem of garlic and sometimes of onion that usually go unrecognized. These pests can reduce stands, decrease plant vigor, and increase post-harvest diseases by their feeding on the roots and the stem plate. Bulb mites have a very wide host range, but cause most of their damage to onions and garlic. These mite pests are usually not seen on the bulb and prefer crawling into crevices between the roots and stem plate. Early in the growing season, bulb mites can cause poor plant stands and stunted growth as they feed on roots. Infested plants easily can be pulled out of the soil because of the poor root growth (fig. 2).

The mite is bulb shaped with its legs moved forward and a bulbous rear end and many long fine hairs (fig. 3). The mouthparts and legs are purplish-brown while the main body is creamy white. These mites have been described as looking like tiny pearls with legs. The mites are extremely small (from 0.02 to 0.04 inches) and are very slow moving. They are usually found in clusters underneath scales and at the base of the roots.

The garlic bloat nematode *Ditylenchus dipsaci* can destroy a crop of garlic in one season. Symptoms of bloat nematode in garlic plants include: bloated, twisted, swollen leaves, distorted and cracked bulbs with dark rings (fig.4). These nematodes also can move to the inflorescence and remain in seeds for long periods of time in some plant species, i.e., beans, clover, and alfalfa where they are major sources of nematode dispersal. The nematodes can be spread around fields by equipment or on clothing and shoes. Garlic bloat nematodes can overwinter in soil or crop debris.

It is not just the direct feeding of the nematodes and mites on garlic and onions that causes problems, their feeding also allows pathogens to enter through the wounds they create. These wounds are very good entry points for pathogens like *Fusarium* spp., *Sclerotium cepivorum* (causes the disease white rot), and various soft-rotting bacteria. The white rot fungus does best in cool temperatures, and symptoms include white fungal growth on the stem or bulb with small, dark structures called sclerotia in the decayed tissue. Later in the season, higher than normal amounts of soft rot and *Fusarium* dry rot may be seen because of the wounds caused by these mites (as we saw in a couple of the garlic fields).

There is no program that certifies garlic as nematode-free. Commercial suppliers of garlic bulbs are aware of this important problem, and may send a portion of their crop to a laboratory for nematode testing, but this does not certify a crop as nematode-free. Because the nematode and mite can survive for long periods on infected plant material, to prevent build-up of the nematode or mite populations in a field, you **MUST** rotate away from any *Allium* crops (garlic, onions, and leeks) and control nightshades for at least 4 years. **DO NOT** keep any bulbs or seed from an affected field no matter how clean it looks. You should start from fresh seed or bulbs. Rotation to areas of the farm that have not had garlic or onion plantings for many years with new garlic or onion seed is the best method of control, however, growers can use soil fumigants to reduce or eliminate the nematodes from infested areas of the field. Growers also can use bio-fumigant cover crops that can be planted after harvesting garlic. Mustard, sorghum-sudangrass have been shown to reduce nematode populations due to the bio-fumigant constituents they produce. Be sure to clean equipment and storage areas with meticulous sanitation techniques.



Fig. 3 Bulb mite.



Fig. 4 Severe garlic bloat nematode damage to the two bulbs on the right vs. non-infested bulbs on the left.



Fig. 1 Bulb mite/bloat nematode infested garlic field.



Fig. 2 Infested garlic bulbs, misshapen or rotting bulbs, sometimes roots are intact other times there are no roots.

Seed Maggots: Very Bad This Spring

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This unseasonably cool moist spring has been perfect weather for an old pest of early planted seeds and bulbs—the seed corn maggot *Delia platura* (SCM) and other seed maggots such as Cabbage maggot *Delia radicum* (it prefers to feed on cole crops) and Onion maggot *Delia antiqua* (it feeds on crops in the onion family). The seed corn maggot is one of the earliest seed maggots in a field and it has a huge host range of seeds and plants that it attacks. Our previous 2-3 springs were unseasonably warm and, at times, dry. These are two conditions that do not favor the maggots, which is why we did not see the level of damage for those few years that we are this spring.

The seed maggots overwinter as pupae in the soil and in early spring (usually early March for SCM and mid-April for onion maggot), the adults emerge. Adults are elongated and dark greyish-brown, with wings that overlap their bodies when they are at rest (Fig. 1).

Large swarms of flies can be seen in the spring flying over newly tilled fields. The flies mate within 2-3 days after emerging and lay eggs in soil that has a great deal of decaying organic matter, including any rotting vegetation or manure as well as germinating seeds or newly set transplants. SCM flies are not finicky and will even target the artificial media in the root balls of transplants.



Figure 1. Adult seed maggot fly.

The eggs hatch in 2-4 days in temperatures as low as 50°F. The larvae develop over a large temperature range: 50°F-90°F. However I have found that the flies do not like to lay eggs in soil that has reached 71°F at a 4-inch soil depth for 2-3 days in a row. Therefore, once soils warm up, the flies tend not to lay eggs any more. Larvae or maggots are yellowish-white, about 1/4 inch in length, legless with head-ends that are wedge-shaped (Fig. 2). The maggots complete their entire development within the soil by burrowing into seeds or feeding on cotyledons emerging from seeds. The pupae are brown, oval-shaped capsules, 1/5 inch in length (Fig. 2). Generally, seed corn maggots complete their life cycle within three weeks and have 3-4 generations. It is the first generation that causes the most crop damage in our area.

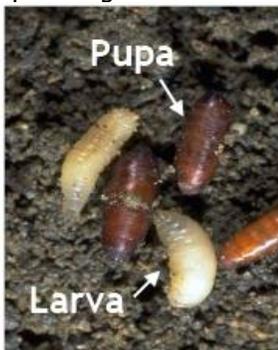


Figure 2. Immature stages.

Seed maggots cause damage by burrowing into seeds or cotyledons and hollowing them out (Fig. 3). Although it can take 5 maggots per snap bean seed to cause significant damage, once the seed has been opened up by the maggots it becomes much more susceptible to invasion from soil borne pathogens. The maggots also can burrow into the bulb or stem of transplants such as watermelon or cantaloupe as well as cole crops, garlic, onions, etc. (Fig. 4).



Figure 3. Seed maggot damage to bean.

University of Massachusetts has a good publication on maggots and lists the Growing Degree Days for emergence of the flies in the spring, found at: <http://extension.umass.edu/vegetable/articles/cabbage-and-onion-maggot-flies>. There is a good report on growing degree days in the IPM report from May 12 of last year. It is available at: <http://ipmnet.umd.edu/landscape/LndscpAlerts/2012/12May11L.pdf>. Peak flights for seed corn and cabbage maggots already have occurred with peak flight for onion maggots is just about ready to occur.



Figure 4. SCM larvae in cantaloupe stem.

Management: As most of you know there is no rescue treatment once maggots are found in the seed or plant. Fields with moist, heavy-textured soil usually have the worst problems. To reduce the appeal of a field to egg-laying adults, disc or plow early in the season to incorporate residues from the previous crop and allow time for residues to completely decompose before planting. Destroy any weed growth. Avoid planting a crop following root crops or cole crops such as cabbage and cauliflower or after fall tomatoes. Ensure rapid seed germination by planting in moist soil, not very deep, and when weather conditions are good. Later-season plantings may avoid the early season infestation of this pest. For crops like onions or garlic row covers can be used as soon as transplants are put in the field. Plants can remain covered until the ground warms. Diazinon as a broadcast application **before** planting can be used with some vegetables (be sure to check the label for each crop and see the Commercial Vegetable Production Recommendations 2013 guide). Entrust is labeled for commercial seed treatment in several crops — Check the label.

Food Safety Survey for Local Tomato and Leafy Greens Growers



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Thanks to a multi-state grant from the USDA Specialty Crop Research Initiative, researchers at four Mid-Atlantic institutions (the University of Maryland College Park, the University of Maryland Eastern Shore, the University of Delaware, and Rutgers University) are working to develop scientifically-based consensus food safety protocols (or "metrics") for tomatoes and leafy greens. The project aims to generate scientific and technological knowledge to develop, refine or defend food safety protocols that can then be implemented on a national or regional basis for both domestic and imported produce. This goal can only be achieved by combining data from experimental research trials with data from local growers.

As part of the project, Professor Erik Lichtenberg at the University of Maryland College Park is conducting an electronic survey of small- and medium-sized farms to determine the cost-effectiveness of different food safety risk-reduction strategies for tomatoes and leafy greens (including lettuce, spinach, kale, mustard greens and cabbage). The survey is completely voluntary and responses are kept confidential. If you grow tomatoes or leafy greens, please take a few minutes to complete the online survey (<http://www.foodumd.org>).

Responses are kindly requested by June 30, 2013. Questions about the food safety survey should be directed to Erik Lichtenberg at: elichtenberg@arec.umd.edu or (301) 405-1279.

Vegetable Transplant Height Control in Vegetable Crops

By Gordon Johnson,
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May is the month where the majority of vegetable transplants are set in the field. Successful crops start with transplants that get off to a good start. The following are some considerations when handling and setting transplants.

Make sure that transplants in trays are hardened off well before transplanting. Hardening off is most commonly done by exposing plants to outside conditions by moving the plants out of the greenhouse, in a

protected area, for about a week. Wagons are ideal because they can be moved into sheds at night if temperatures drop too low or cold strong winds are expected. In greenhouses with roll-up sides, hardening off can be accomplished by increasing the day-time exposure to cross winds. Reduced watering and fertilization are also a part of hardening off the plants. During the hardening off process, the cuticle of the plant thickens. The cuticle is the outermost layer that covers leaf surfaces and is composed of wax, lipids, and hydrocarbon polymers and protects the plant from water loss and desiccation.

We have thousands of plants that are shipped into the region from southern growers; When receiving transplants, make sure to inspect them well upon arrival for signs of disease or damage. For plants in trays, remove from trailers immediately upon arrival and place in a staging area that is protected from wind. Plants that have been pulled from trays and boxed should be transplanted within 2 days of receipt. Holding them longer risks severe defoliation and potential for heating in the boxes. If they must be stored longer, place in a cool but not cold place. Some plants are still shipped bare root in bundles. These also should be planting within 2 days and roots should not be allowed to dry out.

Currently, temperatures are not optimum for setting out warm season transplants. Ideally, you want to plant on a warming trend where nights do not drop below 45. Warm season vegetable transplants vary in their ability to withstand sub-optimal conditions depending on how well they have been hardened off and their inherent ability to withstand stress. Tomatoes, cucumbers, and squash are better able to handle early season stresses than cantaloupes, watermelons, or peppers. When temperatures are cool, soils are wet, and there is cloudy weather, soils stay cool, even under plastic mulch. Growth is minimal in these crops. We often see problems, especially the first few days when sunny weather returns, with plants wilting. This is because root systems have not established or are not functioning well. Root growth is slowed in cold soils and low oxygen in water soaked soils will also limit root growth. Average soil temperatures need to be 65°F or higher and average air temperatures should also be above 65°F (ideally above 70°F) for good establishment of these crops. Seed and root maggots and root diseases such as Pythium can further stress transplants and reduce stands.

Make sure transplants have well developed root systems. Transplants should pull easily from trays and have full root balls. Do not rush transplants into the field. Vine crops are very sensitive to root damage during transplanting.

In seedless watermelon systems, time production of pollenizer transplants so that they coincide well with the seedless transplants. Pollenizers are often planted a number of days after seedless because they emerge quicker. However, pollenizer root balls may not be well formed compared to the seedless transplants and they can suffer excessive losses in the field when planted in stressful conditions. The opposite can also be true if pollenizers are ready but the seedless plants do not have good root balls.

Leggy or tall plants will be a problem in stressful conditions and should not be used if at all possible. Leggy plants are more susceptible to damage in transplanting and wind damage after planting thus subjecting them to additional stress.

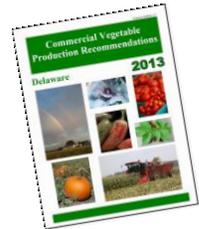
Transplants should be planted at the proper depth. This is particularly critical for watermelons and cantaloupes. There should be enough soil to cover the root ball of these crops but they should not be planted so deep so that the stem is covered. Deep planting in cold wet soils will result in additional stress on melons. Watermelons and cantaloupes should not be set deeper even if they are leggy. Other crops such as tomatoes and peppers can tolerate deeper planting. Extra care should be taken during transplanting during stressful periods to reduce injury to plants, particularly to root balls. Damage to roots will reduce establishment success especially in melons, cucumbers, and squash. Train planting crews so that they do minimal damage to transplants.

If conditions are not favorable for planting and plants will hold, it is best to wait until more favorable weather returns. Often there is no earliness gained by planting in the stressful period; or gains are negated by stand losses and the need to replant areas.

Provision for water at transplanting is critical for plant survival. Planting hole watering is recommended at planting. Mechanical transplanters with water tanks are ideal for this. With hand plantings, provision to irrigate overhead immediately after transplanting may be necessary. In plastic mulch systems with drip irrigation, having adequate water at planting can sometimes be difficult. Running the drip irrigation system so that the planting area is saturated often leads to leaching of

fertilizer nutrients from the bed and can keep beds cold in adverse weather. Adding dilute fertilizer solutions in the transplant water is also a common practice. Follow manufacturer's recommendations and make sure the fertilizer is dissolved well if using dry soluble sources. Fertilizers are salts and excess fertilizer or fertilizer that is unevenly mixed or dissolved can cause salt injury to transplants.

Commercial 2013 Vegetable Production Recommendations Maryland EB 236



On-Line at:

http://mdvegetables.umd.edu/files/EB-236_2013RecGuide.pdf

Also available in a new very interactive format at the Delaware Extension site at:

<http://extension.udel.edu/ag/vegetable-fruit-resources/commercial-vegetable-production-recommendations/>

Vegetable & Fruit Headline News

A bi-weekly publication for the commercial vegetable and fruit industry available electronically in 2013 from April through September on the following dates: March 21; April 18; May 9 & 23; June 6 & 20; July 11 & 25; August 15; September 12.

*Published by the University of Maryland
Extension Agriculture and Natural Resources
Profitability Impact Team*

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Article submission deadlines for 2013: March 20; April 17; May 8 & 22; June 5 & 19; July 10 & 24; August 14; September 11.

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