Vegetable Crop Insects
By Joanne Whalen
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Cucumbers
Although populations of cucumber beetles can vary from field to field, higher populations are present in fields with a history of problems. Fresh market cucumbers are susceptible to bacterial wilt that is vectored by the beetles, so treatments should be applied before beetles feed extensively on cotyledons and the first true leaves. Although pickling cucumbers have a tolerance to wilt, a treatment may still be needed for machine-harvested pickling cucumbers when 5% of plants are infested with beetles and/or plants are showing fresh feeding injury. A treatment should be applied for aphids if 10 to 20 percent of the plants are infested with aphids with 5 or more aphids per leaf.

Melons
Continue to scout all melons for aphids, cucumber beetles, and spider mites. When fields are blooming, it is important to consider pollinators when making an insecticide application. Before the recent rains, we were starting to see an increase in spider mite populations in the earliest planted fields. The threshold for mites is 20-30% infested crowns with 1-2 mites per leaf. Acramite, Agri-Mek, Oberon, Portal and Zeal are miticides labeled on melons for mite control. Be sure to read all labels carefully for rates and restrictions since some are restricted to only one application as well as ground application only.

Peppers
As soon as the first flowers can be found, be sure to consider a corn borer treatment. Depending on local corn borer trap catches, sprays should be applied on a 7 to 10-day schedule once pepper fruit is ¼ – ½ inch in diameter.

Potatoes
Continue to scout fields for Colorado potato beetle (CPB) and leafhoppers. Adult CPB as well as the small and large larvae can now be found. A treatment should be considered for adults when you find 25 beetles per 50 plants and defoliation has reached the 10% level. Once larvae are detected, the threshold is 4 small larvae per plant or 1.5 large larvae per plant. As a general guideline, controls should be applied for leafhoppers if you find ½ to one adult per sweep and/or one nymph per every 10 leaves.

Snap Beans
Continue 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 one third. As a general guideline, once corn borer catches reach 2 per night, fresh market and processing snap beans in the bud to pin stages should be sprayed for corn borer. Sprays will be needed at the bud and pin stages on processing beans.

Sweet Corn
Continue to sample seedling stage fields for cutworms and flea beetles. You should also sample whorl through pre-tassel stage corn for corn borers and corn earworms. A treatment should be applied if 15% of the plants are infested with larvae. The first silk sprays will be needed for corn earworm as soon as ear shanks are visible.
As we move from cold and wet to hot and wet weather we are continuing to monitor our two new special friends SWD and BMSB. So far we are not seeing a lot of activity but we have picked up BMSB in peaches. It is important not to allow these overwintering adults to lay eggs and establish a nymphal population in the orchard. Be sure to be keeping a close eye out for BMSB especially around the boarders of your operation.

At this time bifenthrins section 18 for use in apples and peaches is still being held up by the EPA so be sure not to use any bifenthrin product on your apples or peaches until we get word the section 18 has been renewed. Dinotefuron has been approved for 2014 so that is a nice addition for the toolbox especially later in the season. It is important that when you are making your insecticide selections for the orchard that select something that will have activity on BMSB and keep watching those edges and fence line for activity.

As for SWD it feels like that old joke about jumping off a tall building and being asked how you are doing as you pass each floor, so far so good. Plan products that you would like to use for SWD control now and consider using a material twice then switching to another chemical family to avoid resistance development. Be sure the products you selected are labeled for the crop, do not exceed application numbers or rates on the label and be aware of reentry Intervals and pre harvest Intervals.

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**Example spray program:**

- Chemical A (Delegate)
- Chemical A (Delegate)
- Chemical B (Assail)
- Chemical B (Assail)
- Chemical C (Mustang Max)
- Chemical C (Mustang Max)
- Chemical A (Delegate)
- Chemical A (Delegate)
- Chemical B (Assail)
- Chemical B (Assail)

Be sure to keep an eye out as black raspberries ripen and then each subsequent berry crop for the remainder of the season. This year Penn State and UME will again be partnering using a new lure in the vinegar traps for SWD. We will monitor sweet cherries, tart cherries, black raspberries, table grapes, blueberries, blackberries and fall raspberries on two farms in central and western Maryland. We will have our trap catches identified at FREC in Biglerville and report activity weekly once we get up and running. If you would like to get an email report of our trap counts send me an email and I will add you to the list. bbutlers@umd.edu

I would like to thank Dr. Dave Biddinger and the Maryland State Horticulture Society for supporting these efforts.

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**High Temperatures of This Week Could Mean Poor Fruit Set in Tomatoes**

By Jerry Brust
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The high temperatures we will have this week with daytime highs 90°F and above and nighttime lows only getting down to 70°F in much of the mid-Atlantic for several days in a row may cause blossom drop and fruit abortion in tomatoes. Normally in tomato fields pollination is achieved just by the action of the wind. Pollen is released from the tomato flower and falls downward onto the stigma. Without pollination flowers die and drop. This condition can affect tomatoes, peppers, snap beans, and other fruiting vegetables, but is especially prominent in tomatoes. In tomatoes, blossom drop is usually preceded by the yellowing of the pedicle (fig 1). Tomato flowers must be pollinated within 50 hours or they will abort. This is about the time it takes for the pollen to germinate and move up the style to fertilize the ovary. Tomato plants can tolerate extreme temperatures for short periods, but several days or nights with temperatures above 90°F (daytime) or 72°F (nighttime) will cause the plant to abort flowers and fruit (fig 2). At these temperatures the pollen can become sticky and nonviable, preventing pollination from occurring and causing the blossom to dry and drop. The relative humidity also plays a role in pollination, high levels (>80% RH) (which we had and will have this week) during pollen shed will cause the pollen not to be
released properly resulting in poor or incomplete pollination.

There are some possible remedies to these high temperatures that could increase pollination and fruit set that the vegetable group is working on this year. One of the things I have been working on the last several years is using shade cloth that is draped over the tomato stakes when plants begin to set fruit (fig 3). Two years ago when we had a very hot dry summer yields were increased in the shaded areas by an average of 32%, quality and size of tomatoes increased significantly when the same variety was shaded vs. when it was not (fig 4). Last year when it was not very hot and we had good rainfall throughout the summer yields still increased in the shaded areas vs non shaded areas by 12-15%. I do not think a grower should go out and cover all of their tomato fields with shade cloth, but it could be used for tomato varieties that you grow because your customers really like them, but they just do not produce well in the summer heat. There are some other trials we are conducting to help tomatoes and other vegetables come through the heat, but those results will have to wait for this winter.

Fig. 1 Several flower pedicels turning yellow (arrows).

Fig. 2 Aborted flowers and fruit (arrows) on tomato plant caused by high temperatures.

Fig. 3 Tomato plants covered with a 30% shade cloth after fruit set.

Fig. 4 Tomatoes in the top bin were harvested from shaded areas with white plastic mulch. Tomatoes in the bottom bin were harvested from non-shaded areas with black mulch.
No-Till Spring Vegetables: Let Cover Crops do the Work for You
Natalie Lounsbury and Ray Weil, Department of Environmental Science and Technology, University of Maryland.
nlp9@umd.edu, rweil@umd.edu

August may seem early to think about cover crops, but getting forage radish (*Raphanus sativus* L.) cover crop seed in the ground before the first week of September can have big payoffs the following spring for vegetable producers. By bringing nitrogen, sulfur, and phosphorus to the surface soil, suppressing weeds, and aerating the soil, a winterkilled forage radish cover crop can eliminate the need for tillage and/or a burndown herbicide before early spring vegetables and reduce the fertilizer needs of the spring crop. More rapid soil drying in spring can also allow for earlier field work (Figure 1). In our research trials and collaboration with farmers, we have found that no-till seeding into a winterkilled forage radish cover crop works well for peas (Figure 2), spinach (Figure 3), and beets. Similar trials led by Gordon Johnson at the University of Delaware have also shown good results with peas as well as snap beans.

This system may be also effective for other early crops like lettuce, carrots, and kohlrabi, but we are still investigating whether there is a delay in maturation when these crops are no-till seeded.

**Timeline of No-till System Using Forage Radish**

Early seeding of the forage radish cover crop and careful attention to its fall growth are especially critical if one is aiming for alleviation of soil compaction via “biodrilling” and weed suppression. For organic growers who are not permitted to use herbicides, seeding before the first week of September is imperative. For other growers, a slightly later seeding of forage radish is
possible and will provide some nutrient cycling, but will necessitate a burn down in spring prior to no-till seeding and will not provide the same level of biodrilling.

Below is a timeline of the system with important notes on what to check and when:

<table>
<thead>
<tr>
<th>Month</th>
<th>To-do</th>
<th>What’s happening</th>
</tr>
</thead>
<tbody>
<tr>
<td>August</td>
<td>Seed radish in late August (before first week of Sept), 6-8 lb/acre drilled, as low as 2-3 lb if precision planted in rows 15 inches apart. In low fertility soils, adding 20 lb N/acre can give the radish a boost so the roots can reach deeper soil layers where it can capture much more N.</td>
<td>In many cropping systems, there is residual N in the soil that has not been utilized by cash crops. An early seeded radish cover crop can capture this N as well as other nutrients. Throughout the fall growing season, radish roots can grow &amp; deep and capture up to 30 lb N/acre, though more typical values are 150 lb N/acre.</td>
</tr>
<tr>
<td>September</td>
<td>Check radish stands for density and growth (optimal plant density is 5-8 plants per square foot). If there is inadequate fertility, it will be evident by late September (see photo)</td>
<td>Radish roots are rapidly elongating and capturing nutrients as radish foliage grows tremendously.</td>
</tr>
<tr>
<td>October</td>
<td>Check for any gaps in the radish canopy. If there is visible bare soil, no tilling without herbicides in spring is not recommended.</td>
<td>Radish canopy is shading out light, preventing weed seeds from initiating germination. If the canopy is fully closed by early October, nearly 100% of annual weeds will be suppressed, leaving a weed-free seedbed in early spring. It is the light exclusion that suppresses weeds, not the actual radish biomass.</td>
</tr>
<tr>
<td>November</td>
<td>Harvest some radishes for markets, home consumption, or a special treat for livestock.</td>
<td>Harvesting a portion of the crop for consumption at this point will not substantially reduce the benefits of the cover crop and the radishes are highly desirable in certain markets (generally marketed as “daikon”).</td>
</tr>
<tr>
<td>December</td>
<td>Frosts will knock back the radish, but it takes consecutive nights in the teens (°F) to kill the radish.</td>
<td></td>
</tr>
<tr>
<td>January</td>
<td>Radish generally dies in January in Maryland and will begin to decompose rapidly.</td>
<td></td>
</tr>
<tr>
<td>February</td>
<td>Check for complete winterkill. If the radish has not winterkilled yet, as was the case in 2012, killing via mechanical or chemical means may be necessary. See link on right for more info on killing radish.</td>
<td>Managing Forage Radish Cover Crops that Fail to Winterkilling (starts on P. 3) <a href="https://extension.umd.edu/sites/default/files-docs/Weeds/forpub/Headlines4_r2.pdf">https://extension.umd.edu/sites/default/files/ docs/Weeds/forpub/Headlines4_r2.pdf</a></td>
</tr>
<tr>
<td>March</td>
<td>No-till seed early spring cash crops like spinach, peas, and beets.</td>
<td>Very little cover crop residue remains on the soil surface, allowing the soil to dry out and warm up, and thus eliminating the need for tillage. Nitrogen and sulfur from the decomposing radish tissue become available in March-April, giving a boost to early crops.</td>
</tr>
<tr>
<td>April</td>
<td>Weed cash crops</td>
<td>Although the weed suppression from radish is nearly 100% in late March through early April, weed control may be necessary by mid-late April as it would be with most other systems.</td>
</tr>
<tr>
<td>May-June</td>
<td>Harvest cash crops</td>
<td></td>
</tr>
</tbody>
</table>

**Monitoring Fall Growth to Ensure Optimal Results**

Not all forage radish stands in fall will be adequate to facilitate no-till seeding of spring crops, especially in organic systems where weed suppression is paramount. However, inadequate cover crop stands are evident in fall, so spring plans can be made accordingly.

![September 27, 2012 Seeded August 24, 2012](Early-March-2013)

**Figure 5:** When seeded in late August, forage radish is a rapidly establishing cover crop that can achieve complete canopy closure in six weeks. The rooting depth can reach six feet. Photos: Ray Well and Natalie Luntzenberry.

![September 27, 2012 Seeded August 24, 2012](Early-March-2013)

**Figure 6:** Although this forage radish cover crop was seeded early, it endured a hurricane and saturated soil. Bare patches of soil in late September (left) are areas where weeds were present in March (right).

![September 27, 2012 Seeded August 24, 2012](Early-March-2013)

**Figure 7:** Full canopy closure by late September (left) created a weed-free seedbed in March (right) in Clarksville, MD. Early canopy closure is essential to weed suppression.

![September 27, 2012 Seeded August 24, 2012](Early-March-2013)

**Figure 8:** Inadequate (and spotty) nutrient availability in fall will lead to poor radish growth. This was a sandy soil after a wheat crop with very low residual nutrients. A small amount of fertilizer for a forage radish cover crop may encourage greater total nutrient uptake. Otherwise, a legume is advisable.
No-till Seeding in Spring

Precision seeders such as Monosem and MaterMacc work well in many soil conditions for no-till seeding vegetable crops after forage radish. They are able to slice through the minimal residue. Closing the furrow can require some adjustment to the press wheels in wet or higher clay conditions.

Smaller, human-powered seeders such as the Earthway and Jang are less reliable, but still can work for no-till seeding after forage radish. The soil condition (moisture, texture, amount of crust) and amount of residue are much more significant factors when using a push seeder. The Jang has an available small double disk opener option that can help with small amounts of residue. Walking behind the furrow to close it and provide more seed-soil contact can be effective. Creating a small furrow ahead of time with the edge of a hoe or similar implement can also facilitate seeding with a push seeder—a simple kind of “strip tillage.”

Although we have had success in a wide range of soils, we have also had failures in some soils. In both 2011-12 and 2012-13 at the Wye Research and Education Center, no-till spinach did not perform as well as spinach in a tilled seedbed following radish. In both of these years, the site had fall rain far in excess of the norm that likely affected cover crop performance and soil conditions. It is always adviseable to try any new system on a small scale only, and always maintain a “control” of your usual practice for comparison.

For More Information

Ongoing updates on our research and more extensive information are available on our project website [www.notillveggies.org](http://www.notillveggies.org). We are happy to answer any questions you have and are actively looking for more participants in our continuing research. Please contact Natalie at npl9@umd.edu.

This project follows extensive research at the University of Maryland on various aspects of forage radish as a cover crop. A fact sheet resulting from this research can be found here: [http://notillveggies.org/UMD%20fact%20sheet%20824%20radish.pdf](http://notillveggies.org/UMD%20fact%20sheet%20824%20radish.pdf), and more information specifically for integrating forage radish into organic farming systems is available here: [http://www.extension.org/pages/64400/radishes-a-new-cover-crop-for-organic-farming-systems#.U6GPk_idXrM](http://www.extension.org/pages/64400/radishes-a-new-cover-crop-for-organic-farming-systems#.U6GPk_idXrM).

This project was supported by Northeast SARE grant LNE11-312

Disease Update:
The Latest About Apple Scab & More Info for Fire Blight Management

By Dr. Kari Peter
Penn State Fruit Research and Extension Center

http://extension.psu.edu/plants/tree-fruit

The primary infection period for apple scab is over. If growers are experiencing apple scab at this time, control measures will be needed throughout the remainder of the growing season to keep the disease in check. An option for fire blight management is also discussed.
The Fire Blight Saga Continues

Fire blight is being reported throughout Pennsylvania and Maryland. Management strategies are discussed for dealing with active fire blight infections.

2014: The Year of Fire Blight (photo courtesy of B. Lehman)

Quote of the week:

"Hi Kari,
I just wanted to inform you that right now I have fire blight of the eye. This condition is causing me cross-eyed vision and nausea...believe it or not, I'm actually waiting on 90+ degree weather to cure my fire blight vision.
Just a note,
Bugged By Blight in Pennsylvania*"

*Special thanks to the grower for allowing me to reprint a portion of his email.

Uff da! My Dad and family in North Dakota use this Norwegian expression when they have a feeling of sensory overload or being overwhelmed. As far as disease reporting goes, it was eerily quiet...until last week. This week is a whole other beast. We had two excellent fire blight infection periods during bloom this year: May 9 – 11 and May 13 – 16. For trees that bloomed later, the days surrounding Memorial Day Weekend also had conditions for infection. When you combine the infection periods with the weather conditions during last several of weeks, bacteria that established in the blossoms replicated like crazy. Blossom blight and subsequent shoot blight is quite prevalent throughout the region. The disease pressure has been so severe this year that those orchards (and trees in the home landscape) that were not protected with streptomycin during the critical bloom time will very likely experience some level of fire blight infection. Resistant doesn’t mean immune, especially when the disease pressure is high, so cultivars resistant to fire blight are even showing symptoms, regardless of rootstock. Management decisions and strategies are discussed for getting a handle on the fire blight epidemic underway.

Monitor your orchard for fire blight infection: several times a week

Even if you are not seeing fire blight, you are not quite out of the woods just yet. Blossom blight infection is indicative of blackened flower remnants or small fruitlets, with discoloration moving down the flower stem. Often times you will see tiny ooze droplets on the surface of the diseased tissue. The veins of infected leaves will blacken early on, followed by the shoot tips drooping into the characteristic shepherd’s crook or candy cane shape. A resource for pictures of the stages of fire blight can be found on Dr. David Rosenberger’s May 28, 2014 blog entry.

Blight has struck, what should you do?

I’ve mentioned in previous Disease Updates and during the spring twilight meetings: once fire blight symptoms manifest, spraying streptomycin is ineffective for disease control (unless after a hail event). In addition, using streptomycin during summer sprays can promote streptomycin resistance. The more appropriate question is: should you prune when you see fire blight? This is a tough question and the answer depends on the orchard and the weather conditions.

First things first: prune only in dry weather.

There is a very high chance of spreading fire blight when pruning during wet weather, especially if the wet weather persists. Remove all blight showing within two days after it appears. If it will take much longer (tissue becomes brown and necrotic), focus efforts on salvaging trees where infections may threaten the main tree stem or where infections are occurring in the tops of the trees. Blight in the in the tops of the trees provide an infection source for the lower parts of the tree since bacteria can be “washed” down the tree. Dr. Rosenberger suggests a “fire blight triage” when it comes to pruning decisions once fire blight has struck, going from highest to lowest priority:

- Young orchards 3 – 8 years old with just a few a strikes. (highest priority)
- Young orchards 3 – 8 years old with severe strikes.
- Older orchards with a few strikes.
- The “walk away” group: orchards with so many strikes that most of the tree would need to be removed; severe pruning can stimulate new growth that can become infected. (lowest priority)
If fire blight is to be pruned, use the “ugly stub” method by cutting branches between nodes and several inches away from the central leader or other branch union:

- **2-year-old wood (and older) is more resistant to fire blight and can stop infection movement into the tree.** Since the bacteria can travel inside the tree well ahead of the visible infection (up to several feet), make cuts 8 – 12 inches below the last signs of browning, leaving 4 – 6 inch naked stub in 2-year-old or older wood.
- A canker will form in the stub, which can be cut off with the canker during the next winter.
- Disinfecting pruning tools is ineffective for minimizing spread of the disease.

**How to handle fire blight prunings**

In researching effective fire blight management methods, Michigan State University Extension has the following recommendation for diseased prunings:

Toss prunings in the row middles and allow them to thoroughly dry before mowing them. Dry, dead prunings on the orchard floor do not present a danger to spreading the disease. Dry means that the bark no longer slips on the cut branches and the cambium is brown. With today’s tightly spaced orchards, carrying prunings out of the orchard may spread more blight than occurs when prunings are left to dry in the row middles.

**Effective summer sprays remain elusive**

Apple scab issue? I have a summer spray option for you! Powdery mildew? I have a summer spray option for you! Fire blight? (crickets chirping) This is the hardest part right now – not being able to offer an effective, fail-safe spray strategy to control active shoot blight. In the case of active blight, often times the best strategy is to do nothing before terminal growth has stopped since the spread of fire blight should also stop. However, if growers have young blocks that are threatened, this is a very difficult option to swallow. **Keep in mind: once you see a fire blight infection, the bacteria is inside the tree.** For this reason, it can be difficult to manage an active infection. There are several management strategies floating around to suppress shoot blight, so I would be remiss in not mentioning them. Some of the controls are still in the experimental stage; others have been evaluated and are ineffective. As a result, growers are cautioned to use any of these management strategies at their own risk and expense:

- **Alternative products:** Regalia (plant-based, *Reynoutria sachalinensis*), Serenade Optimum (bacterial-based, *Bacillus subtilis*), and Double Nickel (bacterial-based, *Bacillus amyloliquefaciens*) are biopesticides that are being evaluated to determine usefulness against shoot blight. Serenade Optimum has so far shown favorable results in New York on small trees, pears, and susceptible varieties when applied at 1 pound/acre.
- **Copper products:** Copper works because it will kill bacteria, but the bacteria must be in contact with the copper for it to be killed. Bacteria on the bark and other tree surfaces can be killed; however, copper will not see bacteria inside the tree and the bacteria won’t be killed. Copper can be washed off with rain and can cause fruit russetting, lowering the quality of the fruit. Last season, Dr. Keith Yoder at Virginia Tech evaluated the combination of 2 quarts of Cueva (copper octanoate) plus 8 ounces of Double Nickel during cover sprays (per 100 gal dilute; every other cover spray) to control shoot blight. The combination suppressed shoot blight similar to Apogee applied at petal fall, whereas Cueva alone did not. In addition, Double Nickel appeared to offset the negative effect of the Cueva for fruit russetting, compared to Cueva alone. This may not stop a fire blight epidemic, but it appears it has the potential to slow the spread of the disease. As a general rule when using copper materials, avoid spraying during slow drying conditions. This treatment is being evaluated again this year.
- **Apogee:** Apogee has the ability to control shoot blight, particularly when it’s applied around petal fall and well before shoot blight symptoms appear. Research to date of using Apogee after symptoms indicates suppression of the disease minimal. Apogee stimulates antimicrobial chemicals in the tree; however, we do not know if these chemicals can still be stimulated later in the season.
- **OxiDate:** OxiDate is a hydrogen dioxide (hydrogen peroxide) based product and kills microorganisms via surface contact. Hydrogen peroxide has no residual activity, nor will it control fungi or bacteria that have already penetrated the tissue. Consequently, it must be applied after a pathogen is deposited on the plant surface and before infection is initiated. OxiDate can cause severe fruit russetting under certain conditions. Research has shown no significant control for fire blight infection on apple.
- **Phosphorous compounds:** Aliette, ProPhyte, AgriFos, Phostrol are phosphorous compounds that have been evaluated for controlling fire blight post symptom development. Research to date has not indicated these are useful products for controlling shoot blight.

**Other fire blight disease management considerations**

If fire blight conditions continue to persist, your trees can still be susceptible to bacterial infections as long as the trees are growing, tender green shoots are present, and fire blight infected trees are nearby. To keep the disease in check, the following control strategies are recommended:

- Be careful when pinching off flowers of newly planted trees since bacteria maybe present on the tree. Flower pinching should only be done after a streptomycin spray to kill off any surface bacteria on
the flowers. Do not pinch flowers when trees are wet with rain or dew.

- Avoid hand thinning, bud pinching and other manipulation activities until after terminal bud set. Delaying hand thinning may result in loss of fruit size, but the risk of spreading fire blight outweighs the benefits of early hand thinning. Similar to pinching off flowers, fire blight can be spread on your fingers when hand thinning and bud pinching.

- Control piercing-sucking insects, such as leafhoppers, since the potato leafhopper has been implicated in the transmission of fire blight. In addition, piercing-sucking insects can cause physical injury through normal feeding, thereby by creating an entry point into the plant.

- Control rootstock suckers. This is especially important for M.9 and M.26 rootstocks. It is best to control rootstock suckers via chemical control since pruning or ripping creates open wounds, which bacteria use to gain entry into the plant.

- If known fire blight is nearby: growing trees are susceptible to damage from a violent windstorm or hailstorm and wind and rain can spread the bacteria across a large area. Apply streptomycin within 24 hours of the severe weather event to protect the tree from any wind/rain-driven bacteria that could gain entry into wounds.

**If fire blight still occurred despite streptomycin applications**

Some folks might be quick to say they have streptomycin resistance. The chances of this occurring are very low for two reasons: 1) streptomycin was effective controlling fire blight this year for the majority who sprayed during the infection periods, and 2) fire blight samples from Pennsylvania were evaluated not too long ago for streptomycin resistance and, to date, no streptomycin resistance has been found in Pennsylvania. Folks have to keep in mind: we experienced a perfect storm for fire blight to occur this year. We had great weather conditions for the bacteria to multiply in large numbers leading up to bloom, a long bloom period, and optimal fire blight infection conditions (warm and rainy) during bloom, which lasted several days. Several areas also experienced hail and high winds during the latter half of May, which didn’t help the situation. The disease pressure is so severe this year that any bloom that may have not been protected was fair game to become infected. For those who sprayed streptomycin and still were hit with fire blight, consider these reasons:

- Rain may have washed off any spray, especially since several areas experienced an inch or more during the infection periods.
- Sprays were poorly timed: Streptomycin is only effective 24 hrs before and 24 hrs after a rain event.
- Blooms opened after a streptomycin spray and became infected.
- Rat-tail bloom is still susceptible to infection.

**Hang in there folks...**

Fire blight frustrates everyone (myself included) and additional infections are still very possible. If you're feeling a bit exasperated by Mother Nature and those pesky pathogens are running amok, take a deep breath, slowly exhale and let out a good “uff da!” Don'tcha know...

When controlling for disease, weather and tree growth conditions need to be monitored at a local level within one’s own orchard. Before chemical products are applied, be sure to be in compliance by obtaining the current usage regulations and examining the product label.

**Product information can be easily obtained from CDMS. Specific chemical recommendations are in: the Penn State Tree Fruit Production Guide, the 2014 Spray Bulletin for Commercial Fruit Growers for VA/WV/MD, and Fruit Production for the Home Gardener.**

**IPM Alert: What’s Happening with the Brown Marmorated Stink Bug?**

By Stanton Gill

UME Extension Specialist, Nursery & Greenhouse Management

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Did you ever wonder what happened to all of the brown marmorated stinkbugs? Remember 2011 and 2012 when they were everywhere? Yeah, sure they are still lingering around in a couple houses but most people are reporting they just are not a big problem in their house or garden this season. There was a good number overwintering in people’s houses this winter but the late cold, spring has delayed their movement to the outside this year and many people are reporting they are finding them dead in their house – as if they just ran out of energy. In many landscapes we found many of our well established predators feeding on brown marmorated stink bugs. Several parasitic wasp have also be found attacking different life stages of the bug. Many people are reporting seeing several species of birds feeding on the bugs. This and the strange spring weather appear to be combining to help keep this pest suppressed in several areas in Maryland. There are still a few hot spots like Frederick and Washington county areas. Many of the orchards in these counties are seeing a fair amount of damage on peaches, pears, plums and apples.

This last week I attended a conference organized by USDA at the Delaware University Research Center in Georgetown, Delaware to find out what is the latest research on brown marmorated stink bugs. The bug has been on the move. It is now getting established in southern California and in the agricultural areas around Sacramento. This is a big concern since it has the potential to become a huge problem in orchards, vineyards and vegetable production areas. California produces 90 % of the almonds for the world and the
BMSB feeds heavily on a close cousin of the almond tree – the peach. It is suspected that it will become a problem for almond growers.

The BMSB has also established in Northern Italy and parts of Milan and Torreno, parts of France, and Switzerland. It has also been found in Hungary. One of the questions that has come up is how cold winters impact the brown marmorated stink bug.

Theresa Cira of the University of Minnesota reported on this pest in Minnesota. The winter temperatures in Northern Minnesota reach -35 F and -25 F in southern Minnesota this past winter. She reports that BMSB survived the frigid Minnesota winter by using special proteins to regulate the way their body freezes and minimize damage to cells. A rapid freeze down of the insects kills it but a gradual freezing is something this insect species is built to withstand.

On the parasite research end, Tim Haye of CABI has been looking at the parasite wasp *Trissolus japonica*. Dr. Hayes has been looking at this parasite in mulberry, and jujube orchards in China just outside of Beijing. He found that this species of wasp can parasitize up to 50% of the egg mass of BMSB.

If you are seeing lots of activity from brown marmorated stinkbug in your area let me know. We would like to see if there are hotspots in Maryland where this bug is very active. Sgill@umd.edu or 410-868-9400.

**Cherry Shot Hole Disease**

**Very Active this Season**

By Dave Clement
UME Extension Specialist, Plant Pathology
clement@umd.edu

I’ve attached two pictures of what many of our callers are concerned about on leaf drop and yellowing of cherry leaves. It’s caused by cherry shot hole disease.

Do Particle Film Technologies Have a Fit in Vegetable Crops?

By Gordon Johnson,
DE Extension Vegetable & Fruit Specialist;
gjohn@udel.edu

Particle films are reflective mineral based materials that are sprayed on crops. Available particle films are Kaolin based (a type of clay) and include products such as Surround and Screen Duo. Particle films reflect both infrared (IR) and ultraviolet (UV) light. From a horticultural perspective, they have the potential to reduce heat stress and water stress on the plant and to reduce sunburn on fruit. Particle films have been shown to improve fruit quality and color in some crops. In tree fruits, they have been shown to increase photosynthesis. Particle films also have been shown to reduce damage by certain insects and diseases on tree fruits. While particle films have gained use in tree fruits, their usefulness in vegetables is still unclear. Research in a number of states has shown reduced fruit disorders such as sunburn in peppers and white tissue in tomatoes when applied over those crops. Watermelon growers have used clay products for many years to reduce sunburn in that crop in southern states. However, there are some drawbacks to their use. If used for sunburn protection on fruits, there is added cost to wash the material off at harvest. Where overhead irrigation is used, or during rainy weather, the material can be partially washed off of plants, reducing effectiveness and requiring additional applications.

Research on the use of these products is ongoing at the University of Delaware and the University of Maryland. In Delaware trials, focus has been on reducing stress in watermelons and lima beans and results have been mixed so far. In 2012 (a hot year), there was some increase in early yield in watermelons; in 2013 (a cool year) there was a decrease in overall yield of watermelons (3 weekly applications were made starting at mid fruit set). In lima beans, there was an increase in yield in 2012 when combined with other stress reducing products but not alone; in 2013 there was no effect (one application was made at first flowering). Maryland trials have shown improvements in tomato and pepper fruit quality with the use of particle films.

More research is needed to determine the benefits of particle films for vegetable crops in our region and the best way to use them (timing, rates, and application number).

CDMS

Pesticide Labels and MSDS On-Line at:
http://www.cdms.net/
Maryland Unmanned Aircraft Systems (UAS) Agriculture Forum
Wednesday 25 June, 2014
College Of Southern Maryland,
Leonardtown Campus
Bldg. A Auditorium,
6:30 – 8:30 p.m.

We need your help to understand how unmanned aircraft can work on your farm. Potential uses include scouting for insects and diseases, collecting plant health and fertility information, and mapping fields. We hope to identify farmers who wish to participate as a demonstration and testing farm for this new technology. The research and development of these systems will lay the groundwork to best support our farming community and to preserve our natural resources.

The University of Maryland UAS Test Site and Ausley Associates invite you to the first ever Maryland UAS Agriculture Forum to discuss the agricultural use of unmanned aircraft in our region. The goal of the forum is to facilitate discussion and to document the requirements, desires, and concerns of farmers, developers and resource conservation professionals. The forum is focused on farmers who could use UAS in the future, however interested private individuals as well as government and university stakeholders may attend if space is available.

Presenters will provide a background for farmers, developers and resource conservation professionals on common applications of UAS in agriculture: • Monitoring Crop Growth and Health
• Optimizing Nutrients
• Yield Estimation
• Assessing Herbicide Efficacy
• Stress Detection
Special attention will be devoted to:
• Cost benefit to farmer
• Reduction of run-off into Chesapeake Bay watershed
• Security, privacy, and data right concerns

We expect this forum to be a fulfilling and informative event. There is no cost to attend, but attendance is limited. Register your attendance and other suggested topics by e-mailing Scott Sanders at: scott.sanders@ausley.us

See the Attachments!

1) Summer Horticultural Tour

Mid-Season Aronia Twilight Tour
Save the date!
Tuesday July 8th, 2014
5:00 to 7:30 PM
at
Wye Research and Education Center
Queenstown, MD

University of Maryland Extension Mid-Season Aronia Twilight Tour will be held July 8th at Wye Research and Education Center. The tour will be for all Aronia growers including those interested in growing Aronia. Various subjects will be covered including Aronia’s cultivated origins and breeding potential, chemical application and equipment calibration and research updates. A light meal will be provided.

Anyone interested in registering can contact:
Andrew Ristvey at 410-827-8056
aristvey@umd.edu

Please register by July 1st, 2014.
Wye Research is located at:
124 Wye Narrows Drive
Queenstown, MD, 21658

Vegetable & Fruit Headline News
A timely publication for the commercial vegetable and fruit industry available electronically in 2014 from April through October on the following dates: April 17; May 15; June 19; July 17; August 14; September 18; and October 23.

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

Submit Articles to:
Editor,
R. David Myers, Extension Educator
Agriculture and Natural Resources
97 Dairy Lane
Gambrills, MD 21054
410 222-3906
myersrd@umd.edu

Remaining Article submission deadlines for 2014:
July 16; August 13; September 17; and October 20.

The University of Maryland Extension programs are open to any person and will not discriminate against anyone because of race, age, sex, color, sexual orientation, physical or mental disability, religion, ancestry, national origin, marital status, genetic information, political affiliation, and gender identity or expression.

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2014

Summer Tour
July 9, 2014
7:30 AM - 4:30 PM

Touring Southern Maryland Fruit and Vegetable Farms
Sponsored by
Maryland State Horticultural Society and
University of Maryland Extension

The tour fee covers the cost of registration, bus travel, lunch, drinks, snacks and ice cream.

Attendees will leave their vehicles at one of the three locations listed and board the bus. Stops are in Thurmont, Frederick and Gaithersburg.

No private vehicles allowed to follow bus due to USDA security rules.

First boarding is 7:30 am and final drop off is scheduled for 4:30 pm.
2014 Summer Tour ~ July 9, 2014
MSHS 2014 Member: $40.00 per person  Non-Member: $50.00 per person

1
Bus Pickup 1: 7:30 AM
Catoctin Mountain Orchard
15036 N Franklinville Road
Thurmont MD 21788
Continue via US 15 S to McDonald’s

Bus Pickup 2: 8:00 AM
McDonald’s
S Jefferson Street
Frederick MD
Continue via I-270 to Gaithersburg

Bus Pickup 3: 8:30 AM
Milestone Center (Kohl’s Parking Lot)
Father Hurley Blvd (East exit)
Gaithersburg MD 20918
Continue via MD-200 and I-95 S to BARC

2
Arrive: 9:15 AM
Leave: 10:00 AM
Beltsville Agriculture Research Center (BARC)
10300 Baltimore Blvd.
Building 003
Beltsville MD 20705
Meet Dr. Kim Lewers for a field tour of small fruit research at the USDA-BARC.
Travel via I-95 and MD 202 to Upper Marlboro

3
Arrive: 10:30 AM
Leave: 1:30 PM
Upper Marlboro Facility
2005 Largo Road
Upper Marlboro MD 20774

Field Research: Vegetable Crops-Jerry Brust;
Small Fruits and Grapes-Ben Beale & Joe Fiola
Terp Farm Overview: Allison Lilly and Guy Kilpatrick
High Tunnels: RIMOL Co rep. and John Lea-Cox
(environmental sensors)
Noon-1 PM Lunch catered by Campus Dining featuring local produce
Designing a Packing House for a Diversified Farm-Frank Allnutt, Allison Lilly and Donna Pahl
Continue via I-95 to MD 5

4
Arrive: 2:00 PM
Leave: 3:30 PM
Miller Farms
Phil Miller and Family
1014 Piscataway Rd (MD 223)
Clinton MD 20735
Welcome at the Farm Market followed by a tour of vegetable plantings. Tour will end at Farm Market to visit bakery and ice cream shops.

5
Leave: 3:30 PM
Board Bus for return trip
Stop 1—4:15 Gaithersburg, Milestone Center
Stop 2—4:45 Frederick, McDonald’s
Stop 3—5:15 Thurmont, Catoctin Mountain Orchard

Registration deadline: JULY 2, 2014
If you have questions or on the tour day?
Call 240-409-7491