

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.

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Field Observations from Southern Maryland

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- ✓ Evaporative cooling may be a wise tactic on our vegetable farms as record breaking heat and moderate drought has established itself a little early this year. On young tender vegetables, overhead irrigation may be required during the heat of the day in addition to trickle running at capacity to protect the early fruit set. This tactic may avoid fruit abortion and help promote pollen viability.

Spring Observations from WYEREC

By Michael Newell
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Observations from WyeREC June 8 2011

Peaches - Continue monitoring for Brown Marmorated Stink bug (BMSB). None have been found in the farm traps, but activity is seen in field crops. Once BMSB is found in tree crops, reports from Western Maryland indicate that alternate row sprays of the more effective materials have been successful. Spray intervals should not exceed 7 days. These sprays will also control tarnished plant bug and other cat-facing insects which are normally the pest targeted at this time.

Apples - Continue removal of FireBlight strikes during dry conditions. Think about summer disease spray programs.

Grapes - Pre-bloom to 2-4 weeks after bloom is the most critical period to provide protection of vines and fruits from Black rot, Phomopsis, Downey Mildew and Powdery Mildew. Shoot thinning and positioning is in full swing, it gets more difficult to do from this point forward.

Strawberry Plasticulture - It's time to order plants for fall planting. This link to plant suppliers is provided by the North Carolina Strawberry Association. Consider joining this group for some great information throughout the year.

<http://www.ncstrawberry.org/docs/2011PlantSupplierList.pdf>

Carrying over plants for a second harvest has been effective for some growers. If you have a history of anthracnose, DO NOT CARRY-OVER the planting. The challenge is to manage the plant so that crop load is adjusted to maintain good fruit size. After harvest remove old leaves and fruit. Keep the plant growing with minimal irrigations, but refrain from fertilizer applications until early September. Continue sprays for leaf diseases and monitor and treat for insect pest. Crown thinning will be needed before September, this is critical for maintaining good fruit size.

Double-cropping the plastic to utilize the existing inputs can be done. If the plastic is in good shape some growers will plant vegetables after the strawberries are finished. Kill the strawberry plants with one or two applications of Gramoxone. Leaving the dead plant in place will help keep weeds from emerging from the hole. However, we have seen some staining on muskmelon if the fruit lies on the dead strawberry plants. Never apply residual herbicides over the row, this could allow for the herbicide to concentrate in the planting hole. Standard herbicides recommended for the second crop can be used between the rows. Fertility levels will need to be adjusted through the drip system for the second crop. Pumpkins have worked well for us here as a second crop.

Strawberry Perennial Matted-Row Culture - After harvest, renovation procedures need to be done to maintain a productive field. If broadleaf weeds are a problem, apply 2,4-D herbicide, wait two weeks then mow the leaves off. Narrow the rows to about 10 inches. Using an implement that can apply additional soil (1/4 inch) onto the remaining crowns will increase adventitious rooting. Apply residual herbicides and 30-50 lbs nitrogen. Keep plants in good health with insect and disease control and don't forget to irrigate.

Vegetable Crop Insect Update

By Joanne Whalen
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Cucumbers

All fields should be scouted for cucumber beetles and aphids. Fresh market cucumbers are susceptible to bacterial wilt, so treatments should be applied before beetles feed extensively on cotyledons and 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. The treatment threshold for aphids is 20% infested plants with at least 5 aphids per leaf. Be sure to also watch for beneficials. The threshold for mites is 20-30% infested crowns with 1-2 mites per leaf. We have seen an increase in cucumber beetle activity, especially in cantaloupe fields. Since beetles can continue to re-infest fields as well as hide under the plastic, multiple applications are often needed.

Peppers

Continue to sample for thrips. We are hearing reports of an increase in thrips activity in crops grown in southern states. You should also continue to sample for corn borers and watch carefully for egg masses. Before fruit is present these young corn borer larvae can infest stems and petioles. Be sure to also check local moth catches in your area by calling the Crop Pest Hotline (instate: 800-345-7544; out of state: 302-831-8851) or visiting our website at <http://ag.udel.edu/extension/IPM/traps/latestblt.html>.

Potatoes

Fields should be scouted for Colorado potato beetle (CPB), corn borers (ECB) and leafhoppers. Adult CPB as well as the first small larvae can now be found in fields not treated at planting. 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 1/2 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 1/3. Once corn borer catches reach 2 per night, fresh market and processing snap beans in the bud or pin stages should be sprayed for corn borer. Sprays will be needed at the bud and pin stages on processing beans. Once pins are present on fresh market snap beans and corn borer trap catches are above 2 per night, a 7 to 10-day schedule should be maintained for corn borer control. You can call the Crop Pest Hotline for the most recent trap catches (instate: 800-345-7544; out of state: 302-831-8851) or visit our website at <http://ag.udel.edu/extension/IPM/traps/latestblt.html>.

Sweet Corn

Continue to sample seedling stage fields for cutworms and flea beetles. You should also sample all whorl stage corn for corn borers. A treatment should be applied if 15% of the plants are infested. The first silk sprays will be needed for corn earworm as soon as ear shanks are visible.

Spittle Bugs Common in Strawberry this Year

By Jerry Brust
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Many strawberry growers have seen the meadow spittlebug (*Philaenus spumarius*) in their strawberries this year. Some of these growers include high tunnel growers who have never seen spittle bugs before in their high tunnel strawberries. The spittlebug is an annoying pest on strawberries that under extremely high numbers can stunt plants and reduce berry size. But they are more of a nuisance especially to u-pick growers as the pickers object to being wetted by the insect excretion (the spittle, even though it is harmless).



Fig. 1: Spittle on Stems of Plants Produced by Spittle Bugs

Spittlebugs can be recognized by the white masses of foam found on leaves, petioles, and stems of plants (Fig. 1). The yellow-green nymphs produce this covering to protect themselves from predators and desiccation. Initially the nymphs feed at the base of the plants, but later move up to more tender foliage.

Feeding may cause leaves to become wrinkled and dark-green. Although fruit may be stunted under heavy spittle bug populations, yield loss rarely occurs. High spittlebug populations are often correlated with weedy (including legume cover crops like clover) fields, so proper weed control is important. Nymphs feed for five to eight weeks before entering the adult stage. Newly emerged adults (called froghoppers) are bright green and darken over time to a dull brown. They are very active and readily jump when disturbed. Adults are present on foliage May through November but do not produce any spittle. Adults lay white to cream-colored eggs in the stems and leaves of plants from July through October. These eggs will overwinter and hatch next spring. There is one generation per year in Maryland.

Treatment is rarely necessary for spittlebugs, but u-pick growers need to keep populations to one spittle mass per square foot through prebloom to placate customers. It will be necessary to spread plants and inspect the crowns as well as leaves and stems. Control is considered at one spittlebug per square foot for u-pick operations and 5-6 per square foot (a high population) for everyone else. Aphid control products such as Assail, Thionex, Nuprid, etc. will control spittlebugs too.



Update on Brown Marmorated Stink Bugs in Orchards

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Tracy Leskey (USDA/ARS) provided the following report: "It appears that the beginning of Brown Marmorated Stink Bug (BMSB) immigration and dispersal into commercial orchards has begun in earnest in both WV and MD. Crews out scouting reported large numbers of BMSB in managed peach trees. Not surprisingly, bugs were most dense in the peripheral zone of the plots bordering wild habitat, but not necessarily anywhere near structures. Estimates of bug density were in the vicinity of 3 bugs per tree in border rows, and feeding injury was very fresh but clearly evident."



Sweetpotato Fasciation Photo Perdue University

Fasciation in Vegetables and Fruits

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In recent visits to watermelon fields in Delaware for pollination and fruit set surveys, we found a high number of pollenizer plants in one field that had one or more fasciated stems.

Fasciated stems are ones that are flattened and look like several stems have been fused together. They may be fan shaped in appearance. We also commonly see fasciation in strawberry fruits which develop a "cockscorn" appearance. Fasciation occurs when a growing point changes from a round dome of cells into a crescent shape. Subsequent growth produces a flat stem, flower, or fruit. In some cases fasciation is the result of several embryonic growing points fusing together, with the same flattened or fan-like appearance.

Although the causes of fasciation are not well understood, it is most likely because of a hormonal imbalance. Use of herbicides that are hormone analogs (such as those in the growth regulator or 2,4-D family) can often cause fasciation.

Fasciation can also be due to a random genetic mutation. In some cases, these mutations have been taken advantage of to produce new plants (many ornamentals) that then are propagated vegetatively to keep the fasciated appearance.

Fasciation can also be induced by one or more environmental factors, most commonly cold damage in the spring. Fasciation may also be induced by physical damage to the growing point.

Plant pests may also cause fasciation. Pathogens (bacteria, fungi, virus), insects, and mites, and insects may damage growing points or cause plants to produce excess hormones that will result in fasciated plants. Go to the Purdue Plant and Pest Diagnostic Laboratory site for a picture of a fasciated sweet potato stem: <http://www.ppdl.purdue.edu/PPDL/images/fasciatedsweetpot2.jpg>.



Crimson Clover Photo by C R² Hooks

Can Crimson Clover Hide Eggplant from the Infamous Colorado Potato Beetle

CERRUTI RR HOOKS

Introduction

Eggplant is often attacked by early season insect pests. For example, the Colorado potato beetle (CPB) and different species of flea beetles emerge from their overwintering sites in early spring and migrate to eggplant shortly after it is planted. The CPB overwinters in the soil as an adult and after emerging in the spring, starts feeding and laying eggs on young eggplant. Although much field research has been devoted to developing integrated pest management programs for CPB in potato fields limited research has been directed to managing CPB in eggplant.

Similar to the CPB, flea beetles emerge from their overwintering sites in early spring and migrate to young eggplant seedlings shortly after they have been transplanted. Their feeding can cause extensive shot-hole damage. Heavy feeding by flea beetles can kill young plants; and moderate feeding can delay maturity, and reduce plant size and yield. Flea beetle feeding can be an important cause of eggplant crop failure if not controlled. Similarly to CPB, research on flea beetle management in eggplant is limited.

However, there are certain behavioral aspects of CPB and flea beetles that opens them to cultural control tactics. For example, CPB use visual cues in locating their host plants. Although adults are capable of flying, newly emerged adults often walk after soil emergence. Flights of adult beetles do not commonly occur until warmer temperatures, usually in mid- to late- July. Further, summer generation adults need to feed 5-10 days before their flight muscles are completely developed. Thus, after completing soil pupation, CPB must walk over the ground surface to reach their host plant. This behavior may be considered a "weak link" in the CPB seasonal life cycle. Therefore, a successful management strategy for CPB in eggplant may partially hinge upon the ability to form a "walking barrier" between where they emerge and eggplant. Thus, planting non-host plants around eggplant fields may

help isolate the crop from CPB and delay their arrival time (early season colonization). Several studies have shown that live plant, crop residues or hay mulches within or bordering a crop can be used to decrease CPB numbers within the crop. Most of these studies were conducted in potato or tomato fields. In a lone study involving eggplant a researcher found that CPB populations were significantly reduced in eggplant fields containing straw mulch.

Many growers in Maryland and surrounding states use winter cover crops as part of their standard production practice. Winter cover crops are typically planted in late summer or early fall when cash crops are absent and generally destroyed in the spring. Farmers are mostly unaware that these cover crops can be used to help manage CPB and other insects. Thus, a feasible practice for farmers growing cover crops is to integrate it into their CPB pest management plan.

Crimson clover is a standard legume winter cover crop that flowers from mid-April through May and matures in May or June. Crimson clover has showy, deep red blossoms that produce nectar and are visited frequently by bees. The blooms also harbor beneficial insects that helps keep insect pests in check. Some researchers reported that crimson clover had toxic effects on weed seed germination and some found that crimson clover residues reduced densities of several weed species and that soils where crimson clover was grown contained higher organic matter than no-cover crop soils. However, my interest in crimson clover was its potential to "hide" eggplant from the infamous CPB. Thus, for two summers, a team of graduate students and I planted eggplant into senescing plots of crimson clover at the University of Maryland Research and Education Facility in Upper Marlboro, MD. Our main interest was determining whether we could reduce the number of CPB on eggplant grown in plots of crimson clover compared to plots without crimson clover.



CPB on Eggplant Photo by C R² Hooks

What did we find?

During both years of the study, growth of the crimson clover was excellent and ground coverage was 100% by early March. Flowering began in late-April for crimson clover and continued through May. Beyond this period the crimson clover began to senesce. By late June, the crimson clover stand consisted mostly of organic mulch with only sporadic live patches of crimson clover. In late July, the crimson clover

reseeded itself and covered 90 to 100% of the soil surface.

Six insect pest groups were encountered in the eggplant plots during the two year study. This included flea beetles at least two species of blister beetles, Japanese beetle and the infamous CPB. Eggs of the tobacco hornworm were found on the foliage of eggplant but caterpillar stages were not encountered. In the 2nd year, small numbers of brown marmorated stink bugs (BMSB) were also found on eggplant foliage but egg masses were not found. With respect to these insect pests, only populations of CPB and flea beetles were large enough for us to evaluate.



Eggplant in Senescing Crimson Clover
Photo by C R² Hooks

Conclusion

The purpose of this study was to investigate whether crimson clover grown as a winter cover crop could be used to help managed two early season pests of eggplant. The expected advantage of using a winter cover crop was that it would be easy to incorporate into current farm manager practices in Maryland. Planting eggplant into a senescing crimson clover "dying mulch" resulted in a significant reduction in colonization of eggplant by CPB during both study years. Though flea beetle numbers were less on eggplant grown in crimson clover during the 2nd year of the study, they appeared not to be influenced by the presence of crimson clover.

Well this is not the first study to demonstrate that vegetation whether in the form of living plants or hay mulch could reduce CPB colonization into a crop. Other investigators have found that the presence of straw mulch in potato and eggplant fields can reduce CPB numbers. Some have reported finding fewer CPB on fresh-market tomatoes planted into no-till plots covered with hairy vetch or subterranean clover. Other studies found that winter wheat or rye could act as a physical barrier to CPB walking in search of plants to eat in the spring. For this study, delay colonization of eggplant by CPB seem to be the most important factor contributing to lower numbers on eggplant in crimson clover plots.

The goal of using crimson clover in this study was to reduce and slow colonization of the eggplant by CPB. It appears the crimson clover slowed colonization of the eggplant by CPB as planned. I feel this tactic is grower friendly and a viable ecological approach considering the amount of farm acreage committed to winter cover cropping in Maryland.

Selective and Severe Hail Damage in Some Tomato Fields

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Last week some areas of the mid-Atlantic had intense thunder storms pass through. The research farm in Upper Marlboro was one of those places. There did not seem to be much in the way of hail although you could hear it on the metal roof of the barn, but walking out into the rain you did not see or 'feel' any hail until you got to certain spots and then there was a small collection of hail a little smaller than the size of a dime. We did not see any damage to speak of in the corn that was at 6-leaf. But today as I was walking the tomato field there was damage to both the stems of some plants and to tomato fruit (figs. 1 and 2). This is in stark contrast to what hit the Eastern shore in some spots in May of this year (fig. 3). Damage was severe and in some places total, there was no doubt what the problem was. But the damage from the latest hail storm was very scattered and limited. Only some fruit that was exposed and only the side that was facing up had any damage to it (fig. 2). Damage to some of the stems will be more troublesome than to the fruit as the few damaged fruit will just become secondarily infected and rot on the vine. The damaged stems however may be weak enough that the branch is lost. This scattered hail damage can appear as some sort of insect feeding, growers should make sure to confirm there are pests present before they apply an insecticide spray or two. It is not always obvious that it is hail damage especially when the crops around the tomatoes (mostly corn) show no damage symptoms.



Fig. 1. Hail Damage to Tomato Fruit. Photos by J. Brust.



Fig. 2 Hail Damage to Tomato Stem and Fruit. Photos by J. Brust.



Fig. 3 Severe Hail Damage to Corn and Tomato in May on the Eastern Shore. Photos by J. Lewis.

Watermelon Bacterial Fruit Blotch Epidemiology

By Kate Everts
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MELCAST for Watermelon

The weather based forecasting program MELCAST on watermelon began on Wednesday (May 25). MELCAST is a weather-based spray scheduling program for anthracnose and gummy stem blight of watermelon. If you received a report in 2010, you should have automatically received the first report. If your email or Fax number has changed, please call us. If you did not receive a report and would like to, please call Jeri Cook at (410) 742-8788 and give us your name and Fax number or e-mail address. MELCAST also is available online – bookmark the site <http://mdvegdisase.umd.edu/>. Click on the watermelon picture.



To use MELCAST for watermelons, determine which site is closest to your farm field. Apply the first fungicide spray when your watermelon vines meet within the row. Additional sprays should be applied using MELCAST. Accumulate EFI (environmental favorability index) values beginning the day after your first fungicide spray. Apply a fungicide spray when 30 EFI values have accumulated by the weather station nearest your fields. Add 2 points for each overhead irrigation that is applied. After a fungicide is applied, reset your counter to 0 and start over. If a spray has not been applied in 14 days, apply a fungicide, reset the counter to 0 and start over. Please call if you have any questions on how to use MELCAST on your watermelon crop (Kate Everts at 410-742-8789).

Because there is widespread resistance to strobilurin (group 11) fungicides in Maryland and Delaware, growers should alternate one of the following with chlorothalonil (Bravo, etc.); a tebuconazole product (such as Folicur), Inspire Super, or Switch. Resistance to Pristine has been recorded in many watermelon fields in the southern U.S. We have not found resistance to Pristine here in Delaware or Maryland, yet. However, Pristine should be used with great caution; always tank mixed with chlorothalonil; and alternated with a fungicide that has a different mode-of-action. If a serious disease outbreak occurs in your field, return to a weekly spray schedule.

Vegetable & Fruit Headline News

A bi-weekly publication for the commercial vegetable and fruit industry available electronically in 2011 from April through September on the following dates: April 14 & 28; May 12 & 26; June 9 & 30; July 14 & 28; August 18; September 8

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