

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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Casual Observations from Southern Maryland

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- ✓ Rains finally fell across the region with some consistency last week.
- ✓ Harvest continues with good yields coming in on most crops.
- ✓ Corn earworm pressure is very high with tight spray schedules are needed to keep sweet corn clean. Bt corn is not keeping up with CEW pressure on its own. Fall armyworm is also present.
- ✓ Mites continue to warrant attention in vine and fruiting crops.

Vegetable Crop Insect Update

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Cabbage

Continue to sample for cabbage looper, diamondback larvae, armyworms and Harlequin bug. Although the pyrethroids will provide control of Harlequin bugs they are not effective on diamondback. So be sure to scout and select controls options based on the complex of insects present in the field.

Lima Beans

Continue to scout for spider mites, stink bugs and lygus bugs. Be sure to sample for corn earworm larvae as soon as pin pods are present. A treatment will be needed if you find one corn earworm larvae per 6 ft-of-row. With the increase in local corn earworm catches we are starting to see an increase in larval populations.

Melons

Continue to scout all melons for aphids, cucumber beetles, and spider mites. We continue to see an

increase in aphid populations. Treatments should be applied before populations explode and leaf curling occurs.

Peppers

In areas where corn borers are being caught in local traps, fields should be sprayed on a 7-day schedule for corn borer control. As soon as corn borer trap catches increase to above 10 per night, a 5 to 7-day schedule may be needed. Since trap catches can increase quickly at this time of year, be sure to check local moth catches in your area by calling the Crop Pest Hotline (in state: 1-800-345-7544; out of state: 302-831-8851) or visiting our website at <http://ag.udel.edu/extension/IPM/traps/latestblt.html>

We continue to find beet armyworms (BAW) so be sure to watch for feeding signs and apply treatments before significant webbing occurs. We continue to find aphids in fields and populations can explode quickly, especially where beneficial insect activity is low. As a general guideline, treatment may be needed if you find one or more aphids per leaf and beneficial activity is low.

Snap Beans

At this time of year, you will need to consider a treatment for both corn borer and corn earworms. Sprays are needed at the bud and pin stages on processing beans for corn borer control. An earworm spray will also be needed at the pin stage. Just as a reminder, Orthene (acephate) will not provide effective corn earworm control in processing snap beans. If Orthene is used for corn borer control you will need to combine it with a corn earworm material (e.g. a pyrethroid). You will need to check our website for the most recent trap catches to help decide on the spray interval between the pin stage and harvest for processing snap beans

<http://ag.udel.edu/extension/IPM/traps/latestblt.html>
and
<http://ag.udel.edu/extension/IPM/thresh/snapbeanecbthres.html>

Once pins are present on fresh market snap beans, a 7-day schedule should be maintained for corn borer and corn earworm control.

Sweet Corn

The first silk sprays will be needed as soon as ear shanks are visible. Be sure to check both blacklight and pheromone trap catches for silk spray schedules since the spray schedules can quickly change. Trap catches are generally updated on Tuesday and Friday mornings <http://ag.udel.edu/extension/IPM/traps/latestblt.html> and <http://ag.udel.edu/extension/IPM/thresh/silkspraythresh.html>

You can also call the Crop Pest Hotline (in state: 1-800-345-7544; out of state: 302-831-8851). A whorl stage treatment should be considered for fall armyworm when 12-15% of the plants are infested. We continue to find pockets of high fall armyworm infestations. Since fall armyworm feed deep in the whorls, sprays should be directed into the whorls and multiple applications are often needed to achieve control. Be sure to check all labels for days to harvest and maximum amount allowed per acre.

NOTE – Be sure to check BLT catches in your area for corn borer and corn earworm catches – there has been a significant increase in trap catches over the past 10 day period. You can get updates by calling the Crop Pest Hotline (in state: 1-800-345-7544; out of state: 302-831-8851) or checking our website <http://ag.udel.edu/extension/IPM/traps/latestblt.html>

Some Ugly Tomato Fields

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I have received samples, gotten reports, and have been in some really ugly tomato fields in the past two weeks. The fields consistently have similar appearances where the bottom 1/3 or 1/2 of the plants have dead, dark brown often dried-up leaves (Fig 1). There have been various reasons for some of the dead tissue. In one case plants had Pith necrosis that we talked about a few weeks ago, another field had bacterial spot that was not controlled very well, in another situation mites were at a very high density, but in many situations there was no plant pathological or insect related reason for the terrible looking field. No pathogen could be found in the stems or roots of the plants and only incidental pathogens or insects on the leaves. What seemed to be happening was a rapid decline of the plants over the last couple of weeks. It appears that the stress of this summer is catching up to some fields as they support a heavy fruit load at this time of the season. Additional factors appear to be lower than needed levels of irrigation and possibly the plants are running out of nutrients. It is hard to put a definitive finger on the cause other than the heat and drought seem to be reducing the plants ability to maintain healthy lower foliage. Much of the fruit on

many of these plants is still in remarkably good shape although it goes downhill fast (Fig 2).

The bottom leaves on tomato plants are often used to help fill out fruit when times are tough for the plant, so that these leaves become weakened, yellow and very tough and leathery. This situation seems to be occurring here, but at a much accelerated rate of lower foliage decline. In this weather any additional stress on the plant is going to increase the possibility it declines rapidly.

I do not have a sure-fire plan to remedy the situation other than to pick off the fruit load as much as is reasonably possible and increase irrigation levels as well as to feed the plants low concentrations of NPK. The plants are probably not going to recover to any great extent until the heat wave ceases, but you can maintain the plants until you harvest the fruit. The most important thing to do if your field looks like figure one is to take plant samples to figure out exactly what you have. Whether it is a plant disease or insect problem or an environmental one, steps can be taken to remedy the situation, but you have to be sure what you are dealing with first.



Fig. 1 Tomato field with the bottom half of the plants with dead leaf tissue



Fig. 2 Tomato fruit on plants with dead bottom foliage

Stink Bug Damage Common in Tomatoes This Year

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This has been one of the worse years for stink bug damage in tomatoes that I have seen in a while. Just about every field I walk into has at least some damage while others have severe damage ($\geq 35\%$ tomatoes not marketable). Cloudy spot of tomato fruit is caused by the feeding of various species of stink bug (SB). On green fruit the damage appears as whitish areas with indistinct borders (Fig 1). Individual spots may be 1/16 - 1/2 inch in diameter; or, the spots may merge and encompass a large area of the fruit surface. On ripe fruit the spots are golden yellow (Fig 1). Peeling back the skin shows these areas as white shiny, spongy masses of tissue (Fig.1).



Fig. 1 Severe stink bug feeding on green and red fruit. Outer skin peeled back showing spongy white area.

This damage is most common from late July or early August until the end of the season, concurring with the activity and feeding of stink bugs. SBs are often difficult to see and usually go unnoticed as they spend much of the day on the ground beneath tomato plants, which results in monitoring problems. Only a few are necessary to cause the appearance of cloudy spot on many tomato fruit. Brown marmorated stink bugs (Fig 2) as well as leaf-footed (Fig 3) and tarnished plant bugs also have been observed in larger than usual numbers in tomato fields.



Fig. 2 Brown Marmorated stink bug



Fig. 3 Leaf-footed bug adult

The brown marmorated SB may be responsible for some of the more severe feeding damage observed in some tomato fields. The leaf-footed and tarnished plant bugs usually do not do as much damage to fruit as the larger stink bugs. Feeding damage by the immatures of any of the stink bugs often appears as yellow "star-bursts" on red fruit (Fig 4), which causes a very small shallow white spongy area under the star-burst (Fig 5).

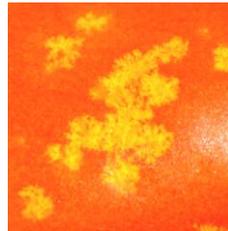


Fig. 4 Star-burst feeding pattern of immatures



Fig. 5 Spongy white area under star-burst feeding stink bug feeding.

Stink bugs and tarnished plant bugs usually move into the edges of tomato fields and seldom are found in the interior of the fields, suggesting that spraying the edges of fields could be used as a control tactic. Stink bugs and especially the leaf-footed and tarnished plant bugs, tend to move into tomato fields when preferred hosts that are adjacent to the fields are disturbed or dry out.

This is an extremely difficult pest to monitor and control. There are no good methods of monitoring these pests. Traps do not work well except for just a few species of stink bug, visually scouting for them has proven to be unreliable and too time consuming. Usually SB damage is only a nuisance, but this year it has resulted in large losses in some fields. Growers who have had damage before from stinkbugs may

want to examine the edges of their fields carefully starting in mid-June for tomatoes with cloudy spot. If it is a dry year as this year has been, it would probably be best to start in early June checking for damage.

There are some acceptable chemical choices for stink bug control. Pyrethroids (Warrior II, Baythroid XL, and Mustang MAX), Venom, Leverage, Voliam Xpress, or Tombstone can be used to reduce damage. It should be understood that none of the chemicals will give complete control, but will reduce damage significantly compared with no chemical usage.

Watermelon Fruit Blotch

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Bacterial fruit blotch on watermelon has shown up in Delaware for the first time this year. This disease is caused by the bacterium *Acidovorax avenae* subsp. *citrulli*, which is most commonly seed-borne. Fruit blotch is favored by warm, humid conditions. The typical symptoms include a dark olive green irregular stain on the fruit. It appears water-soaked, but can be dry. The blotch will spread in size, but usually doesn't extend down into the flesh of the fruit. Older lesions may split open, and then fruit rot can occur from the entry of other bacteria and fungi. Once fruit matures, the waxy rind prevents infection, so infections seen now probably occurred at fruit set or in early fruit development.



Watermelon fruit blotch Image courtesy of David B. Langston, University of Georgia, Bugwood.org

Fields ready for harvest should be kept dry and severely affected fruit or those with splits or wounds to the rind should be culled. Contaminated seed or seedlings are the primary cause of infection, but the bacteria can survive on crop debris and weed hosts. On Delmarva, we have observed instances where the pathogen overwintered and survived on watermelon "volunteer" plants grown in alternate, non-host years.

Fields with known infections should be rotated away from cucurbits, plowed, and weeds and volunteer watermelon plants controlled. Greenhouse sanitation and clean seedlings for the next year are important. Copper or Tanos (8.0 – 10.0 oz/A) applied every seven days will suppress disease progress.

Powdery Mildew on Cucurbits

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Continue to scout cucurbits for powdery mildew. Symptoms typically begin on older, lower leaves and can spread rapidly under dry, humid conditions. Control of powdery mildew begins with regular scouting for symptoms and weekly fungicide applications. Begin a fungicide program when one lesion is found on the underside of 45 leaves. For control of cucurbit powdery mildew in:

Pumpkin and Winter Squash:

Alternate:

Rally (myclobutanil, 3) at 5.0 oz 40WSP/A *plus*

chlorothalonil at 2.0 to 3.0 pt 6F/A

or

Procure (triflumizole, 3) at 4.0 to 8.0 oz 50WS/A *plus*

chlorothalonil at 2.0 to 3.0 pt 6F/A

or

Folicur (tebuconazole, 3) at 4.0 to 6.0 fl. oz 3.6F/A

plus chlorothalonil at 2.0 to 3.0 pt 6F/A

With one of the following:

Micronized Wettable Sulfur (M2) at 4.0 lb 80W/A

(Sulfur may injure plants especially at high temperatures. Certain varieties can be more sensitive. Consult label for precautions.)

or

chlorothalonil *plus* Pristine (pyraclostrobin + boscalid, 11 + 7) at 12.5 to 18.5 oz 38WG/A

or

Quintec (quinoxifen, 13) at 6.0 oz 2.08F/A *plus*

chlorothalonil at 2.0 to 3.0 pt 6F/A

When Powdery mildew has become well established in the mid- to late part of the season, only apply protectant fungicides such as chlorothalonil or sulfur.

Summer Squash and Cucumber:

Alternate:

Rally (myclobutanil, 3) at 5.0 oz 40WSP/A *plus*

chlorothalonil at 2.0 to 3.0 pt 6F/A

or

Procure (triflumizole, 3) at 4.0 to 8.0 oz 50WS/A *plus*

chlorothalonil at 2.0 to 3.0 pt 6F/A

or

Folicur (tebuconazole, 3) at 4.0 to 6.0 fl. oz 3.6F/A

plus chlorothalonil at 2.0 to 3.0 pt 6F/A

With a tank mix containing:

chlorothalonil *plus* Pristine (pyraclostrobin + boscalid, 11 + 7) at 12.5 to 18.5 oz 38WG/A

Muskmelon and Watermelon:

Alternate:

Rally (myclobutanil, 3) at 5.0 oz 40WSP/A *plus* chlorothalonil at 2.0 to 3.0 pt 6F/A
or

Procure (triflumizole, 3) at 4.0 to 8.0 oz 50WS/A *plus* chlorothalonil at 2.0 to 3.0 pt 6F/A
or

Folicur (tebuconazole, 3) at 4.0 to 6.0 fl. oz 3.6F/A *plus* chlorothalonil at 2.0 to 3.0 pt 6F/A

With a tank mix containing:

Quintec (quinoxifen, 13) at 6.0 oz 2.08F/A *plus* chlorothalonil at 2.0 to 3.0 pt 6F/A
or

chlorothalonil *plus* Pristine (pyraclostrobin + boscalid, 11 + 7) at 12.5 to 18.5 oz 38WG/A

More information on TAA for Farmers: TAA for Farmers provides training to help any asparagus producer increase profitability, improve production efficiency, consider marketing opportunities, evaluate alternative enterprises, and in general become more competitive. TAA will also help participants develop a business plan, evaluate changes to their business, and provide cash payments up to \$12,000 to help implement changes. The training will be developed and provided by Extension Educators, Specialists, and industry experts. Training will be available on-line and in person-to-person workshop formats.

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U.S. Asparagus Producers Eligible for Assistance Under TAA for Farmers Program

Applications must be submitted to USDA FSA by September 23, 2010

A grower, of any size, who produces asparagus and can meet the USDA TAA for Farmers eligibility requirements (see below), is eligible for an intensive technical assistance training program, professional consultation in the development of a business plan, and a cash payment of up to \$12,000 to help implement the plan. It is important for asparagus producers to get word of this program in time for them to apply with the USDA Farm Service Agency by the September 23, 2010 application deadline.

Information on the Asparagus TAA for Farmers program is available at:

1. any local USDA Farm Service Agency office
2. on the web at: <http://taaforfarmers.org> or <http://www.fas.usda.gov/itp/taa/taa.asp> or
3. by emailing or calling John Nelson at the WSU Western Center for Risk Management Education, ignelson@wsu.edu, 509-477-2176.

Eligibility Requirements: Asparagus producers must provide documentation that they produced asparagus in the 2009 marketing year and during at least one of the three previous marketing years (2006, 2007, or 2008). Producers may also need to certify that their production or price declined from previous years. Interested family members or business partners may be listed as an alternate on the application form if producers are unable to attend training.

Sunn Hemp: A Super Hero Cover Crop!

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Background Information

Sunn hemp (*Crotalaria juncea*) is a warm-season crop and a member of the *Fabaceae* or legume family. It is a rapidly growing plant often used for cover cropping and green manure purposes in tropical climates. Sunn hemp has many traits that make it a desirable cover crop.

Description

Sunn hemp seeds are small and rounded ranging from black tan. Seeds are usually planted at a rate of 40lbs/acre. In favorable conditions, tender seedlings will emerge as soon as three days after planting. Plants grow rapidly and can reach 4-6 feet in height in about 60 days. Mature sunn hemp plants stand well over 9 feet tall and produce bright yellow showy flowers.



Rapid Growth/Nitrogen Fixer

Sunn hemp is a drought tolerant leguminous plant that can grow well in sandy soils common in Maryland. Sunn hemp is known for its rapid growth and ability to produce huge amounts of biomass and out-compete weeds. When tilled into the soil, sunn hemp has the potential to increase soil organic matter content. Alternatively, sunn hemp can be trimmed and its clipped foliage can act as a slow release fertilizer for the cash crop. As a part of the legume family, Sunn hemp is a nitrogen fixer. This means it can convert inorganic nitrogen into nitrogen useable by other plants. When incorporated into the soil, the nutrients become available for other plants.

Nematode Management

Plant-parasitic nematodes are important crop pests. These tiny round worms have the potential to cause 1-15% yield loss in vegetable crops and can become progressively worse with successive rotations of host plants. In previous experiments, Sunn hemp has been shown to suppress plant-parasitic nematodes efficiently in different crops. The nematicidal or nematode-killing compounds in sunn hemp are suppressive to a wide range of important plant-parasitic nematodes. Sunn hemp has also been shown to enhance nematode-antagonistic fungi (fungi that feed on nematodes), and beneficial free-living nematodes that are involved in soil nutrient cycling

Insect Pest Management

When interplanted with cash crops, sunn hemp has the potential to reduce the colonization of insect pests. Since many insect pests locate their host plants visually, sunn hemp barriers can interrupt this process and reduce colonization. Sunn hemp stands can also serve as a sink for insect transmitted plant viruses. Sunn hemp plantings can serve also as a habitat for beneficial insects such as ladybugs or praying mantises that feed on insect pests.



CMREC, Upper Marlboro 2009 Sunn Hemp Research Plot

Experimental Objectives

The primary objective of this experiment is to evaluate the use of sunn hemp as a cover crop in a sunn hemp-squash intercropped system to suppress insect pests, enhance soil quality and health and improve crop growth and marketable yields. A secondary objective is to determine sunn hemp biomass and nitrogen accumulation prior to its use as a green manure and determine how this relates to changes in soil nutrient status and crop growth after incorporation. The overall goal is to introduce a production strategy that results in greater ecological and economical sustainability. Our specific research objectives are to:

- a. **evaluate the effects of sunn hemp intercropping on insect pests**
- b. **evaluate the effects of sunn hemp on beneficial insect population;**
- c. **determine the impact of sunn hemp cover cropping on vegetable crop growth and marketable yields;**
- d. **document sunn hemp biomass and N accumulation and determine its impact on soil quality and health.**
- e. **evaluate the effects of sunn hemp intercropping on nematode communities.**

Note: Similar objectives are being carried out by our collaborators at the University of Hawaii at Manoa in Honolulu, Hawaii.

UME Environmental Horticulture *New Website Links*

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Environmental Horticulture Web Site:

<http://environmentalhorticulture.umd.edu/>

[Research Data](#)

[General Information](#)

[Selected Plant Species](#)

Environmental Horticulture refers to the use of greenhouse and nursery plants to improve aesthetics in the human environment.

Over the past several years, we have performed a series of research trials studying fertilizer requirements for a wide variety of herbs and ornamental plants. In addition, we provide a large amount of information in the form of fact sheets designed to be useful for both industry professionals and the general public. Included below is a summary of our research results as well as an index of the fact sheets we have available, including a series covering general production information and a series highlighting production and consumer care factors for a variety of selected plant species:

Research Data

[Summary of Previous Results](#)

[Current Results](#)

General Information Fact Sheets

[Greenhouse Management and Operations](#)

[General Production Information](#)

Selected Plant Species - Production and Consumer Care Fact Sheets

[Herbs](#)

[Perennials \(A-G\)](#)

[Perennials \(H-Z\)](#)

[Ferns](#)

[Ornamental Grasses](#)

For more information, contact [Tom Blessington](#)

Vegetable & Fruit Headline News

A bi-weekly publication for the commercial vegetable and fruit industry available electronically in 2010 from March through September on the following dates: March 18; April 1 & 15; May 6 & 20; June 3 & 17; July 8 & 22; August 5 & 19; September 2 & 16.

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Article submission deadlines for 2010: March 17 & 31; April 14; May 5 & 19; June 2 & 16; July 7 & 21; August 4 & 18; September 1 & 15.