

Cornell University
 Cornell Cooperative Extension
 Eastern New York Commercial Horticulture

Vegetable News

VOLUME 5, ISSUE 12
 JULY 14, 2017

Common Bacterial Diseases of Tomatoes in Eastern NY

Teresa Rusinek—ENYCHP

Bacterial speck, spot and canker have been increasing in occurrence and severity in the northeastern United States. Bacterial canker is presently the most serious disease in production systems. Those who had these diseases in their fields last year are at greater risk this year as the bacteria persist in soils for several years as well as on stakes and in transplant production areas. Below are some tips on identification and management of these bacterial diseases.

Bacterial Speck (*Pseudomonas*)

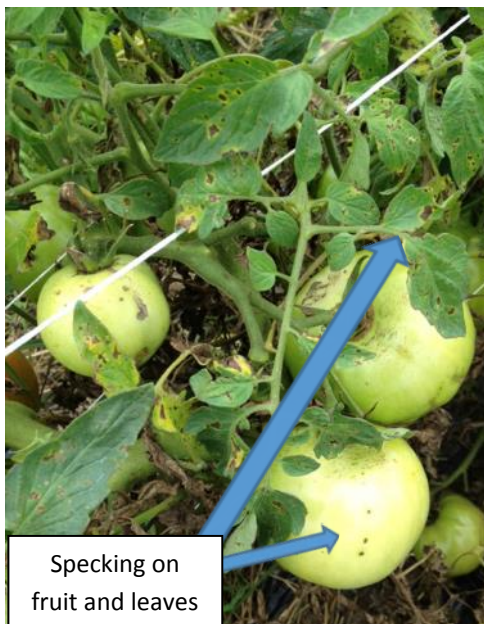
- dark blisters on fruit
- development favored by cool moist conditions
- dark lesions on leaves with discrete yellow halo

Bacterial Spot (*Xanthomonas*)

- dark, scabby lesions on fruit
- can start on or spread to peppers
- favored by warm weather
- often misdiagnosed as speck

Bacterial Canker (*Clavibacter*)

- dark lesions on leaves starting at the edge
- light blisters on fruit (bird's eye blister)
- cankering of branches.
- systemic infections can kill plants



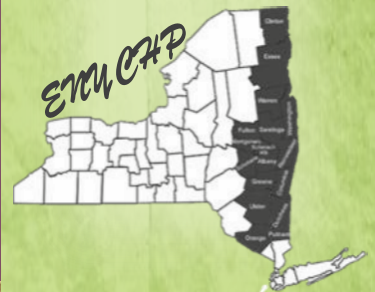
Bacterial Speck on tomato fruit and leaves (photo by Teresa Rusinek)

Controlling Bacterial, Speck, Spot and Canker:

Tanos, when tank-mixed with full rate of copper fungicide, has some suppressive activity on Speck, Spot and Canker, but I think using copper plus mancozeb or

Table of Contents

Tomato Diseases.....	1-2
Nutrient Deficiency of Tomatoes.....	3
Scout for Squash Bugs.....	3
Septoria/ Leafmold.....	4-5
Cucurbit Downey Mildew Control.....	5-8
Garlic Research.....	9
Sweet Corn Update.....	9-10





Pith hollowing step ladder look



The entire high tunnel planting was lost to pith necrosis, tomatoes developed water-soaked lesions on blossom end.



Marginal necrosis on leaves and bird's eye spots on fruit

ManKocide, which is premix of mancozeb + copper hydroxide, is just as effective. The reason for mixing the two together is the addition of the mancozeb increases the effectiveness of the copper by releasing more of the copper ions. Gavel is also labeled due to the mancozeb component of the material but must also be mixed with high rate of fixed copper. In an organic system the grower is limited to OMRI approved copper compounds such as Champ or Cueva.

Trials conducted by Cornell plant pathologists Christine Smart and Margaret McGrath found Actigard (acibenzolar-S-methyl, FRAC group P1) to provide excellent control of bacterial speck without a reduction in yield. They used 0.75 oz. /A applied at 100 gpa on a 7-day schedule. It takes at least three days for Actigard to induce plant defenses, so it is necessary to begin applications before symptoms appear on the plant.

Pith Necrosis:

Pith Necrosis is another bacterial disease of tomatoes that we have been seeing more of. It is caused by any of several soil borne species of *Pseudomonas* or *Pectobacterium carotovorum* that enter the plant through a wound or natural opening. Often, just a few plants are affected in a field or high tunnel, but I have also seen an entire high tunnel planting wiped out from pith necrosis in a matter of 2-3 weeks. Symptoms include: wilting at the top of the plant, yellowing leaves, stem splitting, stem rooting, dry brown stem canker, a hollowing or stepladder look of the pith, and watery decay of tissue especially when *Pectobacteria* are involved. Fruits may

develop water soaked-greasy lesions on the blossom end. Some of these symptoms may be confused with that of bacterial canker, samples can be sent to the Cornell diagnostic lab for confirmation.

Conditions that favor the development of this disease are cool night temperatures, cloudy days, high humidity (often an issue in high tunnels), excessive fertility and irrigation, and rapid growth. Pith necrosis disease progression is slowed during warm and sunny periods and plants may recover from the disease once fertility conditions are corrected.

Bacteria survive in infected plant debris and soil, seed and transplants. The pathogens spread on workers' hands, pruning tools, and by splashing rain or irrigation. Copper sprays are not effective in controlling pith necrosis and there are no resistant varieties available. Avoid planting in fields where there were cull piles and use properly managed compost free of plant pathogens. Delaying planting in springs that are cool and wet may help avoid the disease from developing. Avoid excessive nitrogen rates, especially in the spring when vegetative growth is rapid (don't front-load all your N at planting!). Ventilation in high tunnels and greenhouses, even when it's cold outside, is so important in disease management as well as good sanitation practices.

More resources on Pith Necrosis:

- <http://u.osu.edu/vegetablediseasefacts/files/2014/05/pithNecrosisFactSheet02-1wygptg.pdf>
- <https://www.extension.umn.edu/garden/fruit-vegetable/plant-diseases/pith-necrosis-tomato/index.html>

Symptoms of Nutrient Deficiency on Tomatoes

Amy Ivy, ENYCHP

Some nutrient deficiencies are relatively easy to identify by looking at your plants, see the photos below for some examples. But to get the best yield you can, **don't wait**



1.

until you see symptoms before you adjust your fertility! Regular foliar testing every couple of weeks during the peak season can help you catch and correct small problems before they can impact yield or fruit quality. Contact any of us on the team for help getting started with foliar sampling and interpreting the results.

1. Classic magnesium (Mg)



2.

deficiency symptoms, very common on lower leaves of high tunnel tomatoes. Not a concern unless young leaves show these symptoms.

2. Manganese (Mn) deficiency causes marginal burning like this usually in the leaves about four feet high on the plants. If your irrigation water has a pH over 7.0 acidifying it can help (sulfuric acid for conventional growers, citric acid for organic growers). But excessively high soil levels of P, Ca, and/or Mg can inhibit Mn uptake as well. Mn deficiency can result in blossom drop at this four foot level.



3.

3. Yellow shoulders and uneven ripening are often caused or enhanced with low K levels. Growers need to keep providing K as the crop load increases in mid-summer. High soil levels of Ca and Mg can impede this uptake.

Squash Bug Adults Laying Eggs Now: Go Scout!

Ethan Grundberg, ENYCHP

As if cucumber beetle pressure hasn't been bad enough this season, squash bugs (*Anasa tristis*) are now actively laying eggs on winter squash, pumpkins, summer squash, and zucchini. The adults (pictured in image 1) can be easily mistaken for a stink bug both because of their similar appearance and the distinctive odor they emit when crushed. However, squash bug adults have a narrower body than stink bugs and have a noticeable flare on their rear legs like other species in the "leaf-footed bug" family. Adults overwinter in debris around field edges and being to mate in the spring. Eggs (image 2) are copper colored and laid in clusters both on the top and bottom of leaves between veins. The eggs being laid



now will hatch in 7-10 days and produce small grayish-blue nymphs. While squash bugs do most of their damage on the foliage, adults will also feed directly on fruit later in the season causing extensive pock-marking and creating entry points for other pathogens like black rot.

Squash bugs can be challenging to manage with chemical controls, so eliminating overwintering habitat on field edges by thoroughly incorporating cucurbit crop residues and picking up leftover bulk bins and pallets is a crucial management tactic. Now is the time to scout fields, especially of

continued on next page

pumpkins, to look for egg masses. If more than 1 egg mass per plant is found on average, an insecticide should be applied once the small nymphs have just hatched. Many pyrethroids, neonicotinoids, and carbamates are labeled for squash bug, but care must be taken to not kill off pollinators if plants are flowering. Several studies have found Warrior II w/Zeon Technology (lambda-cyhalothrin, IRAC Group 3A) at 1.5 oz/ac to be among the most effective options. For organic growers, labeled azadirachtin formulations are effective, though some studies are also showing even more promising results from Azera (azadirachtin + pyrethrins) at 2-3 pints/acre. Since nymphs





are often clustered around the base of the plant or on the undersides of leaves, getting good spray coverage and penetration through the leaf canopy is essential for effective insecticide applications, so consider spraying at a slightly higher PSI and/or using a spreader in the mix.



Septoria or Leaf Mold- Which is it?

Marie Ullrich, ENYCHP

Septoria Leaf Spot is a common disease in field and in the greenhouse while Leaf Mold is usually seen in greenhouses only, but is appearing in some fields this year (possibly by bringing transplants that were infected in the greenhouse into the fields). These two diseases can look similar on the leaf. Let's compare them:

	Septoria	Leaf Mold
Causal Organism	<i>Septoria lycopersici</i>	<i>Fulvia fulva</i>
Symptoms	Small, water-soaked circular spots 1/16 to 1/8 in. in diameter first appear on the undersides of older leaves. The centers of the spots are gray or tan and spots have a dark brown/black margin. As the spots mature, they enlarge to about 1/4 in. in diameter and may coalesce to create large areas of disease.	Initial symptoms are pale green to yellowish spots on the upper surface. The spots on the upper surface turn to a distinct yellow color and on the under surface, an olive green to gray mold can be seen. Lesions are larger at
Photo upper leaf surface <i>Photo Credits: Septoria: LI HREC, Cornell Leaf Mold: Purdue Plant & Pest Diagnostic Lab</i>		
Photo lower leaf surface <i>Photo Credits: Septoria: LI HREC, Cornell Leaf Mold: Purdue Plant & Pest Diagnostic Lab</i>		

Conditions that Favor	Moist conditions favor with a temperature range for sporulation from 59° to 80.5°F with 77°F being optimal.	Humid conditions and temperatures between 72°F and 75° F
Cultural Management	Because seed has been implicated as a source, make sure seed is acquired from disease-free seed-producing areas. Make sure greenhouse production areas are free of susceptible weeds and the previous season's tomato crop debris. Practice good sanitation. If infected plants are found, rogue the seedlings before transplanting them to the field. Resistance to Septoria leaf spot has been identified and is being included in breeding programs. Currently, "Iron Lady" and "Jasper" have resistance and more varieties are being developed. It is being paired in "triple-resistant" varieties for Late Blight and Early Blight.	Practice good sanitation and remove tomato debris between crops. Space plants appropriately and prune lower leaves to improve air circulation. Reduce humidity in greenhouses by venting before the humidity increase that comes with evening hours. Tomato plants with resistance to leaf mold are available. However, the fungus is variable and may overcome resistance.
Chemical Management	Be sure to read labels for greenhouse use but many conventional fungicides are available for control such as maneb, mancozeb, chlorothalonil, azoxystrobin, ziram etc. For organic production copper compounds are recommended.	Again, check labels for greenhouse use but several conventional chemicals control <i>Fulvia</i> . Organic producers can also use copper compounds for control.

Cucurbit Powdery Mildew Control

Charles Bornt, ENYCHP

Last week I gave you the options for controlling Cucurbit Downy Mildew (CDM) and this week it's time to start talking about Cucurbit Powdery Mildew (CPM). As we move into the full swing of summer squash harvest I use these as my "indicator" plants for CPM, as usually we will see the first signs of the disease in these early plantings of squash. Also, this is about the time when our other cucurbits are sizing up causing considerable stress on the plants. CPM takes advantage of this stress and allows

CPM to get started. CPM is not the only type of powdery mildew as many different vegetable and other crops are affected by a different species. For example, the pathogen that causes Cucurbit Powdery Mildew is *Erysiphe cichoracearum*, but the one that attacks cole crops is *Erysiphe cruciferarum*. Table 1 gives you an idea of the different types of powdery mildews that can occur and what crops are susceptible. It is important to know that not all powdery mildews are the same and the same fungicides that work on one species may not work on all

Hosts	Fungus species	Controls
cucumbers, endive, lettuce, melons, potato, pumpkin, squash	<i>Erysiphe cichoracearum</i>	resistant varieties of lettuce, cucumber; water sprays; fungicides if necessary on squash and pumpkin
broccoli, Brussels sprouts, cauliflower, and other cole crops; radicchio, radishes, turnips	<i>Erysiphe cruciferarum</i>	not usually required
tomatoes	<i>Erysiphe lycopersici</i>	fungicides if necessary
peas	<i>Erysiphe pisi</i>	resistant varieties; sprinkler irrigation
carrots, parsley, parsnips	<i>Erysiphe heraclei</i>	tolerant varieties
beets	<i>Erysiphe polygoni</i>	tolerant varieties
artichoke, eggplant, peppers, tomatillo, tomatoes	<i>Leveillula taurica</i>	rarely required; fungicides if necessary
beans, black-eyed peas, cucurbits, okra	<i>Sphaerotheca fuliginea</i>	resistant varieties for some; fungicides if necessary

¹ Source: Powdery Mildew on Vegetables, University of California Agriculture and Natural Resources: <http://ipm.ucanr.edu/PMG/PESTNOTES/pn7406.html>

of them.

Getting back to Cucurbit Powdery Mildew—The following excerpts comes from our Plant Pathologist Meg McGrath in the article, “Managing Cucurbit Powdery Mildew”: (The full article can be found at http://vegetablemdonline.ppath.cornell.edu/NewsArticles/Cuc_PM_2016.html)

“1. Begin applications before or at the start of powdery mildew development. The action threshold is one leaf with symptoms out of 50 older leaves examined. Protectant fungicides (chlorothalonil, sulfur, oil, copper, or biopesticides) can be applied before symptoms are found to slow initial development. Important to examine lower surfaces as symptoms may start there, especially when protectants are being used. Powdery mildew usually begins to develop around the start of fruit production. *Be sure to scout in the heart of the plant not just out on the vines—CPM will almost always start on the oldest leaves which tend to be the ones in the crown of the plant.*

2. Alternate among targeted fungicides with specific activity for powdery mildew based on their FRAC code. These do not have curative activity and thus will not affect spots already present, thus starting applications early is critical to successful management as well as minimizing selection pressure for resistance in the pathogen. Alternation programs have often been more effective than single products in efficacy trials, they are required to comply with label use restrictions, and they are important for managing resistance.

3. Apply targeted fungicides with protectant fungicide to manage resistance development and avoid control failure if resistance occurs, and also to comply with label use restrictions (most mobile fungicides are not permitted used exclusively).

4. Apply fungicides on a 7-day schedule.

Recommended targeted fungicides. Alternate among targeted, mobile fungicides in the following five chemical groups (principally the first two), and apply with protectant fungicide to manage resistance development and avoid control failure if resistance occurs, and also to comply with label use restrictions. The first two products are the newest and thus are the most important ones to have in a fungicide program. The pathogen population has been subjected to more pressure to develop resistance to the other three fungicide groups, which are listed in order based on product efficacy in recent fungicide evaluations. The first three fungicides are the only

ones in these chemical groups available in the USA.

Vivando (FRAC Code U8) is a new mode of action. Cucurbits are on a supplemental label. It has exhibited excellent control in fungicide evaluations conducted recently. Activity is limited to powdery mildew. Do not mix with horticultural oils. It can be applied three times per year with no more than two consecutive applications. REI is 12 hr. PHI is 0 days. 365 day plant back restriction for non-labeled crops.

Torino (FRAC Code U6) is a new mode of action. It has exhibited excellent control in fungicide evaluations conducted recently. Activity is limited to powdery mildew. It can only be applied twice to a field in a 12-month period. Consecutive applications are not recommended. REI is 4 hr. PHI is 0 days.

Quintec (FRAC Code 13) has been consistently effective in fungicide evaluations. Quintec is now recommended used less than the label permits, which is a crop maximum of four applications. Aerial applications are not permitted and no more than two consecutive applications. Activity is limited to powdery mildew. It is the only mobile fungicide that does not move into leaves: it redistributes to foliage where spray was not directly deposited, including the underside of leaves, through diffusion and a continual process of absorption and desorption. REI is 12 hr. PHI is 3 days.

DMI fungicides (FRAC Code 3) include Proline, Procure, Rally, and Inspire Super. Additional products are registered for use outside NY. Resistance is quantitative. Highest label rate is recommended because the pathogen has become less sensitive to this chemistry. Efficacy has varied in fungicide evaluations. Proline is thought to have the greatest inherent activity and Inspire Super the least. Procure applied at its highest label rate provides a higher dose of active ingredient than the other Code 3 fungicides. Five applications can be made at this rate. REI is 12 hr. PHI is 0 days, 7 days for Proline and Inspire Super. Powdery mildew is the only labeled cucurbit disease for Procure and Rally. Proline is also labeled for Fusarium blight and gummy stem blight. Inspire Super, which contains another active ingredient (Code 9), is also labeled for Alternaria blight, anthracnose, gummy stem blight, Plectosporium blight, and Septoria leaf spot.

Carboxamide fungicides (FRAC Code 7) registered in NY are Pristine and Merivon. Both also contain the same QoI fungicide (Code 11), which is no longer effective for

powdery mildew. Only Pristine is permitted used on Long Island. Strains of the powdery mildew pathogen resistant to Pristine have been detected and likely are the reason its efficacy has varied. REI for Pristine is 12 hr and PHI is 0 days. Cross resistance was documented between Pristine and Merivon, but not Luna. Therefore, Luna Experience will be the best choice within this group.

No longer recommended. Resistant pathogen strains are sufficiently common to render the following fungicides ineffective: Topsin M (FRAC Group 1; MBC fungicide) and QoI fungicides (Group 11), which include Quadris, Cabrio and Flint.

Recommended protectant fungicides. Many fungicides have contact activity for powdery mildew; mancozeb is an exception. They include chlorothalonil, sulfur, copper, oils (mineral and botanical), potassium bicarbonate, and biologicals. Many of these products are approved for organic production. Sulfur is one of the most effective and least expensive products. Its activity is limited to powdery mildew, thus it is especially useful early in disease development when other diseases are not a concern, including as a preventive application. Melons are sensitive to sulfur especially when hot; there are tolerant varieties. **The following is the spray schedule that I discussed with Dr. McGrath to try and make this all make sense! Table 2 below contains the FRAC Codes, rates REI, PHI etc. for quick reference.**

Week 1: Vivando at 15.4 fl oz/acre (0 days PHI, 12 hour REI) plus Bravo or other chlorothalonil product (0 days PHI, 12 hour REI) at 2.0 pints per acre or sulfur (rates vary according to product selected) or copper (rates also vary according to product selected) when bacterial diseases are a concern. Vivando has no curative action so best results will occur when used prior to disease development. It may be applied a maximum of 3 times, but do not apply more than 2 sequential applications before rotating to another FRAC group. Recommended spray interval is 7 days with a maximum usage rate is 46.2 fluid ounces per season. **DO NOT Mix Vivando with horticultural oils when making applications to crops in the cucurbit vegetables group.** The full label and Supplemental Label for Vivando must be in the users possession when applying. For an electronic version of the full label to print, click the following link: <http://132.236.168.99/ppds/540424.pdf> and for a copy of the supplemental label go to: <http://132.236.168.99/ppds/541253.pdf>

Week 2: Torino at 3.4 ounces per acre (PHI = 0 days with a 4 hour re-entry interval for cucurbits) plus a

protectant. Notes about Torino: Maximum of 2 applications per acre per year and they should NOT be back-to-back for best resistance management. Minimum finished spray volume should be 20 gallons per acre. Plantback Restrictions: 0 days for all crops listed on label, 30 days for all crops NOT listed on label. There are also specific mixing and application Instructions for Torino Fungicide—see label for those details. Torino Fungicide may be unstable in water pH below 4 and above 9. If necessary, buffer water to obtain optimum pH range. Special Instructions for Tank Mixing Torino Fungicide: When tank mixing Torino Fungicide with other products, introduce the products into the tank in the following order: (1) water soluble packets (2) wettable powders (3) water dispersible granules (4) flowable liquids (such as Torino Fungicide) (5) emulsifiable concentrates (6) adjuvants and/or oils. Always allow each product to fully disperse before adding the next product.

Week 3: Quintec at 6 ounces per acre (3 day PHI, 12 hour REI) plus a protectant. **DO NOT USE** on edible peel cucurbits such as cucumbers and summer squash.

Week 4: Proline at 5.7 fluid ounces (PHI 7 days, 12 hour REI) or Procure 480 SC at 8 fluid ounces per acre (PHI = Up to day of harvest, 12 hour REI) plus protectant. You could also use Rhyme at 5.0 – 7.0 fl ounces per acre (0 days PHI, 12 hour REI) in place of Procure. They are in the same FRAC Group so should not be used back to back with each other.

Week 5: Repeat above schedule.

The above program is just a guideline for you to use and to help you organize your fungicide resistance program on your farm. Each week above represents a different FRAC group or different mode of action to help slow down disease resistance. If you've already started your fungicide program, feel free to change the order around to include what you've already used. And remember that the above program is only for Powdery Mildew! When Downy Mildew is found on your farm or near you, fungicides specific for DM will need to be added to the tank.

Cucurbit Downy Mildew Forecast for this week: HIGH Risk for cucurbits in eastern OH, the southern 1/2 of NY, PA except the southeast, northern NJ, western CT, western MA, southern VT, FL, southern AL, southern GA, eastern SC, and far southeast NC. Moderate Risk in southern NH, central and eastern MA, RI, eastern CT, Long Island, central and southern NJ, southeast PA, eastern NC, central SC, central GA, central AL, western MS, far northeast LA, and southeast AR.

(Source: North Carolina State University Cucurbit Downy Mildew Forecasting, <http://cdm.ipmpipe.org/>)

With this weeks weather patterns and the disease found all around us, this means there is a very, very high chance that we will see spores of this disease moving into our region. Please make sure that you review last weeks Cucurbit Downy Mildew information and apply the appropriate protection!

Risk prediction map for Day 2: Tuesday, July 11

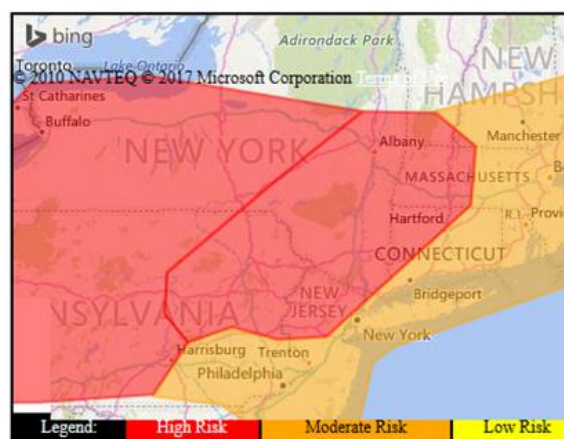


Table 2: Partial list of conventional and organic fungicides labeled for Powdery Mildew Control in Pumpkins, Winter Squash and Gourds.

Fungicide	FRA C Code	Recom-mended Rate/Acre	REI	PHI	Seasonal Limits	Comments
Vivando	U6	15 fluid oz	12 hrs	0 days	3 applications	Do not mix with horticultural oils.
Torino	U8	3.4 oz	4 hrs	0 days	2 applications	Organosilicone or non-ionic surfactant. See specific mixing and handling instructions on label!
Procure 480 SC	3	8 fluid oz	12 hrs	0 days	40 fluid ounces total	
Proline	3	5.5 fluid oz	12 hrs	0 days	2 sprays	
Rhyme	3	5.0-7.0 fluid oz	12 hrs	0 days	4 applications or 28 fluid ounces	
Quintec ¹	13	6 oz	12 hrs	3 days	4 applications or 32 fluid ounces	Do not use on edible peel cucurbits (ie: cucumbers, green and yellow summer squash)
Luna Experience ³	7 & 3	6.0—17.0 fluid ounces	12 hrs	7 days	Do not apply more than 34.0 fluid ounces per acre per year	Do not make more than 2 sequential applications before switching to another fungicide not in Group 7 or 3. Also has Gummy stem blight on the label at 10.0—17 fl ozs/acre
Chlorothalonil (Bravo or other labeled formulation)	M5	See specific label	12 hrs	0 days		
Regalia ²	P5	1—4 quarts	4 hrs	0 days		
Trilogy ²	NC	0.5—1%	4 hrs	0 days		
JMS Stylet Oil ²	NC	3—6 quarts per 100 gallons water	4 hrs	0 days		
Potassium Bicarbonate (MilStop, Armicarb etc.) ²	NC	2.5—5.0 lbs	Varies by product			
Actinovate AG ²	NC	3—12 ozs	1 hr	0		

¹ Do not use on edible peel cucurbits (summer squash, cucumbers).

² Approved for organic use, but be sure to double check with your certifying organization.

³ There are multiple versions of Luna products labeled in NYS but only Luna Experience has the widest label for cucurbits.

Garlic Research Update

Crystal Stewart, ENYCHP

This morning when I pulled my laundry out of the washing machine it still smelled like garlic, so perhaps everyone who has seen (smelled) me over the last few weeks already knows what I've been up to. For those of you who have been fortunate enough to miss this experience, I've spent most of the last few weeks in garlic fields, checking out maturity and disease pressure but also harvesting some pretty exciting research trials. I have two trials examining cultural controls of *fusarium* including the use of raised beds, a variety of mulches, and planting timing; and two trials looking at organic controls including

Oxidate as a seed dip and TerraClean as a bi-weekly soil drench followed by a package of biologicals. We are also examining the role that nitrogen levels and the disease level of seed garlic have on *fusarium* levels.

So far some anecdotal observations are that garlic seems to perform



extremely well on white plastic, yielding very even, large bulbs; garlic is a heck of a lot easier to dig from mulched ground than bare ground (and so far the yields look better from all mulch types compared to bare ground); and that clean seed yields bigger bulbs than infested seed, even when the next generation doesn't grow up to be *fusarium* infested.

All of this work will need to be looked at carefully over the next few months, and will include progressive disease ratings and a statistical analysis of yield differences

between treatments.

Stay tuned for more information! And remember to dry your garlic as quickly as possible and get it into a nice cool, dry storage area as soon as it's done drying.

Images: Garlic harvest at the Long Island Horticulture Research and Education Center (left), and at the Hudson Valley Farm Hub (right).



Sweet Corn Update

Charles Bornt- ENYCHP

On Friday of last week we caught some significant numbers of Corn Earworms in several traps around the Capital District. I suspect they traveled up on some of those storm fronts that have been occurring the last couple weeks. However, trap catches this week were low with only a couple found at the same locations where they were found last week and fields have been treated with Coragen. Western Bean Cutworm has also appeared this week so be on the lookout for continued damage to whorls and tassels that resembles European Corn Borer—there is a good chance you might be finding both of them in some tassels.

I also received word that sap beetles, or picnic beetles as they are sometimes called, were being found in the tips of sweet corn that exhibited no other injury such as worm

or bird feeding damage which is very unusual. Upon further discussion, it was determined that the sap beetles were not the ordinary picnic beetles (*Glischrochilus quadrisignatus*) which have the 4 yellow spots on their back, but rather were Dusty sap beetles (*Carpophilus lugubris*), which are slightly smaller, gray in color and lack the spots on their backs. Most of the time these beetles are attracted to corn that has been damaged by some other insect like Corn Earworm or birds. However, this corn had no evidence of any of this damage yet the beetles were being found in the tips of the ears. Upon doing some research on this pest, I found out that the Dusty sap beetle prefers to lay its eggs just under the husk or between developing kernels of corn. According

to a factsheet I found from the High Plains IPM Guide, a cooperative effort of the University of Wyoming, University of Nebraska, Colorado State University and Montana State University (<http://wiki.bugwood.org/uploads/DuskySapBeetle-SweetCorn.pdf>), "Although dusky sap beetles can be found in sweet corn shortly after silking begins, fields are not highly attractive to beetles until about 15 days later. Sap beetles enter the ears when sugar production begins within the kernels and kernels begin increasing in size. The great majority of eggs are laid in the ears after this point. Sap beetle adults are very mobile in the field and they often move from the ears after picking. When mature corn is picked and placed in a box, most sap beetles will leave the ears and move around within the box."

Sap beetles overwinter as adults and emerge in early spring where they lay their eggs in and near decaying plant material. Once the eggs hatch, the larvae feed, pupate and emerge as adults 3 to 7 weeks later (late June early July) depending on the temperature. If there is any good news, I guess that it would be there is only one generation per year. (Source: University of Minnesota: <https://www.extension.umn.edu/garden/insects/find/sap-beetles-in-home-gardens/>)

It was also pointed out to me that the variety that appeared to be the most susceptible was one with poor tip cover, which allowed the adults to easily lay eggs in the tips of the ears. The grower was not aware of any problems until several of his customers alerted him to the issue. It also appeared that the beetles themselves were not causing a lot of damage, but more of a surprise when the customers opened up the ear. Usually sap beetles are controlled with our worm sprays but it could be in this case they moved in between applications and became protected within the ear. Warrior, Baythroid, Lannate and other materials are all labeled for sap beetle control.

Corn Trap Counts 7/5- 7/11

County	Corn Ear-worm	European Corn Borer-Z (Iowa)	European Corn Borer-E (New York)	Fall Armyworm	Western Bean Cut-worm
Orange	0	0	0	3	4
S. Ulster	1	0	1	0	1
N. Ulster	3	0	0	0	0
N. Dutchess	1	0	1	0	0
Columbia	0	0	0	0	1
Greene	2	0	0	0	0
Albany	0	0	0	0	0
Schoharie	0	0	0	0	0
Fulton	0	0	0	0	0
Saratoga	0	0	0	0	0
S. Washington	0	0	0	0	1
N. Rensselaer	0	0	1	0	0
S. Clinton	0	0	0	0	0
C. Clinton	0	0	0	0	0

Vegetable Specialists

Chuck Bornt
 Cell: 518-859-6213
 Email: cdb13@cornell.edu

Amy Ivy
 Phone: 518-570-5991
 Email: adi2@cornell.edu

Teresa Rusinek
 Phone: 845-340-3990
 x315
 Email: tr28@cornell.edu

Crystal Stewart
 Cell: 518-775-0018
 Email: cls263@cornell.edu

Maire Ullrich
 Phone: 845-344-1234
 Email: mru2@cornell.edu

Ethan Grundberg
 Phone: 617-455-1893
 Email: eg572@cornell.edu

Business Specialist

Liz Higgins
 Cell: 518-949-3722
 Email: emh56@cornell.edu

Food Safety Specialist

Erik Schellenberg
 Phone: 845-344-1234
 Email: jk2642@cornell.edu

