Cornell University Cooperative Extension

Eastern NY Commercial Horticulture Program

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Weekly Vegetable Update

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Regional Updates

North Country – Clinton, Essex, northern Warren and Washington Counties:

What a difference a few days of warm, sunny weather has made! Crops seem to have doubled in size this week, especially tomatoes. Overall, things are looking very good. Not too much pest pressure, lots of new vigorous growth and plenty of sunshine have crops and growers feeling strong and healthy.

Don't let your crops get too dry now. Ideally, apply water before the plants experience or show drought stress. Their roots are more shallow than normal in the formerly saturated soil so they will be more prone to drought stress now. And the enormous growth spurt many are putting on will increase their water demand as well. They don't need any more stress this season, and irrigation is something you CAN control!

Late blight was found on potatoes in western Vermont last week, raising concern especially for growers in the Champlain Valley. Early blight and septoria are much lighter than usual so far this year and tomatoes are putting on a surge of growth. Be sure to protect all that new growth, and reapply as new leaves form, according to the label directions of course.

Capital District – Albany, Fulton, Montgomery, Rensselaer, Saratoga, Schenectady, Schoharie, southern Warren and Washington Counties:

Growers are on high alert for new diseases such as downy mildew and late blight while dealing with the usuals such as early blight and septoria, powdery mildew, and an assortment of leaf spots. Cucumber beetles seem to be reducing in number, while leaf hopper populations in potatoes and beans have exploded coinciding with second cut haying. SURPRISE! Garlic is coming on FAST!! Check your garlic to see if it is ready now. Look for a gap to start forming around the scape if you cut the garlic in half parallel to the root plate. When that happens it is reaching the maximum size the wrapper leaves can contain. Generally there are plenty of healthy leaves keeping the garlic contained, so it's a question of reaching ideal size.

Mid-Hudson Valley- Columbia, Dutchess, Greene, Orange, Putnam, and Ulster Counties:

Elevated temperatures and a reprieve from consistent precipitation have come as a welcomed change. Temperatures are forecasted to remain high for the next several days. This comes as good news as many crops have received an overabundance of moisture which has led to the development of some disease issues; just be sure that irrigated crops are receiving adequate moisture. On the flip side, the hot and dry weather has driven up thrips populations in onion plantings; keep an eye on thresholds and apply pesticides accordingly. Aster yellows has shown up in multiple celery plantings. This disease is caused by a bacterium and vectored by leafhoppers. Infected celery plants are often stunted and yellow, with inner petioles becoming twisted and deformed. Management of this bacterial pathogen is accomplished through control of the leafhopper vector.

Spotting Problems Early

In order to catch problems early, when they are easiest to control, growers need to be constantly on the lookout for any unusual changes in growth and leaf color. How many of these symptoms do you recognize? Some are caused by new pests to our region, so please let us know about what you're finding and we'll be glad to help you diagnose what's going on. – ADI

Swede midge damage to kale – this tiny fly feeds on the growing points of brassicas – broccoli, cauliflower, Brussels sprouts and kale. Look for distorted growth and scarred tissue. Noticing the damage is the easiest way to find this pest. There are several generations/year. Found in northern and western NY & Vermont

White mold on tomato – this fungus also affects beans and basil, sometimes called timber rot in tomatoes. Split open the dry, brown stem and find large black sclerotia (the resting structure for this disease) to confirm. Carefully remove the entire plant without letting the sclerotia fall to the soil where they can persist for many years. Becoming more common in high tunnels.

All Photos by ADI

Leek moth damage to onions – look for this 'windowpane' damage to onion leaves. Split leaf open and look for small yellowish caterpillars or their frass. Please notify Amy if you find leek moth!

Brown leaf mold on high tunnel tomatoes – yellow spots on the leaf surface, brown fuzzy growth on the undersides of the leaves. Sprays are ineffective, plan to use resistant varieties next year.

Sclerotinia White Mold Found on Beans

Scerlotinia white mold, caused by the fungal pathogen *Sclerotinia* spp., was found infecting beans in the Mid-Hudson Valley. This pathogen, which has the ability to devastate plantings, can be identified by a white mold that is fluffy in appearance and grows on the surfaces of infected above-ground plant tissues. Initial symptoms of this disease include soft spots or water-soaked lesions on leaves, stems, blossoms, and pods. These lesions will subsequently enlarge and become covered in white mold. As the disease progresses, leaves will turn yellow-brown and plants will begin to wilt and collapse. The fungus will produce irregularly shaped, hard, black structures termed sclerotia which can survive in the soil for at least three years. Sclerotia will produce spore forming structures called apothecia which will then release spores to initiate a new infection. Disease development is favored by high humidity, wet soil, and temperatures ranging from 68 to 76 °F.

A white, fluffy mold is often seen on above-ground infected plant parts. Photo: KB

Bean plants turning brown and collapsing due to infection by *Sclerotinia* white mold. Photo: KB

Several strategies must be utilized to effectively control white mold. The use of crop rotations to manage this disease can be tricky because of the wide host range of the pathogen. Corn is recognized as a non-host and can be used in rotation with beans. Avoid following or preceding beans with tomatoes, potatoes, lettuce, crucifers, or soybeans in fields with a history of white mold. There are no resistant varieties available, although selecting varieties with open canopies that hold pods higher off the ground can decrease disease severity. Avoid over fertilization, which can cause the production of highly susceptible tissue. Incorporate crop debris immediately following harvest to degrade pathogen survival structures.

Several fungicides can be used to control white mold and should be applied in a manner consistent with their respective product labels. Topsin M has been shown to be one of the most effective fungicides for white mold control. Blossoms are the most susceptible plant parts so applications should begin at early bloom for optimum control. - *KB*

Eastern NY Commercial Horticulture Website

For event announcements and registrations, previous issues of our newsletters and more, please visit the Eastern NY Commercial Horticulture Team's website at http://enych.cce.cornell.edu/. We hope you bookmark it on your computer and begin using it as your 'go to' website for production and marketing information.
Email or call any of the educators with questions or comments on the website – we want to make it work for YOU!

Management of Summer Leaf Diseases in Onion: Target Spot Diseases

Christy Hoepting, Cornell Vegetable Program

As onions begin to bulb they pull resources from the foliage into the bulbs, which naturally causes tip burn and leaf die-back. It appears to be during this stage of growth when we first start to see Purple Blotch (PB) and Stemphylium leaf blight (SLB), as these two leaf diseases prefer older plants and can easily become established on necrotic leaf tissue. Development of SLB and PB are also favored by warm (optimum 77°F) humid conditions and long periods of leaf wetness (16 hours or more). Unlike downy mildew and Botrytis leaf blight, SLB will even continue to develop in hot temperatures up to 93°F, while these other diseases shut down. Thus, PB and SLB are the diseases of summer in onions.

Target spot diseases.

In the past, SLB has typically stayed in the necrotic tissue that is dying anyway, such as in necrotic leaf tissue that has been burned by herbicide or caused by downy mildew, and it tended to act as a secondary pathogen which would not exist if these situations had not occurred. In 2013, SLB moved from its usual background position as a secondary disease into the forefront as an aggressive pathogen that caused excessive leaf dieback and onions to die standing up or prematurely (Fig. 1). Individual lesions quickly develop into elongate boat-shaped lesions very similar to purple blotch lesions (Fig. 2), except they are not purple, but tan or light brown and later black when spores develop (Fig. 3). The elongated spots coalesce into extended patches blighting the leaves and eventually, the onion plant dies standing up. Since PB and SLB are impossible to distinguish visually, I have now started calling them the "target spot diseases".

Although the weather could be partially to blame for the outbreak of SLB in 2013, SLB has been reported to have become a serious disease of onions in Ontario, Canada and in Michigan over the past 4-5 years. Last season, we saw one of the most optimum growing conditions for onions in decades; with moderate temperatures and adequate rainfall the crop never suffered from drought stress, as it typically does during July and August in New York, and perhaps this is why SLB was a non-issue in 2014. So, will SLB become an aggressive primary disease in 2015? Only time will tell, but it would be wise to assume that SLB will continue to be a major player in New York. Unfortunately when SLB is aggressive, it can be more difficult to control than other foliar diseases of onions. To be effective, fungicides for managing SLB need to be applied preventatively. Attempted rescue treatments fail. In Ontario, Canada, SLB appears for the first time in mid- to late-June. So, it makes sense to begin a preventative fungicide program for SLB now, at least for larger onions of 7-10 leaves that are starting to bulb.

Bravo is out, target spot fungicides are in!

In-field small-plot Cornell research trials have revealed some tremendous differences in efficacy among the available fungicides for their ability to control the target spot diseases. Most importantly, Bravo, mancozeb and Rovral all failed to control target spot diseases. At harvest, these treatments looked like the untreated check with the majority of the plants having died standing up/prematurely. The trials also revealed some fungicides with tremendous potential for controlling SLB, including Luna Tranquility, Fontelis and Merivon. Of these products, Merivon (see side-bar) is the only product that is labeled in New York. Of the other registered fungicides available in New York for use in onions, Inspire Super, Scala, Pristine and Quadris Top provided the best control of target spot diseases. Thus, one of these fungicides should be included in the tank mix every week. The disadvantage to using these fungicides is that with exception of Merivon, none of them performed nearly as good against Botrytis leaf blight (BLB) as Bravo does. Fortunately, in the typical hot weather of July and August, BLB tends to be minor, so managing target spot lesion diseases becomes the priority over BLB during the summer.

Rotation restrictions are a challenge!

For managing the development of resistance to the active ingredients, Merivon, Pristine, Inspire Super and Quadris Top all have rotation restrictions that require rotating to different chemical classes after 1-2 applications (see chart). Merivon and Pristine (group 7 & 11) cannot be rotated with each other or with Quadris Top/Quadris (11). Inspire Super (3 & 9) cannot be rotated with Quadris Top (3) or Scala (9), but could be rotated with Quadris (11). Basically, Inspire Super and/or Scala can be rotated with Merivon or Pristine all season for up to 4 and 3 or 6 total number of apps each, respectively (see chart). The only way to use Quadris Top would be to take a week off from Inspire Super, Pristine, Merivon and Scala. Inspire Super could also be rotated with plain Quadris (no Top).

Plus mancozeb for prevention of downy mildew

When I first started conducting fungicide trials in 2004, I quickly learned that mancozeb had minimal, if any activity against BLB and PB. Thus, its sole purpose was to protect against downy mildew (DM). Since DM generally did not occur until August, I pulled mancozeb from my weekly spray recommendations in June and July. In both 2013 and 2014, I had cases of DM occur in mid-July in transplanted onions. So, now, I'm switching back to becoming more judicious with recommending mancozeb for DM during the summer, especially when conditions are humid and night time temperatures dip into the 50s, because dew and cool temperatures favor this disease during the night; even if during the day time, it doesn't feel like DM weather! In 2014, I had a trial with severe DM and target spot disease, and the treatments with mancozeb combined with the good target spot disease fungicides (eg. Scala, Inspire Super) performed as well as the treatment that relied heavily on Ridomil Gold for DM control, demonstrating that managing SLB during a DM outbreak can go a long way. Since both DM and SLB are much better managed preventatively than reactively, it makes sense to include mancozeb in the tankmix for the summer, especially when it is humid.

Continued on next page

Merivon® Xemium® Brand Fungicide (BASF) for control of leaf diseases in onions

Available as a FIFRA Section 24 (c) Special Local Need Label

Merivon is a pre-mix of Xemium® brand fungicide with the new active ingredient, fluxapyroxad belonging to mode of action group 7, and pyraclostrobin belonging to mode of action group 11. Merivon is like a new and improved version of Prisitine, which contains the same amount of pyraclostrobin, but has fluxapyroxad instead of boscalid (also group 7). Of all of the fungicides labeled on onions in New York, Merivon and Prisitne are the only ones containing group 7 mode of action.

Merivon is labeled for Purple blotch, Stemphylium leaf blight (SLB), Botrytis leaf blight (BLB) and Botrytis neck rot, and suppression of downy mildew (DM). In recent Cornell trials, Merivon has been a top performer for control of SLB and BLB, and plant health, and demonstrated suppression of DM (Fig. 1). To limit the potential for development of resistance, no more than two sequential applications may be made before rotating to a different modes of action, and no more than a total of three applications may be made per season.

In New York, Merivon is only available on bulb vegetables (dry bulb onions) and pome and stone fruit via FIFRA Section 24 (c) Special Local Need Labels, which includes the restriction, "Not for sale, distribution, or use in Nassau and Suffolk counties in New York State". It is also classified as restricted use in New York State. **Both the SLN label and the NY-stamped label need to be in the possession of the applicator.**

SLN label (EPA SLN No. NY-150001): http://128.253.223.36/ppds/541184.pdf

NY-stamped label: http://128.253.223.36/ppds/541187.pdf

Merivon will not be legal to use in New York on cucurbit, leafy and root vegetables until new product labeled with the container label with the NY restrictive language is in the channels of trade, which is projected for Spring 2016.

Cornell Fungicide "Cheat-Sheet" for Leaf Diseases in Onions in New York

Compiled by Christy Hoepting, Cornell Cooperative Extension Program, July 2015.

Trade name	Active ingredient	FRAC[1] code	Relative Disease Control Rating[2]				Rotation restrictions	Maximum allowable per season	
			BLB[3]	PB	SLB	DM*		Total	No. of max rate apps
Bravo & generics	chlorothalonil	M5	Best	P-Fail	Fail	Fail	none	20 pts	6
Penncozeb & generics	mancozeb	M3	M-Fail	P-Fail	Fail	M-G	none	32 lbs	10
Rovral & generics	iprodione	E3	M	M-G	Fail	Fail	none	7.5 pts	5
Scala	pyrimethanil	9	M-P	Best	G-P	Fail	none	54 fl oz	3
Bravo 1.5 pt + Scala 9 fl oz	chlorothalonil pyrimethanil	M5 9	Best	Best	M	Fail	none		6
Pristine	boscolid + pyraclostrobin	7 11	VG-p**	M	G	P	No more than 2 sequential apps before rotating to non-7 or 11 group fungicides	111 oz	6
Quadris Top	azoxystrobin + difenoconazole	11 3	M	M-Fail**	M-P B***	M	No more than 1 application before rotating to non-11 or 3 group fungicides	46 fl oz	4
Inspire Super	difenoconazole + cyprodinil	3 9	P-Fail	Fail	G	Fail	No more than 2 sequential apps before rotating to non-3 or 9 group fungicides	80 fl oz	4
Merivon	Fluxapyroxad + pyraclostrobin	7 11	VG	VG	VG	M	No more than 2 sequential apps before rotating to non-7 or 11 group fungicides	33 fl oz	3

[1]**FRAC:** Fungicide Resistance Action Committee Chemical class code.
[2]**Relative disease control ratings** are based on fungicide trials, 2006-2013 (Hoepting *et. al*). SLB trialed in 2013 & 2014. **B:** best (or one of the best) of all fungicides tested; **VG:** very good; **G:** good; **M:** mediocre/middle of the pack; **P:** poor; **Fail:** failed to control disease, not different than untreated control.
[3]**BLB:** Botrytis Leaf Blight; **PB:** Purple Blotch; **SLB:** Stemphylium Leaf Blight; **DM:** Downy mildew.
*Several other fungicides labeled specifically for downy mildew, not listed here. **inconsistent results showing range of results across trials.
***Quadris Top has been a top performer in trials in Ontario, Canada.

Copper Fungicides for Organic Disease Management in Vegetables

Margaret Tuttle McGrath, Cornell University , Long Island Horticultural Research and Extension Center

There are several different copper fungicides approved for use in organically-produced crops. Copper fungicides are important tools for managing diseases that cannot be effectively managed with cultural practices alone. They have broad-spectrum activity, acting on bacteria as well as fungi. Following many years of use, there is a lot more information on efficacy of copper fungicides than the newer biological products. Manufacturers of some biologicals recommend that they be used in a management program with copper fungicides (often in alternation or at low label rate). Thus it appears copper fungicides will continue to be important for managing diseases. Copper fungicides differ in their active ingredient, use rate, re-entry interval, and the amount of copper. Copper is an inorganic compound thus it does not breakdown like organic compounds and consequently copper can accumulate in soil when used intensively. Plants take up some copper from soil because it is a micronutrient. Similarly, humans need a small amount of copper in their diets. Metallic copper equivalent (MCE) is a commonly used measure of the quantity of copper in fungicides.

The specific directions on fungicide labels must be adhered to. They supersede these recommendations (above), if there is a conflict. Check state registration and organic approval before using a product. Any reference to commercial products, trade or brand names is for information only; no endorsement is intended.

Highest label rate of organic copper fungicides for some vegetable crops.

Product	Active ingredient	Metallic copper equivalent	Maximum Labeled Rate (MCE in lbs)				REI	PHI
			Broccoli	Lettuce	Squash	Tomato		
Badge X2	24% copper oxychloride + 21% copper hydroxide	28%	0.75 lb/A (0.21)	1.75 lb/A (0.49)	1.25 lb/A (0.35)	1.75 lb/A (0.49)	48 hr	0 day
Basic Copper 53	98% basic copper sulfate	53%	3 lb/A (1.59)	3 lb/A (1.59)	2 lb/A (1.06)	4 lb/A (2.12)	24 hr	0 day
Camelot	58% copper salts of fatty and rosin acids	5.14%	0.75 pt/A (0.05)	3 pt/A (0.22)	3 pt/A (0.22)	3 pt/A (0.22)	12 hr	0 day
Champ WG	77% copper hydroxide	50%	2 lb/A (1.0)	Not labeled	3 lb/A (1.5)	4 lb/A (2.0)	24 hr	0 day
CS 2005	19.8% copper sulfate pentahydrate	5%	25.6 oz/A (0.8)	Not labeled	25.6 oz/A (0.8)	32 oz/A (1.0)	48 hr	0 day
Cueva	10% copper octanoate	1.8%	1 gal/A (0.15)	1 gal/A (0.15)	1 gal/A (0.15)	1 gal/A (0.15)	4 hr	0 day
Nordox 75	84% cuprous oxide	75%	2 lb/A (1.5)	1.25 lb/A (0.94)	1.25 lb/A (0.94)	2.5 lb/A (1.88)	24 hr	0 day
NuCop HB	77% copper hydroxide	50%	1 lb/A (0.5)	1 lb/A (0.5)	1.25 lb/A (0.63)	2 lb/A (1.0)	24 hr	1 day

* MCE = Metallic copper equivalent. REI = Re-entry interval. PHI = Pre-harvest interval. Most labels do not state minimum time after an application that harvest can be done; however, the REI for Worker Protection Standard affects harvest.

Potato Post-Harvest Tips

Just are reminder not to wash potatoes that still have field heat on them. The lenticels are like pores and when the tuber is hot, the pores are open. Putting that potato in cold water sucks the water in towards the center of the spud. This brings all of the bacteria that might be hanging out on the surface into the potato's starchy center. Within a day or so the potatoes will begin to develop soft rot.

The greater the difference between the water temperature (colder) and the potato core temperature (hotter) the more likely and severely this will happen. Save your harvest and wait until the potatoes are cool to wash them. Better yet, if possible refrigerate them before washing if using cold well water. If in question, you may have to forgo washing them. A middle-ground would be to allow them to cool in a barn, overnight, before washing. -MU

Calendar of Events

Tuesday, July 21st – Blueberry Variety Review Field Day, 3-**5pm at Winney's Farm, 113 Winney Road,** Schuyler-ville, NY 12871. Byron Winney has one of the largest plantings of blueberries in the state. Look at and taste more than a dozen different varieties and learn about winter hardiness, plant form, fruiting characteristics, plant longevity and pest tolerance first hand. There is no charge for this workshop, but please help us plan and register by calling Marcie at 518-272-4210. If you have questions, give Laura a call at 518-791-5038. The workshop is a rain or shine event.

July 20-21, Produce Safety Alliance Grower Training Course & Farm Food Safety Plan Writing Workshop, St. **Agustine's Parish 3035 Main St, Peru, NY 12972.** CANCELED

Saturday, July 25th, The First Annual Eastern NY Equipment Demonstration Day: This Year's Focus: New and Innovative Cultivation Tools, 1:00—5:00 pm (rain or shine) at the Hudson Valley Farm Hub, 1875 Hurley Mountain Road, Hurley, NY 12443. Come and see some of the most innovative cultivation tools being produced by the world's leading manufacturers in action on a variety of vegetables and field crops! Find out if these tools are right for your operation before you purchase them. Not only will we be looking at these units for vegetables, but also field corn and soybeans- so there is something for everyone. There is no fee or registration for this meeting. Click here for full program details.

Monday, July 27th, Wash Station and Food Safety Workshop, 10:00am -2:00pm at Free Bird Farm, 497 Mckinley Rd. Palatine Bridge, NY 13428. Join the Eastern New York Commercial Vegetable Program and Robert Hadad from the Cornell Vegetable Program on Monday, July 27th to learn about the process of designing, building, and operating a small-scale, post-harvest handling system. This workshop will focus on proper washing and handling practices, as well as food safety. The wash system we will ex-amine is designed to work best for new and small growers. Cost for this program (includes lunch) is $10.00 for ENYCHP enrolled members and $15.00 for non-enrolled. Click here for full program details

Wednesday, August 19th— Limiting Bird Damage in Fruit: State-of-the-Art Pest Management Tactics 4H Training Center, 556 Middleline Rd, Ballston Spa, NY 12020. This com-prehensive class will feature results and speakers from a multi-year, multi-state project that looked at several different fruit crops. Registration details to follow.

Thursday, August 20th– Save the date for the Tomato Variety and Disease Twilight Meeting at the Hudson Valley Farm Hub, 1875 Hurley Mountain Road, Hurley, NY 12443. More information to come.

Infiltration

This week's tip is about preventing infiltration of contaminated water into your crops. This only applies if you are washing vegetables that have a lot of internal volume in a dunk tank (think tomatoes, melons, peppers, summer squash). The issue is that when you have produce that has been heated by the sun all day and you're picking it and putting it in a bath of cold water, you can actually get water infiltrating into the produce as the pressure in the produce decreases upon cooling.

If any piece of produce was contaminated for any reason, whether it was touched by a worker who hadn't washed his hands or pooped on by a bird out in the field, and that produce goes in the dunk tank, you may be getting pathogens into the water and then infiltrating into the produce. The water will usually infiltrate into the produce through a cut or the scab where it was attached to the vine.

It's best to always use sanitizers in dunk tank wash water. Many growers use various kinds of bleach (must be labelled for washing fruits and vegetables) or other sanitizers such as Sanidate or Tsunami.

Second, it's better to use single pass (spray) water, where infiltration is not an issue. Third, do what you can so that the temperature difference between the crop and the water is not so big. You can harvest earlier in the morning when the crop pulp temperature is low and then infiltration won't be as much of a problem. If you can get away with it from a marketing perspective and your crop doesn't look too dirty, then don't wash your produce! Washing it, even in a sanitizer, is not making the crop any safer because the risk of cross-contamination actually outweighs the benefit of dirt removal. It's better for your customers to wash the produce under flowing water in their individual sinks. Safer for them, and less work for you!- -ES

Harvesting Garlic - Timing is Key!

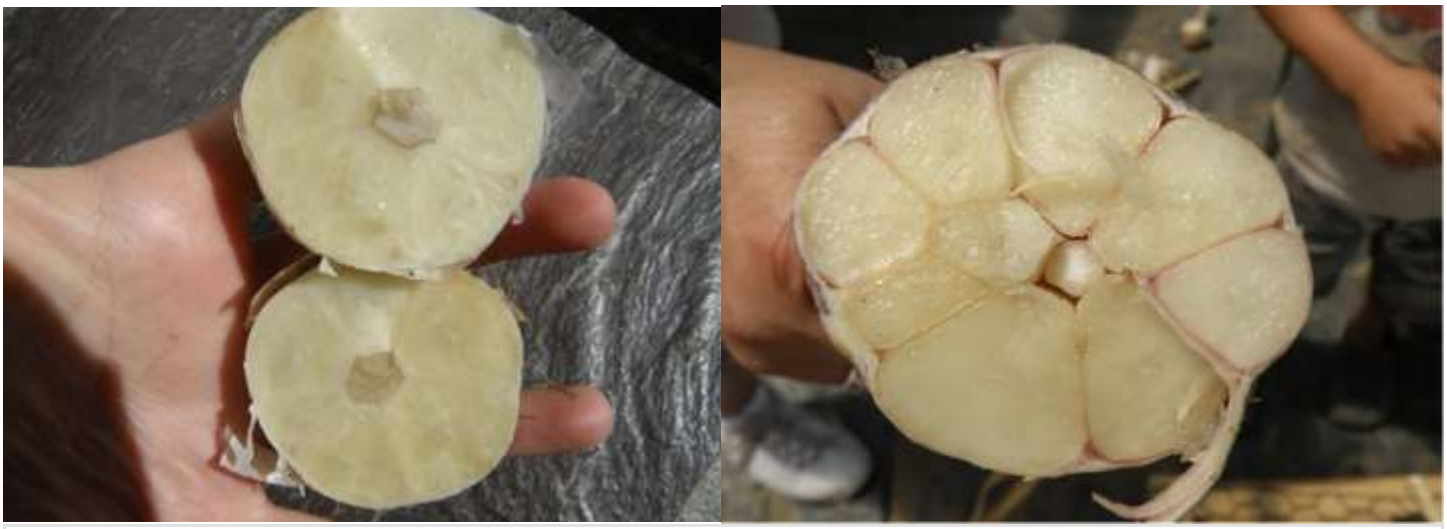
Everyone knows the balancing act that is garlic harvesting—too early and the cloves are small and don't store well, too late and the head pops, making it unmarketable and more susceptible to diseases. So, as we near harvest, how should a grower decide if the garlic is ready? The best answer is to pull a few plants, cut through the head sideways (so you cut through all the cloves), and see how well developed the cloves are. You can use the leaves as a guide to decide when to do this (lowest third or half of the leaves yellowing and dying is a good mark to start with), but looking at the cloves is the best way to know if the garlic is ready. Cloves should fill the wrappers—if they seem a little loose, the garlic has a little ways to grow. A little of the very outer wrapper may have started to decay at this point. That is okay—it's a normal part of the maturation process. The key is to harvest before the bulbs pop, which can happen relatively quickly, especially if we have another wet year. If you don't think you will be able to get out and harvest for a period of time, it's better to harvest bulbs a little too early than a little too late.

Cutting the tops in the field: If you find that you do not have space to bring whole plants into the drying area and maintain good air circulation, cutting the tops off the garlic is a good solution. Cutting the tops has the added benefit of leaving significant amounts of moisture in the fields rather than bringing all that lush, green growth into the drying area. Tops can be cut as close to ground level as you can get if using a sickle bar mower, or you can cut them by hand at 1.5" to 6" long. Our trials have shown that there is no increase in disease incidence even when cutting the garlic down to its final length as you bring it into the drying area.

Field grading: Hopefully you have been removing sick and damaged plants each time you weeded the garlic, so there won't be many left. Harvest is one last chance to clean up your crop before you bring it into tight quarters where disease can spread like wildfire. Remove any garlic that doesn't look great and set it aside rather than bringing it in and finding it later. You might also consider selecting your seed garlic at the same time. Save out the best garlic as your own seed to maximize next year's crop. You also don't need to clean your own seed of dirt or remove roots, which will save you labor if you set it aside now.

To wash or not to wash? Generally, you want to clean your garlic in the most gentle way possible. Most of the time this can be done dry. You can gently rub most of the dirt off of the garlic while harvesting, then remove a little more as you transfer from the wagon to your drying area. The one exception to this rule might be if you have to harvest garlic from muddy soils. In that case, washing may be warranted, but do it right away while the dirt is still mud on the bulbs, not after it has dried on them. You want to avoid wetting and drying the garlic over and over. Regardless of method, do not bang heads to remove dirt, gently remove excess by hand. The more garlic is banged during the process, the more it will bruise and the worse it will store.

Move your garlic from the field into the drying area relatively quickly—most people harvest during the morning and have garlic in the barn, high-tunnel, or shed by mid-



Knowing when to harvest garlic can be tricky. Use the leaves as a first indicator, but also feel and look at the bulb. You want the bulb to be very firm in its skins, and when you cut it in half perpendicular to the scape you want to see a small gap around the scape. The garlic on the left isn't quite ready; the garlic on the right is. *Photos by CLS*

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Harvesting Garlic– Timing is Key! , continued from last page

day. Garlic can be dried in a variety of ways, as long as a few fundamental ideas are followed. First, you want to have good airflow over the garlic to move moisture away. This means not having garlic packed too tightly into the drying area. Each layer of garlic should have good air movement, whether hanging in rafters or sitting on benches. If there are parts of the drying area that are stagnant and wet, you need to remove some top growth and throw it away, reduce density of plants in the area, or increase air movement.

Next, you want to choose an area that gets hot, but not too hot. Garlic will dry well at 110 degrees, but we try not to go much above that because at 120 degrees waxy breakdown, a physiological disorder, starts to occur. This temperature can be reached in a barn, shed, or high tunnel. Make sure you have the temperature in your drying area well controlled, so that you do not overshoot that target. -*CLS*

Tomato Epinasty

For the past couple of years we've been seeing very odd growth in some high tunnel tomatoes in the first half of the season, especially in the cherry types. The newer leaves have a 'shoestring' look to them and are often twisted and stunted. This symptom can be caused by a virus, but the assays come out negative. This year we saw it again, especially in tunnels that had drainage problems during periods of heavy rains. It turns out that tomatoes under excessively wet conditions produce ethylene as a response to the stress and that ethylene causes the plant to go into epinasty. Epinasty is a growth response where one layer of cells grows faster than the other, causing distorted growth. Luckily, these plants usually outgrow the problem once soil moisture conditions even out. -AI

Sweet Corn Pest Trap Catches

(Last Week ending 7/7/15, This Week ending 7/13/15)

Location	ECB-E Last Week	ECB-E This Week	ECB-Z Last Week	ECB-Z This Week	CEW Last Week	CEW This Week	FAW Last Week	FAW This Week	WBC Last Week	WBC This Week
Central Clinton	2	0	0	1	0	0	0	0	1	0
South Clinton	0	0	0	0	0	0	0	0	0	0
Orange County	0	0	3	3	6	7	0	0	2	1
Central Ulster	0	0	0	0	0	0	2	1	N/A	N/A
Northern Ulster	3	1	3	0	0	0	N/A	N/A	N/A	N/A
Southern Ulster	0	1	0	0	0	0	2	1	N/A	N/A
Northern Washington	0	0	0	0	0	0	N/A	N/A	N/A	N/A
Southern Washington	0	0	0	0	0	0	N/A	N/A	N/A	N/A
Albany County	N/A	0	N/A	0	N/A	0	N/A	0	N/A	0
Montgomery County	0	0	0	0	0	0	N/A	N/A	N/A	N/A
Schoharie County	0	1	0	0	N/A	N/A	N/A	N/A	N/A	N/A
Northern Columbia	5	0	6	1	0	0	N/A	0	N/A	0

Reminder on Calculating Fertigation Rates for Plastic Mulches

Fertigating or the injecting of fertilizers into drip irrigation water with crops grown on plastic mulches is a very common and simple practice these days, however achieving the right balance can be tricky. Too much fertility at the wrong time and you could end up with a beautiful plant and no fruit which can happen in tomatoes and peppers or too little and you might not have achieved the optimal yields or quality you were looking for. Below are some general "rule of thumb" reminders when using fertigation:

First, calculating fertilizer needs where plastic mulches and drip irrigation is used: The key to remember when trying to figure out how much fertilizer to dissolve in your bucket for a crop planted into plastic mulch is, it is not the same as a "field acre". You should only calculate the fertilizer needs for what is covered by the mulch. The easiest way for me to describe this to you is to give you an example: First, you need to determine what your bed top width is or, in other words, the area across that your mulch covers. For example, if you are using a Rain-Flo raised bed maker, a typical bed top width is 30 inches or about 2.5 feet. There are other machines and other systems that might use a different width so you need to go out and measure it. Take this value and multiply it by the row length and finally multiply that by the number of rows per section that you irrigate at one time or "zones". For example, if my bed width is 2.5 feet, my rows are 345 feet long and I have 5 rows per section then my total acreage would be (2.5 x 345 x 5) divided by 43,560 (number of square feet in an acre) which would be 0.1 acres! If I need to apply 7 pounds of actual nitrogen (per field acre) and the analysis of my nitrogen source is 20% nitrogen, I divide 7 pounds by 0.20 (that is the fertilizer analysis expressed as a decimal). STOP! This is where it get tricky: That means for one field acre I would need 35 pounds of this fertilizer for one "field acre". BUT, because I'm only treating the acreage that is covered by the mulch, I actually only need to dissolve 3.5 pounds of this fertilizer to get my 7 pounds of nitrogen per acre. Why? I only have 0.1 acres to actually treat so if you need to multiply your actual acerage (0.1 acres) x the amount of fertilizer needed for an entire acre (35 pounds) = 3.5 pounds of actual 20-20-20 to dissolve in solution. If you need help, please call me (Chuck Bornt) at 518-859-6213.

Some other things to remember:

1. Before you go through all the work to plumb in a fertigation unit on your drip system, make sure that the unit you purchase meets the required "gallons per minute" (GPM) needs otherwise it will not operate correctly! For example, if you purchase a Mazzi injector that needs 10 GPM and you are only irrigating a section at a time that is only using 8 GPM, there is not a enough flow rate to syphon the fertilizer solution into the main line.

2. Make sure the system has been turned on long enough to pressurize it completely. Failure to do this will result in all of your fertilizer solution getting sucked up all at once and only going to a couple rows.

3. The longer the fertigation event can occur the better the distribution of fertilizer will be. That means if a typical irrigation event for you is 3 hours, then try to have the fertigation happen during the majority of this run time minus the full pressurization and time at the end to make sure the lines are flushed. Minimally I would like to see 15—25 gallons per acre of water used to dissolve your fertilizer to help ensure the best distribution of fertilizer. If you can use more then great!

4. Know your irrigation waters pH: this is something that I know many of us do not do often enough and is a critical factor in nutrient uptake when fertigating. Most crops optimally mine most nutrients (in particular nitrogen and potassium) at a pH of 6.2—6.5. If your irrigation water is above that, you may not be getting the biggest bang for your buck with your fertigations. You can use either sulfuric acid or citric acid to help acidify your water and use the online alkalinity calculator to get your acid concentrations. Be sure to follow all directions on the calculator and pay careful attention to the pull down menus on the input side to get the correct recommendations.

5. Some of you might recall this information from an article the Steve Bogash did a couple of years ago in regards to tissue testing, but the information is still as valid and important today as it was then and we still aren't doing enough of it. "Growing great tomatoes that are full flavored and have low losses in the packing house requires keeping tissue potassium levels above 3%. From before the first blossoms to the last harvest, tomato plants (and peppers as well) require huge amounts of potassium to produce the most flavor and prevent yellow shoulders / gray wall. Although I look at every nutrient level, those most important to packout are the following:

Continued on next page

Reminder on Calculating Fertigation Rates for Plastic Mulches, continued from last page

⇒Tissue N levels should be at about 4% as fruit are developing. Higher levels can create soft fruit, more foliage, and fewer fruit.

⇒Tissue K levels need to be above 3% for tomatoes and peppers to produce the highest quality fruit and to keep creating new blossoms.

⇒Ideally Ca should be at about 3% and Mg at 0.8-1%. This prevents cracking and produces fruit that are tough enough for packing and shipping.

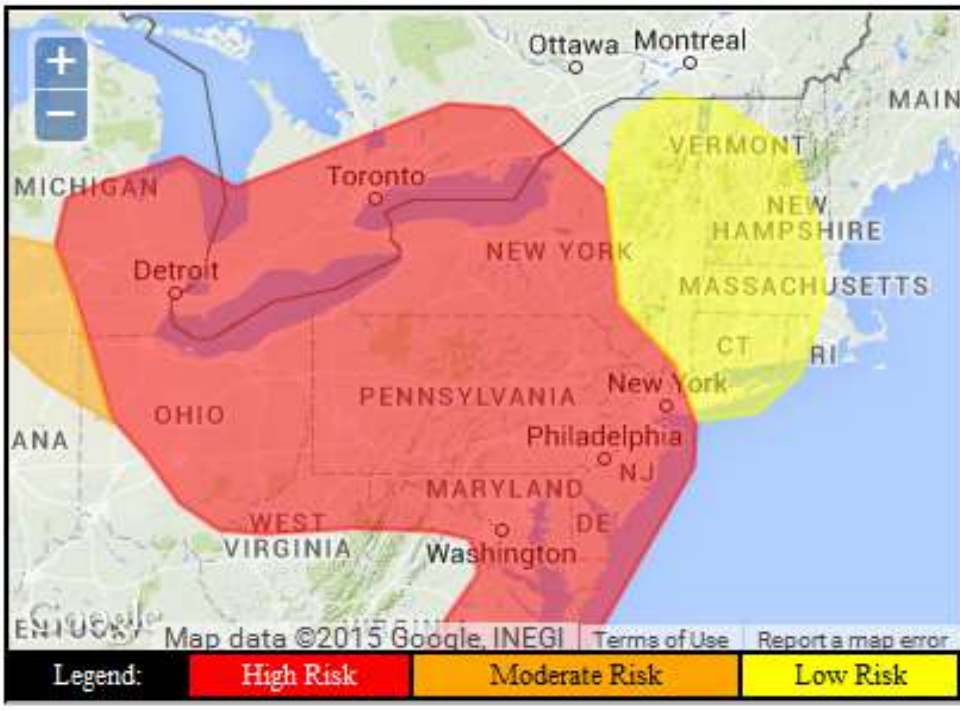
In retrospect, although I've always recommended bi-weekly tissue testing to growers due to the cost of the tests, I now recommend weekly sampling that starts as early as the plants can handle the cut." (*Source: Steve Bogash, Penn State Extension Vegetable, Small Fruit, and Mushroom Production News, June 2, 2014*

6.In my opinion, I think weekly fertigation (which some growers are doing) and spoon feeding our plants is a better way to go instead of applying a large dose of fertilizer a couple times a season. It might be that this constant feeding and watering, may improve not only yield but fruit quality as well. Large doses of fertility on certain crops may lead to issues such as fruit cracking (tomatoes) or over vegetative growth. If you need help calculating rates or have questions about these recommendations or need recommendations for other crops, please feel free to contact Chuck Bornt at 518-859-6213. *-CDB*

Cucurbit Downy Mildew Forecast for this week

It would appear that it is going to be a good week for spreading CDM all over the northeast so be sure to make sure your cucurbits are protected. IF you need assistance in identifying what might be CDM or fungicide recommendations, please do not hesitate to contact one of the vegetable educators in the ENYCHP. Our contact information can be found on the front of this newsletter!

Risk prediction map for Day 2: Tuesday, July 14



Forecaster: TK at NCSU for the Cucurbit *ipm*PIPE - 2015

HIGH Risk for east-central and eastern NC, eastern and northern VA, MD, DE, NJ, PA, central and western NY, northern WV, OH except the southwest, southern ON, and central and eastern lower MI. Moderate Risk to cucurbits in northern FL, GA but the far north, SC, south-central and southeast NC, southwest MI, and northeast IN. Low Risk for central and southern AL, the FL panhandle, central and southern FL, eastern NY, Long Island, and New England except ME and far eastern MA. Minimal Risk to cucurbits otherwise.

-CDB

2015 Weather Table—The weather information contained in this chart is compiled using the data collected by Network for Environment and Weather Applications (NEWA) weather stations and is available for free for all to use. For more information about NEWA and a list of sites, please visit http://newa.cornell.edu/ This site has information not only on weather, but insect and disease forecasting tools that are free to use.

2015 Weekly and Seasonal Weather Information

	Growing Degree Information Base 50^{O} F			Rainfall Accumulations		
Site	**2015 Weekly Total** 7/6– 7/12	**2015 Season Total** 3/1 - 7/12	**2014 Season Total** 3/1 - 7/13	**2015 Weekly Rainfall** 7/6-7/12 (inches)	**2015 Season Rainfall** 3/1 –7/12 (inches)	**2014 Total Rainfall** 3/1 - 7/12 (inches)
Albany	**165.0**	**1315.0**	**1238.0**	**1.15**	**11.81**	**14.85**
Castleton	**155.4**	**1236.2**	**1173.6**	**1.71**	**13.50**	**14.57**
Clifton Park	**157.0**	**1255.1**	**1115.0**	**0.03**	**11.75**	**15.91**
Fishkill	**162.0**	**1271.4**	**Na[1]**	**0.04**	**5.14**	**Na[1]**
Glens Falls	**145.6**	**1103.6**	**1122.0**	**0.29**	**10.74**	**18.61**
Griffiss	**131.7**	**1035.7**	**1039.5**	**0.83**	**18.28**	**23.12**
Guilderland	**150.0**	**1176.0**	**1128.0**	**1.62**	**13.57**	**Na[2]**
Highland	**164.0**	**1336.8**	**1258.3**	**0.07**	**15.51**	**19.83**
Hudson	**165.7**	**1335.4**	**1260.7**	**0.47**	**12.76**	**20.22**
Marlboro	**160.1**	**1272.9**	**1202.0**	**0.17**	**12.22**	**18.03**
Montgomery	**164.5**	**1312.1**	**1228.0**	**0.23**	**14.20**	**16.59**
Monticello	**135.9**	**1006.0**	**952.0**	**0.47**	**8.25**	**6.85**
Peru	**147.8**	**1032.7**	**1052.7**	**0.01**	**13.12**	**14.74**
Red Hook	**159.4**	**1265.0**	**1238.9**	**0.77**	**14.68**	**8.47 ***
Wilsboro	**146.7**	**1007.0**	**1012.9**	**0.09**	**17.18**	**10.97**
South Hero, VT	**151.0**	**1066.4**	**1070.4**	**0.21**	**15.39**	**15.66**
N. Adams, MA	**134.0**	**1000.6**	**990.0**	**1.36**	**13.56**	**15.40**
Danbury, CT	**155.0**	**1176.9**	**1111.5**	**3.29**	**14.52**	**16.33**

Na[1]: The Fishkill site is new for 2015 so there is no historical data to report.
Na[2]: The Guilderland weather station was not properly reporting precipitation data in 2014 so no data will be shown for this site.
*: Precipitation data for this site did not began until May of 2014.