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## Weekly Vegetable Update

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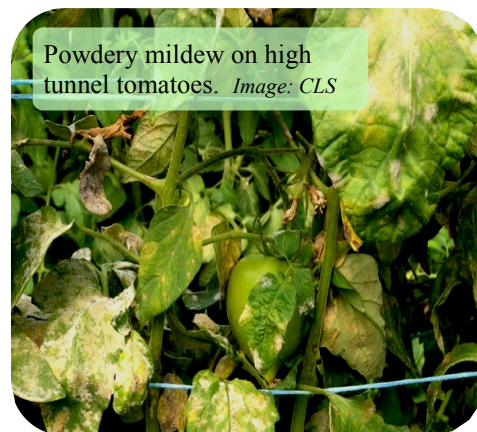
### Eastern New York Crop Updates

With weather similar to last week, many crops are continuing on without major changes. The big disease event of the week was finding late blight in more tomatoes in Columbia County and in a potato field in the Capital District. No other major new diseases were found. Drier conditions (up until the rain this past Tuesday/Wednesday) resulted in an increase in insects such as aphids, thrips, mites and leafhoppers. Regular rainfall helps keep insect pressure down by drowning and knocking them off of plants.

**Sweet Corn:** We continue to catch high numbers of Fall armyworm (FAW) and second flight European corn borer (ECB) adults in our New Paltz traps. One field that we scouted in the late whorl stage, had a combined ECB and FAW feeding damage of 20%. Corn earworm (CEW) and Western bean cutworm (WBC) adult populations remain low in both our New Paltz and Warwick trap sites. However, with the high number of FAW and ECB populations, a 5 day spray schedule is recommended.

**Tomatoes:** The high risk of late blight in the area means that growers should continue on a tight spray schedule. Organic growers should be spraying copper and any biologicals ideally before and definitely after each rain. Make sure to penetrate deep into the canopy with any sprays. During periods when we are not experiencing rain, spray every 5-6 days. Conventional growers should continue to cover with protective fungicides such as Bravo (0 days PHI [pre-harvest interval], 12 hour REI [restricted-entry interval], Mancozeb (5 day PHI, 24 hour REI) and add copper especially if bacterial infections from Canker or Speck are present on your farm or neighboring farms. Pay extra attention to PHI and REI now that harvest is occurring. If Late Blight is in your region and or weather is conducive to disease development, you will want to include directed sprays for Late Blight, such as Tanos (3 day PHI, 12 hour REI), or Previcur (5 day PHI, 12 hour REI). Be aware that some of these materials such as Ranman (0 PHI, 12 hour REI) is specific to control oomycetes like Late Blight and does not control Early Blight or Septoria. Be sure to include a material such as Bravo and or copper that control Septoria and Early Blight as these diseases can also defoliate plants. Revus top (1 day PHI, 12 hour REI) provides translaminar control of Late Blight and also provides excellent control of Early Blight and Septoria leaf spot.

Powdery mildew has been flaring up in high tunnel tomatoes. The primary way to treat powdery mildew in tunnels is to increase air circulation, if possible. If powdery mildew is a perennial problem, choosing resistant varieties, pruning more aggressively, and increasing plant spacing will help in coming years. Powdery was reported in field tomatoes on Long Island last week, and we could see a similar situation up here. Warm, humid weather without rain is particularly conducive to powdery infections. If powdery is found in the field, conventional growers can use fungicides with a FRAC code of 3 or 11, such as Rally (3) or



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*Eastern New York Crop Updates, continued from previous page*

Cabrio (11). Fungicides from FRAC group 11 might also help control Early Blight and Septoria. Quadris Top has products from groups 3 and 11. Organic growers can use sulfur products such as Microthiol, and potassium bicarbonate products such as Amicarb.

**Potatoes:** With increasing sightings of Late Blight and concern mounting, it's important to be able to distinguish Hopper Burn from Late Blight lesions.

Hopper burn shows up as a browning and dead/curled tissue along the margins of potatoes, often leaving a distinctive "V" necrosis pattern at the tip of the leaf. The damage is from the leafhopper feeding and damaging the vascular system of the potato. The damage can be so severe it decreases production. Different varieties have different levels of susceptibility. Damage is regularly accompanied by yellowing around lesions delineating damaged areas from healthier tissue.

Late Blight, however leaves a much rounder lesion that is not nearly as common on the leaf margins but could be anywhere on the leaf. Late Blight is also less likely to have yellowing. Damage is much more black/grey/purple.

If you think or know you have Late Blight, please contact one of the ENYCHP educators listed on the front page sidebar so we can help you identify the problem and track the disease locations.

**Garlic:** Garlic is nearly dry in many areas. To see if garlic is fully dry, peel down to the lowest wrapper leaf against the scape. Once the space between this leaf and the scape is dry, the garlic is fully dry. Once dry, you can move garlic to a cool (less than 70° F is good) and dry (less than 70% RH) place to store until sale. Make sure to keep checking on garlic once you have it in storage so you can adjust conditions if needed. If you keep garlic in the hot, dry environment where you dried it, it will continue to slowly lose weight and eventually quality. However, if more pressing tasks keep you from it for a week or two, your losses will be minimal, so this can be a rainy-day task.

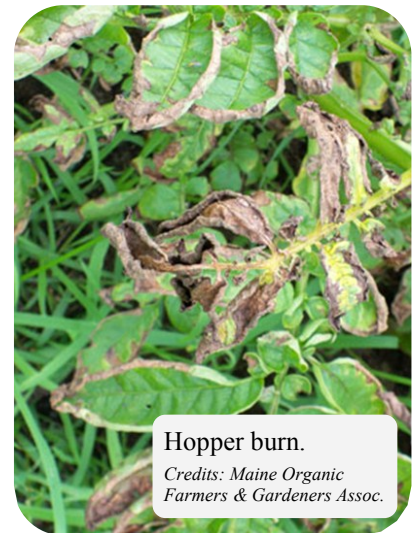
**Onions:** Onions are sizing nicely. Remember to irrigate late onions during dry spells, and keep scouting for thrips and diseases.

**Cole Crops:** In general fall plantings of cole crops look very nice. Some localized control of flea beetles has been needed where growers aren't covering their plantings, and cabbage worm pressure is still high in places. But, overall, these plants are looking healthy and happy.

**Cucurbits:** Powdery mildew (PM) is beginning to show up but conditions have not been ideal lately. As mentioned in the tomato section, PM prefers humid conditions to wet so this is one disease that our frequent rains actually discourage. Virus is showing up in pumpkins in scattered locations. There's nothing to do once virus arrives except rogue out the affected plants to keep it from spreading but depending on how late in the season you find it, you might just ignore it.

**Brassicas:** Now is a good time to top your Brussels sprouts to encourage the sprouts along the stem to size up uniformly (see photo). The growing tips of Brussels sprouts produce auxin, a hormone that inhibits side branching. By removing the tip you stop the auxin production and the side sprouts will size up at roughly the same time. Remove the whole tip, a good inch down to stop the auxin production.

Kale forests are a common sight this time of year. By regularly harvesting the lower leaves, kale will continue to grow upward, turning your field into a miniature forest of kale (see photo).



Hopper burn.

Credits: Maine Organic Farmers & Gardeners Assoc.



Late blight. Credits: Meg McGrath



Winterbor in front, Toscano in back.



Remove the growing point now to encourage sprouts to size up uniformly. Photo by ADI

## Post Harvest Washing of Vegetables

By Chuck Bornt and Crystal Stewart, CCE ENYCHP, with assistance from Gretchen Wall, Produce Safety Alliance, Cornell University

As harvest of many vegetables is in full swing, there are a couple of things we would like to remind you about when handling fresh fruits and vegetables, especially when it comes to washing them. At a time when we continue to hear about foodborne illness outbreaks related to contaminated produce, it is even more important to think about how you handle your produce, not only to ensure that it is safe, but also that it retains its highest quality. Please, this is only the tip of the iceberg when it comes to produce handling and safety. For much more information please visit the Produce Safety Alliance website at: <http://producesafetyalliance.cornell.edu/> or consider signing up for our next GAPs Online Produce Safety Course starting September 3<sup>rd</sup> (<http://www.gaps.cornell.edu/eventscalendar.html>).

1.) If washing produce make sure that only clean, potable (water that you would drink) is used. Washing fruits and vegetables in dirty water makes no sense and may result in the opposite of what we are striving for: safe, clean produce! A sanitizer MUST be added to all bulk water (potable) in tubs or tanks where multiple items of produce will be submerged, floated, or rinsed. If using single pass water (such as spraying from a hose that supplies potable water), using a sanitizer isn't as critical as if you are using water in bulk form (such as in a tub or tank). However, it is ideal to have sanitizer in single pass water to prevent the build-up of microorganisms in equipment or on spray tables.

2.) Be sure that your produce is not warmer than the wash water you are using—according to research, the wash water should be about 10°F warmer than the produce. Be sure to “pre-cool” the product before running it through your washer. Susceptible fruit, such as tomatoes, melons, or apples, that are warmer than the wash water can cause the wash water to actually get “sucked” into the fruit through the stem scars or wounds on the fruit. This only applies if the fruit is submerged or floated and is not likely to occur with single pass spray. If you can't pre-cool your product, you might need to warm you wash water to achieve the same goal.

3.) If possible, have your harvesters try to remove as much of the soil as possible before placing it into the harvest tote. This will help reduce the amount of organic matter that can tie up and deactivate any kind

chlorine or sanitizer treatment. Regardless of the type of wash system you are using, establishing schedules to change water on a regular basis is critical. Adding sanitizer to dirty water will render the product ineffective to do that job. Changing water could be done hourly, per batch, or for each commodity, depending on the harvest conditions (think: muddy versus dry). Establish schedules that work best for your farm.

4.) There are a number of different sanitizers that can be added to wash water, but you need to make sure that you follow EPA rule as not all products are labeled for this kind of use. A sanitizer is not intended to ‘wash’ the fruit, since once pathogens are on the surface, they are nearly impossible to remove. Instead, a sanitizer is added to prevent cross-contamination in the water and within equipment. In order to “legally” use any sanitizing agents, the crop name or labeled for direct use on fruits and vegetables MUST be on the label of a water sanitizer product because it is considered a “pesticide” by EPA FIFRA. And second, the sanitizer must be registered for use in the state! Going to the market and buying some household bleach is not legal! These products do not have fresh fruit or vegetables on the label which makes them inappropriate to use. See Table 1 for a list of approved sanitizers (please note that this is not a complete list of approved sanitizers but suggestions). For organic growers, sanitizers such as Tsunami 100, Sanidate 5.0, or Stor-Ox can be used.

Remember that chlorine or any of these sanitizers are tied up or deactivated easily by organic matter, so make sure the product is free from lots of dirt or debris before putting it through the washer or tub will allow more of the sanitizer to be active. It is best if a low level of sanitizer can be present in **ALL** batch water to prevent cross-contamination. This may require frequent changes of batch water to keep the organic load low, but if you are doing any type of bulk

situation, all bulk water should have added sanitizer. In most situations 50 - 100 parts per million (ppm) of chlorine is what folks are using. A Dosatron or similar injector can be used to inject the right rates of sanitizer into your water. Another way to add sanitizers to your handling system, such as if you use the same roughneck tubs to wash produce, is to mark with a sharpie the line for 10 gallons (or whatever volume of water you want to use) to fill to, then use a dedicated teaspoon or measuring cup with a line specific to the amount of sanitizer needed. Table 2 below will help you determine the amount of bleach or chlorine needed to achieve the proper dilution rates in your wash water.

**Table 1: Active Ingredients and Trade Names of Approved Sanitizing Products**

<b>Active ingredient: Sodium hypochlorite</b>
Ultra Clorox bleach
Clorox Germicidal
Pioneer Ag Sanitizer 12.5%
Calcium hypochlorite
Arch Chemical Cal-Hypo
Chlorine dioxide
Safe Ox
<b>Active ingredient: Hydrogen peroxide</b>
StorOx
Oxidate
<b>Active ingredient: Peroxyacetic acid &amp; Hydrogen peroxide</b>
Ecolab Tsunami 100
Sanidate 5.0
StorOx 2.0

*Continued on next page*

*Post Harvest Washing of Vegetables, continued from previous page*

Also, if possible adjust your pH between 6.0-7.0 for better chlorine efficacy. Organic growers, be sure to read your labels to determine correct formulations, as they vary widely.

5.) Make sure you have the appropriate tools to monitor your sanitizer levels. Using the ‘glug-glug’ method and walking away from the wash system without checking that the desired level of sanitizer is achieved in the wash water is not only a waste of your time, but also a waste of expensive sanitizer products. If using chlorine, you can check the parts per million by using paper chlorine strips (similar to those that you can find at pool stores). It is important to note that only strips that measure FREE chlorine and NOT TOTAL chlorine are used to measure levels. Free chlorine measures the level of sanitizer that is available to do its job, whereas total chlorine may include some of the sanitizer that has been bound by organic matter and not active. Make sure the strips can measure the level you want to achieve; there are strips for high doses (50-100+ ppm) or low doses (10 ppm or less). There are more sophisticated ways to monitor your sanitizer level, such as through the use of titration kits, automated systems, or ORP (oxidation-reduction potential) meters. These methods may be more of an investment in the short term, but long term, they are more accurate than using strips. Different sanitizers require different monitoring tools, so be sure to choose what is appropriate for your product and system. Monitoring should be done on an established schedule and readings should be recorded so that action can be taken if sanitizer levels in the water are too low (or too high!).

6.) You should also be rinsing and sanitizing your washer and tables often (at the end of each day, end of each batch of produce etc.). I know there are lots of nooks and crannies in those washers, but using a pressure washer or even high pressure nozzle will help remove a lot of the debris. If you can incorporate a sanitizing agent in that water, that will also help. This will help prevent the build-up of microorganisms and help reduce the likelihood that a biofilm may form. A biofilm is just what it sounds like – a film of bacteria, including potentially harmful pathogens that could establish themselves inside equipment. Biofilms are extremely hard to remove with sanitizers and other cleaning agents once they have formed.

7.) I know everyone uses something different for harvest totes—buckets, crates, baskets, etc. If they are made of

solid materials like plastic, you should be rinsing and sanitizing them frequently as well. They can easily become dirty and pose another risk of contamination in the handling procedure. One other note if you are using wood in the packing area or for packing containers. Wood cannot be sanitized because it is a porous surface. However, this does not mean that you need to remove every wood surface on your farm because we know that just isn’t practical. Do the best you can – clean wood surfaces like tables and crates on a frequent schedule using detergent and clean water. Let them dry out between uses and replace them when they are damaged. In the long run, investing in surfaces that are easy to clean AND sanitizer, such as plastic or stainless steel, is ideal.

**Table 2: Amount of sodium hypochlorite to add to wash water for 50-150 PPM dilution**

Target PPM	ml/L	tsp/ 5 gal	cup/ 50 gal
<b>Sodium Hypochlorite, 5.25%</b>			
50	1.0	3 2/3	3/4
75	1.4	5 1/2	1
100	1.9	7 1/4	1 1/2
125	2.4	9	2
150	2.9	11	2 1/4
<b>Sodium Hypochlorite, 12.75%</b>			
50	0.4	1 1/2	1/3
75	0.6	2 1/4	1/2
100	0.8	3	3/5
125	1.0	3 3/4	4/5
150	1.2	4 1/2	1

For more information or help on sanitation please visit Cornell University’s Produce Safety Alliance website at: <http://producesafetyalliance.cornell.edu/> or contact **Gretchen Wall**, Cornell University Department of Food Science at phone (607) 255–6806 or email [glw53@cornell.edu](mailto:glw53@cornell.edu).

The following information can be found in the 2014 Cornell Integrated Crop and Pest Management Guidelines for Commercial Vegetable Production on pages 67 (including Table 2, referenced there as Table 10.2.1).

“Decay is usually the most obvious postharvest problem. Many decay organisms (bacteria and fungi) cannot invade sound, undamaged tissue, but as the tissue becomes older, it becomes weaker and more subject to invasion. To control postharvest losses, it is recommended that produce be washed in chlorinated water before storage or shipping (see Table 10.2.1) . The wash temperature should be about 10°F warmer than the produce temperature to ensure that decay organisms are not sucked into the tissue. For a 25 parts per million (ppm) solution, use one tablespoon household bleach (5.25% sodium hypochlorite) per eight gallons of water or one pint bleach per 264 gallons. Since chlorine is most effective at a slightly acidic pH, it is important that wash water is buffered to adjust the pH to between 6 and 7.

Chlorine in the wash water is often inactivated when the wash water becomes dirty. Use filtering devices to remove soil and organic material, and check the chlorine concentration often. Produce should be subjected to the chlorinated wash from one to ten minutes. After it is removed, allow it to drain for several minutes before packing.”

## Worms in Tomatoes

Growers are used to dealing with worms (caterpillars, really) in corn, but in tomatoes? Yes, tomatoes can be hit hard by a few different caterpillars and now that the fruit is ripening up it's a critical time to be on the lookout for them. Tomato hornworms can devour a breathtaking amount of leaves overnight. They are huge but well camouflaged and surprisingly hard to see, even when you know they are there. Try looking for their large droppings on some leaves, then look up from there. They tend to lie right along the rib of the leaf or stem. They also feed on the fruit, both green and ripening. The adult is the intriguing hummingbird moth, so named because it flies and hovers just like a hummingbird as it sips nectar from flowers. The adult is also called a sphinx or hawk moth.



Tomato hornworm. Notice the size in relation to the gloved hand, and the bare stems. Photo by ADI



Young tomato fruitworm beginning to tunnel into a green tomato. Credits: <http://www2.ca.uky.edu/>

The more damaging worm in tomatoes is the tomato fruitworm. In corn it's called the corn earworm, but it's one and the same. Earlier in the season the adult moth lays its eggs on fresh corn silk, but once silks have dried the moth prefers tomatoes. The larvae range in color from yellow to green to reddish brown and are covered with short bristles that give them a rough texture. They tunnel into green tomatoes, ruining them. Yellow striped armyworm causes similar damage. Several insecticides are labelled for tomato fruitworm but not the yellow striped armyworm so check pages 381-2 of the current Vegetable Pest Management Guidelines for all your options if you decide to spray. -ADI

## Agricultural Producers in NY Still Have Time to Apply for Direct Farm Ownership Loan Program

The U.S. Department of Agriculture (USDA) Farm Service Agency (FSA) today announced that farmers and ranchers still have time to apply for low interest 2014 loans available through FSA's direct farm ownership program. The deadline to submit applications is Sept. 30, 2014.

Eligible producers can borrow up to \$300,000 in direct farm ownership loans to buy or enlarge a farm, construct new farm buildings or improve structures, pay closing costs, or promote soil and water conservation and protection. The interest rate on select loans can be as low as 1.5 percent with up to 40 years to repay.

FSA encourages all interested applicants to apply for direct farm ownership loans. For more information about the program and other loans administered by FSA, visit any FSA county office or [www.fsa.usda.gov](http://www.fsa.usda.gov). For local FSA Service Center contact information, visit <http://offices.sc.egov.usda.gov/locator/app>.

### Soil Health Field Day

August 21, 2014 from 4:30-8:30 pm

Kinderhook Creek Farm, Inc., 5168 South Stephentown Road, Stephentown, NY

Soil is the backbone of every farm and needs to be managed for maximum production. Are you using the most current techniques for the best results? Join us at our Soil Health Field Day where you will enjoy dinner on the farm, demonstration cover crop plots, a farmer panel, soil health demonstrations and equipment demonstrations. Speakers include Olga Vargas, NRCS Soil Scientist; Paul Salon, NRCS Plant Materials Specialist; and Frank Gibbs, Certified Professional Soil Scientist and Certified Crop Advisor.

1.5 DEC Credits and 4 CCA Credits Available. The meeting is FREE, but please RSVP by August 18, 2014. For more information or to RSVP contact Marcie Vohnoutka at (518) 272-4210 or [mmp74@cornell.edu](mailto:mmp74@cornell.edu).

Sweet Corn Trap Catches for the Week Ending August 10th					
Location	ECB-E	ECB-Z	Corn Earworm	Fall Armyworm	W. Bean Cutworm
Albany	0	0	0	0	6
C. Clinton	0	0	0	0	2
S. Clinton	0	0	0	0	10
Columbia	0	3	0	0	6
Fulton	0	0	0	0	12
Orange	0	0	0	0	0
Saratoga	0	0	N/A	N/A	N/A
Schoharie	0	0	3	0	0
C. Ulster	8	10	1	13	0
N. Ulster	3	2	0	N/A	N/A
C. Washington	5	4	1	0	0
N. Washington	1	0	2	0	1

**2014 Weather Table**—This chart is compiled using the data collected by Northeast Weather Association (NEWA) weather stations. For more information on NEWA and a list of sites, visit <http://newa.cornell.edu/> This site has information not only on weather, but insect and disease forecasting tools that are free to use.

<b>2014 Weekly and Seasonal Weather Information</b>						
Site	Growing Degree Information Base 50 <sup>o</sup> F			Rainfall Accumulations		
	2014 Weekly Total 7/28– 8/10	2014 Season Total 3/1 - 8/10	2013 Season Total 3/1 - 8/10	2014 Weekly Rainfall 7/28– 8/10 (inches)	2014 Season Rainfall 3/1 - 8/10 (inches)	2013 Total Rainfall 3/1 - 8/10 (inches)
Albany	145.8	1865.8	1869.0	0.61	7.39	24.95
Castleton	136.3	1760.0	1874.9	0.79	8.61	23.00
Clifton Park	138.2	1696.0	1768.5	0.38	9.26	25.35
Glens Falls	131.0	1673.3	1622.5	0.24	10.94	20.60
Guilderland	147.0	1710.0	1777.5	N/A	N/A	5.54
Highland	143.8	1847.9	1993.2	0.19	11.61	23.04
Hudson	143.2	1883.6	1960.7	0.70	9.83	20.17
Marlboro	140.3	1798.9	1925.2	0.21	12.78	26.58
Montgomery	143.3	1830.8	1888.5	0.07	14.46	25.20
Monticello	116.1	1446.6	1514.0	N/A	N/A	N/A
Peru	135.7	1594.7	1637.3	0.28	10.13	18.55
Shoreham, VT	138.0	1671.5	1746.2	0.63	9.22	19.69
Wilsboro	127.6	1533.1	1611.0	N/A	N/A	21.45

Cornell Cooperative Extension and the staff assume no liability for the effectiveness of results of any chemicals for pesticide use. No endorsement of any products is made or implied. Every effort has been made to provide correct, complete, and current pesticide recommendations. Nevertheless, changes in pesticide regulations occur constantly and human errors are still possible. These recommendations are not substitutes for pesticide labeling. Please read the label before applying any pesticide. Where trade names are used, no discrimination is intended and no endorsement is implied by Cornell Cooperative Extension.

Diversity and Inclusion are a part of Cornell University’s heritage. We are a recognized employer and educator valuing AA/EEO, Protected Veterans, and Individuals with Disabilities.