Cornell University Cooperative Extension

Eastern NY Commercial Horticulture Program

Vol. 1, Issue 19
August 8, 2013

Weekly Vegetable Update

ENYCH Program Educators:

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

Amy Ivy
Phone: 518-561-7450
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

Fruit
Laura McDermott
Cell: 518-791-5038
Email: lgm4@cornell.edu
Berries

James O'Connell
Phone: 845-691-7117
Email: jmo98@cornell.edu
Berries & Grapes

Michael Fargione
Phone: 845-691-7117
Email: mjf22@cornell.edu
Tree Fruit

Kevin Iungerman
Phone: 518-885-8995
Email: kai3@cornell.edu
Tree Fruit & Grapes

Layout:
Carrie Anne Doyle

Content Editor:
Crystal Stewart

Regional Updates:

Crops in general are recovering from the heat wave and settling into more normal growth patterns. Corn and lettuce harvest dates are "running together" due mostly to wet weather/heat wave impacts.

Tomatoes are finally starting to ripen. There are large amounts of green tomatoes on the vine. The heat wave earlier in July likely delayed ripening (see articles in this newsletter on tomato ripening issues). Peppers are being harvested widely, and fruit set has been very good on most farms.

Early onion harvest continues. Direct seeded onions are showing wide variations in expected yield from quite poor to excellent. It seems as though planting date has had a larger-than-usual impact on production. Of course wild swings in temps and soil moisture have had played a large role. The wet June hampered timely field access and some weed control programs suffered and now the crop is suffering from the presence of competition.

Insect pressure continues to be an issue. We are seeing larger-than-average numbers of hornworms in some tomato plantings (threshold is one hornworm per plant). If you notice plants being quickly defoliated in the hightunnel or field, it's worth taking the time to scout a section of the row to make sure you don't have a hornworm problem. In some cases entire fruit clusters are being damaged. There are many types of hornworms, and based on the number of hawkmoths (adult hornworms) spotted in corn traps and pollinating flowers, it's a good year for all of them.

Slightly smaller than life-sized hornworm. Image: ADI

Cucumber beetle populations have spiked again in some areas, and are feeding heavily enough to abort young melons and other cucurbits. Make sure to scout for these late-season beetles and control as needed.

Plantings for fall harvest are on or close to schedule. Weather has been good for transplant establishment, and also dry enough for seeding. Rains late this week will be welcomed.

What's the Deal With Tomatoes This Year?

We have been getting lots of calls from growers having issues with tomatoes ripening (or not), with internal defects, and with insect damage. Here are explanations for a few of the things we are seeing in the field.

Tomato Ripening Issues

By Dr. Stephen Reiners, Cornell Dept. of Horticultural Sciences

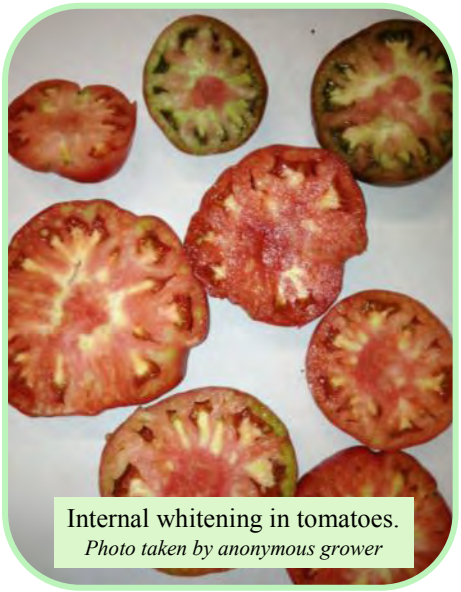
With all of the hot weather we've experienced this summer, growers were expecting their tomatoes to ripen very quickly. Unfortunately, just the opposite is happening. Ripening seems very slow, almost like what we see in the autumn when temperatures are much cooler. So what's happening?

It takes six to eight weeks from the time of pollination until tomato fruit reach full maturity. The length of time depends on the variety grown and of course, the weather conditions. The optimum temperature for ripening tomatoes is 70 to 75°F. When temperatures exceed 85 to 90°F, the ripening process slows significantly or even stops. At these temperatures, lycopene and carotene, pigments responsible for giving the fruit their typical orange to red appearance cannot be produced. As a result, the fruit can stay in a mature green phase for quite some time.

Light conditions have very little to do with ripening. Tomatoes do not require light to ripen and in fact, fruit exposed to direct sunlight will heat to levels that inhibit pigment synthesis. Direct sun can also lead to sunscald of fruit.

Do not remove leaves in an effort to ripen fruit. Also, soil fertility doesn't play much of a role. We do know that high levels of magnesium and low levels of potassium can lead to conditions like blotchy or uneven ripening or yellow shoulder disorder. But the slowness to ripen is not likely due to soil conditions and adding additional fertilizer will do nothing to quicken ripening.

If you absolutely cannot wait, some growers will remove fruit that are showing the first color changes. These fruit, in the "mature green" or later phase, could be stored at room temperature (70- 75°F) in the dark. A more enclosed environment would be best as ethylene gas , released from fruit as they ripen, will stimulate other fruit to ripen. If temperatures remain high outdoors, these picked fruit will ripen more quickly, perhaps by as much as five days. As far as flavor, the greener fruit should develop flavor and color similar to what you would get if field ripened. The key is picking them when they are showing the first signs of ripening (no earlier) and keeping them at room temperature. Do not refrigerate, as this will absolutely destroy their flavor.



Internal whitening in tomatoes.
Photo taken by anonymous grower

Internal Whitening

Another problem that has appeared on some tomato fruit is internal whitening, where the tissue does not turn red but instead is white and hard. Jerry Burst from UM has studied ripening issues for some time now and observed this condition during and after periods of excessive heat and/or when plants are potassium (K) deficient. He also observed that potassium deficiency is exacerbated by heavy fruit load. For various reasons, plants may be K deficient even when soil levels are sufficient. Foliar testing can help growers monitor the actual levels in the plant and adjust fertility through foliar sprays or fertigation with soluble K. *–TR*

Tomato Pollination and Excessive Heat

By Jerry Brust, IPM Vegetable Specialist, Univ. of Maryland

The extreme heat we had will play havoc on tomato fruit that was just flowering or ripening, causing problems in fruit development due to poor pollination. Constant exposure of a tomato plant to high temperatures (day/night temperatures of 95/80°F) significantly reduces the number of pollen grains produced and released per flower and decreases the pollen's viability. Most pollen is shed between 10 am and 4 pm and 3-hours or more at 103°F on two consecutive days can cause fruit set failure. Temperatures at night may play a more important role in determining whether or not pollination takes place than day time temperatures. This is because ideal fruit set occurs within a very narrow range of night temperatures (60°-70°F). If tomato plants experience night temperatures above 75°F, interference with the growth of pollen tubes can occur preventing normal fertilization and causing blossom drop. Prolonged high humidity (>80%) also will hinder good fruit set as the pollen either will not shed freely or the pollen grains may bind together, resulting in poor pollination. Poor pollination may result in under-size fruit that looks 'normal' but is just a great deal smaller. Other problems include poor development of the gel inside the fruit. This causes the fruit to appear angular and soft when squeezed. When this type of fruit is cut in half, open cavities can be seen between the seed gel and the outer wall. High temperatures during the ripening period additionally can cause 'internal whitening' in tomato fruit. This white tissue only is noticeable when the fruit is cut. The hard, white areas tend to be in the vascular tissues in the outer and center walls of the fruit. Low potassium levels are also associated with 'internal whitening'. There is not a great

Tomatoes, continued from page 2

deal that can be done about any of the environmental problems other than to be sure to water enough and do not over fertilize during these extreme conditions. Although growth regulating chemicals can be used sometimes to help fruit set under cooler than ideal conditions there is no growth regulator that will induce normal fruit development under high temperature conditions.

Alternaria Leaf Spot in Brassicas

By B. Dicklow, UMass Extension updated by Susan Scheufele. Edited by CLS

Alternaria leaf spot is a fungal disease that affects all cultivated brassicas, causing small black spots that grow into large lesions with characteristic concentric rings on leaves, stems and heads. The disease can be caused by several fungi in the genus *Alternaria*, but the most damaging species in the production of vegetable brassicas are *A. brassicae* and *A. brassicicola*.

Alternaria lesions on a cabbage leaf.
Photo courtesy UMass Extension

Disease development is favored by cool temperatures and long periods of leaf wetness or high relative humidity, and Alternaria leaf spot can be a limiting factor in the production of vegetable and seed crops in regions where these conditions are common. Infection can cause reduction in crop quality and yield through damage to seeds, seedlings, leaves, and heads, and can also spread during storage of vegetable crops like cabbage. Brussels sprouts can be rendered unmarketable by Alternaria lesions on the buds. The disease can spread in storage so management is especially important for cabbage and other storage crops and crops should be inspected for early symptoms before storing. In New England, as cultivation of a wide range of brassica crops has increased in recent years, this disease has become more severe and is causing more losses, especially in fall crops.

The initial symptoms of Alternaria leaf spot are small black dots surrounded by chlorotic haloes. As the disease progresses lesions expand into characteristic, dark brown to black circular leaf spots with target-like concentric rings. The centers of lesions often turn brown and crack or fall out, giving the leaf spots a shot-hole appearance. Individual spots coalesce into large necrotic areas and leaf drop can occur. Lesions can occur on petioles, stems, flowers, flower pedicels, and seed pods. Pod infection causes distortion, premature shattering, and shriveled, diseased seed that germinate poorly.

Alternaria species overwinter primarily in diseased crop debris. Long-lasting resting or overwintering spores have been reported but are not widely found. The disease is favored by temperatures of 60-78° F and 12 hours of relative humidity of 90% or more. The main means of introduction into new areas is on infested seed. However, spread from one infected crop into nearby crops occurs easily once the disease is established on a farm. The fungi sporulate profusely and are spread throughout fields by wind, splashing water, equipment, and workers.

In 2009, a Brussels sprout variety trial was conducted by the UMass Vegetable IPM Program. Seven varieties were evaluated—Vancouver, Franklin, Nautica, Diablo, Dimitri, Roodnerf and Oliver. Among these varieties, Oliver and Franklin showed significantly more disease damage than the other cultivars. The ENY Commercial Horticulture team is conducting two variety trials this year on an organic and a conventional farm, and will be reporting the results of these trials in our monthly newsletter and at winter meetings.

Management

- Buy certified, disease-free seed or treat seed with hot water
- Select disease resistant cultivars; in broccoli, look for a tight, well-domed head
- Practice long rotations (at least 3 years) with non-brassica crops
- Locate seedbeds and transplant production and early Brassicas successions so as to reduce the risk that wind-borne inoculum reaches transplants
- Avoid planting succession crops in close proximity and rotate late season crops to new fields
- Control brassica weeds which can serve as alternate hosts
- Avoid overhead irrigation, especially during head development; allow sufficient drying time before nightfall if overhead is used.
- Work in young, uninfected plantings first, and older, infected plantings last
- Incorporate diseased plant debris into the soil immediately after harvest
- Eliminate cull piles and manage compost piles well in order to break down infected crop residues

Chemical Control. There are a number of synthetic fungicides available to effectively control this disease. Please consult the *Guidelines.* There are also many OMRI-approved materials labeled for control of Alternaria in brassicas but there is no efficacy data to support their use. The UMass Extension Vegetable Team is conducting a research trial this fall to evaluate efficacy of some of these materials, so look for updates in the coming months.

Harvesting Ripe Melons

By Justin O'Dea, CCE Ulster County

We anticipate inquiries about melon ripeness beginning around this time of year; the first glut of melon crops have just begun to come in in the Hudson Valley. If you are an experienced melon grower, you probably already understand that this process can be a bit of an art, which requires some trial and error and training in what to look for. Even if you are experienced, it can be a challenge if you have employees that aren't experienced melon pickers, or are coming in too focused on harvesting for quantity over quality. Know what to look for and play it safe by taking an extra moment to look for *more than one* indicator of melon ripeness, and to make this clear to your employees. Your melons can get *softer* once picked, but melon *sweetening* really happens on the vine.

A pervasive folk method to determine melon ripeness is to knock them and listen for a dull thud sound (indicating a softened tissues, and a higher inner water content), *but this is a more risky way to determine melon ripeness for market.* It is easy to misjudge the sound (likened to thumping a gallon jug of water), especially to an inexperienced ear; many extension publications discourage this indicator for this reason. It may be a secondary indicator after considering some more consistent indicators of melon ripeness. Generally all melons' unripe pale color will darken ("warm") and dull as they ripen to a color distinct to melon type/variety, be heavier compared to unripe melons of the same size, and may give off distinctly ripe melon odors.

Cantaloupes (i.e. muskmelons) probably have the clearest indicators of ripeness. The stems of these melons crack where it meets the melon when ripening. When the stem is cracked half way around, this called *half-slip* (see picture).

Arrow pointing to dry, brown tendril on watermelon.
Photo courtesy http://banyans-end.blogspot.com

Cantaloupe with arrow pointing to halfway formed stem/ melon crack, indicating half-slip stage. This melon also shows defined netting and yellow hues on rind.
Photo in adapted image courtesy www.senior-gardening.com.

At half-slip, the melon takes some force to remove from the stem, and is not yet at full flavor but is close. Harvesting at half-slip is commonly used if the melon is going to be transported before marketing so that it gives it some more shelf life. If your melons are going to direct markets though, go for *full-slip,* occurring a few days after half-slip. At that point the crack is more full, the melon easily comes off the stem, and is at peak flavor. Ripe cantaloupes will also go from having a grayish-green to more yellowish hue under the "netting" on the melon surface, which if they are ripe, should be well formed/defined (see picture).

Watermelon stems do *not* crack off where they meet the melon, and are difficult to remove even when ripe, without cutting. Instead look up the stem from the melon to the first tendril nearest the melon. The tendril should dry and brown if the melon is ripening or completely ripe (see picture). This should be your primary indicator. Couple this with looking at the ground spot, which if ripe, should have turned from whitish, pale-green to yellow. To be safe, *use both indicators*. To test this, I recently pulled melons out of a field that had yellow ground spots but *no* brown tendrils- none were ripe compared to ones that also had dry, brown tendrils.

Honeydew-type melons, like watermelons, do *not* have stems that crack at where they meet the melon, and should be cut to harvest. Also like watermelon, look for a dry, brown tendril, and color changes. Ripening honeydews will transition from pale green (unripe), to whitish, and then to

continued on page 5

Harvesting Ripe Melons, continued from page 4

tan/yellowish hues (see picture). The change in melon color, coupled with a slight softening of the melon rind at the blossom end, and/or a slightly springy rind at the stem end, indicates a ripe honeydew. Also, honeydew seeds become loose when ripe (this does *not* apply to watermelon and cantaloupe types), and if you shake the melon you may be able to feel the seeds moving inside the melon. Honeydew harvested at the whitish color stage is similar to harvesting a cantaloupe at half-slip, extending shelf life, but at the sacrifice of some flavor.

For more information:

- http://www.extension.umn.edu/distribution/horticulture/M1262.html
- http://pubs.ext.vt.edu/2906/2906-1308/2906-1308.html
- http://njaes.rutgers.edu/pubs/download-free.asp?strPubID=FS610

Ripening honeydew melon showing yellowish rind hues.
Courtesy www.swallowtailgardenseeds.com

Corn Earworms: Not Just a Pest of Corn

By Justin O'Dea, CCE Ulster County

Despite the name, corn earworm can cause considerable damage on a number of vegetable crops besides its favored host, sweet corn. Tomatoes (especially), peppers, beans, heading brassicas, and lettuce are crops commonly found with corn earworm damage, but the pest may also be found on many other crops and weeds. In tomato this pest is often alternatively called "tomato fruitworm", and a suite of other names specific to various crops that corn earworm attacks.

If you don't have pheromone traps for this pest at your farm, monitor for eggs, larvae, and adult moths depositing eggs (pictures below). Monitoring tomatoes may take priority over other crops since damage is more likely there; eggs are commonly found on leaves just below flower clusters, and a single larva can cause damage to many fruits. Corn earworm damage can also introduce secondary pathogen infections. If you need to control for tomato hornworm also, management of both pests in conjunction is possible. A number of insecticides are effective for corn earworm (see Cornell recommends) including spinosad (Entrust) and Bt for organic management. In small acreage operations, handpicking larva can also be effective.

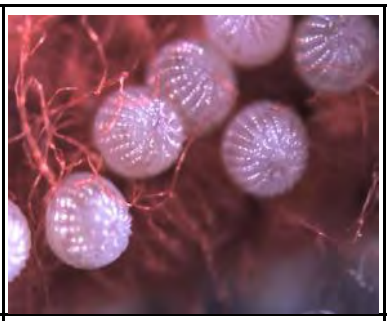
For more information:

http://pubs.ext.vt.edu/3103/3103-1537/3103-1537.html

http://extension.umass.edu/vegetable/insects/corn-earworm

http://veg-guidelines.cce.cornell.edu/27frameset.html (scroll down to tomato fruitworm/hornworm section under *27.6: Insect Management*)

Corn earworm adult moth.
Photo courtesy www.cirrusimage.com



Corn earworm eggs.
Photo courtesy www.wikimedia.org

Corn earworm larva.
Courtesy Oklahoma State-U Entomology & Plant Pathology

Corn earworm feeding and damage on tomato (left and center) and pepper fruits (right).
Photos courtesy of University of Delaware Cooperative Extension (left), and Missouri Botanical Garden (center and right)

Meetings and Notices

Bejo Seeds Open House and Demonstration Trials August 27-28, 2013 10am to 6pm, Geneva, NY

Come join us to view a wide variety of quality vegetable crops at Bejo's Research and Development Farm! Refreshments plus Light Lunch served on Tuesday, August 27. To RSVP please call (315) 789-4155.

- Home & Market Garden Exhibit
- Commercial Strip Trials
- Food Concept Sampling
- Organic Variety Exhibit
- Seed Dealer Displays
- Product & Equipment demonstrations
- Product Market Displays

Corn Trap Catch Numbers

Location	ECB-E	ECB-Z	Corn Earworm	Fall Armyworm	W. Bean Cutworm
N. Washington	10	0	1	0	0
C. Washington	4	0	0	0	0
N. Rensselaer	0	0	0	0	0
Albany	0	0	0	0	0
C. Fulton	0	0	0	0	0
N. Columbia	0	0	0	0	0
Saratoga	0	0	1	0	0
Schoharie	0	0	9	0	0
C. Clinton	0	0	0	0	20
S. Clinton	0	0	0	0	26
Orange	2	2	3	0	0
C. Ulster	4	0	1	0	0
S. Ulster	0	0	0	0	0
N.Ulster	7	0	1	0	0

Weekly and Seasonal Weather Information

	Growing Degree Information Base 50^{O} F			Rainfall Accumulations		
Site	**2013 Weekly Total** 7/31—8/06	**2013 Season Total** 3/1 - 8/06	**2012 Total** 3/1—8/06	**2013 Weekly Rainfall** 7/31—8/06 (inches)	**2013 Season Rainfall** 3/1—8/06 (inches)	**2012 Total Rainfall** 3/1—8/06 (inches)
Albany	**106.5**	**1643.1**	**2038.8**	**0.02**	**21.77**	**16.62**
Castleton	**122.4**	**1753.6**	**2114.6**	**0.35**	**20.24**	**16.76**
Chazy	**82.8**	**1522.4**	**2101.1**	**0.14**	**19.08**	**13.56**
Clifton Park	**100.5**	**1671.5**	**1906.8**	**0.03**	**20.43**	**19.92**
Clintondale	**118.9**	**1910.1**	**1575.5**	**NA**	**NA**	**16.21**
Glens Falls	**107.1**	**1558.8**	**1705.0**	**0.62**	**17.52**	**14.83**
Granville	**109.8**	**NA**	**1809.5**	**0.01**	**NA**	**18.75**
Guilderland	**117.5**	**1562.3**	**1754.0**	**0.08**	**5.65**	**5.57**
Highland	**129.7**	**1901.0**	**2080.2**	**0.51**	**16.21**	**18.01**
Lake Placid	**66.2**	**1037.4**	**NA**	**1.05**	**20.00**	**NA**
Montgomery	**119.6**	**1801.2**	**1820.0**	**0.33**	**15.26**	**NA**
Monticello	**91.6**	**1312.3**	**1753.0**	**0.01**	**0.19**	**1.44**
Redhook	**129.2**	**1796.7**	**1936.5**	**0.43**	**15.06**	**13.20**