Cornell University Cornell Cooperative Extension Eastern New York Commercial Horticulture

VOLUME 5, ISSUE 18 AUGUST 31, 2017

## Around the Farm this Week Charles Bornt–ENYCHP

Sweet corn – Fall Armyworm (FAW) moth counts in our traps sharply increased this week in several locations and damage in young corn was clearly evident. Lots of ragged feeding injury and sawdust like frass can be found in whorl stage corn. Time insecticide applications when tassels first start to emerge followed by a second application when the rest of the tassels emerge if using any of the pyrethroids, like Warrior, Grizzly, Artic etc. Likewise, this week we saw an increase in Corn earworm (CEW) moths with some locations looking at a 4-5-day insecticide schedule: see table 1 on fresh silking corn. Aphids are also still easily found, so even if you're not treating for worm pests you might need to treat for aphids. Usually the above mentioned materials for FAW are active on aphids or you can use Assail or Lannate.

Table 1: Average CEW pheromone trap catches during silk stage.

Average corn earworm catch						
Per Day Per Five Days Per Week Days Between S						
<0.2	<1.0	<1.4	No Spray(for CEW)			
0.2-0.5	1.0-2.5	1.4-3.5	6 days			
0.5-1.0	2.5-5.0	3.5-7.0	5 days			
1-13	5-65	7-91	4 days			
over 13	over 65	over 91	3 days			
Add one day to the recommended spray interval if daily maximum temperatures are less than 80° E for the previous 2-3 days						

Spray intervals should be lengthened by a day if daily maximum temperatures were less than 80° F for the previous 2 to 3 days.

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Vine crops: Pumpkins are coloring up quickly it seems in many parts of the region and some early harvests have actually begun. Be sure to maintain your powdery and downy mildew spray Schedules, especially on later planted fields that still might not be as far along as you would like them to be. This last week of dry weather has been very favorable for Powdery mildew, while the dews of the mornings and cooler temperatures have



Figure 2: Plectosporium blight foliar symptom. Note the lighter green area around the darker lesion.

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been favorable for Downy (so no way to win this battel)! And, just because you haven't had enough, the heavy dews and remnants of this year's early rains have led so some Plectosporium blight outbreaks in zucchini and pumpkins; see the article in this edition by Crystal Stewart for more information on managing plectosporium.

Brassicas: Last year I had a home gardener send me a photo of a worm



Figure 1: Cross-striped Cabbageworm - young caterpillar. Photo: A. Legrand, UCONN

week that one of our colleagues, Dr. Ana Legrand at the University of **Connecticut Plant Science Research** Farm in Storrs. Connecticut found eggs and larvae. Dr. Legrand provided us with the following pictures (Figures 1 & 2) showing a young and older caterpillars and noted "the typical cross-stripes and black on top of yellow lateral bands are more distinct in the older one". Refer to the following links for more information

on this insect:

http://

raw2/

ipm.uconn.edu/

html/517.php?

documents/

and http://

pest on their cabbage that I had not seen before, but have heard about from other states. With some help from our Cornell Entomologist, we determined that it was a Cross-striped cabbageworm.



Figure 2: Cross-striped Cabbageworm - older caterpillar. Photo: A. Legrand,

Although I have not seen it for myself in any commercial plantings in our region, I did come across a report late last

## **Black Rot in Crucifer Crops** Teresa Rusinek, edited by Ethan Grundberg-ENYCHP

Though temperatures have mostly been below the ideal range for black rot to develop in brassicas, the disease is popping up in some fields in the region. Black rot disease is caused by the bacteria Xanthomonas campestris. Infections can be systemic in seedlings or localized in more mature plants. Seed can be infested with the bacteria on and within the seed coat and a source for infecting young seedlings. Infected seedlings may not show symptoms for some time, so it's easy to transplant seemingly healthy plants into the field and symptoms to show up later. Bacteria from infected plants (including cruciferous weeds such as wild radish and mustard) and other sources such as equipment, debris in soil can also enter plants through openings on the leaf margin. These localized infections produce the classic V-shaped lesion. Insect feeding can be another route of entry for the bacteria which may produce a more irregularly shaped lesion. When you cut through the leaves or stems of infected tissue you may see black discoloration the

bacteria produce in the vascular tissue. Warm, wet conditions favor black rot development and expression of symptoms. Rain and heavy fogs or dews and day temperatures of 75° to 95°F are most favorable. Under cool, wet conditions infection can occur without development of symptoms. Consequently, transplants grown at low temperatures may be infected but remain symptomless. The bacteria do not spread below 50°F or during dry weather.

Once plants are infected it is difficult to control this Disease, especially under wet conditions. Labeled copper compound sprays under dry conditions can provide some control. All crucifer crops are susceptible to this disease, but kale and radish are less easily affected. Many cabbage varieties have some level of tolerance to black rot, while most broccoli and cauliflower varieties tend to be susceptible.

Given limited chemical control options and the

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susceptibility of crucifers to black rot, "prevention is the best line of defense" according to Christine D. Smart & Holly W. Lange of Cornell University who coauthored the following piece excerpted from the July 18, 2013 eXtension article Managing Black Rot of Cabbage and other Crucifer Crops in Organic Farming Systems found at (http://www.extension.org/pages/29925/managing-blackrot-of-cabbage-and-other-crucifer-crops-in-organicfarming-systems#.Ui8pRsZQHpU)

There are three preventative measures that can reduce the risk of a black rot outbreak:

Start with clean seed – It is known that the bacterium that causes black rot can survive on and in seed. Hot water

treatment can be used to destroy the bacteria that may be infesting your seed. If you have purchased seed that NOT been hot water treated, you can treat the seed yourself, but it is critical to do it correctly. For cabbage and Brussels sprouts, soak seed for 25 minutes in 122°F water; for Chinese cabbage, broccoli, cauliflower, collard, kale, kohlrabi, rutabaga or turnip, soak for 20 minutes in 122°F water. Mustards, watercress and radish are more susceptible to heat damage, and should be soaked for 15 minutes in 122°F water. Treat a small number of seeds the first time to ensure that the treatment is not reducing seed germination.

Use clean transplants - If you are



Black rot lesions on Red Russian kale

growing your own transplants, make sure that the greenhouse has been cleaned well prior to starting transplants-even if you had no disease last year! Bacteria have a remarkable way of surviving in weeds, organic matter, or nooks and crannies, so if possible, get rid of all weeds, use new or disinfected flats, and disinfect benches and tools prior to the start of a new season. Be sure to keep foliage as dry as possible, and do not brush or trim wet plants. Use pathogenfree growing media. Compost added to growing media can be a source of inoculum if diseased plant matter was added to the pile.

Rotate with non-crucifers – Because the black rot

bacterium can survive in debris in the soil, it is important to rotate away from crucifer crops for a minimum of three years.



Typical V-shaped black rot lesions on leaf edge

## Plectosporium blight affecting Zucchini Crystal Stewart, ENYCHP

Plectosporium is a relatively uncommon, but significant disease of cucurbits in New York. Zucchini are most susceptible, but an outbreak can be very damaging to pumpkins or even cucumbers. On harder rinded cucurbits such as pumpkins, the lesions are more of a problem on stems and the handle and can make them so brittle they snap. On the more delicate cucurbits, lesions are also found on the fruit, and have a very unique star or diamond shape with cracked corners. Lesions are generally not found on the middles of leaves, but may be found on the leaf



veins. This year, we almost always see a mix of diseases, so wading through the multiple symptoms can be challenging. It can help to look for any symptoms which are unique to a certain disease, like the stem/fruit lesions in this case. Plectosporium is favored by rainy weather, so the dry period we are entering will help. If you are dealing with plectosporium, protectants such as chlorothalonil on a 7 day schedule during rainy weather has generally proven effective. In addition to chlorothalonil, strobilurins (FRAC group 11) such as Flint and Cabrio are also

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effective. It's not clear if any organic controls such as copper or biologicals are effective on this disease.

Table 2: Fungicides labeled for Plectosporium blight management.						
Fungicide	FRAC Code	Recommended Rate/Acre	REI	PHI	Seasonal Limits	Comments
Bravo or OLF (chlorothalonil)	M5	Varies by label	12 hours	0 days		
Inspire Super	3+9	16-20 fl ounces	12 hours	7	80 fluid ozs per season	No more than 2 sequential applications before rotating to a fungicide in another class
Roper DF Rainshield or OLF (mancozeb)	М3	2-3 lbs	24 hours	5		Please be sure to check your label as not all formulations of mancozeb are labeled for pumpkins and squash
Cabrio EG	11	12-16 ounces	12 hours	0		Should be tank mixed with another product such as chlorothalonil. No more than 1 application before rotating to a fungicide in another class
Flint	11	1.5 – 2.0 ounces	12 hours	0		Should be tank mixed with another product such as chlorothalonil. No more than 1 application before rotating to a fungicide in another class

# Late Summer Tunnel Tomato Fertility

Judson Reid, Cornell Vegetable Program

High tunnel tomatoes experience higher nutritional demand than field tomatoes as they yield more and earlier during longer, warmer days. These conditions are stressful for the crop as fruit is maturing while more shoots and flowers are being produced. The result is often deficiencies in nitrogen, phosphorus and/or potassium which leads to flower loss. This effect is more pronounced in high yielding determinate varieties and heirlooms than hybrid indeterminates.

Wholesale prices for tomatoes can see a late season rebound, particularly in wet years. So how do we prevent this late-season nutritional stall and increase our profitability? Soil testing is the first step, particularly to understand our season-long phosphorus and potassium needs. If our soil tests show greater than 20 lbs P/ac, we don't need to add more. Our current estimated nitrogen budget for high tunnel tomatoes is around 150 lbs/ac. This can be delivered at a rate of 5-10 lbs N/ac/wk with a

soluble source such as potassium nitrate (13-0-44). For organic nitrogen approaches see previous article <u>https://rvpadmin.cce.cornell.edu/uploads/doc\_570.pdf</u>

The amount of potassium needed is a little more difficult to predict than the other macronutrients. We know that the plant will uptake K at a ratio of 1:3 compared to nitrogen. An excellent source of K is sulfate of potash (0-0-52) for both conventional and organic growers. If it fits with other nutrient demands, Sul-Po-Mag is a possibility (0-0-22-22(S)-11(Mg)). However, potassium uptake is often limited by excess soil magnesium, calcium, phosphorus or pH. This is where late season foliar tests are very important. We need to know how well the plant is taking-up potassium and then correct through dripfertigation as needed. Remember, that as days shorten and nights cool, nitrogen demand will decrease significantly. In our research we have found that farmers commonly increased profitability by decreasing unnecessary amendments.

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The following Plant nutrient levels are low, deficient or borderline: Nitrogen-Phosphorus-Potassium-

## Trialing No-Till Vine Crops on the Black Dirt with Paul Ruszkiewicz Ethan Grundberg, ENYCHP

For the last few issues of the weekly vegetable newsletters, we are going to highlight some of the innovative practices that growers in the region are trying out this year. Though no-till and reduced tillage vine crop systems have been around for a long time, they are not widely adopted in eastern New York. Pumpkin and squash growers have voiced many concerns over transitioning to no-till: increased rodent pressure, losing windows in the fall to clean up perennial weeds while establishing a cover crop for mulch, tying up nitrogen with all the residue, and keeping soils too cool in the spring for good crop germination. Some of these risks, especially rodent and weed pressure, are even greater on the muck soils in Orange County. However, as the acreage dedicated to vine crops on the black dirt continues to grow (around 650 acres of kabocha squash alone are in the ground this year), some growers are



looking to notill systems to improve fruit quality and smother weeds in season.

Paul Ruszkiewicz of John Ruszkiewicz Farms in Pine Island grows on about 240 acres of muck soil (124 acres of onions, 35 acres of field corn, 60 acres of soy beans, and 20 acres of vine crops) with his father. In addition to farming, Paul serves as an elected county legislator, a board member of Orange County Cooperative Extension, an advisory board member of the Eastern NY Commercial Horticulture Program, and president of the Orange County Vegetable Growers Association. While onions are still the backbone of the farm, the Ruzskiewiczs' crop mix reflects a broader trend on the black dirt towards incorporating field crops and vine crops both to take advantage of good markets and to rotate ground out of onion production every few years. Paul started growing vine crops about 10 years ago, but saw an opportunity to tweak his approach to pumpkin and squash production this year.

The original plan was to spin on 2 bushels of winter rye per acre in early October 2016, let the crop grow to maturity through the spring of 2017, mow and bale the rye to sell to local dairy farms, then plow and plant soy and cucurbits in those fields by mid-June. Everything was going as planned until the rye was mowed; first the rains made the fields to wet to get the tractor in to bale, then the prolonged wet weather made the hay worthless. Paul saw an opportunity to experiment.

"I had heard about guys planting into rye. It appealed to me because number one, I'd get better weed control from the mulch and, number two, with the squash sitting on the mulch, it reduces the potential for staining (especially on the black dirt) and diseases." So, Paul dropped his MaterMacc seeder in between the windrowed rye to plant 3 acres of kabocha squash and about another 2 acres of pumpkins no-till into rye stubble. "For it being a last minute experiment, it came

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out pretty well. Germination was good, considering I just dropped it in the ground, no zone tiller or anything. Weed control is so-so; I think if you did it more methodically you'd have better weed control," reflects Paul.

Paul is looking forward to continue experimenting with the system next year. Since the rye was mowed, there was some weed pressure between rows that required an early application of Sandea. Other growers on the muck are intrigued by Paul's experiment, too. Several farms



have agreed to trial some no-till plots experimenting with different rolled mulches (rye, barley, and sorghumsudangrass for later plantings) as well as different modifications to seeders to improve seed-to-soil contact at planting (addition of different styles of heavy coulters in front of double disc openers).

I'm excited about the potential for these no-till vine crop systems to not only improved in-season weed control and fruit quality, but also to help slow the rate of subsidence on the muck soils. Though preserving organic matter is less of a concern on black dirt farms where SOM percentages range from 30% to 85%, the huge pool of carbon contained in these soils is practically an all-you-can-eat buffet for microorganisms. When soil is moldboard plowed and exposed to the oxygen in the air, aerobic microbes start to feast and convert some of that carbon into CO2 gas. Not only is CO2 a greenhouse gas, but the process essentially shrinks the soil volume. We've all seen a compost pile be reduced to half its original size over time when it is turned regularly to allow exposure to oxygen; that same process is at

work when black dirt fields are flipped year after year. By reducing the amount of tillage and putting some carbon back into the soil with the heavy mulch from the rye, barley, and/or Sudex crops that the cucurbits will be planted into, growers should be able to slow the rate of subsidence/sinking and help extend the productive lives of their fields.

If you're interested in trialing some no-till or reduced-till vine crops on the black dirt next year, contact Ethan Grundberg at eg572@cornell.edu or 617-455-1893.

## Some Thoughts on Harvesting Storage Onions Crystal Stewart, ENYCHP

With the quality of onions being all over the place this year, now is a good time to be thinking about decision making regarding harvest time, field versus indoor drying, and prioritization of storage vs movement of the onion crop. Here are a few things to consider:

 Onion maturity: Storage onions should be allowed to fully mature prior to harvest. This improves their quality but also allows for the natural process of dying in which the neck seals the bulb off from diseases. Harvest onions when the tops are falling over (lodging) naturally, if at all possible (the onion in the bottom left hand corner of the picture on the next page is a great example). Also look for the top of the onion to be round (not conical or indented).

Time for a mini-rant: Should you roll the tops of your onions if they don't go down naturally? NO. Never ever, not ever. When onion tops fall over naturally it is because a layer of cells has died especially to seal off the onion from disease. When you roll the tops of the onions, you are

crushing and tearing the tops, and opening holes for disease to enter directly into the bulb.

2) What if the tops don't fall over? Sometimes the tops die prematurely due to disease or insect pressure. If this happens, they will not fall over. These onions will not develop the same tight necks, but might be used in short-term storage if allowed to dry properly and then topped.

3) Windrowing in the field: A healthy, naturally dying onion can be windrowed in the field for up to 2 weeks. During this time the tops will mostly dry down and a short drying period of a couple days is all that is needed prior to storage. To windrow onions undercut them and lay them on the ground in center of the row. It's ok if they get rained on, but you want to handle them only when they are dry again. Don't handle when wet with morning dew, either.

If onions have not lodged on their own, the outer scales will not die in quite the same way and onions may be more susceptible to sunscald, neck rot, and other issues.

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If possible, dry these onions with the tops intact and with protection from sun and rain.

3) When is an onion dry and ready for storage? When the neck is rubbed between your thumb and forefinger, there should be no slipping. You should be rubbing dry papers together. When that is true, top at 2-3 inches and bring onions into storage at as close to 32 degrees as possible.

This (red) onion is not yet mature, but is healthy and should be able to mature and store well if harvest is delayed until the tops fall.



The onion at top right is also not fully mature but has foliar disease that might interfere with die-down and long term storage.

The lower left onion was pretty healthy and is mature, with the tops down. It will be undercut and windrowed for a couple of weeks to allow the tops to dry.

The bottom right onion is mature but the tops died standing up. It is much more likely to have secondary diseases because of the loose neck.

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# Sweet Corn Pheromone Trapping Network 8/23 - 8/29

County	Corn Earworm	European Corn Borer-Z (Iowa)	European Corn Borer-E (NY)	Fall Armyworm	Bean Cutworm
Orange	6	0	0	31	4
Columbia	19	8	0	150+	6
Greene	1	1	0	18	0
Albany	4	18	0	3	0
Schoharie	0	0	0	5	6
Fulton	0	0	0	1	0
Saratoga	4	0	0	9	0
S. Washington	0	0	0	1	5
N. Rensselaer					
S. Clinton	0	0	0	0	16
C. Clinton	0	0	0	1	18

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