Cornell Cooperative Extension
Eastern NY Commercial Horticulture Program

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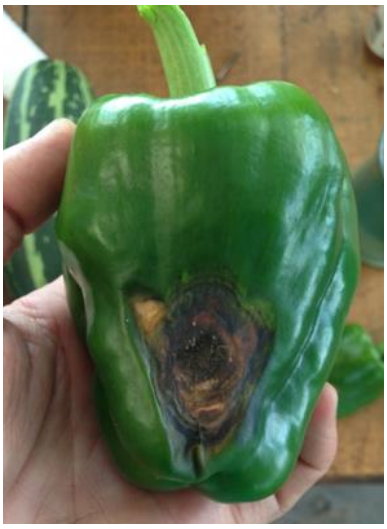
Vegetable News

What Happened to My Peppers?

Amy Ivy, CCE ENYCHP



Blossom end rot lesion on the lower side of the pepper with secondary fungal rot visible.

Left: Sun scald lesion on the most exposed section of the pepper fruit. The location on the fruit is diagnostic for both BER and sun scald.

The hot, dry weather we're having is bringing on all sorts of problems this month. Two of the most common we're seeing on peppers throughout our eastern NY region are sun scald and blossom end rot (BER). Most growers are familiar with BER on tomatoes where the bottom, or blossom end, of the tomato fruit dies. Peppers suffer the same problem, but instead of the bottom-most part of the fruit dying, the dead patches usually appear on the sides of the fruit. Secondary rots can develop in these dead patches making identification a bit tricky. If you're seeing many fruits with large, dead spots like in the picture on the left, chances are good it's BER, caused by insufficient water. We realize water supplies are low but to correct this problem you need provide more water. Adding calcium will not correct this problem. In most cases there is plenty of calcium but the plants need water to move it through the plant to the fruit. Foliar feeding does not solve this problem either.

Sunscald damage looks a lot like BER damage on peppers. But you can usually tell which is which by considering where on the fruit the injury is occurring. With sun scald the damage will, not surprisingly, be on the side of the fruit facing the sun. Once the fruit is picked this orientation is lost and it can be a bit trickier to determine. But if you compare the 2 photos on this page, you can see the sunscald (right photo) is on the highest side of

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the fruit, while the blossom end rot (left photo) is in a depression. Because peppers can point in various directions as they ripen on the plant, sun scald doesn't always occur on the shoulders. Remove damaged fruit as soon as you see it to direct the plant's energy to ripening the remaining fruit.

Bushy plants with plenty of leaves to cast shade will have less of a sun scald problem. But with the cold start to the season this year, many pepper plants set fruit before putting on good shoot growth and now those fruits are more exposed to the sun.

Be Prepared for Basil Downy Mildew

Ethan Grundberg, CCE ENYCHP

The long stretch of warm dry weather is over, so expect to see basil downy mildew (BDM) begin to spread across the region. There were confirmed cases of BDM in New Jersey in early July, so the oomycete is already present in the region. BDM (*Peronospora belbahrii) is a different pathogen from cucurbit downy mildew (Pseudoperonospora cubensis)*; however, the environmental conditions that favor the spread of the two diseases are very similar and, as a result, often produce outbreaks around the same time. The first symptom of BDM is usually the development of angular yellow patches on the top side of basil leaves, followed shortly by the arrival of purplish gray spores on the leaf underside. After sporulation, the yellow patches turn brown and gray.

Growers have increasingly been planting the variety 'Eleonora' by Vitalis Organic Seeds due to its intermediate resistance to BDM. However, 'Eleonora' is still very susceptible and growers should still monitor their plantings of resistant varieties carefully. Purple and Thai type basils typically have better resistance than sweet Genovese types. Rutgers released three new BDM-resistant sweet and Genovese basil varieties for 2018: Obsession DMR, Devotion DMR, and Thunderstruck DMR. These varieties have been included in field trials at the Long Island Horticultural Research Laboratory and have demonstrated superior resistance compared to other commercially available varieties with intermediate resistance. All three are available through VDF Specialty Seeds (https://www.vdfspecialtyseeds.com/).

The best cultural practices to avoid BDM are those that minimize leaf wetness and humidity levels, especially in high tunnels. In order to effectively manage BDM, fungicide applications should begin before visual symptoms develop. So, if you haven't seen signs of BDM yet, be sure to begin your preventative spray program now! Ranman (cyazofamid; FRAC code 21), Revus and Micora (mandipropamid; FRAC 40), and Quadris (azoxystrobin; FRAC 11) are all labeled for use on basil for BDM. Studies conducted on Long Island in 2013 found that Revus and Ranman were most effective at controlling BDM on both 'Italian Large Leaf' and 'Eleonora' varieites. The same study tested the efficacy of several OMRI-approved fungicides as well (Regalia, Actinovate, and Trilogy), but found them to be mostly ineffective. Some studies have found Procidic (3.5% citric acid) to be somewhat more effective for organic growers and was deemed NOP compliant by the Washington State Department of Agriculture. Double Nickel 55 (*Bacillus amyloliquefaciens*), MilStop (potassium bicarbonate), Trilogy (neem oil), and OxiDate (hydrogen dioxide) are also labeled for use on basil for suppression of BDM. Since OxiDate is a contact fungicide with no residual activity, it should only be used in conjunction with another fungicide. If you are unable to control BDM on your crop, be sure to disk in the infected plantings as soon as possible to help reduce the inoculation source for other plantings.

For more information on BDM, please refer to http://vegetablemdonline.ppath.cornell.edu/NewsArticles/BasilDowny.html and http://blogs.cornell.edu/livegpath/extension/basil-downy-mildew/ .

This season, CCE ENYCHP will be offering text updates straight to your phone. Our texts will get you the information you need in the fastest and most concise way possible! Only the most important crop alerts will be sent ("Late Blight found in N.Columbia County", for example), and you can choose to receive updates on whichever commodities you wish- Vegetables, Berries, Grapes, or Ag. Business. **CLICK HERE TO SIGN UP FOR OUR CCE ENYCHP TEXT ALERTS!**

Carrot Rust Fly– From Zero to Terrible in a Blink

Crystal Stewart, CCE ENYCHP

I've never personally encountered carrot rust fly until this year, and after pulling a few handfuls foul, melting carrots, I'm quite certain I'd prefer not to see it again. However, chances are good that isolated populations will show up here and there throughout eastern NY, so I want to simply place some information about this pest into the back of your mind, hopefully never to be accessed again.

Eric Sideman from the Maine Organic Farmers' Association wrote a great article about this pest some years ago, which beautifully explains the life cycle and organic controls:

"… The spring generation of the fly lays its eggs on the ground at the base of the carrot plant in mid-May to early June. The young larvae burrow into the soil and feed on the small roots of the growing carrot. Then the older larvae enter the main root. When the larvae mature they leave the carrot and pupate in the soil. The second generation of adult flies emerges from the pupae from mid-August to mid-September and lays another batch of eggs that produce the maggots that develop in storage carrots. If carrots remain in the garden, these larvae mature, leave the carrot, pupate in the soil over winter and emerge in spring as flies. Wild and volunteer carrots, parsley, celery, coriander and parsnips are other hosts, and rust fly larvae from these crops mature and pupate in the soil, so crop rotation is unlikely to provide control. Larvae feeding during the summer cause stunted plants that turn yellow. Larger larvae destroy the crop. To add insult to injury, soft rot bacteria may take hold in the tunnels, so that the carrots decompose into a soft, smelly mess. Larvae in fall carrots may be small when the crop is harvested for storage and may go unnoticed, but they continue to develop into large larvae during storage. Controls for carrot rust fly are all cultural modifications. If feasible, rid the growing area of all hosts the year before growing carrots, and, in any fields that had hosts, plow deeply in the fall to bury overwintering pupae.
Planting later than the end of May will avoid the first generation of egg-laying flies. Harvesting an early planting by mid-June will get carrots out before the larvae enter the taproot or grow large enough to be noticed. Harvest early plantings in blocks and be sure to harvest the crop completely so that the area will not produce second-generation flies….

….By far, covering the planting with floating row cover is the best control – especially if you have had repeated problems with the pest and know that it overwinters regularly in your area. Carrots that are relatively large in August, when the second generation of egg-laying flies is active, and that are intended for late fall harvest are most important to cover. Early carrots that are large when the first generation is laying eggs, from mid-May to June, may also be important to cover if you plan to harvest those carrots in late summer, since that would give the larvae time to grow."

If you think you have seen (or felt—gross) carrot rust fly, feel free to give me a call to talk through protecting your next generation of carrots.

Wanted: Leaf Mold Samples

Attention high tunnel tomato growers: We are looking for samples of brown leaf mold (*Passalora fulva,* formerly called *Fulvia fulva*) for a research project conducted by Dr. Christine Smart in Geneva. If you have any leaves that look like these pictures, please contact any of us on the team so we can collect some samples. It's an easy disease to diagnose from pictures but Chris's project is looking at which particular genetic strains of this disease are showing up where. For useful information about this disease which include pictures of look-alike problems as well visit: https://rvpadmin.cce.cornell.edu/uploads/doc_347.pdf

Above: at first, leaf mold makes bright yellow spots like this. If you turn the leaf over you will see fuzzy purplish brown growth underneath each spot.

Below: Later, the yellow spots turn brownish but the underside of the leaves is still distinctive.

Time for Powdery Mildew Scouting and Control

Charles Bornt, CCE ENYCHP

Powdery mildew was seen at a low level in summer squash this week. This disease typically begins to develop when cucurbit plants start to produce fruit, or are sustaining another stress like the drought conditions we have been in the last couple weeks. I tend to always use yellow squash as my "indicator" crop as we usually see it in these plants first. Thresholds are 1 lesion out of 50 older leaves examined, and when you scout you need to pull away the leaves on top and get into the crown area where the older leaves are as this is where the first infections start. Too often growers start treatments too late because we are not looking in this area. Below is the list (Table 1) of Powdery mildew targeted fungicides recommended this season, with the top choices being Vivando, Proline or Procure, and Quintec. These need to be used in alternation and tank-mix with a protectant fungicide. You will note that Torino is no longer being recommended as disease tolerance/resistance has been detected throughout the northeast region with significant failures in Long Island according to our Cornell Vegetable Pathologist Meg McGrath.

Organic and conventional growers: Crystal is working with our new biocontrol specialists, Amara Dunn, to trial biological fungicides such as Serifel, LifeGard, and Regalia along with traditional controls to see if we can improve plant resistance to powdery mildew. Results of this trial will be explored during a meeting in late August and at the winter meeting. Stay tuned for more information!

A note on protectants this year: As many of you might have already found out or at least heard, chlorothalonil or the active ingredient in Bravo, Initiate and many other generic formulations is very, very short this year. Our Cornell Vegetable Pathologist Meg McGrath has had good luck with substituting sulfur materials such as Microthiol Dispress or JMS Stylet Oil for use as a protectant. I asked her about injury and she would recommend that you not follow these in succession but substitute something in between (like maybe chlorothalonil). She also was adamant **that neither of these materials be used on cantaloupes or cucumbers** as they are much more sensitive to these products. I would also advise that if you decide to use these products, apply them first thing in the morning or late in the evening to reduce any potential damage. And please note that even though mancozeb (Dithane, Roper etc.) is a protectant, it is not labeled for powdery mildew and should not be used.

For more specific information about the groups of different fungicides and more information on managing powdery mildew, please visit Meg McGrath's article on VegMD Online at: http://vegetablemdonline.ppath.cornell.edu/NewsArticles/Cuc_PM_2016.html

Week 1: Vivando plus protectant
Week 2: Quintec plus protectant (Not for use on edible peel crops such as summer squash, cucumbers)
Week 3: Procure/Rhyme/Proline or Luna Experience plus protectant (Be sure to use all of these at the highest labeled rates)
Week 4: Vivando plus protectant
Week 5: Quintec plus protectant (chlorothalonil)
Week 6: Procure/Rhyme/Proline or Luna Experience plus protectant

When necessary add in specific materials for Cucurbit Downy Mildew starting with Orondis when models put us into high risk or found in the region.

Organic recommendations: See the products in red for rates and more information. Adequate coverage of foliage is also necessary for good control of Powdery Mildew. Start applications as soon as fruit start to set! The materials listed below really have no systemic activity and need to be applied weekly **before Powdery mildew starts!**

Table 1: Recommended list of conventional (black fount) and organic (red font) fungicides labeled for Powdery Mildew Control in Pumpkins, Winter Squash and Gourds. Please be sure to read the labels of the products you are using – this table is not a substitution for the information contained on the label that is attached to the product container.

Fungicide	FRAC Code	Recommended Rate/Acre	REI	PHI	Seasonal Limits	Comments
Vivando (Metrafenone)	U6	15.4 fluid oz	12 hrs	0 days	3 applications	Do not mix with horticultural oils Do not apply more than 46.2 fl ozs/A per year. Do not make more than 2 sequential applications should be made before switching to another FRAC Code

Procure 480 SC (Triflumizole)	3	8 fluid oz	12 hrs	0 days	40 fluid ounces total	No more than 2 sequential applications should be made before switching to another FRAC Code
Proline 480 SC (Prothioconazole)	3	5.5 fluid oz	12 hrs	0 days	2 sprays	Recommend using a non-ionic surfactant
Rhyme (Flutriafol)	3	7.0 fluid oz	12 hrs	0 days	4 applications or 28 fluid ounces	
Quintec[1] (quinoxyfen)	13	6 – 8 oz per acre	12 hrs	3 days	4 applications or 32 fluid ounces	Do not use on edible peel cucurbits (ie: cucumbers, green and yellow summer squash) Do not apply more than two consecutive applications of Quintec before alternating to a different mode of action. The total number of group 13 fungicide sprays per crop should not exceed 50% of the total number of powdery mildew sprays.
Luna Experience[3]	7 & 3	17.0 fluid ounces	12 hrs	7 days	Do not apply more than 34.0 fluid ounces per acre per year	Do not make more than 2 sequential applications before switching to another fungicide not in Group 7 or 3 So do not use Procure, Proline or Ryhme following this material). Also has Gummy stem blight on the label at 10.0—17 fl ozs/acre
Chlorothalonil (Bravo or other labeled formulation)	M5	See specific label	12 hrs	0 days		Please note the "Special Eye Irritation Provisions" on the label
Regalia[2]	P5	1—4 quarts/ arce	4 hrs	0 days		Apply in 25 – 100 gallons of water per acre Use on a 7-10 interval
Trilogy[2]	NC	0.5—1%	4 hrs	0 days		Can be highly toxic to bees
JMS Stylet Oil[2]	NC	3—6 quarts per 100 gallons water	4 hrs	0 days		
Potassium Bicarbonate (MilStop, Armicarb, Kaligreen etc.)[2]	NC	2.5—5.0 lbs	Varies by Product – Read the label!			Please be sure to read the label of the particular product you have as rates and the use of spreader/stickers vary from one product to the next.
Actinovate AG[2]	NC	3—12 ozs	1 hr	0		Requires a spreader/sticker such as Nu-Film P or other approved material Use in 20-150 gallons of water/acre Apply on a 7-14 day schedule
Copper	Various formulations please see labels for more information					
Double Nickel 55 Biofungicide	NA	.25—3.0 lbs	4 hours	0 days		Use 0.25 –1.0 lb under low disease pressure and 1.0—3.0 under higher disease pressure.

[1] Do not use on edible peel cucurbits (summer squash, cucumbers).
[2] Approved for organic use, but be sure to double check with your certifying organization.
[3] There are multiple versions of Luna products labeled in NYS but only Luna Experience has the widest label for cucurbits.

Ode to the Leafhopper

Elizabeth Buck, CCE Cornell Vegetable Program

Roses are red
violets are blue
potato leafhopper
I do not like you.

A little green wedge
so cute you might seem
but to my sweet lil' crops
you are horribly mean.

My snaps and my dry beans,
and my potatoes – don't start!
To see crisped, curled leaf edges
it saddens my heart.

In my mind I imagine
an evil smile on your face
when you inject that toxin
into each leaf that you taste.

And why must you insist
on moving around
each time the alfalfa
is cut to the ground?
At least for the scouts
you create some small fun
whisking sweep nets about
while they walk in the sun.
Across the potato tops
five swings I must make
unless in snap or dry beans
where twenty swoops it takes.
For those who prefer
a more hands-on style
flip 50 leaves over
and count nymphs for a while.
Seed treatment fully protects
beans that emerge from the ground
in this case treat only
if little green nymphs are found.

Without Cruiser seed treatment
to keep the beans clean
Until bloom leaf hoppers
must seldom be seen.

In this case finding
one nymph per trifoliate leaf
or 100 adults per 20 sweeps
spells out probable future grief.
Now in the potato
the action threshold is less
15 nymphs on 50 leaves or
one adult per sweep is a mess.
An unfortunate nuisance
I believe it is true
natural enemies are often
insufficient to manage you.
So treat you I shall
if threshold you surpass
I promise to rotate
if the first control does not last.
Pyrethrin will work
to knock back the pest
a repeated application
is probably best.
Or I could choose
to go with some neem
azadirachtin is another
option that's green.

Systemic activity
will get the job done
though fungicide incompatibility
can happen with some.

Some of the insecticides used
have restrictions and such
Group 1A & B, 3A, and 4A
Read the label with this stuff.
Resistant varieties?
Some do exist
but only for potato
beans haven't the genetic gift.
Regarding aster leafhopper
your lettuce and carrot troubling friend
a few of the same products
their lives will end.
So in conclusion
I bid you adieu.
Potato leafhopper
I do not like you.

CLICK HERETO SIGN UP FOR OUR CCE ENYCHP TEXT ALERTS and stay in the know about pest outbreaks in our region!

https://mailchi.mp/7a7cc033546c/k24yc2ayt1

CCE Eastern New York Commercial Horticulture Program

Upcoming Events

July 2018

20 Minute Ag Manager Webinars:

All webinars run from 12:00 until 12:30.

To register, go to https://tinyurl.com/y9gfqbmx. *Registering once gives you access to the series.*

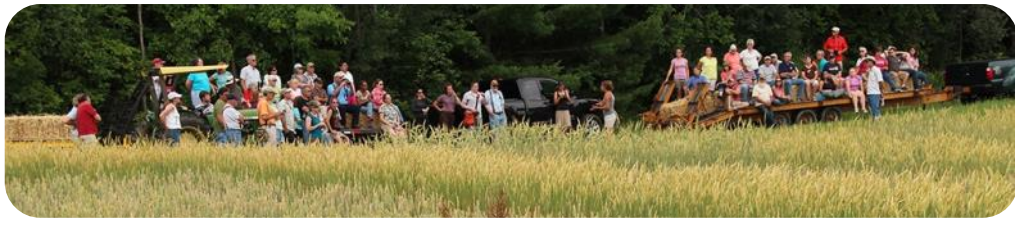
July: Managerial Accounting

- July 3—Budgeting 101
- July 10—Assessing a Capitol Investment
- July 17—Relevant Information and Sensitivity Analysis
- July 24—Pricing for Profit
- July 31—Know When to Hold'em, Know When to Fold'em

YouTube

Previous 20 Minute Ag. Manager sessions area now available on our ENYCHP YouTube—Learn the highlights in just 5 minutes!

July 31st, 2018– Reduced Tillage in Organic Systems Field Day 9am—3pm Cornell Willsboro Research Farm, free and open to the public, for question s call Amy Ivy at 518-570-5991 or adi2@cornell.edu, DEC Credits have been applied for.



Vegetable Specialists

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

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

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

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

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

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

Business Specialist

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

ENYCHP Office

518-746-2553
415 Lower Main Street
Hudson Falls, NY 12839
aef225@cornell.edu

Office Hours: Monday, Wednesday & Friday 8:30am– 4:00pm

Find us on Facebook