

More bad news! Late blight has been confirmed in 2 WNY counties in potato fields. All

of WNY is now at high risk of late blight infection!

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Purple blotch and Stemphylium leaf blight are the diseases of summer in onions. Learn

what to look for and how to manage these diseases.

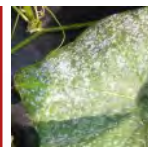
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How do organic high tunnel tomato growers manage nutrient dilemmas? Six emergent trends

and management suggestions are provided.

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With the wet conditions and cool nights, powdery mildew can be found on the edges of cucurbit

fields and in susceptible squash varieties.

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# VEGEdge

YOUR TRUSTED SOURCE FOR RESEARCH-BASED KNOWLEDGE

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*Photo: Missy Call*



**Cornell University**  
Cooperative Extension  
Cornell Vegetable Program

## Late Blight Confirmed in Livingston and Wyoming Counties!

*Carol MacNeil, CCE Cornell Vegetable Program*

Late blight (LB) was found and confirmed in the past week in commercial potato fields in Livingston and Wyoming Counties, about 10 miles apart. **All of Western NY and the Finger Lakes region is now at high risk of LB infection!** The July 1 Livingston County sample was determined to be US-23, virulent on both tomato and potato, and sensitive to mefenoxam (Ridomil, etc.) fungicides. Note from the 7/1/15 *VegEdge* Late Blight Risk article, from MSU plant pathologist W. Kirk: *2014 trials and field observations indicated mefenoxam applied protectively to [healthy] crops provided excellent LB control against US-23. Trials in 2013 indicated mefenoxam products applied to blighted foliage [with US-23] did not successfully prevent further disease development, however.* If LB lesions are easy to find, note that many more lesions will grow enough to become visible in a few days! LB has now been confirmed in FL potatoes and tomatoes (US-23), CA tomatoes (US-11), NC, WI, WA, and in the past few days in NJ and VT.



Late blight on potato, September 2013.  
*Photo: Carol MacNeil, Cornell Vegetable Program*

*continued on page 3*



**VegEdge** newsletter is exclusively for enrollees in the Cornell Vegetable Program, a Cornell Cooperative Extension regional agriculture team, serving 11 counties in Western New York.

The newsletter is a service to our enrollees and is intended for educational purposes, strengthening the relationship between our enrollees, the Cornell Vegetable Program team, and Cornell University.

We're interested in your comments. Contact us at:  
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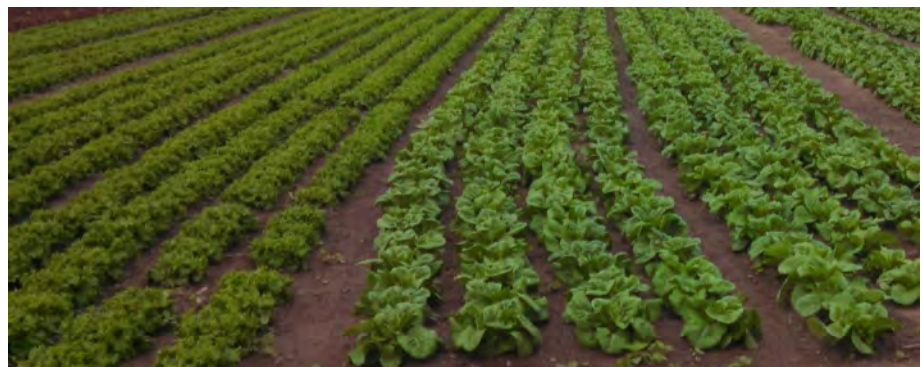
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*The next issue of VegEdge will be produced July 15, 2015.*



## <<< BREAKING NEWS >>>

### Fresh Market Potato Opportunity

*Carol MacNeil, CCE Cornell Vegetable Program*

The Little Potato Company of Canada is considering opening a packing plant in the Eastern US, expanding on their current PEI and Alberta locations. Their creamer and fingerling potatoes are in select supermarkets in the US, in 1.5 and 5 lb. bags, and in microwave and roasting trays. They contract with Canadian and US growers to produce top quality creamer and fingerlings (<=1 5/8" in diameter), using varieties developed in their own breeding program. Cornell plant breeder Walter DeJong has some of their varieties in trial near Ithaca this year. Contact Agronomist Steve Moorehead if you are interested at: [steve@littlepotatoes.com](mailto:steve@littlepotatoes.com) or 902-213-1540. For more info about the company and their Dutch roots go to: <http://littlepotatoes.com/> 



Continuing frequent rainfall has been extremely favorable for the development of LB for weeks. Scout fields twice a week. Destroy all potato culls, volunteers. Blight units (BU) in the chart are high or very high for all locations for the past week. The trigger in the LB Decision Support System (DSS) forecast for applying a fungicide is 30 BUs if the variety is susceptible, and the last fungicide used was chlorothalonil, mancozeb, Tanos, Curzate, Reason, Quadris Opti, Forum, Phostrol, or Headline(potato)/ Cabrio(tomato). All tomato and potato growers, conventional and organic, should be applying fungicides at no longer than 5-7 day intervals. (For less than 5 day intervals alternate fungicides. Follow the directions on the label!)

Ranman, Revus Top, Previcur Flex, and Presidio, and especially mefenoxam (Ridomil) fungicides (on sensitive LB strains) have longer residual activity than chlorothalonil, mancozeb, etc. fungicides. Gavel and Omega (potatoes only) also have somewhat longer residual. A protectant fungicide mixing partner is needed with all the longer residual fungicides except Revus Top, Gavel, and Ridomil ready-mixed products. Copper and Prophyt have somewhat shorter residual activity than chlorothalonil, etc.

**If LB is suspected act immediately!** LB develops very rapidly and can spread many miles in days.

- Check out the photos at: <http://livegpath.cals.cornell.edu/gallery/tomato/tomato-late-blight/>
- Contact a Vegetable Specialist ASAP.

**If you have experience identifying LB and find it, act immediately!**

- Save fresh foliage with dark lesions in a sealed plastic bag for confirmation and LB strain analysis, and contact a Vegetable Specialist ASAP.
- Kill LB hotspots and a 30 ft. border to stop spore production there.
- Spray the field with a LB fungicide, and maintain a very tight spray interval.

**CCE Cornell Vegetable Program Specialists:** Carol MacNeil at [crm6@cornell.edu](mailto:crm6@cornell.edu) or 585-313-8796 in Canandaigua, or the closest Specialist to you at: [http://cvp.cce.cornell.edu/contact\\_information.php](http://cvp.cce.cornell.edu/contact_information.php)

See the *2015 Cornell Integrate Crop and Pest Management Vegetable Guidelines*, for detailed recommendations. See the updated *2015 Organic Production and IPM Guide for Potatoes* at: [http://www.nysipm.cornell.edu/organic\\_guide/default.asp](http://www.nysipm.cornell.edu/organic_guide/default.asp) ●

## Bacterial Speck on Tomato

Darcy Telenko, CCE Cornell Vegetable Program

Bacterial speck is beginning to wreak havoc in a number of tomato fields. Bacterial speck is caused by *Pseudomonas syringae* pv. tomato. Initial leaf symptoms appear as black lesions, 1/8 to ¼ inch in diameter with a distinct yellow halo. This disease is of most concern from planting until first fruits are one third of their final size.

Management of bacterial speck and other bacterial diseases on tomato is limited. There are no resistant varieties. Two-year rotations away from tomato and pepper with nonhost crops

are recommended to reduce bacterial speck. Plant treated and/or certified seed and transplants. All plant stakes should be disinfested if they are to be reused, either by steam treatment or wash in bleach solution or disinfectant.

Copper compounds, Actigard, Tanos, and Gavel are a few products labeled for use in managing bacterial specks. Follow label guidelines for tank-mixing and rotation for resistance management. ●

**Late Blight Risk Chart, 7/7/15**

Location <sup>1</sup>	Blight Units <sup>2</sup> 7/01-7/07	Blight Units <sup>2</sup> 7/08-7/10	Location <sup>1</sup>	Blight Units <sup>2</sup> 7/01-7/07	Blight Units <sup>2</sup> 7/08-7/10
Appleton	35	17	Kendall	36	18
Arkport	54	21	Lodi	32	19
Baldwinsville	28	18	Lock/Niag F.	40	17
Bergen	23	17	Lyndonville	40	18
Buffalo	37	12	Medina	41	17
Butler	43	19	Penn Yan	52	18
Ceres	49	21	Rochester	40	16
Elba	54	12	Sodus	37	19
Farmington	44	19	Versailles	37	18
Gainesville	54	19	Wellsville	50	20
Geneva	46	19	Williamson	34	18

<sup>1</sup> Past week Simcast Blight Units (BU)

<sup>2</sup> Three day predicted Simcast Blight Units (BUs)



Late blight lesion on tomato.  
Photo: Meg McGrath, Cornell



Late blight lesion on potato showing sporulation on the underside of the leaf.  
Photo: Carol MacNeil, CVP



Tomatoes with severe bacterial speck infection.  
Photos: Darcy Telenko, CVP

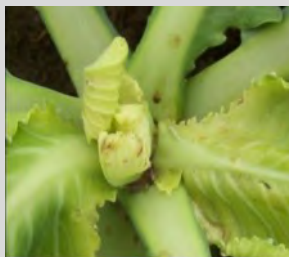
# CROP INSIGHTS

## BRASSICAS

Caterpillars continue to feed on un-protected plantings, and populations can be respectable. Black rot was detected this week. Aphid pressure is starting to rise on all crops - be sure to check any leafy brassica salad greens, kale, and radishes over the next few weeks.

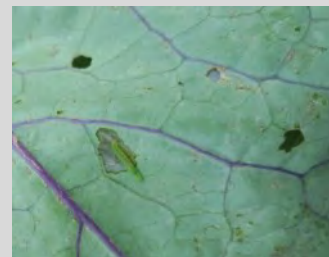
## CABBAGE & COLE CROPS

Flea beetles, diamondback moths (DBM), imported cabbage worms (ICW) and onion thrips are the main pests this week. The critical growth stage to control these worms is from the 8 leaf stage until head formation. Look for newly hatched larvae in the heart leaves where their feeding leaves tiny brown scarring (Fig. 1). Once they get bigger, they generally feed on the undersides of leaves making small irregular holes (windows) leaving the upper leaf surface intact (Fig. 2). This type of injury generally does not affect yield UNLESS populations are high or the feeding is in the heartleaves prior to head formation. When scouting, be sure to look at both the undersides of leaves as well as digging into the heart leaves. DBM wriggle when prodded and hang by a silk thread and ICW are sluggish and fuzzy. In seedlings, treatment is warranted if 20% (all worms included) of plants are infested. The threshold rises to 30% infestation in the early vegetative to cupping stage and then drops to 5% through harvest. Bts (Dipel, Xentari, etc.) are all very effective against ICW and can also be used for DBM at low populations. Avaunt, Radiant, Coragen, Voliam Xpress, Proclaim and Belt are also very effective against all the main worm pests and are recommended if high populations of DBMs appear. Pyrethroids are generally effective for ICW and flea beetles, but note that their use is sometimes associated with a buildup of DBM and aphids.



**Figure 1.** Brown scarring caused by worm pest feeding in the heart leaves of cabbage.

Photo: Christy Hoepting, CVP



**Figure 2.** Diamondback moth feeding (window paning) on undersides of leaves.

Photo: Christy Hoepting, CVP

## DRY BEANS

Planting of short season varieties continues in fields dry enough to work. Some earlier planted beans have 3 fully expanded trifoliates. Very low numbers of the first Western bean cutworm (WBC) moths have been caught.

## ONIONS & GARLIC

Garlic is dying back. Stemphyllium is present in several locations, and while not a big concern to the garlic, want to watch nearby onions for cross-over onto weak tissue. Thrips pressure is variable upland, some locations have very little and some locations could consider spraying. Beginning to see some leaf die-back due to bacterial rot.

A 5-day break from rainfall events has allowed the onion crop to green up and start growing again, and for the most part it is looking good with onion thrips and leaf diseases well under control. Fungicide programs that have been relying on Bravo for control of Botrytis leaf blight (BLB) are working very well, and BLB lesion counts were either down or holding from a week ago in treated fields. Seems as if we are over the hump for BLB. Onion thrips numbers increased this past week with the spray threshold of 1.0 thrips per leaf being exceeded in several direct seeded fields in Elba; not so much in Wayne County or Potter. Movento has been working tremendously well with a single application providing 2 to 3 weeks of control. It is expected that in these situations that the Movento is going to "run out of gas" very soon. If thrips have reached the spray threshold and it has been more than 3 weeks since the first application of Movento, for resistance management purposes, we recommend to abandon the second application of Movento and move to the next product in sequence with a different mode of action. This will ensure that not more than one generation of onion thrips is exposed to Movento in a row, assuming that a single generation lasts about 2 weeks. Next in sequence after Movento could be Agri-Mek SC 3.2 fl oz or Agri-Mek 0.15EC 14 fl oz or other EC generics (note the different rates with the different formulations), Radiant, Exirel or Lannate + Warrior. If thrips populations are 1.0 per leaf or less following Movento and there are more than 3 weeks remaining before onion harvest, then use one of the Agri-Mek products, because it has a 30 day PHI and if its use is delayed, it may no longer fit within its PHI. If thrips are greater than 2 per leaf, use Radiant. If the crop is within 2-3 weeks of harvest and thrips are 1.0 per leaf, you could use Lannate + Warrior and save Radiant for later when pressure is higher.

Unfortunately, Cornell studies have shown that when Radiant, Agri-Mek and Movento were combined with Chloronil 720 (same active as Bravo), thrips control was significantly reduced by 12 to 35%. Because of this tank-mix incompatibility, there is little opportunity to use Bravo later in the season, at least not in the same tank mix with the insecticides for thrips control. For transplanted onions, especially those that have started bulbing, it is recommended to consider using a spray program that provides preventative control of Stemphyllium leaf blight – see article, pg 6.

## PEPPER

Warm humid weather has also brought bacterial problems. Both pepper and tomato this week were infected with Bacterial Spot. Copper, with mancozeb, are the primary sprays for decreasing the spread of the disease. Fields should be rotated and minimum of 2 years away from peppers and tomatoes.



Bacterial spot on pepper.  
Photo: Judson Reid, CVP

continued on next page



## POTATO

See the “Late Blight Risk” section of this issue for information on the first **late blight** in NYS in 2015 in Livingston and Wyoming Counties.

Growers have been hilling and spraying when fields dry out enough to get in with equipment. Some aerial application of fungicides is being done. Potato foliage looks good, many fields are flowering, and many tubers have set on the earlier planted potatoes, except for those areas of fields that drowned out, and on the margin of those areas.

**Colorado potato beetle (CPB)** is present at all stages, from small to large larvae and occasional adults. They were also seen in one field of potatoes treated with a systemic neonicotinoid insecticide at planting. Be sure not to use a foliar insecticide like Admire Pro or generics, Endigo ZC, Actara, Assail or Leverage if a systemic seed or in-furrow insecticide treatment for CPB was used at planting, since they are all in the neonicotinoid Chemical Class. If you did not use a neonicotinoid at planting, and you do not have a resistance problem, then these insecticides are a good choice for one generation of CPB larvae only, and only every other year or so. Coragen, Radiant, Blackhawk or Rimon (supplemental label required) are other choices, especially against small to medium CPB larvae. If pyrethroids or Pyganic have not been used for CPB historically in your area they may work, especially on smaller larvae. Use each Chemical Class of insecticide on only one larval generation in a year to avoid the development of resistance. See the CPB multi-year insecticide rotation recommendation in the June 24 VegEdge.

If you’ve been targeting small larvae with Azera, Entrust, any azadirachtin/neem or any abamectin product, or Trigard, and you have primarily small larvae present, you may have one more chance to use one of those products, if you’re at threshold, before the larvae grow too large for good control. Don’t use Entrust more than twice in a row! Organic growers note that the *2015 Organic Production and Pest Management Guide for Potatoes* is now available at: [http://www.nysipm.cornell.edu/organic\\_guide/veg\\_org\\_guide.asp](http://www.nysipm.cornell.edu/organic_guide/veg_org_guide.asp)

## TOMATO

The big news in tomatoes is the appearance of Late Blight in Western New York – see cover article. This is US strain 23, which fortunately has a number of commercial varieties with listed resistance including Iron Lady, Mtn. Merit, Plum Regal, Jasper and Defiant PHR. Cultivar resistance coupled with a preventative spray program can extend harvest of marketable tomatoes despite the presence of late blight.

The disease pressure on tomatoes is high right now: Late Blight, Early Blight, Septoria and Bacterial diseases. Copper, with mancozeb, are the primary sprays for decreasing the spread of the Bacterial Spot.

Fields should be rotated and minimum of 2 years away from peppers and tomatoes.

Any spray program must consider all these diseases whether present on farm or not.

Verticillium wilt is also rearing its head in areas where this soilborne pathogen is present.

Occasional heavy, hot-spot pattern feeding is being reported. Two pests tend to be the culprits: Colorado potato beetle larvae and tomato fruitworm, which is actually just a corn earworm going under an alias. The fruitworm/earworm will drill directly into green and ripe fruit.



Bacterial Spot on tomato.  
Photo: J. Reid, CVP



Typical lesion of Verticillium wilt on tomato stem.  
Photo: Darcy Telenko, CVP



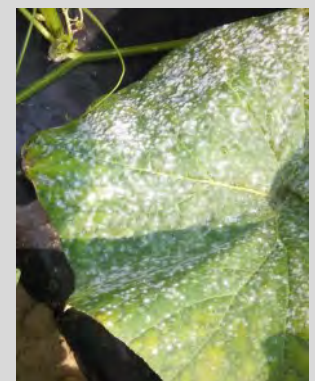
Tomato fruitworm AKA corn earworm. Photo: E. Buck, CVP

## VINE CROPS

Angular leaf spot continues to be found in many cucurbits including squash, cucumbers and melons. Hot spots of cucumber beetles continue to appear, so keep a close eye. We are starting to find bacterial wilt where the cucumber beetle is feeding and spreading this disease. Squash bug eggs are present, but not yet hatching along Lake Ontario.

Downy Mildew was identified in Orleans and Allegany Counties this week on cucumber. This makes the range between the three sites found in WNY to be quite wide therefore presume it is probably all over the place. The windy conditions on Tuesday followed by showers will just make this problem worse across the region. Keep up the treatments and tighten the schedules to stay ahead of this disease. Be ahead of the outbreak by keeping up the preventative treatments on cantaloupe plantings. See last week’s VegEdge cover article, 7/1/15, for more information about Downy Mildew.

With the wet conditions and cool nights, powdery mildew can be found on the edges of fields – see article, pg 9. This is especially true where tree lines cast shade in the mornings. Powdery mildew is also active on susceptible varieties of squash.



Powdery mildew on squash leaf.  
Photo: Darcy Telenko, CVP

# Management of Summer Leaf Diseases in Onion: Target Spot Diseases

Christy Hoepting, CCE 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.

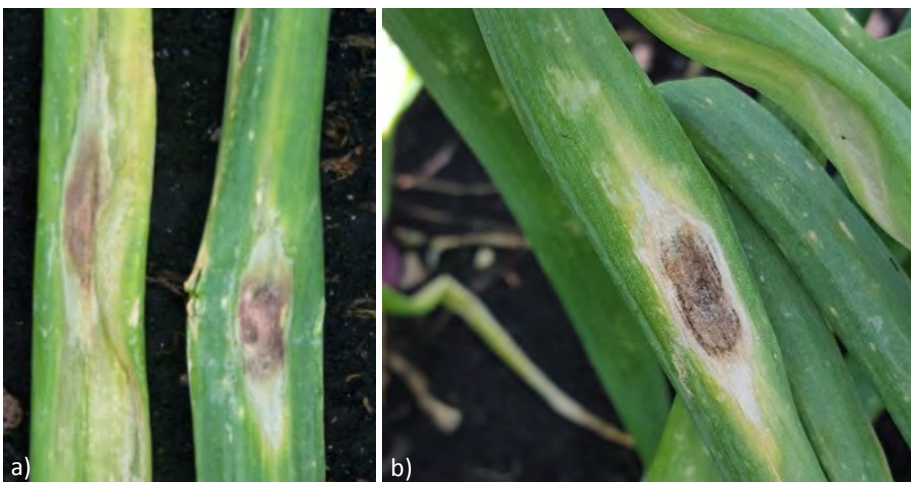
**Target spot diseases.** In the past, SLB has typically stayed in the necrotic tissue that is dying anyway, such as in necrotic leaf tissue that has been burned by herbicide or caused by downy mildew, and it tended to act as a secondary pathogen which would not exist if these situations had not occurred. 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



**Figure 1.** Onions “dying standing up” as a result of immature mortality caused by Stemphylium leaf blight disease. Photo: Christy Hoepting, Cornell Vegetable Program



**Figure 2.** Characteristic boat-shaped target spot purple (a) and black (b) lesions of Purple Blotch on otherwise green leaf tissue. Photos: Christy Hoepting, Cornell Vegetable Program



**Figure 3.** Extended lesions of Stemphylium leaf blight showing black sporulation. Photo: Christy Hoepting, Cornell Vegetable Program



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 NY. Of the other registered fungicides available in NY 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 [Cornell Fungicide “Cheat-Sheet” for Leaf Diseases in Onions in New York](#) online at [cvp.cce.cornell.edu](http://cvp.cce.cornell.edu)). 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. 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. ●

## 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 Pristine, 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 Pristine 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.

# High Tunnel Tomato Nutrient Management – Organic Sites

Judson Reid, CCE Cornell Vegetable Program



Fe deficiency in tomato related to high soil pH.  
Photo: Judson Reid, CVP



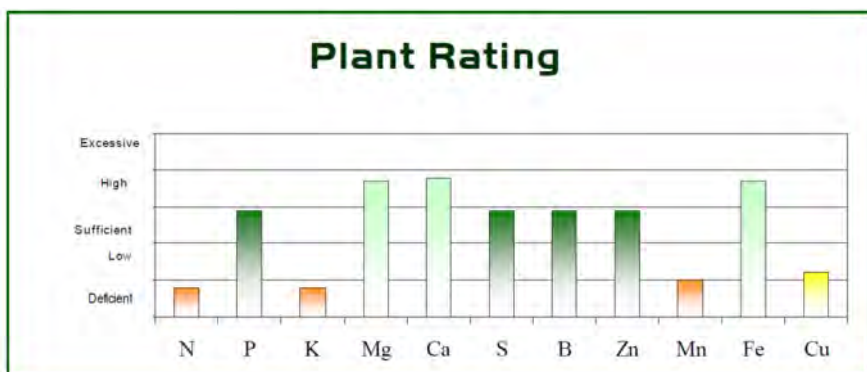
Mg deficiency in high tunnel tomatoes.  
Photo: Judson Reid, CVP



Flower drop in tunnel tomatoes. Low N, P, and/or K contribute to flower loss and poor quality fruit.  
Photo: Judson Reid, CVP

Six emergent trends at organic high tunnels!

1. High levels of organic inputs such as compost and manure lead to sky high levels of calcium, phosphorus and magnesium in the soil.
2. Water pH and alkalinity are high and often not managed (see previous installment).
3. Soil pH trends upwards due to high Ca content of certified organic fertilizers and the above mentioned water.
4. Mid-to-late season macro-nutrients such as nitrogen and potassium become deficient.
5. Yield loss due to flower drop and poor fruit quality.
6. High tomato cull rates negatively affects local chicken feed sales volume.



**Figure 1.** High calcium and magnesium along with low nitrogen and potassium. A common nutrient dilemma in organic high tunnel tomatoes.

Without the highly available, and often isolated, nutrients available to conventional growers, how do we approach this challenge in an organic high tunnel?

1. Soil test annually if not more often. Informed decisions require information.
2. Use high calcium inputs, including compost, in moderation, if at all.
3. Keep a close eye on soil pH and apply sulfur in the fall if there is an upward trend.
4. Apply macronutrients pre-plant. This means 100% of N, P, and K requirements (see side bar for certified forms).
5. Foliar test in season and make corrections with soluble materials (see side bar for certified forms).
6. Have a plan to rotate your high tunnel site to fresh soil every 2-3 years.
7. Harvest high quality tomatoes for human consumption, not chicken feed.

## HIGH TEST OMRI LISTED FERTILIZERS

Pre Plant-Alfalfa, Soy and Feather meal for Nitrogen

Pre Plant for pH-Elemental Sulfur

Rock Phosphate (analysis varies, not soluble)

Sodium Nitrate 16-0-0 (soluble for injection)\*

Sulfate of Potash (0-0-52, (soluble for injection))

Magnesium sulfate (10% Mg-best applied foliar)

*This information is a synthesis of several projects funded by New York Farm Viability Institute, Specialty NYSDAM Crop Block Grants and CU Federal Formula Funds, and NNY Agricultural Development Program. Any opinions, findings, conclusions, or recommendations expressed in this publication are those of the author(s) and do not necessarily reflect the view of the U.S. Department of Agriculture. 🍅*



# Powdery Mildew in Cucurbits

Elaine Roddy, OMAFRA; originally published 7/22/11

[Powdery mildew has been reported in several squash fields in the Ontario, Canada region as of July 6. ed. E. Roddy, OMAFRA]

Unlike many fungal pathogens, powdery mildew does not require prolonged leaf-wetness for infection to occur; in fact spores may germinate at humidity levels as low as 20%! The development of this disease does slow down at temperatures above 30C [86F]. However, slightly cooler night-time temperatures may result in an unexpected infection period.

Fungicide efficacy is optimized when they are used preventatively. Scout fields regularly and initiate a spray program no later than the first sign of infection. Look for small, white powdery lesions on the underside of the leaf surface (Figure 1). Symptoms typically first appear on the leaves in the mid-portion of the plant or on the stems.

It is important to keep all new growth adequately protected. The leaves are most susceptible to infection 16-23 days after unfolding. Pumpkins and squash are particularly susceptible to powdery mildew. Uncontrolled infections result in premature defoliation, smaller fruit sizes and lower sugar levels.

[For more on cucurbit powdery mildew, including targeted fungicides and recommended protectant fungicides, check out Veg MD Online: <http://vegetablemdonline.ppath.cornell.edu/NewsArticles/Cucurbit%20Powdery%20Mildew%20MGT%202013v2.pdf> ed. R. Hadad, CVP] ●



Figure 1. Powdery mildew on lower leaf surface  
Photo: OMAFRA

## WNY Sweet Corn Trap Network Report, 7/7/15

Marion Zuefle, NYS IPM Program; <http://sweetcorn.nysipm.cornell.edu>

Numbers remain low throughout Western NY. Only two sites reporting European corn borer (ECB)-E and five sites reporting ECB-Z. Corn earworm (CEW) was caught at three sites this week. All three sites had trap catches low enough to not require a spray. Only Eden reporting Fall armyworm (FAW) this week. Western bean cutworm (WBC) is beginning to appear, with a few sites reporting one moth each.

Michigan State University recommends scouting for WBC egg masses when cumulative trap catch numbers reach 100 moth/trap for field corn, however egg masses have been found in sweet corn when trap catches were still in the single digits. Therefore it is recommended that all fields that are in the whorl or early tassel stage be scouted for egg masses with a 4% threshold for processing sweet corn and a 1% threshold for fresh market sweet corn. WBC will usually lay eggs on the upper side of the top 1-3 leaves of pre-tassel corn, close to the leaf base. After tasseling has finished WBC seek out younger corn or dry beans. To scout for egg masses check the top 3 leaves of ten corn plants in ten locations throughout the field. The eggs are easy to observe if you view the leaf while holding it towards the sun. The egg mass will appear as a distinct shadow.

It takes between 5-7 days for eggs to hatch. It is critical that sprays are timed before the larvae have a chance to enter the ear. The egg mass will become purple in color approximately 24 hours before egg hatch. See the [western bean cutworm fact sheet](#) and [ID card](#) for additional photos of egg masses and larvae. ●

### WNY Pheromone Trap Catches: July 7, 2015

Location	ECB-E	ECB-Z	CEW	FAW	WBC	DD to Date
Baldwinsville (Onondaga)	0	0	0	0	1	1017
Batavia (Genesee)	0	1	0	0	1	772
Belfast	0	3	0	0	0	930
Bellona (Yates)	NA	NA	NA	NA	NA	1115
Eden (Erie)	0	0	1	1	1	951
Farmington (Ontario)	0	0	0	0	0	974
Hamlin (Monroe)	1	2	0	0	0	950
LeRoy (Genesee)	0	1	1	0	0	924
Lockport (Niagara)	0	0	0	0	1	950
Pavilion	0	0	0	0	0	924
Penn Yan (Yates)	0	0	0	0	0	1069
Seneca Castle (Ontario)	0	0	0	0	0	992
Spencerport (Monroe)	0	2	1	0	0	1086
Waterport (Orleans)	0	0	0	0	0	950
Williamson (Wayne)	2	0	0	0	0	898

ECB - European Corn Borer

CEW - Corn Earworm

FAW - Fall Armyworm

WBC - Western Bean Cutworm

NA - not available

DD - Degree Day (modified base 50F) accumulation

Average corn earworm catch			
Per Day	Per Five Days	Per Week	Days Between Sprays
<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°F for the previous 2-3 days.

# Monitor Herbicides Rotational Restrictions and Drift to Avoid Plant Injury

Darcy Telenko, CCE Cornell Vegetable Program

Many residual herbicides have the potential to persist in the soil providing a longer window of weed control. As a consequence herbicide residuals may remain active in future growing seasons and could injure or kill in susceptible crops when planted. The length of time a herbicide will remain in the soil varies with climate conditions, soil type and production practices. A number of commonly used herbicides in vegetable production have rotational restrictions. If you are growing a diverse array of crops you need keep a close eye on these restrictions – careful reading of labels, documenting herbicide application dates, and careful planning can help you avoid future issues in your rotation scheme. (See the table for reference on a few herbicides with rotational restrictions).

In addition, lately I have seen a lot of herbicide injury to plants caused by drift. When planting numerous crops in close proximity caution must be taken to limit drift when applying herbicides. Application of pesticides in the evening when wind speeds are lower, use of a hooded sprayer, and increasing droplet size all can help reduce the potential for drift. Herbicide drift injury may

mimic other problems, but the biggest indicator of herbicide injury is that the problem will not spread like a disease. The initial injury takes place and all new growth should not be affected as long as the injury wasn't severe.

**Table 1.** Common Vegetable Herbicides with Crop Rotation Restrictions

Herbicide	Common name	Rotation Restriction (months after application)				
		Dry bean	Sugar beet	Potato	Cucumber	Tomato
AAtrex	Atrazine (1 lb a.i./A)	21	21	10	21	21
Callisto	mesotrione	18	18	10	18	18
Clarity	dicamba	4	4	4	4	4
Dual Magnum	metolachlor	0	FS*	0	FS	6
Eptam	EPTC	0	10	10	10	10
Impact	topramezone	18	18	9	18	18
Laudis	tembotrione	10/18	10/18	10	18	10
Lorox	linuron	4	4	4	4	4
Matrix	rimsulfuron	10	18	0	10	0
Optill	saflufenacil + imazethapyr	4	40	26	40	40
Outlook	dimethenamid	0	10	10	10	10
Permit	halosulfuron	0	21	9	9	8
Princep	simazine	21	21	21	21	21
Prowl	pendimethalin	0	12	10	10	10
Raptor	imazamox	0	18	9	9	9
Reflex	fomesafen	0	18	18	18	18
Sharpen	saflufenacil	6	6	6	6	6
Sonalan	ethalfluralin	0	8/13	10	10	10
Stinger	clopyralid	10.5	0	18	18	18
Treflan	trifluralin	0	12	5	5	5

This table is a general guideline for crop rotational restrictions. Herbicide persistence and carry-over potential are variable and dependent upon soil and environmental conditions. Consult herbicide label for further information. Adapted from 2012 MSU Weed Guide <http://www.msuweeds.com/assets/2012WeedGuide/2012WGTable12new.pdf>

\*FS= rotational crops may be planted the following spring. ●

## UPCOMING EVENTS *view all Cornell Vegetable Program upcoming events at [cvp.cce.cornell.edu](http://cvp.cce.cornell.edu)*

### Vegetable Pest and Cultural Management Field Meetings

July 21, 2015 | 6:00 PM - 8:00 PM

Allegany County – Ernest Giroud farm, 10431 County Rd 23, Fillmore, NY 14735

July 22, 2015 | 6:00 PM - 8:00 PM

Orleans County – Stephen Martin farm, 2352 Oak Orchard River Rd, Medina, NY 14103

July 24, 2015 | 6:00 PM - 8:00 PM

Yates County – Howard Hoover farm, 2845 Swarthout Rd, Penn Yan, NY 14527

August 12, 2015 | 7:00 PM - 9:00 PM

Seneca County – Jesse Stoltzfus farm, 5907 Rt 414, Romulus, NY 14541

These courses will demonstrate pest management in fresh market vegetables in both field and greenhouse (high tunnel) vegetables; primarily for those growing for wholesale auction. A hands-on demonstration of weed, insect and disease identification in vegetables including management options such as inter-row cover crops, grafting and where appropriate, spray options will be used to educate growers. Judson Reid, Senior Extension Associate with the Cornell Vegetable Program along with CCE associates Darcy Telenko, Robert Hadad and Elizabeth Buck will instruct participants and facilitate peer-based learning. Details on each topic will focus on field observations at these farms.

DEC recertification credits will be offered. No cost to attend. Contact Judson Reid at 585-313-8912 for more information.





## Weather Charts

John Gibbons, CCE Cornell Vegetable Program

### Weekly Weather Summary: 6/30 – 7/6/15

Location	Rainfall (inch)		Temp (°F)	
	Week	Month July	Max	Min
Albion	0.27	0.16	88	49
Appleton, North	0.23	0.05	81	48
Baldwinsville	1.46	0.53	83	49
Buffalo*	0.58	0.52	85	50
Butler	1.57	0.28	83	49
Ceres	1.00	0.19	82	49
Elba	0.74	0.37	82	44
Farmington	0.37	0.27	84	46
Gainesville	1.14	0.40	84	42
Geneva	0.92	0.40	82	51
Lockport	NA	NA	NA	NA
Lodi	0.06	0.03	85	46
Penn Yan*	0.56	0.46	82	51
Rochester*	0.55	0.25	85	51
Romulus	NA	NA	80	48
Silver Creek	0.22	0.09	82	47
Sodus	1.46	0.58	83	46
Versailles	NA	NA	84	46
Williamson	0.01	0.00	82	49

### Accumulated Growing Degree Days (AGDD) Base 50°F: April 1 – July 6, 2015

Location	2015	2014	2013
Albion	1000	958	977
Appleton, North	802	804	834
Baldwinsville	1017	1053	1020
Buffalo	1020	984	1071
Butler	1038	1023	1026
Ceres	903	863	857
Elba	772	781	903
Farmington	974	971	932
Gainesville	805	774	NA
Geneva	992	993	982
Lockport	NA	894	NA
Lodi	1115	1092	1129
Penn Yan	1069	1052	1064
Rochester	1086	1066	1103
Romulus	1012	1008	NA
Silver Creek	917	916	1005
Sodus	883	930	NA
Versailles	951	940	1023
Williamson	898	918	945

\* Airport stations

\*\* Data from other station/airport sites is at: <http://newa.cornell.edu/> Weather Data, Daily Summary and Degree Days.

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VegEdge is the award-winning newsletter produced by the Cornell Vegetable Program in Western New York. It provides readers with information on upcoming meetings, pesticide updates, pest management strategies, cultural practices, marketing ideas and research results from Cornell and Cornell Cooperative Extension. VegEdge is produced every few weeks, with frequency increasing leading up to and during the growing season.



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