Common pests of cole crops – diamondback moth, cabbage looper, and imported cabbage worm – also target high tunnel Asian greens.

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VEGEdge

YOUR TRUSTED SOURCE FOR RESEARCH-BASED KNOWLEDGE

Volume 13 | Issue 10 | June 14, 2017

Cornell University
Cooperative Extension
Cornell Vegetable Program

Spinach harvest in Western NY, June 2015. *Photo: Julie Kikkert*

Cabbage Worms in High Tunnel Greens

Judson Reid, CCE Cornell Vegetable Program

Many Asian greens grown in spring high tunnels are attractive to the pests common to cole crops outside: Diamondback Moth, Cabbage Looper and Imported Cabbage Worm. Since high tunnels offer a warmer environment and plenty of desired hosts, these pests can overwinter and develop rapidly inside high tunnels in the spring. Their feeding, droppings and presence can all make high tunnel greens unmarketable. Scout for these pests now, particularly as greens near harvest stage. To control these pests, effective spray materials must be labeled for greenhouse use. These include:

- Bts (Dipel, Xentari, Javelin)-0D PHI
- Baythroid XL-0D PHI
- Entrust-1D PHI

Cabbage worm on high tunnel Asian greens. Their presence, feeding damage, and frass can make the greens unmarketable. *Photo: Judson Reid, CCE CVP*

VegEdge newsletter is exclusively for enrollees in the Cornell Vegetable Program, a Cornell Cooperative Extension regional agriculture team, serving 13 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.

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The next issue of VegEdge will be June 21, 2017.

Seneca County sweet corn ready for transplant, June 10, 2017. *Photo: Judson Reid, CCE CVP*

Powdery Mildew in Peas

Kate Everts, Vegetable Pathologist, University of Delaware and University of Maryland; from University of Delaware Cooperative Extension, Weekly Crop Update, Vol. 25, Iss. 11, 6/9/17

[Powdery mildew of peas is uncommon in NY in most years. However, it is being reported in Ontario, Canada and on the Delmarva this season. I am interested to hear if anyone has seen this locally. Hopefully, weather conditions will be less favorable for the disease going forward. ed. J. Kikkert, CCE CVP]

Pea powdery mildew is currently widespread on Delmarva. This disease occurs throughout the US. The pathogen can overwinter in debris, on alternate hosts, or (less commonly) be seedborne. Because the pathogen is widespread, high disease severity occurs when conditions are favorable. Powdery mildew is favored by nights with dew, moderate temperatures (68-75F), and low light intensity. These conditions have prevailed in Maryland and Delaware for the last several weeks. Powdery mildew infestations can lead to uneven ripening of the crop, and yield loss (fewer peas per pod, lowered pea weight, etc.). Quality losses also occur. Several pea cultivars that are resistant to powdery mildew are available, and should be used if possible. Fungicides that are registered for management of powdery mildew include sulfur, which needs to be applied at 3 to 10 lbs/A, and Endura and Priaxor. These fungicide treatments can be costly because two applications at a 10 day interval may be needed.

Powdery mildew on succulent peas.
Photo: J. Lewis

WNY Sweet Corn Trap Network Report, 6/13/17

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

There were seventeen sites reporting this week. European corn borer (ECB)-E was trapped at three sites and ECB-Z was trapped at five sites. The five sites that had ECB-Z were all located in eastern NY. Four sites reported corn earworm (CEW) with the Eden site trap catch high enough to be on a 4 day spray schedule. Fall armyworm (FAW) was trapped at two sites. Several sites have now deployed their Western bean cutworm (WBC) traps, but so far no sites have trapped WBC.

Most sites are well within the growing degree range for peak flight and are approaching the first generation treatment period. This years flight for ECB-E has been very low but continue to scout for any signs of eggs, larvae or feeding damage. The treatment threshold at tassel emergence is 15% infested plants.

Several reports have come in regarding damage attributed to armyworm. The damage is very similar to fall armyworm but the larvae were identified as true armyworm. Larvae can be distinguished by the prominent inverted 'Y' on the head of fall armyworm which is not present on true armyworm (see photos). For more information on true armyworm and the risk to sweet corn please see this recent post by Michigan State University at http://tinyurl.com/MSUarmyworm

True armyworm larva does not have inverted 'Y.

Fall armyworm larva. Note the prominent inverted 'Y' on head.

True armyworm damage.

Fall armyworm damage.

WNY Pheromone Trap Catches: June 13, 2017

Location	ECB-E	ECB-Z	CEW	FAW	WBC	DD to Date
Baldwinsville (Onondaga)	NA	NA	NA	NA	NA	708
Batavia (Genesee)	0	0	1	0	0	654
Bellona (Yates)	NA	NA	NA	NA	NA	774
Eden (Erie)	0	0	9	0	0	763
Farmersville (Cattaraugus)	0	0	0	0	0	591
Farmington (Ontario)	0	0	0	0	NA	696
Hamlin (Monroe)	NA	NA	NA	NA	NA	603
LeRoy (Genesee)	NA	NA	NA	NA	NA	668
Pavilion	NA	NA	NA	NA	NA	591
Penn Yan (Yates)	0	0	0	0	0	725
Ransomville (Niagara)	0	0	0	0	0	692
Seneca Castle (Ontario)	12	0	0	0	0	694
Williamson (Wayne)	NA	NA	NA	NA	NA	617

ECB - European Corn Borer
CEW - Corn Earworm
FAW - Fall Armyworm
WBC - Western Bean Cutworm
NA - not available
DD - Degree Day (modified base 50F) accumulation

Fungicide Recommendations for Botrytis Leaf Blight in Onion Featuring 2016 Fungicide Trial Results

Christy Hoepting, CCE Cornell Vegetable Program

In 2016, a fungicide trial was conducted in a commercial onion field in muck soil in Sodus, NY in yellow direct seeded onions, c.v. Safrane to evaluate the relative efficacy of selected fungicides for their control of Botrytis leaf blight (BLB). Treatments began on June 21 when BLB pressure reached 0.5 BLB lesions per leaf and continued every 7-8 days for seven consecutive weeks until the onions started to lodge on Aug-2. BLB disease pressure was moderate with a mean count of 38 BLB lesions per 3 outer leaves per plant in the untreated control on Aug-2 (data not shown). A BLB disease score was comprised of six BLB evaluations including lesions counts, lesion size and density ratings and overall BLB control rating per plot. Low disease score indicates less disease while high disease score indicates a lot of disease. In 2016, the untreated control had the highest disease score (102), which was almost 8-times higher than the best treatment (13.3) (Table 1).

Bravo is still the best for BLB

Historically, in on-farm fungicide trials conducted in commercial onion fields (Hoepting 2006-2013), Bravo has had the best efficacy against BLB. In 2016 trial, the best treatment in the trial was Bravo 1.5 pt + Scala 9 fl oz, which represented 87% disease control compared to the untreated, and was not significantly different than Bravo 3 pt or Bravo 1.5 pt. Of the four treatments that included Bravo, three of them placed within the top five lowest disease scores.

How well do the best Stemphylium leaf blight fungicides control BLB?

The top performing fungicides for control of Stemphylium leaf blight (SLB) in New York field trials have been Luna Tranquility, Merivon, Inspire Super, Fontelis (not labeled in NY) and Quadris Top (Hoepting 2013-2016). Of these, for BLB control in 2016 trial, Merivon (Fig. 1) was not significantly different than the best treatment and had the third lowest disease score representing 79% control. Luna Tranquility was not significantly different than Bravo 3 pt (76% control). Based on these results, it is expected that both **Merivon and Luna Tranquility would provide satisfactory control of BLB.** Alternatively, **Quadris Top** (Fig. 1) and Inspire (not labeled as a single active in NY) **failed to control BLB** and were not significantly different than the untreated (Table 1). With these exceptions, all other SLB fungicides provided some control of BLB. Fontelis was not significantly different than Merivon (68% control), but Inspire Super was not significantly different than Quadris Top (57% control).

Table 1. Efficacy of selected fungicides for control of Botrytis Leaf Blight (BLB) in order from best to worst control: Field Trial in Sodus, NY, 2016.

Fungicide and Rate/A[1]	FRAC[2] Group	Mean BLB Score[3]		
Bravo 1.5 pt + Scala 9 fl oz	M5, 9	13.3	i[4]	Not significantly different than the best treatment
Bravo 3 pt	M5	17.3	hi	
Merivon** 9 fl oz	7, 11	21.2	ghi	
Bravo 1.5 pt	M5	24.0	e-h	
Scala 9 fl oz (A-G) + Rovral 1 pt	9,E3	24.1	ghi	
Luna Tranquility* 16 fl oz	7, 9	24.5	fgh	
Inspire Super** 20 fl oz + Rovral 1 pt	3, 9, E3	25.0	e-h	
Bravo 1.5 pt + Dithane 75DF 3 lb	M5, M3	32.1	d-g	
Fontelis** 1.5 pt	7	32.1	d-g	
Endura 6.8 oz	7	34.0	d-g	
Tilt 8 fl oz	3	37.7	c-g	
Inspire Super** 20 fl oz	3, 9	44.2	b-f	
Rovral 1.5 pt	E3	44.8	b-e	
Switch 14 fl oz	9, 12	49.7	bcd	
Inspire 7 fl oz	3	74.9	ab	Not significantly different than the untreated
Quadris Top** 14 fl oz	3, 11	78.6	abc	
Untreated control	--	102.3	a	
P value (α=0.05)		***<0.0001***		

[1] All treatments applied A-G: A - 21 Jun; B - 29 Jun; C - 6 Jul; D - 13 Jul; E - 20 Jul; F - 27 Jul; G - 2 Aug. All treatments applied with nonionic surfactant Induce 0.125% v/v A-C and Activator 90 0.125% v/v E-G. spray volume: 40 gpa; pressure: 28-30 psi.

[2] **FRAC:** Fungicide Resistance Action Committee chemical class group.

[3] **BLB Score (6 data points):** [6 Jul No. BLB lesions/plant] + [20 Jul No. BLB lesions/plant] + [2 Aug No. BLB lesions/plant] + [2 Aug (BLB lesion size rating scale 9-5/plant) x 10] + [Aug 2 (BLB density rating scale 0-5/plant) x 10] + [19 Aug visual disease control rating/plot]; lower score = low disease and vice versa.

[4] Numbers in a column followed by the same letter are not significantly different, Fisher's Protected Least Significant Difference test ($p<0.05$).

**Top-performing fungicide for control of Stemphylium leaf blight (Hoepting 2013-2016).

Rovral to the rescue

Rovral alone provided only mediocre control of BLB (56% control), which is similar to previous field trial results (Hoepting 2006-2011) and to Inspire Super in 2016 trial. However, when it was tank mixed with Inspire Super, BLB disease score was reduced by 44% and was not significantly different than Bravo 3 pt and Inspire Super + Rovral provided 75% control. Similarly, Rovral + Scala was not significantly different than the best treatment (76% control). Although not trialed in 2016, in previous studies, Scala alone has only provided medicore control of BLB; however, Bravo 1.5 pt + Scala 9 fl oz has always been a top performer for controlling BLB. Based on these results, **to achieve satisfactory results of BLB when using Inspire Super and Quadris Top, Rovral 1 pt may be added to the tank mix**.

continued on next page

Figure 1. Two fungicides with excellent control of Stemphylium leaf blight had very different efficacy on Botrytis leaf blight: Merivon (left) had very good control of BLB, while Quadris Top (right) failed to control BLB as noted by the leaves being riddles with BLB lesions. 2016 fungicide trial (Hoepting, 2016).
Photos: C. Hoepting, CCE CVP

Alternatives for Bravo for BLB to solve the Bravo-Movento tank mix dilemma
Several years ago Cornell studies showed that when insecticides for control of onion thrips (OT), Movento, Agri-Mek and Radiant were tank mixed with Chloronil 720 (generic version of Bravo), thrips control was significantly reduced by 12 to 35%. So, the dilemma is that when it is desired to use Bravo for best control of BLB and Movento for best control of OT in the same tank mix, that it would be at the expense of Movento's ability to achieve optimal thrips control.

Based on 2016 trial results, alternative to Bravo for BLB when using OT insecticides include:

- Merivon
- Luna Tranquility
- Inspire Super + Rovral 1 pt
- Scala 9 fl oz + Rovral 1 pt
- Quadris Top + Rovral 1 pt (theoretically, not field trialed)

Note, mancozeb and Quadris do not control BLB
In previous field trials (Hoepting 2006-2011), both mancozeb and Quadris failed to control BLB. In 2016 trial, Quadris Top failed to control BLB. Quadris Top is essentially Quadris + Inspire and since Inspire also failed to control BLB, we can conclude that the Quadris component of Quadris Top also failed to control BLB. In general, FRAC 11 fungicides like Quadris, are not expected to control BLB. In 2016, although mancozeb alone was not trialed, when it was used in combination with Bravo 1.5 pt, Bravo 1.5 pt + mancozeb did not further reduce BLB score, in fact it was higher indicating again that mancozeb has no activity on BLB. **Switch (FRAC 9, 12), also performed poorly for BLB in this trial.**

Fungicide Recommendations for Control of BLB in Onion

- Scout for BLB and start spraying when threshold of 1 BLB per leaf is reached (see last week's issue of Veg Edge for scouting tips)
  - ◊ Apply Bravo 1.5 – 3 pts
- When threshold is reached to apply Movento for onion thrips:
  - ◊ If no SLB:
    - ♦ Scala 9 fl oz + Rovral 1 pt (as a substitute for Bravo)
  - ◊ If SLB:
    - ♦ Merivon
    - ♦ Luna Tranquility
    - ♦ Inspire Super + Rovral 1 pt
    - ♦ Quadris Top + Rovral 1 pt
- Continue to apply fungicides for BLB as long as disease is present

Late Blight Risk – Severity Values Continue to Accumulate

Darcy Telenko and John Gibbons, CCE Cornell Vegetable Program

Late blight severity values have reached the threshold with current station data or with forecasted dated at all locations, except five (Ceres, Fairville, Geneva, Kendall, and Lodi). The threshold for risk is 18 SVs and within about a week of reaching 18 SVs growers need to apply fungicide on all potatoes 4+ inches tall, and on all field tomatoes, to protect them against late blight. Once you've applied your first fungicide, use Simcast or early blight P-Days to help schedule your fungicide applications for the remainder of the season.

There are no new late blight confirmations this week. We will continue to watch the national occurrence map to track late blight movement.

Late Blight Severity Values* 6/13/17

Location*	Total	Forecast 6/14-6/16	Location	Total	Forecast 6/14-6/16
Albion	36	5	Lodi	0	2
Baldwinsville	20	2	Lyndonville	16	2
Bergen	17	1	Medina	18	3
Buffalo	26	4	Niagara Falls	22	3
Ceres	5	2	Penn Yan	19	2
Elba	19	2	Rochester	26	3
Fairville	9	1	Sodus	21	0
Farmington	16	2	Versailles	22	3
Gainesville	48	4	Volney	27	3
Geneva	0	1	Wellsville	22	2
Kendall	14	1	Williamson	17	2
Knowlesville	53	2	Wolcott	22	2

* Severity value accumulations start 5/12/2017

Considering Phostrol (and Other Like Fungicides) for Potato Disease Control

Amanda J. Gevens, Associate Professor & Extension Vegetable Plant Pathologist, University of Wisconsin-Madison;
from Vegetable Crop Update, No. 8, 6/10/17

[Here is a great article from the Univ. Wisconsin Vegetable Crop Update. We have seen mixed results with phosphorous acid fungicides for different diseases but when it does work, it seems to do a good job. ed. R. Hadad, CCE CVP]

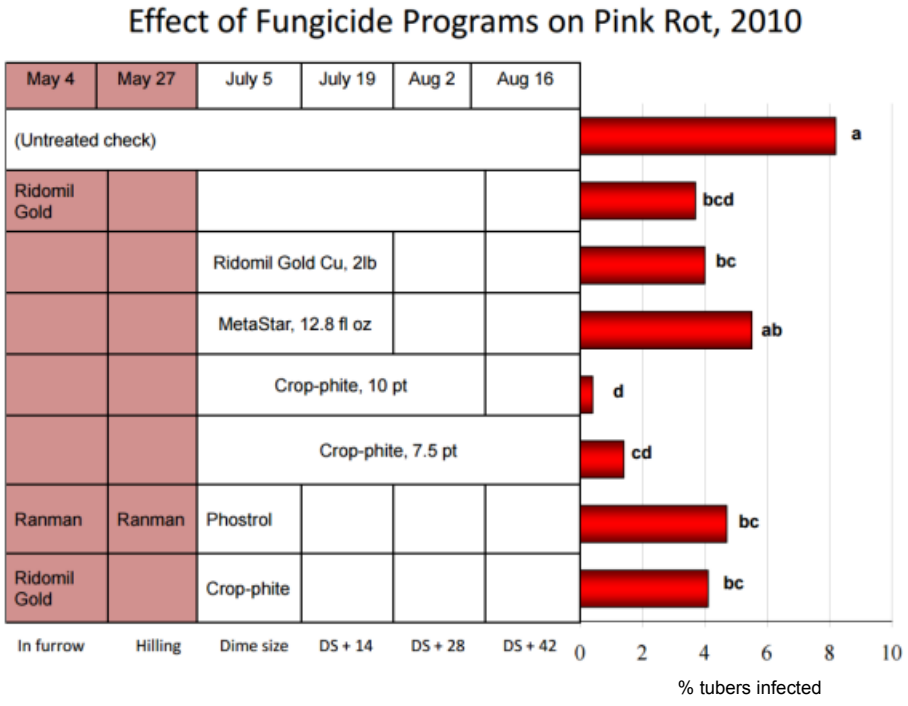
How do the phosphorous acid fungicides differ from phosphoric acid compounds?
Both phosphor**ic** acid (H3PO4) and phosphor**ous** acid (H3PO3) are agrochemicals useful in crop production. Under normal plant growth conditions, both agrochemicals dissociate and exist as corresponding anions, **phosphate** and **phosphite**, consecutively.

The distinction between the two: phosphate is a nutrient source of P essential for plants, and phosphite helps control diseases caused by oomycetes (water mold pathogens). Phosphate and phosphite are not equivalent inside the plant. Phosphoric acid or phosphate cannot function as phosphorous acid or phosphite and *vice versa*. Since phosphites are systemic and very stable in plants, they should not be applied frequently. To manage the development of phosphite-resistant oomycetes, care should be taken to alternate or mix phosphites with other effective fungicides. The fungicide labels for phosphorous acids typically do not provide a season limit per acre/crop because they are exempt from the requirement of tolerances.

How do phosphorous acids work as fungicides?
Phosphorous acids can control diseases caused by Oomycete (water mold) pathogens such as *Phytophthora erythroseptica* (pink rot) and *Phytophthora infestans* (late blight). Pythium is typically not controlled with phosphorous acids. These pathogens are fungus-like but differ in their cell wall structure and nuclear contents of cell walls.

Phosphorous acid has both direct and indirect effects on oomycetes. It directly inhibits a particular process in the metabolism of oomycetes; it indirectly stimulates the plant's natural defense response against pathogen attack in a systemic (xylem and phloem) manner. It should be noted, however, that even though this group of fungicides is considered at low risk for resistance development in the pathogens (FRAC Group 33), that phosphonate-resistant oomycetes have been reported. **Phosphorous acid compounds including Phostrol, Prophyt, Rampart, Fungi-Phite, K-Phite, Fosphite, Phiticide (Crop-phite), Confine Extra, and Alude can be very effective in managing pink rot and late blight of potato,** especially in the case of Ridomil-resistant mefenoxam/metalaxyl-resistant) late blight or pink rot strains. I provided 2 figures, below, from Dr. Jeff Miller's research farm (2010) which demonstrated pink rot control and yield preservation with use of phosphorous acid fungicides applied at dime-size (DS) tuber and in 2 subsequent applications (DS + 2 weeks and DS + 4 weeks). In my own research with Phostrol at the UW-Hancock ARS, we have never seen yield reductions with use as a foliar fungicide. We have tested various timings (single applications up to 10 applications) and rates (up to 10 pint/acre for each application) of Phostrol for observation of plant health and post-harvest oomycete disease control. In summary of results, a 3 to 5 treatment program, initiating at DS tuber, followed by treatments every subsequent 2 weeks, at rates between 7.5-10 pt/acre were successful in limiting tuber late blight and pink rot.

Figure 1. Effect of fungicide programs in controlling pink rot on potato tubers. Miller, Miller, Taysom, & Anderson, Managing Pink Rot, Online Powerpoint from 2012 IPC Pink Rot Miller Research LLC.
Note: Crop-phite and Phostrol are phosphorous acid fungicides.



In our post-harvest treatment trials with Phostrol at the UW Hancock Storage Research Facility, we have consistently seen strong control of late blight, pink rot, and silver scurf. It is critical that the treatment is applied in as little carrier water as possible (at most 0.5 gal/ton tubers) so that the tubers do not appear wet, but rather

continued on next page

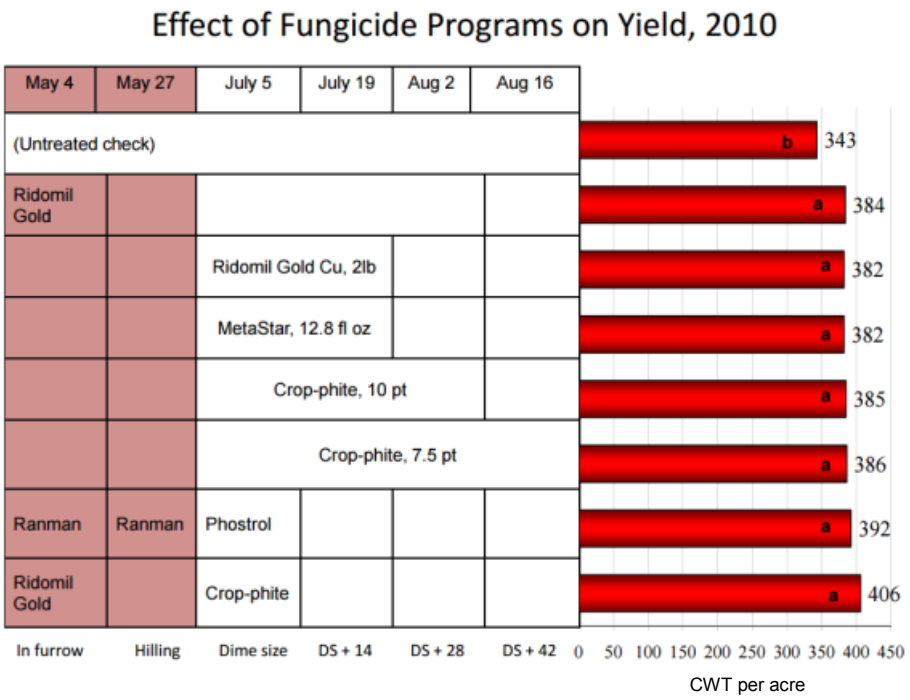
just lightly misted with the phosphorous acid fungicide. Results can be found throughout the Wisconsin Potato Educational Conference Proceedings from recent years: http://www.plantpath.wisc.edu/wivegdis/#

What are the concerns with using phosphorous acid fungicides?
Phosphorous acid fungicides are not great contact fungicides and their use does need to be accompanied by application of a base protectant (mancozeb or chlorothalonil) or other fungicide to target control of early blight and late blight.

There have been reports of phytotoxicity from phosphorous acid use. This has been a challenging condition to recreate in research plots. In my UW-Hancock ARS trials with Phostrol, spanning 3 years, we saw phytotoxity only **once** under conditions of heavy leaf wetness followed by very intense sunshine/US (no clouds in sky). In Idaho, Dr. Miller has attempted to recreate phytotoxicity through various application approaches and mixes and his results indicated lack of consistency in the resulting condition. However, he noted that he has only seen phytoxicity occur with early morning phosphorous acid applications and not at all with chemigated applications.

Post-harvest applications can be highly effective in managing late blight, pink rot, and silver scurf. Studies have indicated that treatment on seed potatoes entering storage is safe and does not change seed performance. Phosphorous acids should not be applied to short dormancy varieties that may be sprouting at the time of harvest. The treatment can burn the growth points and result in tuber wounds that are susceptible to secondary infection and breakdown in the pile.

Figure 2. Effect of fungicide programs on yield. Miller, Miller, Taysom, & Anderson, Managing Pink Rot, Online Powerpoint from 2012 IPC Pink Rot Miller Research LLC. Note: Crop-phite and Phostrol are phosphorous acid fungicides.



Useful documents for more information:
Brunings, Guodong, Simonne, Zhang, Li, Datnoff. Are Phosphorous and Phosphoric Acids Equal Phosphorous Sources for Plant Growth. University of Florida IFAS Extension. http://edis.ifas.ufl.edu/hs254

Miller, Miller, Taysom, Anderson. Managing Pink Rot. Power Point Presentation from Miller Research LLC. (2012 IPC Pink Rot). www.millerresearch.com

Miller, Olsen. Top Ten Things to Know About Phosphorous Acid. Power Point Presentation offered through Oregon State University Hermiston Website. http://oregonstate.edu/dept/hermiston/sites/default/files/miller_hermistonx.pdf

Are You Selling Your Crops Wholesale? If Not, Why? Grower Survey

Robert Hadad and Crystal Stewart, Cornell Cooperative Extension

The CCE regional vegetable teams are conducting a study to examine the viability of current wholesale market channels for vegetable producers, and to determine what the primary barriers to entering the wholesale market are. A great deal of resources are being devoted to encouraging growers to sell produce in the wholesale market; we want to help understand what support growers need to ensure this a winning proposition.

Please take 5-10 minutes to complete the survey, which is designed for both growers who are wholesaling and those who are not. This information will help us to understand the current situation for growers, and will help us select a smaller group to participate in focus groups later in the winter.

We hope to use this information to inform the State about which initiatives are most needed by the growers; the wholesalers who may be able to make changes that better accommodate growers; and to provide growers a more complete picture of how the NY fresh market produce industry is handling the wholesale market.

Questions? Contact Robert Hadad at rgh26@cornell.edu or 585-739-4065. Please feel free to share this email and link with any growers you think should participate.

Take the Survey online or contact us for paper copy of the survey.

CROP INSIGHTS

Flea beetles were hitting brassicas, eggplant, and potatoes hard in a number of locations.

Cutworms are still active chewing through stems of many types of vegetable transplants and seedlings.

Root maggots still being found on cabbage as well as small loopers damaging young leaves of kale, cabbage, and broccoli.

Leaf miners have damaged chard plantings while some miner damage being found on spinach.

Slugs active on lettuce.

Bottom rot and other root or basal rots being seen in lettuce. Extreme weather swings have severely stressed many lettuce plantings. See article below.

CUCURBITS

The current Cucumber downy mildew risk remains in the South. It has been positively identified on cucumber in North Carolina, South Carolina, and new reports in Georgia. We will continue to monitor and update this weekly.

ONIONS

The heat and sunshine has moved the crop along. Earliest transplants are in the 8-10 leaf stage and just starting to bulb and the majority of the direct seeded acreage is in the 3-4 leaf stage. It is during this time that we typically first start to see Botrytis leaf blight (BLB) and onion thrips (OT) – see last week's issue of VegEdge for scouting tips. Our scouting counts for these pests this week has turned up mostly zeros, although both are starting. The recommendation to start fungicide application for BLB is 1.0 BLB lesion per leaf: only a couple fields have reached this threshold. See article on new BLB fungicide recommendations, page 4. The recommendation for first onion thrips spray is Movento, because it tends to have a long residual when applied to young plants. If Movento has not been applied to early transplants already, plan on treating this week, as its efficacy tends to drop when it is applied to bigger plants. Main-season transplants should be fine until at least next week, unless they have already reached threshold.

In the past, we have recommended a spray threshold of 1.0 OT per leaf to initiate first spray of Movento. However, several growers tend to apply Movento when onion thrips are much less than that. In 2016, Cornell Entomologist, Brian Nault conducted a field trial that compared OT control when Movento was applied starting at 0.1 and 1.0 OT per leaf for both single and double application of Movento (Fig. 1). Essentially, his results showed that 1) double application of Movento resulted in reduced thrips numbers only 2 weeks after the second spray; and 2) Spray threshold of 1.0 was reached 2 weeks after 0.1 OT per leaf; both single and double app treatments kept thrips below spray threshold until same point in season (Jul-19), which was for 4 weeks and 2 weeks for the 0.1 and 1.0 thresholds, respectively. In the end, both spray thresholds resulted in the same control. To caution against Movento "running out of gas" too soon, which could result in pushing whole insecticide program forward and running out of effective products in the end, Nault recommends not spraying at 0.1 per leaf. Perhaps, 0.4 to 0.6 is a fair compromise? Look forward to much more recommendations on onion thrips management in upcoming issues.

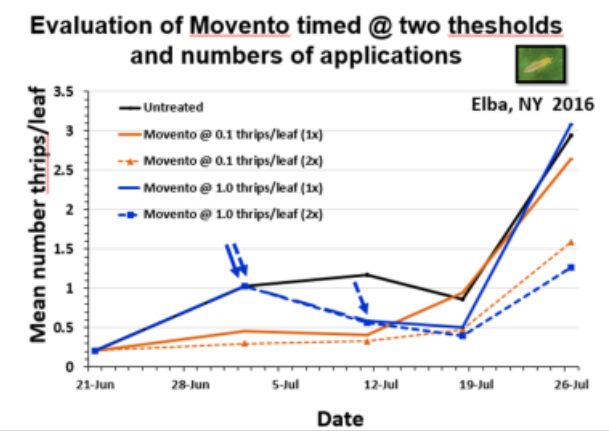


Figure 1. Effect of initial spray threshold (0.1 vs. 1.0) and single vs. double applications of Movento on onion thrips control in onion: Field trial, Elba, 2016 (Nault et al). Note, no difference between thresholds with respect to the time in the season that OT numbers increase.

Wayne Co. onion thrips management meeting is tomorrow Thursday, June 15 at Johnson storage in Sodus at 9 am – see announcement, page 10.

Oswego Onion Twilight Meeting will be Thursday, June 22 at Dunsmoor. RSVP for Oswego meeting is requested – see announcement, page 10.

Note – there will not be an Elba onion twilight meeting this year.

Bottom Rot in Lettuce

UConn IPM Program

[Bottom rot and other root or basal rots are being seen in lettuce. Extreme weather swings have severely stressed many lettuce plantings. Here's a great description of this disease from UConn IPM Program. ed. D. Telenko, CCE CVP]

Bottom Rot is caused by the fungus *Rhizoctonia solani*, which affects **lettuce, escarole, endive, potato, pepper, eggplant, radish, cucumber, and many other fleshy plants**. This worldwide disease was first identified on lettuce in 1900 in Massachusetts greenhouses. It is now a greenhouse and field disease and is favored by warm, wet conditions. Plants are usually affected when they are nearly mature.

Symptoms. The first symptom seen from above is usually wilting of the outer leaves. Before this happens, the fungus enters the plant through lower leaves which are touching the soil. Slightly sunken spots, rust-colored to chocolate brown, appear on the leaf petioles and midribs. These spots can be very small or can grow rapidly to cover the entire petiole/midrib area. While

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continued – Bottom Rot in Lettuce

these spots are being formed, they may ooze a light brownish or amber colored liquid. If conditions are unfavorable for the fungus, the rust colored spots on the petioles will dry and turn chocolate brown. Under warm, wet conditions, the fungus will continue to grow upward into the leaf blades, and destroy them as it grows from leaf to leaf. The entire head may become a slimy brown mass that soon dries and becomes darker. The stems are usually the last part of the head to decay. Tan to brown web-like fungal growth is usually easily seen on the infected head tissues. Small, irregularly shaped cinnamon brown to dark brown lumpy structures, known as sclerotia, may be seen on the head and on the soil under it. The fungus also provides a path for the entry of secondary rot bacteria.

Rhizoctonia Bottom Rot

Photo: UMass Extension

Are Your Pre-Plant and Pre-Emergence Herbicides Keeping Weeds at Bay?

Darcy Telenko, CCE Cornell Vegetable Program

As many pre-plant incorporated (PPI) and Pre-emergence (PRE) herbicides are being put out, keep in mind that soil chemistry (pH), structure and moisture can all influence the activity of soil -applied herbicides. Unevenness of plant residue in a field can influence soil moisture and herbicide activity on the target weeds and could place uneven residues into the root zone leading to crop injury. Also keep in mind that if herbicides are being applied after plastic mulch has been put down that many labels have "for row-middle applications only" or state that "if sprayed over plastic mulch significant crop injury can occur when spray residue is concentrated in the plant hole by irrigation or rainfall."

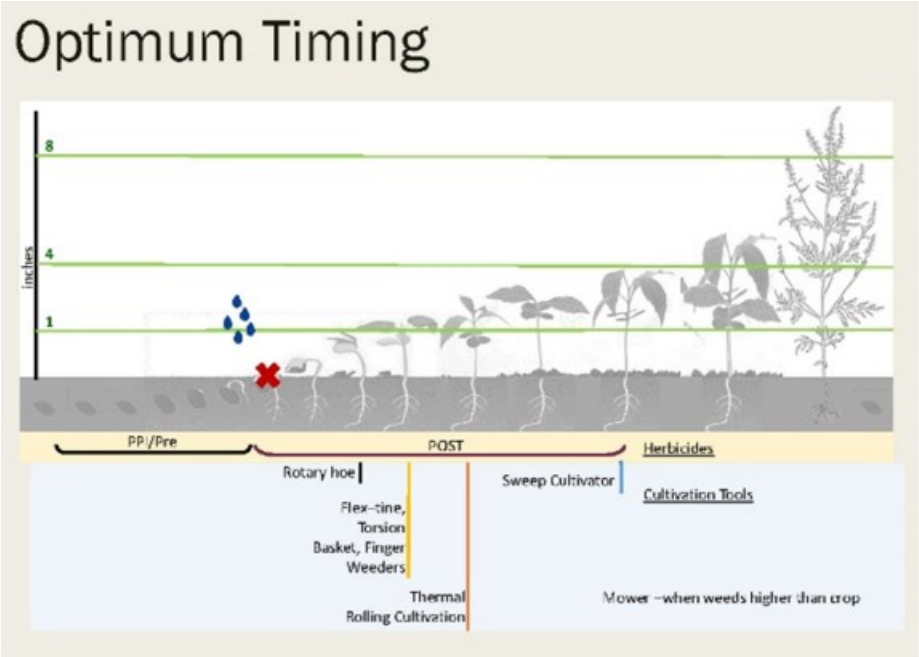

Image: Darcy Telenko, CCE CVP

Herbicide activity is influenced by light, temperature, humidity, soil moisture, wind and precipitation. Field conditions before, during and after herbicide application can influence coverage, absorption, and translocation in a plant. Temperature extremes can slow plant metabolism and reduce herbicide effectiveness. The optimum temperature for herbicide activity generally range from 65 to 85°F corresponding to ideal temperatures for crop and weed growth. High temperatures, low humidity and wind can lead to vaporization, crystallization and degradation of the herbicide. In general, moisture is required to activate many herbicides used in vegetable production. It is important to understand the specific requirements for each herbicide: Is there a rainfast (rain-free) period? Does it need rain or irrigation to be activated? Does it need to be mechanically incorporated? What's the best timing of application?

Are there weed seedlings starting the break through? What are they? Should they have been controlled? Reasons why Herbicide selection had marginal activity on weed species include:

- Poor timing of application - weeds too large or seeds escaped exposure to management application and germinate.
- Environmental factors reduce herbicide effectiveness- soil moisture, rain event, soil characteristics (pH, texture, organic matter).
- Application issues –sprayer skips, poor calibration, poor spray coverage. Cultivation, post herbicide application – remember catching escapes is best when they are still small

How are you going to knock them back? Is there any post emergence herbicides available for your crop and the weed species? Do you have cultivation equipment available?

For cultivation tools see the figure as a reference for optimum timing based on weed height. Rotary hoes work best on weeds less than 0.5 inch, flex-tine, torsion, basket, and finger weeders work

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best on those less than 1 inch, thermal and rolling cultivators less than 2 inches, and sweep cultivars less than 4 inches. Generally, post emergence herbicides are most effect when weeds are less than 4 inches tall – read the label to determine optimum heights and application rates for individual weed species.

UPCOMING EVENTS

view all Cornell Vegetable Program upcoming events at cvp.cce.cornell.edu

"Research Scouting" Program - Wayne County

June 15, 2017 | 9:00 - 10:00 AM
Johnson Fish Farm storage, Fish Farm Rd (0.4 miles past Sebring Rd)

CVP "Research Scouting" program featuring onion thrips 2016 debriefing and 2017 season ramp-up with Brian Nault and Christy Hoepting. 1 DEC recertification credit will be available at each meeting.

From Route 88 just south of Sodus, take Feiock Rd. (on the east) to Fish Farm Rd. Turn right onto Fish Farm Rd. and continue 1.34 miles past right angle turn with Sebring Rd. Johnson storage is on Fish Farm Rd. 0.4 miles past Sebring Rd. on the left.

2017 Oswego County Onion Growers Twilight Meeting

June 22, 2017 | 5:00 - 8:00 PM
John Dunsmoor Farm (Lake Elizabeth), 777½ County Route 53 , Oswego, NY 13126

Featuring herbicide demonstration for control of marsh yellowcress, including Prowl EC vs. H2O, incorporating Chateau into pre-emergent herbicide program, post-emergent control, tank mixes and crop safety, and new pipeline herbicides, Zidua, Reflex and active ingredient, bicyclopyrone. 2.0 DEC credits applied for in categories 1a, 10, and 23; CCA credits applied for. Dinner included.

This event is FREE! RSVP would be much appreciated. RSVP to Christy Hoepting, 585-721-6953, cah59@cornell.edu; or Kathy Stancampiano, 315-591-3478, kathys@newyorkbold.com. Contact Christy Hoepting with questions.

Fresh Market Vegetable Field Day

June 26, 2017 | 9:00 AM - 3:00 PM
CVP Fresh Market Demo Site at Partridge's on the Farm Market
4924 Ellicott St Rd (Rt 63), Batavia, NY 14020

Extension Vegetable Specialists, Darcy Telenko, Judson Reid, Robert Hadad, and Christy Hoepting along with Megan Burley, Extension Educator, Cornell Cooperative Extension Erie County, will be leading research site tours and answering questions on early pest management options for fresh market vegetable growers. Information will be provided for both conventional and organic growers at all levels of expertise.

- Weed management tools for fresh market vegetables
- Fresh market vegetable plot tour – tomato varieties and organic spray programs for disease management; cucumber varieties and organic spray programs for downy mildew; herbicide options in sweet corn; stale-seedbed techniques for weed management in root crops; weed management in root crops and zucchini
- GAPs/FSMA update
- Garlic: Tour of the trials, review of cultural and organic products for fusarium management, Q&A
- Pest management in tomato, pepper, and eggplant
- New market opportunities

Regional equipment dealers and industry representatives will be onsite to display equipment and new technology. CCA and 3.0 DEC credits (categories 10, 1a, and 23) will be available.

Pre-registration cost: $25 Cornell Vegetable Program enrollees; $35 all others. Lunch provided if pre-registered by June 22. At-the-door cost: $35 each and lunch is not guaranteed. Visit https://cvp.cce.cornell.edu/event.php?id=719 for more info. *We appreciate the support of Arctic Refrigeration, BASF, BioSafe Systems, Empire Tractor, KeyPlex Biopesticides, NutriAg USA, Oro Agri, Seedway, Seigers Seeds, and Stokes Seeds.*

2017 NOFA-NY On-Farm Field Days

From June to October, field days on farms in 14 counties feature a wide range of practical topics for farmers. A full listing of this summer's field days can be found at http://bit.ly/2q9qnto and a link to register. Pre-registration is encouraged. Costs: $15/individual, $25 for two or more people from same farm, unless otherwise noted.

Weather Charts

John Gibbons, CCE Cornell Vegetable Program

Weekly Weather Summary: 6/06 – 6/12/17

Location	Rainfall (inch)		Temp (°F)	
	Week	Month June	Max	Min
Albion	0.33	1.02	85	46
Appleton, North	0.20	0.82	86	44
Baldwinsville	0.25	1.82	90	47
Buffalo*	0.14	0.27	84	48
Ceres	0.36	0.53	85	41
Elba	0.16	0.42	85	45
Fairville	0.22	1.19	88	44
Farmington	0.05	0.18	86	45
Gainesville	0.19	0.38	83	42
Geneva	0.00	0.28	88	47
Lodi	0.09	0.36	90	45
Niagara Falls*	0.20	0.33	88	50
Ovid	0.13	0.49	89	46
Penn Yan*	0.12	0.47	91	48
Phelps	0.00	0.23	89	46
Portland	0.16	0.37	84	50
Rochester*	0.06	0.92	90	50
Silver Creek	NA	NA	85	49
Sodus	0.23	1.72	89	47
Versailles	0.30	0.43	84	44
Volney	0.26	1.53	88	45
Williamson	0.10	1.20	89	45

Accumulated Growing Degree Days (AGDD)
Base 50°F: April 1 – June 12, 2017

Location	2017	2016	2015
Albion	490	478	593
Appleton, North	422	383	455
Baldwinsville	524	490	616
Buffalo	504	515	611
Ceres	455	370	519
Elba	464	327	451
Fairville	470	424	NA
Farmington	471	446	583
Gainesville	382	331	471
Geneva	506	475	594
Lodi	601	528	685
Niagara Falls	571	544	545
Ovid	551	497	647
Penn Yan	548	494	652
Phelps	501	461	610
Portland	559	478	576
Rochester	543	504	657
Silver Creek	527	446	540
Sodus	487	450	539
Versailles	543	451	566
Volney	459	NA	NA
Williamson	465	407	499

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

Cornell University
Cooperative Extension
Cornell Vegetable Program

480 North Main Street
Canandaigua, NY 14424

VEGEdge

YOUR TRUSTED SOURCE FOR RESEARCH-BASED KNOWLEDGE

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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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