Overwintering foliar diseases – Septoria leaf spot, early blight (Alternaria), and bacterial spot and speck – are the primary concern for tomatoes in NY.

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Potato leafhoppers typically go undetected until the feeding damage, called "hopperburn", shows up. Beans and potatoes may be at risk.

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No single pesticide will control all potato pests. A list of products labeled in NY is provided to help you control the pests in your potato field.

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Need to start your onion thrips management program? A flowchart is provided with several insecticide sequence options for onion thrips control.

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VEGEdge

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Cornell University
Cooperative Extension
Cornell Vegetable Program

Beets!
Photo: Julie Kikkert

Common Foliar Diseases of Tomato in New York

Judson Reid, CCE Cornell Vegetable Program

Diseases of tomatoes have been slow to develop thus far in New York in 2017, not for lack of favorable weather conditions, but rather because crops went out very late. Excessive and persistent moisture delayed transplanting, but we expect several disease to occur on tomatoes every year.

Overwintering foliar diseases are the primary concern for tomatoes. They include:

- Septoria Leaf Spot
- Early Blight (Alternaria)
- Bacterial Spot and Speck

The above pathogens all overwinter in NYS on soil and tomato stakes. Crop rotation (of 3 years) and clean stakes are the first steps in preventing these diseases. Sanitize used stakes with a product such as Green-Shield or Oxidate, after removing soil with a pressure wash if possible. Consider new stakes when there has been high levels of disease on previous year's crop.

Fungicides (and bactericides) can be helpful in managing these diseases after they

Septoria Leaf Spot of tomato. *Photo: J. Reid, CVP*

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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.

We're interested in your comments. Contact us at:
CCE Cornell Vegetable Program
480 North Main Street, Canandaigua, NY 14224
Email: cce-cvp@cornell.edu

Web address: cvp.cce.cornell.edu

Contributing Writers
Robert Hadad
Christy Hoepting
Julie Kikkert
Judson Reid
Darcy Telenko

Publishing Specialist/Distribution/Sponsors
Angela Parr

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The next issue of VegEdge will be July 5, 2017.

Extension Vegetable Specialist Robert Hadad addressing the attendees of the Fresh Market Vegetable Field Day on Tuesday in the garlic trials. Robert, along with Christy Hoepting, answered garlic disease questions and offered recommendations on BMPs to reduce soilborne diseases and pests of garlic.
Photo: David Ludwig, CCE CVP

continued from cover – Common Foliar Diseases of Tomato in New York

have been confirmed with weekly scouting. Fungicides must be rotated between modes of action (called FRAC groups). Tanos 50 DF has two active ingredients in groups 11 and 26, and is labeled for suppression of all 3 diseases listed above. However, it must be tank-mixed with a contact fungicide for best results. This could include a tank-mix with copper fungicide (Group M1-the choice for bacterial diseases), mancozeb (M3) or chlorothalonil (M5). Do not make more than 1 application before alternating with a non-Group 11 fungicide. These could include Endura (Group 7) or Inspire Super (Groups 3 and 9), but these will not provide control of bacterial diseases.

Copper remains the preferred organic fungicide, however Regalia and Companion have shown some efficacy on Early Blight in Long Island trials.

Cultural management approaches to these foliar diseases include growing resistant varieties:

- Iron Lady
- Defiant PHR
- Mtn. Merit
- Plum Regal (Plum)
- Jasper (Cherry)
- Mtn Magic (Campari)

Late Blight does not overwinter in NYS in the absence of a living host. Living hosts could include live tomato or potato plants, or tubers. Outbreaks over the last several years had origins outside the state. The above listed varieties vary in their resistance to the overwintering foliar disease, but also bring the advantage of Late Blight resistance. This resistance combined with the fungicides listed above can provide considerable Late Blight control, if the disease is active in 2017.

It should also be noted that high tunnels can effectively manage the foliar diseases listed here.

Don't Get Burned by Leafhoppers on Beans and Potatoes

Julie Kikkert, CCE Cornell Vegetable Program

Potato leafhoppers often go undetected on crops until the typical feeding damage called "hopperburn" shows up. These tiny insects (up to 1/8th inch long) don't overwinter in NY, but migrate from the southern US. Potato leafhoppers are now being reported across the state and populations have exploded in alfalfa fields this week (NYS IPM Field Crops), which is often the first crop affected here. Typically, as alfalfa fields are cut, the leafhoppers migrate into other crops. Potatoes, snap beans, dry beans and lima beans are very susceptible to crop damage. The leafhopper is a sucking insect. In the process of removing sap from the plant, leafhoppers leave a toxic salivary secretion in the plant that causes injury. The first sign of feeding is whitening of the leaf veins. These areas then become flaccid and yellow, then dry up and turn brown. Curling of the leaves is also common.

Adults of the potato leafhopper are very long-lived and generations continue to overlap and increase during the summer months. Susceptible crops should be scouted now through August. It is important to note the presence of the young nymphs, which indicate a reproducing population. The insects are wedge-shaped and green. Long hind legs allow them to hop like a grasshopper, and powerful wings allow quick flight. Adults and nymphs are very active and can walk in all directions. When the foliage is disturbed, adults quickly fly up into the air and then settle down again. A sweep net run across the foliage can help determine the population of adults in the field. Adults also get caught in tractor radiator and air intake

Potato leafhopper nymph. *Photo: University of Minnesota*

screens during cultivation or potato hilling. To check for nymphs, examine the underside of leaves. A hand lens may be needed to see the smallest nymphs.

Beans have an action threshold of one nymph per trifoliate leaf or 100 adults per 20 sweeps. Processing snap beans and dry beans often have a Cruiser insecticide seed treatment which protects the plants for roughly 30 days after planting, and sometimes longer if pressure is low and growing conditions are ideal. In general, Cruiser seed treatments are working if you don't see the presence of nymphs on the plants. Several foliar insecticides are labeled and work very well. Be cautious as some are labeled only for dry beans and others only for succulent beans. Refer to the 2017 Cornell Guidelines for product selection.

Potatoes are very sensitive to leafhopper feeding and the treatment threshold is just an average of one adult per sweep with a net, or more than 15 nymphs per 50 compound leaves. Elba, Prince Hairy and King Hairy are resistant to potato leafhopper. Varieties with some tolerance include Green Mountain, some russets, Snowden, Ontario, Katahdin and Yukon Gold. Red Norland is very susceptible. Several products are labeled for leafhoppers in potatoes (consult the 2017 Cornell Vegetable Guidelines) or the list from Dr. Brian Nault at Cornell (see page 5 of this issue of VegEdge, or visit http://rvpadmin.cce.cornell.edu/uploads/doc_422.pdf

WNY Sweet Corn Trap Network Report, 6/27/17

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

Twenty-seven sites reported this week. European corn borer (ECB)-E was trapped at seven sites and ECB-Z was trapped at nine sites. Fifteen sites reported corn earworm (CEW) with ten sites high enough to be on a 4, 5, or 6 day spray schedule (see chart below). Fall armyworm (FAW) was trapped at two sites and Western Bean cutworm (WBC) was trapped at four sites this week.

Even though ECB trap catch numbers remain low, feeding damage has been observed in the field. If corn is in the tassel emergence stage the threshold is 15%. The threshold for silking corn drops to 5% infested plants. If the corn field is silking, scout for egg masses and larvae within the ear zone. The ear zone is the area between the two leaves above the top ear and one leaf below the bottom ear. ECB egg masses are usually located on the underside of the leaf along the midrib. The egg mass consists of 10-35 flattened eggs that overlap like fish scales. Eggs take approximately 100 base 50 degree days to hatch. Egg masses will change from white to cream to black as they age. When they appear black they are in the "black head" stage and will most likely hatch with 24 hours.

WNY Pheromone Trap Catches: June 27, 2017

Location	ECB-E	ECB-Z	CEW	FAW	WBC	DD to Date
Baldwinsville (Onondaga)	3	0	7	0	1	972
Batavia (Genesee)	0	0	1	0	0	922
Bellona (Yates)	NA	NA	NA	NA	NA	NA
Eden (Erie)	0	1	2	0	2	1037
Farmersville (Cattaraugus)	0	0	1	0	0	NA
Farmington (Ontario)	1	0	2	0	0	955
Hamlin (Monroe)	0	2	1	0	2	866
LeRoy (Genesee)	NA	NA	NA	NA	NA	940
Pavilion	NA	NA	NA	NA	NA	NA
Penn Yan (Yates)	0	8	1	1	NA	1004
Ransomville (Niagara)	0	2	4	0	0	966
Seneca Castle (Ontario)	0	0	0	0	0	960
Williamson (Wayne)	0	1	2	0	0	869

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 and recommended spray interval

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.

Pesticide Options for Pests of Potato in New York

Brian Nault, Dept of Entomology, Cornell University, NYSAES; edited by D. Telenko, CCE Cornell Vegetable Program

The many pesticide options available for managing potato pests. There are products that will control Colorado potato beetle, aphids, leafhoppers, flea beetles, cutworms, European corn borer, wireworms, symphylans, spider mites and slugs. Of course, there is no single product that will control all of these pests. Therefore, it is important to know what pests you anticipate needing to manage before planting as well as those that infest your fields during the season. To assist you in determining what product or products might best manage the complex of pests in your potato fields, a list of over three dozen products labeled on potato in New York have been summarized in the accompanying chart on the next page (also available on the CVP website Potato page at: http://rvpadmin.cce.cornell.edu/uploads/doc_422.pdf).

Information in this chart is organized into two major groups: pesticides registered in NYS for use at planting and those as foliar treatments. Within each of these sections, the pesticide active ingredient is listed, followed by the trade name(s), rates, Insecticide Resistance Action Committee (IRAC) mode of action group number, the type of application, whether it can be used on Long Island, if it is safe for bees, and whether it is OMRI approved. This information is followed by the pests listed on the product label. The "Y" in white boxes signifies "YES" that the product may be applied in a certain manner in New York State, can be used on Long Island, toxic to bees, OMRI approved and labeled for a certain pest.

This chart does not provide information on which products are most effective for managing certain pests or pest complexes. Additionally, this chart does not provide information on which products may no longer be effective due to insecticide resistance. For example, there are neonicotinoid and pyrethroid insecticides labeled for Colorado potato beetle control, but these classes of insecticides may not work on certain farms due to insecticide resistance. There are other resources available to help you determine which insecticides should be used and the manner in which to use them to avoid insecticide resistance. Go to: http://nault.entomology.cornell.edu/extension/colorado-potato-beetle-in-potatoes/ - click on [PDF], and refer to the *Cornell Cooperative Extension's 2017 Cornell Integrated Crop and Pest Management Guidelines for Commercial Vegetable Production*.

continued on next page

Pesticides available in New York for managing pests of potato

Y - denotes "YES"; application use is labeled in New York State, Long Island, toxic to bees, OMRI approved and the pest is listed on the product label.

				APPLICATION							PESTS										
											CPB										
Insecticide component	Trade name	Rate	IRAC class	Seed piece	Soil	Long Island use	Bee toxicity	OMRI approved	REI (h)	PHI (d)	larvae	adults	Aphids	Potato leafhopper	Flea beetles	Variegated cutworm	European corn borer	Wireworms	Symphalans	Spider mites	Slugs and snails
FOLIAR																					
abamectin	Abba 0.15 EC	8.0 - 16.0 fl oz/acre	6			Y	Y		12	14	Y									Y	
	Agri-Mek SC	1.75 - 3.5 fl oz/acre	6			Y	Y		12	14	Y									Y	
acetamiprid	Assail 30 SG	1.5 - 2.5 fl oz/acre	4a			Y	Y		12	7					Y						
		1.5 - 4.0 fl oz/acre	4a			Y	Y		12	7		Y		Y							
		2.5 - 4.0 fl oz/acre	4a			Y	Y		12	7			Y				Y				
azadirachtin	Neemix 4.5	2.0 - 16.0 fl oz/acre	UN			Y	Y	Y	4	0	Y		Y	Y	Y		Y				
	Ecozin Plus 1.2 ME	15.0 - 30.0 fl oz/acre	UN			Y	Y	Y	4	0	Y		Y	Y	Y						
azadirachtin/pyrethrin	Azera	1.0 - 3.5 pt/acre	3a,UN			Y	Y	Y	12	0		Y		Y	Y						
beta-cyfluthrin or cyfluthrin	Baythroid XL	1.6 - 2.8 fl oz/acre	3a			Y	Y		12	0		Y			Y		Y				
		2.8 fl oz.acre	3a			Y	Y		12	0			Y								
	Tombstone	1.6 - 2.8 fl oz/acre	3a			Y	Y		12	0		Y			Y		Y				
		2.8 fl oz.acre	3a			Y	Y		12	0			Y								
bifenazate	Acramite 4 SC	16.0 - 24.0 fl oz/acre	UN			Y	Y		12	14										Y	
bifenthrin	Sniper	2.1 - 6.4 fl oz/acre	3a			Y	Y		12	0					Y						
carbaryl	Sevin XLR Plus	1 - 2 qt/acre	1b			Y	Y		12	7		Y		Y	Y		Y				
chlorantraniliprole	Coragen	3.5 - 5.0 fl oz/acre	28						4	14		Y					Y				
cryolite	Prokil Cryolite 96	10.0 - 12.0 lb/acre	UN			Y			12	0	Y										
cyromazine	Trigard	2.7 - 5.3 fl oz/acre	17						12	7	Y										
dimethoate	Dimethoate 400 or OLP	1.0 pt/acre	1b			Y	Y		48	0			Y	Y							
esfenvalerate	Asana XL	5.8 - 9.6 fl oz/acre	3a			Y	Y		12	7		Y	Y	Y	Y	Y	Y				
flonicamid	Beleaf 50SG	2.0 - 2.8 fl oz/acre	9c			Y			12	7			Y								
indoxacarb	Avaunt	3.5 - 6.0 fl oz/acre	22			Y	Y		12	7		Y					Y				
imidacloprid	Provado 1.6F, Nuprid 1.6F	3.75 fl oz/acre	4a			Y	Y		12	7		Y	Y	Y	Y						
	Courage 2F	3.0 fl oz/acre	4a			Y	Y		12	7		Y	Y	Y	Y						
	Montana 2F	3.0 fl oz/acre	4a			Y	Y		12	7		Y	Y	Y	Y						
imidacloprid + cyfluthrin	Leverage 360	2.8 fl oz/acre	3a,4a			Y	Y		24	12		Y	Y	Y	Y	Y	Y				
iron phosphate	Sluggo Ag	20.0 - 44.0 lb/acre				Y		Y	-	-											Y
lambda-cyhalothrin	Warrior II w/ Zeon Tech	0.96 - 1.6 fl oz/acre	3a			Y			24	7				Y		Y					
		1.3 - 1.9 fl oz/acre	3a			Y			24	7		Y	Y		Y		Y				
metaldehyde	Deadline M-Ps	20.0 - 40.0 lb/acre				Y			-	-											Y
methomyl	Lannate LV	1.5 pt/acre	1b			Y	Y		48	6					Y	Y					
		1.5 - 3.0 pt/acre	1b			Y	Y		48	6			Y	Y							
novaluron	Rimon 0.83EC	6.0 - 12.0 fl oz/acre	15			Y			12	14	Y						Y				
permethrin	Ambush 25W	3.2 - 12.8 fl oz/acre	3a			Y	Y		12	14		Y	Y	Y	Y						
	Pounce 25 WP	6.4 - 12.8 fl oz/acre	3a			Y	Y		12	14		Y	Y	Y	Y		Y				
pymetrozine	Fulfill	2.75 - 5.5 oz/acre	9b			Y			12	14			Y								
spinetoram	Radiant SC	6.0 - 8.0 fl oz/acre	5			Y	Y		4	7		Y			Y		Y				
spinosad	Blackhawk	1.7 - 3.3 fl oz /acre	5			Y	Y		4	7		Y					Y				
	Entrust SC	3.0 - 10 fl oz/acre	5			Y	Y	Y	4	7		Y					Y				
spirotetramat	Movento	4.0 - 5.0 fl oz/acre	23			Y			24	7			Y								
thiamethoxam	Actara	1.5 - 3.0 oz/acre	4a				Y		12	14		Y		Y	Y						
		3.0 oz/acre	4a				Y		12	14			Y								
sulfur	Microthiol Disperss	-				Y		Y	24	0										Y	
thiamethoxam + lambda-cyhalothrin	Endigo ZC	3.5 - 4.5 fl oz/acre	3a,4a				Y		24	14		Y		Y	Y	Y					
		4.0 - 4.5 fl oz/acre	3a,4a				Y		24	14							Y				
		4.5 fl oz/acre	3a,4a				Y		24	14			Y								
zeta-cypermethrin + abamectin	Gladiator insecticide	8.0 - 19.0 fl oz/acre	3a,6				Y		12	14		Y	Y	Y	Y		Y			Y	

A Quick Reference to Fungicides for Diseases in Cucurbits

Adapted from - ***Mobile Fungicides for Managing Powdery Mildew, Downy Mildew, and Phytophthora Blight in Cucurbits***. *2016. M. McGrath, Plant Pathology and Plant-Microbe Biology Section, Cornell University Long Island Horticultural Research and Extension Center, mtm3@cornell.edu; http://vegetablemdonline.ppath.cornell.edu/*

*[**Downy mildew was detected Tuesday in Essex Ontario, Canada** on cantaloupe and cucumber, June 23 in Maryland and today in Allen Co. Kentucky. It looks to be only a matter of time we will be seeing it appear in western NY. Protectant sprays should be going out on all susceptible cucurbits. ed. D. Telenko, CCE CVP]*

Apply fungicides for a particular disease in alternation to manage resistance (in the use directions on many labels; typically, 1 or 2 consecutive spray maximum) and to ensure effective control if resistance develops. In addition, sulfur is a very effective, inexpensive product for powdery mildew, no efficacy for other diseases. Oils (several botanical and mineral oils available) are also a good choice

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for powdery mildew only. Chlorothalonil and copper have broad-spectrum activity. Copper also effective for bacterial diseases. Mancozeb is recommended when only downy mildew is occurring. QoI* and Ridomil fungicides are not recommended due to resistance. (*Amistar, Cabrio, Quadris, Flint).

Fungicide	FRAC Code	Diseases	Recommended Rate/A (labeled)	REI	PHI	Seasonal Limits	Approx.$/ A/ spray
Vivando [g]	U6	Powdery mildew	15 fl oz	12 h	0 d	3 sprays	$33.15
Torino [a]	U8	Powdery mildew	3.4 oz	4 h	0 d	2 sprays	$24.00
Quintec [b]	13	Powdery mildew (melon, pumpkin, w. squash, gourd)	6 fl oz (4-6)	12 h	3 d	24 fl oz	$23.60
Proline [c]	3	Powdery mildew	5.7 fl oz	12 h	7 d	2 sprays	
Procure [c]	3	Powdery mildew [c]	8 fl oz (4-8)	12 h	0 d	40 fl oz	$36.84
Merivon [c]	7	Powdery mildew	5.5 fl oz (4-5.5)	12 h	0 d	3 sprays	
Pristine [c]	7 + 11	Powdery mildew [c]	18.5 oz (12.5-18.5)	12 h	0 d	4 sprays (74 oz)	$70.85
Ranman [a, d]	21	Blight, Downy mildew	2.75 fl oz(2.1-2.75)	12 h	0 d	6 sprays	$25.24
Zampro	40 + 45	Blight, Downy mildew	14 fl oz	12 h	0 d	3 sprays	
Forum	40	Blight, Downy mildew	6 fl oz	12 h	0 d	5 sprays	$17.86
Revus [a, c]	40	Blight, Downy mildew (low efficacy DM cucumber)	8 fl oz	12 h	0 d	4 sprays (32 fl oz)	$30.31
Phostrol, etc.[f]	33	Blight, Downy mildew	2.5 – 5 pt	4 h	0 d	7 sprays	$11.44 – $22.88
Presidio [c, g]	43	Blight, Downy mildew [c]	4 fl oz (3 – 4)	12 h	2 d	4 sprays (12 fl oz)	$44.94
Tanos [e]	27 + 11	Blight, Downy mildew	8 oz	12 h	3 d	4 sprays	$25.02
Zing!	22 + M	Downy mildew	36 fl oz	12 h	0 d	8 sprays	$17.72
Curzate [e]	27	Downy mildew	3.2 oz	12 h	3 d	9 sprays	$13.26
Previcur Flex [c]	28	Downy mildew [c]	1.2 pt	12 h	2 d	6 pints	$18.32

[a] Organosilicone and/or non-ionic surfactant required (Revus) or recommended.
[b] Quintec is not labeled for use on edible-peel cucurbits. 10-14 day spray interval.
[c] Limited use recommended because resistance suspected of affecting efficacy especially when applied often.
[d] Rate range applies for downy mildew; high rate for blight.
[e] Short residual; apply another fungicide within 5 days.
[f] Other phosphorous acid fungicides include ProPhyt and Fosphite. Rate and seasonal limits vary a little among products. Recommended tank mixed with other fungicides. Note that there are also phosphate fertilizers, which are not fungicides.
[g] Plant-back restriction for non-labeled crops is 365 days for Vivando and 18-month for Presidio. Tank-mix each of these fungicides with a protectant, with the exception of Zing! (or Gavel), which are formulated with chlorothalonil or mancozeb. Need to tank-mix is specified in use directions on many labels.

CROP INSIGHTS

Downy mildew (DM) has been found in a field of pickling cucumbers in Essex County, Ontario, Canada. The remnants of tropical storm Cindy may also be moving DM up the East Coast threatening Long Island and southeastern NY. With the cool wet weather we have been dealing with in WNY is ideal for DM to take hold very quickly. The only thing standing in the way of DM being blown in is the wind direction. If the winds stay out of the west or southwest, we might be all right for the time being but any shift out of the northwest will quickly blow spores into Niagara, Erie, and Chautauqua Counties. It is time to apply protective sprays. – *RH (See article - A Quick Reference to Fungicides for Diseases in Cucurbits, page 5.)*

Hail damage to zucchini. *Photo: D. Telenko, CCE CVP*

Cucumber beetles are in full force. A tight spray schedule is needed to keep these pests at bay once the seed treatment wears off .For organic growers getting ready to remove row cover, having a trap crop of hubbard squash some distance away can help move the beetles away from the cucumbers. Treat the hubbard squash with a broad spectrum insecticide or flame. Reducing the population down will help keep the pressure of the pest lower. Spraying the cucumbers with the kaolin clay, Surround, also will help in reducing feeding damage to the plants and reduce the potential threat of bacterial wilt being passed. – *RH*

Recent storms continue to bring lots of water and even hail to the region. Luckily much of the damage has been superficial, however some of these injuries may serve as sites of infection for various fungal and bacterial diseases. Young fruit is the most vulnerable as to damage as even

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small wounds may cause scarring and make them unmarketable as they reach maturity. In many field raised beds are keeping plants from getting water-logged as we continue to see more rainfall. *– DT*

Raised beds are helping keep tomato roots from becoming water-logged. *Photo: D. Telenko, CCE CVP*

Defoliation of 2 rear potato plants compared to healthy, uninfested plant in the foreground. *Photos: D. Telenko, CCE CVP*

Colorado potato beetle (CPB) larvae are actively feeding in eggplant, tomato and potato fields throughout the region. In several areas, they are above threshold. If you are implementing an insecticide program remember to rotate chemistries for resistance management. *– DT (See article – Pesticide Options for Pests of Potato in NY, page 4.)*

GARLIC

Colletotrichum fungal disease has been found fairly widespread in WNY. Rain water that might have collected in the leaf whorl just prior to scape emergence seems to be a possible trigger. Spores get into that wet environment and infects the scape. Possibly damage by thrips may also open up wounds to infections. First a pale yellow streak appears then a lesion forms. When the spores start to develop on the scape, the lesion area appears orange and fuzzy. The lesions will grow and the scape will rot off. At present there is no known treatment for this problem.

Garlic scape with orange fuzzy spores on lesion. The yellow infection is spreading to either side of where the orange spores are. The scape will soften and rot from here. *Photo: R. Hadad, CCE CVP*

Early symptoms we have noticed prior to actually seeing the lesions on the scape is that sometimes the plant leaves are twisted and the newly emerging scape is more twisted than normal.

ONIONS

The crop looks so beautiful this time of year! Not much new to report this week! Botrytis leaf blight (BLB) continues to move slowly if at all, both in fields that have and have not been sprayed. Fungicide of choice for BLB is Bravo. Since Bravo interferes with efficacy of Movento, Scala 9 fl oz + Rovral 1 pt may be substituted for Bravo in fields where Movento is going into the tank mix, or Movento and Bravo may be applied in separate passes to maximize efficacy of Movento. See June 14 issue of Veg Edge for more info on BLB fungicides.

Thrips counts continue to be very low with only a handful of insects being found in 35 to 50 plants scouted per field. Some fields are getting very early applications of Movento (defined by less than 0.5 OT per leaf), while several growers will wait until their field reach the treatment threshold. However, fields that are 7-8 leaf stage and just starting to bulb may need to get the first application of Movento on, especially in areas where an influx from cutting of hay or harvest of wheat is common. This way, Movento will already be in the plant doing its job when the wave of thrips arrives. Onion fields that have not started to bulb, have less than 0.5 OT per leaf and are not located in known influx areas do not need to pull the trigger early on Movento. This year, we have a new insecticide to use to manage onion thrips in onions. It is Minecto Pro, which is essentially a pre-mix of Agri-Mek and Exirel. For resistance management purposes, growers may only use two sequential applications of either of the active ingredients in Exirel and Agri-Mek, whether it be as Agri-Mek, Exirel, Minecto Pro or combination of any of these three products. Another catch is that Minecto Pro and Agri-Mek both have 30-day pre-harvest intervals, which means that they will have be placed in second place after Movento in sequence. The other insecticide options that may be used in rotation include Radiant, Lannate and Warrior. As always, to prevent resistance from developing to Radiant, we encourage to delay its use until the month of August in order to not expose multiple sequential OT generations per year. Careful thought should be put into your season long thrips management plan now, so as not to burn through effective insecticide options too quickly. *(See article - 2017 Insecticide Treatment Options for Onion Thrips Management in Onion, page 8.)*

Figure 1. At Oswego Onion Twilight Meeting, attendees viewed 36 different treatments for pre- and post-emergent control of marsh yellowcress (annual mustard) and lady's thumb/smartweed. Pre-emergent treatments featured the strength and weaknesses of individual herbicides (weedy plots in photo) and the synergy when they are used in programs (clean plots in front of photo). The goal is to find a program that offers most effective broad-spectrum weed control and crop safety (of course!). *Photo: A. Celentano, CCE CVP*

Thank you to the over 50 people who attended the Oswego County Onion Twilight Meeting last Thursday evening! The meeting featured a trial tour of many different approaches to both pre- and post-emergent weed control in direct seeded onions (Fig. 1 & 2).

Photos: C. Hoepting, CVP

Figure 2. One of the objectives of Hoepting's post-emergent onion herbicide research program is to identify tank mixes that offer both greater broad-spectrum weed control and ability to control larger weeds. An experimental tank mix of Chateau 2.0 oz + Goaltender 2 fl oz resulted in mortality of both marsh yellowcress (left) and pigweed (middle) that were 6-8" tall/wide, while not touching lamb's quarters (middle). Injury to the onions was a bit more than we would like to see, but may be worth it for the control of such large weeds. On the right, experimental tank mix of Buctril 2E 4 fl oz + bicyclopyrone 3.4 fl oz wiped out ragweed that was 2-6" tall with remarkable crop safety when applied to 2-leaf onions. Bicyclopyrone is a new active ingredient that currently in development for onions.

2017 Insecticide Treatment Options for Onion Thrips Management in Onion

Ashley Leach and Brian Nault, Dept of Entomology, Cornell University, NYSAES; and Christy Hoepting, CCE Cornell Vegetable Program

Onion thrips (*Thrips tabaci*) are beginning to colonize onion fields in New York, and many growers have begun their onion thrips management programs for 2017. The following flowchart (Fig. 1) provides several different insecticide sequence options for controlling onion thrips this season.

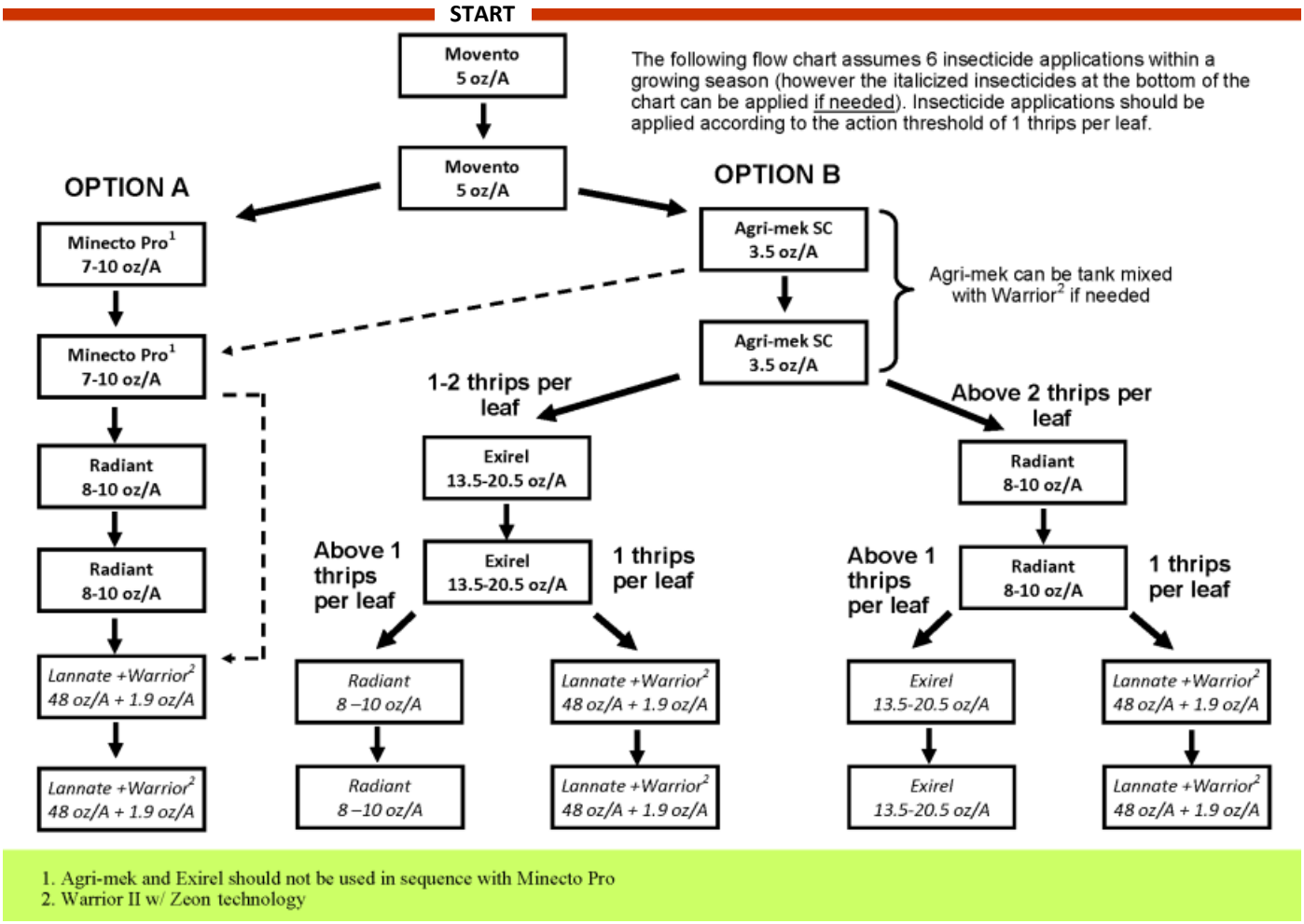

Figure 1. Guidelines for 2017 onion thrip management. (Leach)

Start with Movento

We suggest beginning onion thrips management with two sequential applications of Movento® (spirotetramat) at 5 fl oz per acre. **Movento® is unparalleled early in the season at controlling thrips because it kills larvae and eggs and as a systemic insecticide can often offer weeks of control**. Because Movento is not nearly as effective on larger onion plants that are bulbing (e.g., 1-2 inch bulbs), make sure that Movento is applied before this time. After Movento® applications are made, growers should consider following 'Option A' or 'Option B' for their remaining insecticide applications (Fig. 1).

Option A – Minecto Pro for High Pressure

'Option A' features the recently registered Syngenta product, Minecto® Pro, which is a pre-mix of Agri-mek® SC (abamectin) and Exirel® (cyantraniliprole). While Minecto® Pro may be two to three times the price of Agri-mek®, Minecto Pro® can offer superior control of thrips. In a 2016 insecticide evaluation trial in Elba, NY, Minecto® Pro performed equivalently to Radiant® SC at 10 fl oz per acre (spinetoram) and reduced thrips by 80% when compared to the untreated control. Therefore, Minecto® Pro at 7-10 fl oz per acre can be a great option if onion thrips populations rebound with a vengeance after Movento® has run out of gas (Fig. 1). However, **Minecto® Pro** should be applied early to mid-season because it **has a 30-day pre-harvest interval, just like Agri-Mek® SC**. Following the 'Option A' track, growers should use either two applications of Radiant® or a tank mix of Lannate® LV (methomyl) and Warrior® II with Zeon technology (lambda-cyhalothrin), depending on the onion thrips density. If densities remain high (above 2 thrips per leaf) after applications of Minecto® Pro, Radiant® should be ap-

continued on next page

plied at 8-10 fl oz per acre. If densities are low (1-2 thrips per leaf), growers may consider applying a tank mix of Lannate® LV and Warrior® II with Zeon technology (48 fl oz per acre and 1.9 fl oz per acre, respectively).

Option B – Agri-Mek for Low Pressure

'Option B' includes insecticide sequences that have been available for the past few years and have proven effective at controlling thrips. This option may be less expensive than 'Option A' and might be selected if onion thrips densities remain relatively low after the two applications of Movento®. In 'Option B', we suggest making two sequential applications of Agri-mek® SC at 3.5 fl. oz per acre after applying Movento® (Fig. 1) (See 'Other variations' below). Some growers have experienced reduced performance of Agri-mek® SC in the past two years, thus **we recommend tank mixing Warrior® II with Zeon technology with Agri-mek® SC, but only if needed.** After two applications of Agri-mek® SC, either Radiant® SC or Exirel® should be applied depending on the onion thrips density. Exirel® at 13.5-20.5 fl oz per acre is recommended when onion thrips densities are 1-2 thrips per leaf. In insecticide efficacy trials conducted in 2016, two sequential applications of Exirel® reduced onion thrips densities of 4 thrips per leaf, but was not successful at higher densities. Thus, we still recommend Radiant® at 8-10 fl oz per acre when onion thrips densities are greater than 2 per leaf. If additional insecticide applications are needed, a tank mix of Lannate (48 fl oz per acre) and Warrior® II with Zeon technology (1.9 fl oz per acre) can be co-applied to prolong thrips control until harvest.

The Cornell Onion Thrips Management Plan (OTMP) involves following a strategic sequence to reduce the development of insecticide resistance and following spray thresholds to minimize overall insecticide use. In Elba, where OTMP has been adopted, the average reduction in pesticide use is 50% compared to weekly calendar spraying. Successful implementation of OTMP requires scouting in order to make informed decisions. It all hinges on knowing the pest pressure in your fields.
Photo: C. Hoepting, CCE CVP

Other variations

This flowchart is meant to aid growers in controlling onion thrips in 2017; however, it is not an exhaustive list of insecticide sequence options to control thrips. There are other sequences that are not listed and may be equally effective at controlling onion thrips. For example, if following 'Option B' and onion thrips densities increase after one application of Agri-mek®, growers may consider moving to the 'Option A' track and make an application of Minecto® Pro to decrease onion thrips densities (Fig. 1, dotted line).

No more than two applications of abamectin per season

Whether you stick with 'Option A' or 'Option B' or end up jumping tracks, no more than two (sequential) applications of Agri-Mek®, either alone or as part of Minecto® Pro, may be made per season. Similarly, no more than two (sequential) applications of Exirel®, either alone or as a component of Minecto® Pro, may be made per season. For example, if you use Agri-Mek® followed by Minecto® Pro, you may not apply a second Minecto® Pro or a second Agri-Mek®. Instead, you may choose from either i) Exirel®, ii) Radiant®, or iii) Lannate® + Warrior® II with Zeon technology.

Late Blight Risk Update

Darcy Telenko and John Gibbons, CCE Cornell Vegetable Program

Late blight severity values continue to build at all locations, except four (Fairville, Geneva, Kendall, and Lodi). The forecasted change in value remains low. 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.

Again, 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* 6/27/17

Location	Total	Forecast 6/28-6/30	Location	Total	Forecast 6/28-6/30
Albion	70	3	Lodi	0	1
Baldwinsville	30	4	Lyndonville	18	2
Bergen	21	2	Medina	22	2
Buffalo	34	2	Niagara Falls	29	3
Ceres	18	2	Penn Yan	27	1
Elba	21	2	Rochester	40	2
Fairville	16	2	Sodus	29	3
Farmington	27	2	Versailles	31	2
Gainesville	66	2	Volney	39	4
Geneva	1	2	Wellsville	45	2
Kendall	16	3	Williamson	24	2
Knowlesville	53	2	Wolcott	28	2

* Severity value accumulations start 5/12/2017

UPCOMING EVENTS

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

2017 Vegetable Pest and Cultural Management Field Meetings for Auction Growers

~~June 30, 2017~~
Yates County rescheduled to 7/21 (see below)

July 5, 2017 | 7:00 PM
Seneca County – **Levi Esh farm, 2033 Yerkes Rd, Romulus, NY 14541**

July 21, 2017 | 6:00 PM
Yates County rescheduled (from 6/30 to 7/21) – **Allen Zimmerman farm, 3351 Hoyt Rd, Penn Yan, NY 14527**

August 4, 2017 | 6:00 PM
Orleans County – **Albion farm TBD**

August 8, 2017 | 6:00 PM
Chautauqua County – **Jacob Hostetler farm, 561 Frew Run, Frewsburg, NY 14738**

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 Telenko and Hadad will instruct participants and facilitate peer-based learning. Details on each topic will focus on field observations at the farm.

WNY Soil Health Alliance Summer Field Day

August 22, 2017 | 8:30 AM - 3:30 PM
Orleans County 4-H Fairgrounds Trolley Bldg, 12690 Rt 31, Albion NY 14411

Two guest speakers will kick off this exciting event: Wendy Taheri, a nationally recognized expert in Mycorrhizal Fungi, and John Wallace, soon to be an Assistant Professor at Cornell with extensive experience in drilled interseedings of corn. In the afternoon, attendees will observe 8 cover crop trials and explore a soil pit, with on-site discussion led by Wendy Taheri, TerraNimbus LLC. There will also be cover crop interseeder and herbicide demonstrations. The full agenda and information on how to register is available at http://www.wnysoilhealth.com/events/. $40/pre-registered participant; $50/walk-in. Lunch included.

Good Agricultural Practices/Harmonized GAPs Farm Food Safety Training

September 26-27, 2017 | 9:30 AM - 4:00 PM
TBD but will likely be in Cattaraugus County

Farm food safety is common-sense practices organized to assist farmers to improve their skill set to continue to grow safe and healthy food.

Day One of this GAPs training will be an educational training on farm food safety principles and practices to provide the background and information for farmers to understand how to minimize the risk of food born disease contamination. Day Two will be for those who want help with writing a farm food safety plan. If you want to be certified under the GAPs or HGAPs program, a farm food safety plan is needed for the audit.

Cost: Pre-registration is required. $25 for first farm attendee ($15 for second) for County Extension enrollees; $35 and $15 for non-enrollees. Online registration will be available soon. For more information, contact Robert Hadad at rgh26@cornell.edu or 585-739-4065.

Fresh Produce Buyer/Purchaser Farm Food Safety Educational Meeting

October 17, 2017 | 9:30 AM - 2:30 PM
NYS Agricultural Experiment Station, 630 W North St, Jordan Hall, Geneva, NY 14456

Anyone who purchases locally grown produce directly from farmers should attend this session to better understand the issues of farm food safety along with the basic principles and practices that farmers are involved with. This workshop will cover programs like GAPs and HGAPs as well as the new federal regulations under the Food Modernization Act. Having a clear understanding of standards, regulatory requirements, and the practices followed to reduce microbial risk will be covered. Also covered will be a discussion on the regulations governing locally processed foods.

Cost: $25. Online registration will be available soon. For more info, contact Robert Hadad at rgh26@cornell.edu 585-739-4065.

Good Agricultural Practices/Harmonized GAPs Farm Food Safety Training

Late Fall/Early Winter 2017 | 9:30 AM - 4:00 PM
Niagara/Orleans County area - location TBD

For more information, contact Robert Hadad rgh26@cornell.edu or 585-739-4065.

Weather Charts

John Gibbons, CCE Cornell Vegetable Program

Weekly Weather Summary: 6/20 – 6/26/17

Location	Rainfall (inch)		Temp (°F)	
	Week	Month June	Max	Min
Albion	0.88	2.39	82	53
Appleton, North	1.83	3.00	77	52
Baldwinsville	0.81	4.74	81	54
Buffalo*	0.29	1.45	80	56
Ceres	1.38	4.43	80	48
Elba	0.71	1.69	80	52
Fairville	NA	NA	80	53
Farmington	0.78	2.55	82	51
Gainesville	NA	NA	NA	NA
Geneva	0.60	3.66	80	54
Lodi	0.03	1.28	84	54
Niagara Falls*	1.90	2.50	81	55
Ovid	0.75	2.91	83	54
Penn Yan*	0.50	2.38	84	55
Phelps	0.52	2.74	85	53
Portland	0.87	2.78	83	57
Rochester*	0.70	3.11	82	54
Silver Creek	NA	NA	83	51
Sodus	1.36	4.49	80	55
Versailles	NA	NA	81	54
Volney	0.22	2.57	80	52
Williamson	0.73	3.19	83	55

Accumulated Growing Degree Days (AGDD) Base 50°F: April 1 – June 26, 2017

Location	2017	2016	2015
Albion	766	738	845
Appleton, North	668	606	663
Baldwinsville	791	735	869
Buffalo	795	785	867
Ceres	703	578	761
Elba	734	517	656
Fairville	730	638	NA
Farmington	731	673	826
Gainesville	NA	528	681
Geneva	773	716	845
Lodi	886	794	951
Niagara Falls	874	827	792
Ovid	829	751	905
Penn Yan	830	760	911
Phelps	776	691	860
Portland	840	728	818
Rochester	834	772	925
Silver Creek	803	684	775
Sodus	754	683	769
Versailles	819	686	810
Volney	712	NA	NA
Williamson	731	637	711

* 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

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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.

VEGETABLE SPECIALISTS

Robert Hadad | 585-739-4065 cell | rgh26@cornell.edu
food safety & quality, organic, business & marketing, and fresh market vegetables

Christy Hoepting | 585-721-6953 cell | 585-798-4265 x38 office | cah59@cornell.edu
onions, cabbage, potatoes and pesticide management

Julie Kikkert | 585-313-8160 cell | 585-394-3977 x404 office | jrk2@cornell.edu
processing crops (sweet corn, snap beans, lima beans, peas, beets, carrots) and dry beans

Judson Reid | 585-313-8912 cell | 315-536-5123 office | jer11@cornell.edu
greenhouse production, small farming operations, and fresh market vegetables

Darcy Telenko | 716-697-4965 cell | 716-652-5400 x178 office | dep10@cornell.edu
soil health, weed management, fresh market vegetables, and plant pathology

PROGRAM ASSISTANTS

Amy Celentano | ac2642@cornell.edu

John Gibbons | 716-474-5238 cell | jpg10@cornell.edu

Bethany Hunt | bh493@cornell.edu

Audrey Klein | ak2459@cornell.edu

David Ludwig | dgl55@cornell.edu

Cordelia Machanoff | ch776@cornell.edu

Angela Parr | 585-394-3977 x426 office | aep63@cornell.edu

ADMINISTRATION

Peter Landre | ptl2@cornell.edu

Steve Reiners | sr43@cornell.edu

For more information about our program, email cce-cvp@cornell.edu or visit us at CVP.CCE.CORNELL.EDU

Cornell University
Cooperative Extension
Cornell Vegetable Program