

Spring Berry "To Do" List

All Berries: Spotted Wing Drosophila traps have been deployed throughout the region. Growers should know that individual SWD flies were caught last week in an intense trapping experiment in a blueberry field near Geneva, NY. This is not that unusual, but still disconcerting. Growers are encouraged to review the list of insecticides approved for use in NYS – the updated list is attached.

Blueberries

- Blueberry bloom and corresponding fruit set looks very strong throughout the region. Some plantings are exhibiting heavy bloom at the expense of leaves and/ or shoot development.
- Concern about mummyberry is ongoing. In plantings that still have significant bloom AND if mummyberry strikes are seen OR if the planting has a history of mummyberry problems, an application of Indar could be very helpful.
- Cranberry and cherry fruitworm monitoring is underway. No major flight recorded as of this writing.
- Entrust SC has a new label for bushberries (blueberries included) that reduces the REI and increases the allowable number of sprays per season. For more information about the label, visit <u>NYSPAD</u>

Strawberries:

- Southern locations and row-covered berries have been ripening and picking will start in earnest this weekend. Many other locations are progressing slowly.
- Slugs are being seen throughout the region and can be a huge problem for strawberry growers. Slugs cause holes in leaves and fruits. Higher populations may be seen near fields with clover cover crops. Control options include metaldehyde (Metarex, Durham Metaldehyde Granules, and Deadline Bullets or M-Ps) and iron-



Slug damage on fruit. Photo: Ontario Strawberry IPM, OMAFRA

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based (Sluggo-AG, IronFist) baits. These baits should be applied in the evening after a rain. While granular formulations may be most appropriate in a U-Pick, a mini-pellet (M-P) formulation (ie Deadline) may offer a longer residual. Apply in a band along the crop perimeter or spot-treat where needed. Avoid contacting fruit with metaldehyde baits and don't use metaldehyde products around pets.

- Fruit rot not that noticeable yet but it's bound to be an issue this year given the weather. Leaf spot is much more widespread due to the cool, rainy weather. Normally leaf spot can be controlled by mowing and burying leaves at renovation, but the pressure is higher this year. A spray program that rotates labelled products like Captan, Copper, Rally, Cabrio, Pristine and Mettle is appropriate.
- Scout for angular leaf spot which is a bacterial disease more information in this newsletter.
- Bud weevils are no longer a threat as most berries (with the exception of Valley Sunset and Malwena) have finished blooming.
- Weak or stunted plants may indicate root problems. Now is a good time to evaluate for root weevils and red stele disease.
- Root weevil larvae can be found at root zone now you can start to look for leaf notching as well. Both of these root problems can be evaluated with diagnostics which are free of charge if you live in the 17 county Eastern NY region. Call Laura McDermott at 518-791-5038.



Leaf notching caused by root weevil adults. Photo : L. Pashow

Brambles:

- Floricane brambles are flowering with some bud set in the south. Primocanes are pushing nicely throughout the region. Most growers report very strong bloom.
- Orange rust on black raspberries has been reported in a few locations. This disease is a problem for black and purple raspberries but



Early season rust symptoms on a black raspberry floricane. Photo: Ohioline, The Ohio State University



Welcome to Cornell Cooperative Extension Intern Cameron Fuhr!

Cameron is a rising senior at Cornell University. He is majoring in Biological Sciences, with a focus on ecology and evolution. He's also a Communications major. This summer, he is working with Peter Jentsch, Teresa Rusinek, Chuck Bornt and Laura McDermott at the Hudson Valley Research Laboratory on several projects that use a complex of entomopathogenic (insect killing) nematodes to control damage to vegetable and fruit crops. He is interested in agriculture, as he is a member of Alpha Zeta agriculture fraternity at Cornell. He will also be using his communications and media background to document the nematode project through video.

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Field Technician for Hudson Valley Position is Open

Brief Job Description:

Under the guidance of regional specialists, the field tech travels to research plots on commercial farms throughout the Hudson Valley region served by the ENYCHP to assist in the collection and recording of data. Scouts for insects, diseases, weeds and crop damage in research plots and commercial fields and maintain good records. Work will frequently be performed in commercial fields that have been

sprayed with pesticides, and will require training in Worker Protection Standards (WPS) to understand the safe field re-entry period and practices. Performs basic data entry and summary. Assists in logistical setup for educational meetings and events throughout the region. Ensures that all protocols and procedures adhere to safety requirements.

This is a temporary appointment for approximately 20 weeks with a maximum weekly hours of 39. Hourly rate of \$13 to \$15 commensurate with experience.

Applications must be received by: 6/15/17

For full description and how to apply go to: <u>https://cornell.wd1.myworkdayjobs.com/en-US/CCECareerPage/job/New-York-State-Other/Research-Field-Tech--</u> -Middletown--NY_WDR-00011049-1

Angular Leaf Spot of Strawberries

Kathy Demchak, Penn Stat University Small Fruit Extension Associate

Angular leaf spot, caused by the bacterium Xanthomonas fragariae, is frequently problematic in strawberry plantings.



This disease is favored by cold, wet conditions, so often is more apparent in years when spring temperatures are cool. The bacteria get spread within a planting by splashing of water droplets, so needing to use over-

head irrigation frequently for frost protection can make the problem worse.

It is important to note that because this disease is caused by a bacterium, rather than a fungus, fungicides used to control other diseases will not help have an effect on angular leaf spot. Symptoms can vary a bit in coloration depending on the plant variety, weather conditions, and time of year. Key diagnostic features, however, are that the lesions are confined by the small veins of the leaf and the infected areas appear as a lighter color when leaf is held up to the light, as the bacteria cause the tissue to clear. Thus, the lesions have a blocky or "angular" appearance, sometimes referred to as a "windowpane" effect. As infected areas accrue, blocks of damage tissue die and turn a brown or red-brown color. In the photo below on the left, there is a small amount of infected tissue on a young leaf, so tiny areas of infected tissue are seen. In the photo on the right, more tissue has been infected for a longer period of time.

When infected tissue is viewed with light shining on it, instead of through it, the infected areas appear dark. In the photos below, recently infected tissue can be seen on the leaf underside as blocky dark green areas which turn black as the tissue dies. Once the tissue dies, the infection is obvious on both the upper and lower leaf surface.



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Again, note the angular shape of infected areas. Angular leaf spot also affects the fruit cap (calyx). The caps may have a blackened appearance if they have not had an opportunity to dry out, and after a dry spell may be described as brown rather than black. This is the symptom that often gets people's attention as the fruit becomes unsalable.



Botrytis gray mold, caused by a fungus, can also turn caps brown. If the caps turn brown and you don't know which disease is causing the caps discolor, check to see whether leaf symptoms of angular leaf spot are also present, and if they

are, angular leaf spot may be the problem. If leaf symptoms of angular leaf spot are not present, gray mold may be the issue. An additional clue is that if gray mold is the

problem, the berry tissue will also eventually turn soft as it become infected, whereas with angular leaf spot, the berry tissue remains normal in appearance. The berry often doesn't develop much sweetness with either disease, presumably because sugars cannot be translocated into the fruit normally when the caps are damaged.

Angular leaf spot and leaf scorch, a disease caused by a fungus, are also easily confused so here are photos to help you tell the difference. These photos are of the same two leaves, held differently so sunlight either shines down on them, or through them. The primary disease affecting the leaf on the left is leaf scorch, and the one on the right, angular leaf spot. In the photo on the left, where sunlight is shining down on the leaves, the leaves appear very similar. In the photo on the





The primary disease affecting the leaf on the top is leaf scorch, and the one on the bottom, angular leaf spot.

similar. In the photo on the

right, where leaves are held up so that sunlight shines through the leaf, you can see that light does not shine through the leaves with leaf scorch on the left, but the "windowpane" effect of angular leaf spot can be clearly seen. Note that in these two leaves, there is some of each disease present on each leaf.

No strawberry varieties have resistance to angular leaf spot. It is systemic within plants, and cannot be eradicated. The bacteria can also invade the plant's vascular system, causing a general decline, but this is less commonly seen than other symptoms.

Cultural controls consist of minimizing the amount of overhead irrigation used, and any practices that encourage drying of foliage such as keeping plantings weeded. Straw mulch can help minimize water droplet splashing, and avoiding moving equipment or harvesters through wet foliage will minimize the spread of inoculum. As mentioned above, commonly-used fungicides don't help with controlling this disease. Copper can help though phytotoxicity symptoms, which will appear as a general reddening or purpling of the leaves, may appear if more than four or five sprays are used. Avoid applications when tempera-

> tures are warm (higher than the mid-70s). Copper also tends to accumulate in the soil, so routine use without a reason is not recommended. Making applications early in the season will minimize infected leaf material, and prior to wet spells as temperatures become warmer may help to protect the caps. The main purpose of copper sprays is to protect tissue from infected bacterial slime, so if you are in a dry period, you can skip sprays for a while and save them for when you might need them later. Copper hydroxide formulations may be more effective than copper sulfate formulations.

Source: Penn State Extension fact sheet

Economics Concept for Farmers: Price Elasticity of Demand or how will your total revenue change if you change your prices? Elizabeth Higgins, ENYCHP

Farmer Pat's fruit farm sells berries to local restaurants. Because of higher input costs, in 2016 Pat decided to raise the price of raspberries and red currents by 10%. She decided not to change the price on the other berries she offers because she didn't want to upset her customers and raspberries and currents were her crops with the smallest profit margins. Pat's Fruit farm is the only source of local berries in the community for local restaurants and her customers are loyal, so Pat figured that she didn't have to worry about matching other farm's prices for berries.

At the end of the season Pat looked at her finances. Pat knew that total revenue = price x quantity sold

- Raspberry revenue (2015) = \$5.00/qt x 10,000qts = \$50,000
- Raspberry revenue (2016) = \$5.50/qt x 7,730qts = \$42,500
- Red Currant Revenue (2015) = \$10/qt x 5,000qts = \$50,000
- Red Currant Revenue (2016) = \$11/qt x 5,000qts = \$55,000

Pat was surprised to discover that at the end of the season her red current revenue went up by 10%, as she had expected, but her total raspberry revenue went down by 15% compared to 2015. What happened?

One likely scenario is that Pat's customers were **price** elastic for raspberries and price inelastic for red currents. When a consumer's demand is price elastic it means that they will reduce their demand for a good by a higher percentage than the percentage of the price increase – as prices go up by 1% their demand decreases by more than 1%. So, when Pat raised raspberry prices by 10%, if her customers were price elastic, they would have reduced the quantity of raspberries they purchased by more than 10%. This is what Pat discovered when she looked at who purchased raspberries last year and compared their purchases this year. She found that many of her customers for raspberries last year purchased more blueberries and strawberries from her this year - two crops that she didn't raise the prices for, and which were relatively less expensive than her raspberries. When she

called some of her customers, she found that several had, in fact, decided to buy different, less expensive berries from her, because they were a good substitute in their desserts for the raspberries and would result in a higher profit margin.

Price inelastic customers respond less drastically to a price increase. Their demand for the product does not change by as high a percentage as the change in price. So, if the price increases by 10%, their demand for the product would decrease by less than 10%. Pat found that the bulk of her red current sales went to two Scandinavian restaurants that had a lot of menu items that required red currents. The owners responded that her red current prices were still affordable at the new price given their need – in fact, they planned to buy even more next year. So what did Pat learn? Overall her gross revenue for raspberries and red currants after the price increase actually went down by \$3000, which was disappointing. She found that her customers were very price elastic to raspberries - so she learned she needed to be careful about raising prices too rapidly or she needed to also consider raising the prices on the substitutes she sells at the same time so that customers wouldn't see a set of obvious affordable substitutes. When she looked at her overall sales she found a 25% increase in strawberry and blueberry restaurant sales in 2016 compared to 2015. She thinks that not raising the prices on these crops at the same time may have been a costly mistake.

She also found that her red currant customers were more price inelastic. They needed red currants and her prices weren't high enough, even at the price increase, to change their demand. She thinks that she probably could either expand red currant production and sell more, or raise the price again or maybe even both.

Fortunately, the revenue from the increase in her strawberry and blueberry sales offset the decline in raspberry revenue so that Pat ended up with a little more revenue in 2016. Next year Pat's new understanding of her customers and their responsiveness to price changes will help her do a better job with pricing her products.

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Calendar of Events

June 15, 2017 - <u>UMass Extension Fruit Program Berry Twilight Meeting</u>, 5:00-&:30, Nourse Farms, 41 River Rd., Whately MA. Strawberry & Raspberry Variety Showcase, Blackberry Swing Arm Trellis Demo, High Tunnel Berry Production Update, Spotted Wing Drosophila Management Research and Management Update. 1 Pesticide Credit requested. Cost \$20 payable at the meeting. Light fare and refreshments included. Pre-registration is encouraged by emailing <u>umassfruit@umass.edu</u> in order to provide enough seating and food. For more info go to http://ag.umass.edu/fruit/upcoming-events.

Ag Business Tuesdays this Summer – free farm business technical assistance.

The Cornell Cooperative Extension Eastern NY Commercial Hort Team, in collaboration with CCE County offices, is offering free farm business technical assistance appointments this summer on Tuesdays at various locations in our service region. Topics for consultations can include: labor regulations and management, risk management (insurance and best practices), land use regulations and zoning, other foodregulations (labels, processing), personal finance and farm transition planning, tax and other grant and incentive programs, bookkeeping and recordkeeping, pricing products and market channel assessment, contract terms and negotiation, and loan programs and financing decisions. At your appointment we can either help to answer your questions or help direct you to the right resources.

Planned locations for June, and July 2017

- June 20 CCE Orange County, Middletown NY
- June 27 CCE Essex County, Westport NY
- July 11 CCE Clinton County, Plattsburg NY
- July 25 CCE Warren County, Warrensburg NY

Appointments are in 1.5-hour increments starting at 9:00 am. In some cases, early morning or early evening appointments may be available. Pre-registration in advance is required - we cannot accommodate walk-ins. If you can't physically come to the office, we can also schedule an appointment by phone or a video conference. To register go to: http://bit.ly/20yaGpM or call (518) 949-3722 and leave your name, preferred date and preferred time and the best way to reach you. Liz will also be doing farm visits in the counties on the following Wednesday. If you would like a farm visit, contact her directly at emh56@cornell.edu.



Berry Specialist

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Business Specialist

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

Food Safety Specialist

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June 2017 - Labeled Insecticides for Control of Spotted Wing Drosophila in New York Berry Crops – Quick Guide Compiled by Greg Loeb, Laura McDermott, Peter Jentsch, Tess Grasswitz, & Juliet Carroll, Cornell University. Updated regularly.

BLUEBERRIES										
PRODUCT	AI ¹	IRAC group ²	EPA#	Rate/A	REI ³	DTH ⁴	Max. Prod/A/yr (ai)	Total applic's	Spray Interval	Probable efficacy
^{^@} Entrust Naturalyte (2ee) ^a	spinosad	5	62719-282	1.25-2 oz	4 hr	3 d	9 oz (0.45 lb)	3 per crop	>6 d	Good to Excellent [#]
^{^@} Entrust SC	spinosad	5	62719-621	4-6 fl oz	4 hr	1 d	29 fl oz (0.45 lb)	6 per crop	> 6 d	Good to Excellent [#]
[@] Delegate WG (2ee)	spinetoram	5	62719-541	3-6 oz	4 hr	3 d	19.5 oz (0.305 lb)	6	> 6 d	Excellent [#]
*Exirel	cyazypyr	28	352-859	13.5-20.5 fl oz	12 hr	3 d	61.5 fl oz (0.4 lb)	3	> 5 d	Excellent
*Brigade WSB (2ee)	bifenthrin	3A	279-3108	5.3-16 oz	12 hr	1 d	5 lb (0.5 lb)	-	>7 d	Excellent
*Danitol 2.4EC	fenpropathrin	3 A	59639-35	16 fl oz	24 hr	3 d	32 fl oz (0.6 lb)	2	-	Excellent
*Mustang Max Insecticide (2ee)	zeta-cypermethrin	3A	279-3249	4 fl oz	12 hr	1 d	24 fl oz (0.15 lb)	6	> 7 d	Excellent
*Mustang Maxx Insecticide (2ee)	zeta-cypermethrin	3 A	279-3426	4 fl oz	12 hr	1 d	24 fl oz (0.15 lb)	6	> 7 d	Excellent
[^] Pyganic EC 1.4	pyrethrin	3A	1021-1771	1 pt-2 qts	12 hr	0 d	-	-	-	Fair to Poor
[^] Pyganic EC 5.0	pyrethrin	3 A	1021-1772	4.5-18 fl oz	12 hr	0 d	-	-	-	Fair to Poor
*Triple Crown	bifenthrin, imidacloprid, zeta- cypermethrin	<mark>3A,4A</mark>	279-3440	6.4-10.3 fl oz	12 hr	3 d	31 fl oz (0.54 lb)	5	>7 d	Good to Excellent
Assail 30SG	acetamiprid	4 A	8033-36- 70506	4.5-5.3 oz	12 hr	1 d	26.7 oz (0.5 lb)	5	> 7 d	Good [#]
*Lannate SP	methomyl	1A	352-342	0.5-1 lb	48 hr	3 d	4 lb (3.6 lb)	4	> 5-7 d	Excellent

*Refer to label for details and additional restrictions.

#Adding sugar (sucrose) at 2 lb/100 gal water as a feeding stimulant will increase efficacy. ^Approved for organic use in NY.

@After two consecutive applications must rotate to different mode of action.

¹ Active Ingredient.

² Mode of Action, based on IRAC group code (UN = unknown).

³ Re-entry Interval (hr = hours).

⁴ Days to Harvest (d = days).

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BLUEBERRIES										
PRODUCT	AI1	IRAC group ²	EPA#	Rate/A	REI ³	DTH ⁴	Max. Prod/A/yr (ai)	Total applic's	Spray Interval	Probable efficacy
*Lannate VP	methomyl	1A	352-384	1.5-3 pts	48 hr	3 d	12 pts (3.6 lb)	4	> 5-7 d	Excellent
*Imidan 70W	phosmet	1B	10163-169	1.33 lb	24 hr	3 d	7.125 lb (5.0 lb)	5	-	Excellent
Malathion 5EC (2ee)	malathion	1B	19713-217	2 pts	12 hr	1 d	6 pts (3.75 lb)	3	> 5 d	Good
Malathion 5EC (2ee)	malathion	1B	66330-220	2 pts	12 hr	1 d	6 pts (3.75 lb)	3	> 5 d	Good
Malathion 8 Aquamul (2ee)	malathion	1B	34704-474	2.5 pts	12 hr	1 d	3.75 pts (3.75 lb)	1	> 5 d	Good
Malathion 57 (2ee)	malathion	1B	67760-40- 53883	2 pts	12 hr	1 d	6 pts (3.75 lb)	3	> 5 d	Good
^AzaSol	azadirachtin	UN	81899-4	6 oz in 50 gal	4 hr	0 d	-	-	-	Fair to Poor
^#Grandevo	Chromobacterium subtsugae strain PRAA4- 1 and spent fermentation media	UN	84059-27	2-3 lb	4 hr	0 d	-	-	≤7 d	Fair to Poor

^a In organic production, Entrust must be rotated with insecticides with different modes of action, consider using Grandevo or products containing the active ingredients azadirachtin or pyrethrin.

*Refer to label for details and additional restrictions.

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RASPBERRIES & BLACKBERRIES											
PRODUCT	AI1	IRAC group ²	EPA#	RATE/A	REI ³	DTH ⁴	Max. Prod/A/yr (ai)	Total applic's	Spray Interval	Probable efficacy	
^{^@} Entrust Naturalyte (2ee) ^a	spinosad	5	62719-282	1.25-2 oz	4 hr	1 d	9 oz (0.45 lb)	3 per crop	> 6 d	Good to Excellent [#]	
^{^@} Entrust SC (2ee) ^a	spinosad	5	62719-621	4-6 fl oz	4 hr	1 d	29 fl oz (0.45 lb)	3 per crop	> 6 d	Good to Excellent [#]	
[@] Delegate WG (2ee)	spinetoram	5	62719-541	3-6 oz	4 hr	1 d	19.5 oz (0.305 lb)	6	> 4 d	Excellent [#]	
*Brigade WSB (2ee)	bifenthrin	3 A	279-3108	8-16 oz	12 hr	3 d	2 lb (0.2 lb)	1 post bloom	-	Excellent	
*Brigade EC (2ee)	bifenthrin	3 A	279-3313	3.2-6.4 fl oz	12 hr	3 d	12.8 fl oz (0.2 lb)	1 post bloom	-	Excellent	
*Danitol 2.4EC	fenpropathrin	3 A	59639-35	16 fl oz	24 hr	3 d	32 fl oz (0.6 lb)	2	-	Excellent	
*Mustang Max Insecticide (2ee)	zeta-cypermethrin	3 A	279-3249	4 fl oz	12 hr	1 d	24 fl oz (0.15 lb)	6	>7 d	Excellent	
*Mustang Maxx Insecticide (2ee)	zeta-cypermethrin	3 A	279-3426	4 fl oz	12 hr	1 d	24 fl oz (0.15 lb)	6	> 7 d	Excellent	
[^] Pyganic EC 1.4	pyrethrin	3 A	1021-1771	1 pt-2 qts	12 hr	0 d	-	-	-	Fair to Poor	
[^] Pyganic EC 5.0	pyrethrin	3 A	1021-1772	4.5-18 fl oz	12 hr	0 d	-	-	-	Fair to Poor	
*Triple Crown	bifenthrin, imidacloprid, zeta- cypermethrin	<mark>3A,4A</mark>	279-3440	6.4-10.3 fl oz	12 hr	3 d	10.3 fl oz (0.181 lb)	1 post bloom	> 7 d	Good to Excellent	
Assail 30SG	acetamiprid	4 A	8033-36- 70506	4.5-5.3 oz	12 hr	1 d	26.7 oz (0.5 lb)	5	>7 d	Good [#]	
Malathion 5EC (2ee)	malathion	1B	19713-217	3 pts	12 hr	1 d	9 pts (6.0 lb)	3	>7 d	Good	

*Refer to label for details and additional restrictions.

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Malathion 5EC (2ee)	malathion	1B	66330-220	3 pts	12 hr	1 d	9 pts (6.0 lb)	3	>7 d	Good	
Malathion 8 Aquamul (2ee)	malathion	1B	34704-474	2 pts	12 hr	1 d	6 pts (6.0 lb)	3	>7 d	Good	
Malathion 57 (2ee)	malathion	1B	67760-40- 53883	3 pts	12 hr	1 d	9 pts (6.0 lb)	3	>7 d	Good	
^AzaSol		UN	81899-4	6 oz in 50 gal	4 hr	0 d	-	-	-	Fair to Poor	
Molt-X	azadirachtin	UN	68539-11	10 oz in 50 gal	4 hr	0 d	-	-	-	Fair to Poor	
^{*#} Grandevo	Chromobacterium subtsugae strain PRAA4-1 and spent fermentation media	UN	84059-27	2-3 lb	4 hr	0 d	-	-	≤ 7 d	Fair to Poor	

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^{^@} Entrust Naturalyte (2ee) ^a	spinosad	5	62719-282	1.25-2 oz	4 hr	1 d	9 oz (0.45 lb)	5	> 5 d	Good to Excellent [#]
^{^@} Entrust SC (2ee) ^a	spinosad	5	62719-621	4-6 fl oz	4 hr	1 d	29 fl oz (0.45 lb)	5	> 5 d	Good to Excellent [#]
[@] Radiant (2ee)	spinetoram	5	62719-545	6-10 fl oz	4 hr	1 d	39 fl oz (0.305 lb)	5	> 3 d	Excellent [#]
*Brigade WSB (2ee)	bifenthrin	3A	279-3108	8-16 oz	12 hr	0 d	5 lb (0.5 lb)	-	> 7 d	Excellent
*Danitol 2.4EC	fenpropathrin	3 A	59639-35	16-21.3 fl oz	24 hr	2 d	42.7 fl oz (0.8 lb)	2	-	Excellent
[^] Pyganic EC 1.4	pyrethrin	3A	1021-1771	1 pt-2 qts	12 hr	0 d	-	-	-	Fair to Poor
[^] Pyganic EC 5.0	pyrethrin	3A	1021-1772	4.5-18 fl oz	12 hr	0 d	-	-	-	Fair to Poor
Assail 30SG	acetamiprid	4 A	8033-36- 70506	4.5-5.3 oz	12 hr	1 d	13.8 oz (0.26 lb)	2	> 7 d	Good [#]
Malathion 5EC (2ee)	malathion	1B	19713-217	3.2 pts	12 hr	3 d	12.8 pts (8 lb)	4	> 7 d	Good
Malathion 5EC (2ee)	malathion	1B	66330-220	3.2 pts	12 hr	3 d	12.8 pts (8 lb)	4	> 7 d	Good
Malathion 8 Aquamul (2ee)	malathion	1B	34704-474	2.0 pts	12 hr	3 d	8 pts (8 lb)	4	> 7 d	Good
Malathion 57 (2ee)	malathion	1 B	67760-40- 53883	3.2 pts	12 hr	3 d	12.8 pts (8 lb)	4	> 7 d	Good
^AzaSol	azadirachtin	UN	81899-4	6 oz in 50 gal	4 hr	0 d	_	-	-	Fair to Poor
^#Grandevo	<i>Chromobacterium</i> <i>subtsugae</i> strain PRAA4-1 and spent fermentation media	UN	84059-27	2-3 lb	4 hr	0 d	-	-	\leq 7 d	Fair to Poor

^a In organic production, Entrust must be rotated with insecticides with different modes of action, consider using Grandevo or products containing the active ingredients azadirachtin or pyrethrin.

*Refer to label for details and additional restrictions.

#Adding sugar (sucrose) at 2 lb/100 gal water as a feeding stimulant will increase efficacy. ^Approved for organic use in NY.

@After two consecutive applications must rotate to different mode of action.

¹ Active Ingredient.

² Mode of Action, based on IRAC group code (UN = unknown).

 3 Re-entry Interval (hr = hours).

⁴ Days to Harvest (d = days).