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Eastern NY Commercial Horticulture Program

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Tree Fruit News

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Regional Updates*:

North Country—Clinton, Essex, northern Warren and Washington counties

Tree phenology: Apple=post bloom

Current growing degree days 1/1/13 to 8/19/13	Base 43°F*	Base 50°F*
Chazy	2666	1808
Peru	2669	1836
South Hero, VT	2805	1950
Willsboro, NY	2660	1805
Shoreham, VT	2823	1972

Pest focus—Apple: scab, sooty blotch, flyspeck, fruit rots, codling moth, apple maggot.

Capital District—Albany, Fulton, Montgomery, Rensselaer, Saratoga, Schenectady, Schoharie, southern Warren and Washington counties

Tree phenology: Apple, pear, peach, cherry, plum, apricot=post bloom

Current growing degree days 1/1/13 to 8/19/13	Base 43°F*	Base 50°F*
Granville	2672	1837
North Easton	2922	2043
Clifton Park	2827	1973
Guilderland	2866	2005

Pest focus—Apple: scab, sooty blotch, flyspeck, fruit rots, codling moth, apple maggot. Stone fruit: brown rot, oriental fruit moth, aphids. Pear: Fabraea leaf spot, pear psylla.

Mid-Hudson Valley—Columbia, Dutchess, Greene, Orange, Sullivan and Ulster counties

Tree phenology: Apple, pear, peach, plum, cherry, apricot=post bloom.

Current growing degree days 1/1/13 to 8/19/13	Base 43°F*	Base 50°F*
Hudson	3088	2207
Highland	3134	2214
Marlboro	3044	2141
Montgomery	3034	2137

Pest focus—Apple: scab, sooty blotch, flyspeck, fruit rots, codling moth, apple maggot, leafhoppers, brown marmorated stink bugs, San Jose scale. Stone fruit: brown rot, oriental fruit moth, aphids. Pear: Fabraea leaf spot, pear psylla.

Coming Events

Coming Events: Range (normal ± std deviation)	Base 43°F*	Base 50°F*
Apple maggot flight peak	2103-2657	1408-1838
Comstock mealybug 2nd gen. crawlers emerge	2234-2624	1505-1781
Comstock mealybug 2nd gen. crawlers subside	2735-2771	1794-1958
San Jose scale 2nd gen. crawlers emerge	2746-2852	1916-2104

**All degree day data presented are BE (Baskerviile-Emin) calculations.*

Orchard Environmental Stresses Suggest Present Harvest and Longer Term Climate Resiliency Strategies

By Kevin Iungerman, ENYCH

You may recall that I called attention to the incidence of bitter rot following upon sunburn in the last issue of the Tree Fruit News. Looking back over our rainfall events and precipitation totals in eastern NY over the past several months, we have gone from gross excess to, lately, beginning deficit situations (see Tables 1 and 2) – which if not alleviated through irrigation and/or rainfall, may cause drop problems as trees are carrying substantial crop (and in places quite heavily so, due to inadequate thinning). Most locations have now been in deficit status since August 14, though some locations had deficit onset as early as August 10 (Table 2).

Table 1. Rain and Solar Radiation, Eastern NY Orchard Locations, June-August 2013

NEWA Station	June		July		August (1st - 19th)	
	Rain	Solar Radiation	Rain	Solar Radiation	Rain	Solar Radiation
Chazy	9.98	12507	2.83	16026	1.11	8256
Peru	9.99	12981	3.93	14673	0.94	7893
Shoreham	6.75	9498	4.10	9695	0.69	4998
North Easton	8.53	7868	4.49	13292	1.77	6840
Clifton Park	8.05	10256	2.73	11706	2.23	6146
Guilderland	na	10511	na	11829	1.13	6531
Hudson	6.41	13873	3.87	14777	2.50	8160
Marlboro	9.02	12574	4.13	12544	6.99	7288

Data from NEWA sites having both solar sensors and complete data sets. Solar radiation in Langley units. *Table by K. Iungerman ENYCH*

Looking at orchard and crop conditions in Washington, Essex, and Clinton Counties over the period Friday, August 16, through Sunday, August 18, two situations of adverse tree response are evident, either from our earlier situations of either saturated soils and /or excessive cooling and respiration need during high heat events.

A number of plantings in poorly drained low areas have fared poorly and many of the trees in such locations are very lightly cropped, and tree canopies are noticeably chlorotic (that light sickly green appearance). These areas are prone to other injuries as well, including winter injury and spring frosts, and in cases, they represent good choices for removal. Root injury almost certainly was extensive. (See photos following tables.)

Then the heat experience: in one location that had not experienced the worst heat last month (in terms of frequency of occurrence - i.e. temperatures exceeding 89° F, see Table 3), other factors, including the flat lay of the land, or droughty soils, may have concentrated the heat's ill effects, as did over cropping, and a history or young trees bearing prematurely (somewhat of a perfect storm). In this situation I saw quite severe sunburn to Honeycrisp, and Gingergold especially, and less to Sweetango, and McIntosh (in that order of severity). (See accompanying photos.)

Fortunately (depending on your viewpoint) blocks quite close by had much lesser percentages of damage – but in the first worst affected area, loss will probably approach

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Table 2. Eastern NY Orchard Water Balance Estimate, August 19, 2013

NEWA Station	Orchard Evapotranspiration (gallons)		Current August 19 Water Balance Deficit (gallons/acre)		
	Per tree	Per Acre	Daily	Cumulative	Onset date
Chazy	3.1	3084	-3084	-17868	Aug 11
Peru	3.3	3262	-3262	-16751	Aug 10
Shoreham	2.4	2371	-2371	-11696	Aug 10
North Easton	3.3	3306	-3306	-18023	Aug 14
Clifton Park	2.7	2693	-2693	-14393	Aug 14
Guilderland	3.2	3154	-3154	-14858	Aug 14
Hudson	3.1	3086	-3086	-19456	Aug 14
Marlboro	2.9	2897	-2897	-17286	Aug 14

Calculations based on high-density trees at 4'x11' spacing (990 trees per acre). Data from NEWA sites having solar sensors and complete data sets. *Table by K. Iungerman ENYCH*

Sunburn on McIntosh. *Photo by K. Iungerman*

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30% on the Honeycrisp, and perhaps 10-15% loss in the less severely affected areas.

Sunburn on Ginger Gold.
Photo by K. Iungerman

Elsewhere in the region I did not see comparable sunburn loss *but some could be found just about everywhere, which is a significant departure for this production region.* Other than the bitter rot I noted previously at the Saratoga location in our last issue, I have had no further report of extensive sunburn injuries.

Now there may be the matter of what is not apparent to the eye. My thoughts on this are that the extensive earlier water and heat stresses can potentiate any later water deficit stress situation and thereby increase the potential for fruit drop. Growers should plan to pay close attention for signs of premature drop, and after harvest, to plan on closely monitoring samples (keep close to the door) of whatever fruit is placed into storage.

By mixing Retain and NAA together, you can reduce drop while maintaining firmness. Cornell faculty and others have been evaluating tank-mixing Retain with NAA and the results appear better than either product alone. Essentially, NAA delays drop by keeping the apple stem from separating from the spur but it causes increased fruit ethylene production and subsequent fruit softening. In counteraction, Retain reduces ethylene production, but it also delays color development and it may not compensate for the effects of warmer-than-normal heat, which increases drop. Lower rates of Retain are less effective at controlling drop and keeping fruit firm, but also have less negative impacts on color development.

NAA can be used as a rescue treatment for control of pre-harvest drop when applied as the first sound fruit begin to drop. When several apples drop in response to limb bumping, it is time to either harvest varieties like McIntosh

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Table 3. Eastern NY July 2013 Orchard Temperatures > 89° F

	Avg	Max	Min		Avg	Max	Min
Chazy				**Peru**			
7/17/13	80.4	92.1	72.1	7/17/13	81.6	92.1	71.9
7/19/13	79.8	93.0	70.1	7/19/13	*80.0*	*92.1*	*70.1*
Shoreham				**North Easton**			
7/5/13	*75.7*	*90.2*	*69.1*	7/4/13	*79.4*	*91.3*	*69.0*
7/15/13	*78.9*	*93.1*	*68.6*	7/5/13	*78.9*	*89.9*	*70.0*
7/17/13	*80.0*	*93.2*	*68.7*	7/15/13	*79.6*	*89.5*	*70.0*
7/18/13	*79.8*	*92.7*	*70.9*	7/16/13	*78.8*	*90.0*	*67.9*
7/19/13	*79.8*	*93.4*	*71.0*	7/17/13	*80.0*	*90.0*	*70.4*
				7/18/13	*81.8*	*89.4*	*73.1*
				7/19/13	*82.9*	*91.4*	*70.5*
Clifton Park				**Guiderland**			
7/4/13	*79.4*	*91.3*	*69.0*	7/4/13	*78.5*	*91.0*	*67.0*
7/5/13	*78.9*	*89.9*	*70.0*	7/5/13	*80.1*	*91.0*	*68.0*
7/14/13	*77.7*	*90.2*	*68.0*	7/15/13	*81.8*	*90.0*	*75.0*
7/15/13	*79.9*	*89.9*	*70.0*	7/16/13	*80.6*	*92.0*	*71.0*
7/16/13	*79.7*	*92.8*	*68.0*	7/17/13	*82.6*	*93.0*	*74.0*
7/17/13	*81.3*	*92.2*	*67.9*	7/18/13	*83.9*	*93.0*	*76.0*
7/18/13	*82.6*	*92.0*	*75.0*	7/19/13	*83.1*	*94.0*	*72.0*
7/19/13	*82.6*	*93.1*	*70.9*				
Hudson				**Marlboro**			
7/5/13	83.2	93.0	73.0	7/5/13	*71.1*	*89.9*	*45.0*
7/6/13	82.0	91.5	72.2	7/6/13	*82.6*	*90.0*	*76.0*
7/7/13	78.3	91.0	69.5	7/7/13	*81.3*	*90.0*	*73.0*
7/14/13	79.1	93.0	70.0	7/14/13	*78.8*	*89.2*	*70.4*
7/15/13	81.3	92.0	72.0	7/15/13	*81.4*	*90.2*	*72.0*
7/16/13	80.9	92.3	69.0	7/16/13	*80.4*	*90.8*	*69.0*
7/17/13	82.8	95.9	69.0	7/17/13	*80.9*	*92.8*	*69.6*
7/18/13	84.6	98.3	72.9	7/18/13	*84.0*	*95.6*	*74.0*
7/19/13	84.4	96.9	71.0	7/19/13	*83.8*	*92.8*	*74.0*

Use of NEWA sites having solar sensors and complete sets of actual reported and adjusted data.
Table: K. Iungerman ENYCH

Sunburn on Sweetango™. *Photo by K. Iungerman*

Sunburn on Honeycrisp.
Photo by K. Iungerman

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within 2 days or apply NAA. Rates of 10-20 ppm NAA are usually needed to be an effective stop-drop. Maximum control can be obtained using a split application of 10 ppm followed by a second spray of 10 ppm five days after the first. Split applications can provide drop control for about 12 days from the first treatment. Please refer back to the July 24 Tree Fruit News for more details.

Poor cropping trees in wet area.
Photo by K. Iungerman

Chlorotic orchard block with scant crop. *Photo by K. Iungerman*

Looking ahead, as climate shift portends more episodic seasonal heat and precipitation events, it behooves us to have fully functional tile systems, adequate irrigation capacity, and research into crop protectant coverings that may mitigate the effects of high heat. That last research aspect was denied when an earlier research proposal along these lines was rejected but it is to be submitted again by Cornell and Eastern New York Hort Team applied researchers and perhaps it will gain more traction.

The Affordable Care Act and Your Business: Information Sessions Now in the North

The new federal health care law called the Affordable Care Act (ACA) will soon change the way that businesses and/or employees will obtain their health insurance. Some employers will be mandated to provide health insurance for their employees. Others may want to offer insurance to assist in employee retention since there will be a tax penalty for any non-insured individuals.

Often sole proprietorships look for ways to find affordable health insurance for themselves and employees. The ACA offers a 3-legged approach to resolve this problem: increased protection for the insured, cost containment, and increased access to coverage and benefits through the exchange.

Enrollment begins in October 2013, with a goal of providing health insurance for the 2.8 million New Yorkers who are uninsured. More than half of those work full time jobs! The benefits of the ACA are: a projected 66% reduction in health insurance premium costs, protections covering preventive care, no lifetime benefit caps, the right to appeal, and a reduction in pre-existing condition exclusions.

To answer concerns regarding how the ACA will directly impact you, Cornell Cooperative Extension in partnership with Community Health Advocates is providing ACA educational sessions at the following locations and times:

Tues Sept 24:

From 1-3 pm at the Extension office in Plattsburgh and

From 7-9 pm at the Extension office in Westport

Wed Sept 25:

From 1-3 pm at the 911 Building, Bare Hill Road, Malone

From 7-9 pm at the Extension Learning Farm in Canton

Thu Sept 26:

From 1-3 pm at the Extension Office in Watertown

From 7-9 pm at the Extension Office in Lowville

For additional information or to preregister, contact Anita Deming at ald6@cornell.edu or 518-962-4810 x409.

Apple Rootstock Research Featured at the August Fruit Field Day at Geneva

By Terence Robinson, Cornell Dept. Horticulure.
Adapted by Kevin Iungerman, ENYCH

At the Geneva Field day on August first, 4th year HC trees on several new Geneva and Russian rootstocks were featured. Rootstocks from around the world are being evaluated at the Geneva Experiment Station to identify those that are not only dwarfing and highly productive, but which also have resistance to fire blight and tolerance to upstate NY winters. These stocks include ones from Geneva (G series), Japan (JM series), the Czech Republic (JTE series), Germany (PiAu series, Sup Supporter series), Russia (Bud series), and France (Pajam, P) as well as the more familiar Malling rootstocks (M, England).

- Of the rootstocks being evaluated, the most dwarfing, B.71722, is too dwarfing for commercial use.

- Rootstocks CG.2034 and B.9 were very dwarfed while G.11, CG.4003, and G.41TC were slightly larger.

- Rootstocks G.41N, Sup.3, M.9T337, G.935TC, and M.26 were all slightly larger and similar; those of a larger group size included B.10 and G.214.

- A more vigorous group still, included G.202TC, B.67-532, G.935N, CG.5202, G.202N, CG.5087, CG.4004, CG.4013, CG.4814, and B.73-150.

- Finally, the most vigorous stocks included PiAu 51-11, B.7068, G.214, B.72-021, CG.3001, PiAu 990, and B.72-020.

The most yield-efficient rootstock was G.4003, followed by B.71-722 (which was extremely dwarfed), and then successively in declining efficiency were: B.9, B.10, M.9T337, G.11, G.41N, CG.2034, G.202TC, Sup.3, CG.5087, M.26, CG.4814, CG.202N, CG.5202, G.935N, M.9Pajam2, G.935TC, B.73-150, B.70-68, G.214, B.72-021, CG.3001, and PiAu 9-90. Finally, there is B.72-020, which had the lowest yield efficiency.

Fruit size was large with almost all stocks. However, those seen to have small fruit size included B.71-722 and CG.4003. Tree survival was poorest (significantly less than 100% statistically) with B.71-722 and G.41TC.

Among the CG stocks, G.11 and G.41 were the smallest followed by G.214, G.935, and CG.202, which are considered intermediate in vigor. Semi-dwarf stocks are G.30, CG.210 and G.969. Semi-vigorous stocks are G.890.

Dr. Robinson's Prepared (Handout) Comments on the Geneva Rootstocks:

Geneva 11 is similar in size to B.9 and is very precocious, has very high yield efficiency and reduces bienniality with Honeycrisp. It is fire blight resistant and has good resistance to Phytophtora root rot, but it is not resistant to wooly apple aphids or apple replant disease. It is an excellent replacement for M.9. Stoolbed production in the US in 2012 was at 800,000 liners and production should increase to 1,000,000 liners in 2013. We suggest G.11 be used with vigorous varieties like McIntosh, Jonagold, or Mutsu.

Geneva 41 is similar in size to vigorous clones of M.9 such as Nic29 or Pajam 2 but is the most efficient dwarf footstock in our trials. It too reduces bienniality with Honeycrisp. It has excellent fruit size and induces wide branch angles. It is highly resistant to fire blight and is also resistant to Phytophthora and woolly apple aphids. It has good tolerance of apple replant disease and has good winter hardiness. Its stoolbed production in the US in 2012 was 600,000 liners. Substantial new stoolbeds have been planted which should increase production to 1,200,000 liners in 2013. We suggest G.41 be used with weak varieties like HC, Snapdragon™ (formerly NY1), Jonamac, Macoun, and Empire.

Geneva 935 is similar in size to M.26 and is very yield efficient. It induces wide branch angles, is highly resistant to fire blight and Phytophthora, and appears to have some tolerance of apple replant disease. It also appears to be very winter hardy, but it is not resistant to wooly apple aphid. Fruit size has been slightly smaller than with M.9. It is an excellent new rootstock for weak growing cultivars like spur-type Delicious, Honeycrisp, SweetTango™, or Snapdragon™. Its stoolbed production in the US in 2012 was 300,000 liners and production should increase to 400,000 liners in 2013.

Geneva 202 produces a tree slightly larger than M.26. It has high yield efficiency and is precocious. It is resistant to fireblight, Phytophthora, apple replant disease and to woolly apple aphid. It is useful with weak growing cultivars and as an alternative to M.26 in climates that have problems with woolly apple aphid. It has become a popular dwarfing rootstock in NZ. Its stoolbed production in the US in 2012 was 150,000 liners with substantial new stoolbeds planted.

Geneva 214 is similar in size to the vigorous clones of M.9 in other trials. Due to outstanding performance of G.214 in trials done in NYS and WA State it was released in 2010. It is slightly less yield efficient than G.41 but has better stoolbed propagation characteristics, which may make it easier to introduce quickly. The first commercial stoolbeds of these stocks were panted in 2013.

Geneva 969 is intermediate in size between M.26 and M.7. It is highly yield efficient and was released in 2000 as a free

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standing semi-dwarf tree for processing orchards. It is resistant to fire blight, Phytophtohora, and to woolly apple aphid. It has excellent stoolbed propagation characteristics. It performs well in northern climates. It is an excellent stock for weak growing cultivars in northern climates like Honeycrisp and Snapdragon™ when planted at high densities. The first commercial stoolbeds of this stock will be planted in 2013.

Geneva 890 is similar in size to MM.106. It is more yield efficient than M.7 or MM.106 and was released in 2010 as a free standing semi-dwarf tree for processing orchards. It has excellent stoolbed propagation characteristics and is resistant to fire blight, Phytophthora and wooly apple aphids. The first commercial stoolbeds for this stock will be planted in 2013.

Four other Geneva rootstocks (65, 16, 30, and 210) have also been released but have limited commercial propagation. G.65 is too dwarfing in many locations, while G.16 is susceptible to latent virus infections when grafted with infected budwood. G.30 is very productive in the orchard and is proving to be useful in northern growing areas where it shows wide soil adaptation and good winter hardiness and high yields. However, it is difficult to handle in the stoolbed and nursery due to excessive production of sharp spines. This has limited its production for the last 5 years to about 100,000 liners per year. G.210 is newly released with similar characteristics as G.30 but with fewer spines.

Brown Marmorated Stink Bug Update

By Peter Jentsch, Cornell Dept. Entomology, Hudson Valley Lab, Highland, and Mike Fargione, ENYCH. Edited by K. Iungerman, ENYCH

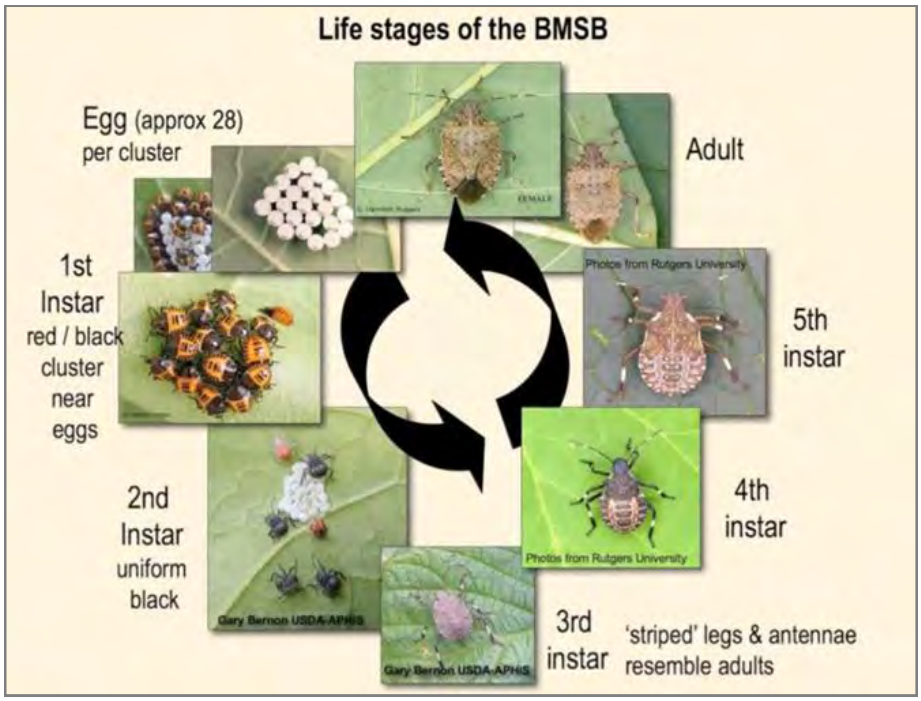
Peter Jentsch, Entomologist at Cornell's Hudson Valley Lab, and Extension Associate Mike Fargione, with Cornell's Eastern NY Commercial Horticulture Program, reported seeing increasing numbers of Brown Marmorated Stink Bugs (BMSB) coming into traps placed along orchard perimeters in the lower Hudson Valley (Orange, Ulster, Dutchess and Columbia Counties) just prior to August 12. Second hand reports were received of BMSB in Ulster County apple and peach orchards and in Dutchess County apple blocks. These relatively low numbers appear to be signaling that 1st generation adults are beginning the seasonal move into these area orchards, and indeed, some fruit damage was found in some Columbia County apples and Dutchess County peaches and Asian pears.

Since this insect causes the greatest damage along orchard perimeters, growers in the region ought to scout along wooded edges and hedgerows bordering their orchards.

Pay special attention to higher elevation and droughty sites or wherever any "Tree of Heaven" (*Ailanthus altissima*) may be found (typically in very southerly locations).

BMSB may also be more abundant in the upper canopy of the orchard, so climbing or employing ladders may be needed to improve scouting efficacy. This insect is quite active in the evening and may be observed during night and early morning orchard operations and during harvest of early maturing varieties. Inform harvest workers to be on the lookout for the insect by providing images of BMSB life stages. (Repeated here and to be found with additional information at: http://hudsonvf.cce.cornell.edu/bmsb1.html.)

Very low populations observed during scouting can be misleading due to the elusive nature of this pest, thereby possibly obscuring the very significant but hard-to-see numbers that are capable of causing severe fruit injury. At this point, we suggest that pesticide applications should begin after confirmed BMSB sightings have occurred in the orchard, or if confirmed damage is seen, or



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prophylactically if you have not already applied an effective material and you had significant BMSB damage last season.

You will have to balance the need for effective control with Pre-Harvest Interval restrictions attending legal materials. Don't use up your short-PHI materials too soon on late-harvested cultivars, as additional sprays could likely be needed. Based on efficacy, we had previously suggested growers consider bifenthrin (Bifenture EC, Bifenture 10DF or Brigade WSB; PHI=14 days; **SLN label for use on BMSB only in Dutchess, Orange and Ulster counties)** or fenpropathrin (Danitol 2.4EC; PHI=14 days) as a first-spray option.

In recent bioassay results, we've found endosulfan (Thionex 50WP and Thionex EC; PHI=21 days) to exhibit effective residual activity, and this may be a good first-spray choice for late-maturing cultivars to help save shorter-PHI materials for later use. Leverage 360 has also been found to be effective on BMSB, and we suggest saving this in case a late spray is needed because of its short, 7-day PHI. Note: last season's observations have shown that beta-cyfluthrin alone (such as Baythroid XL 1EC and Tombstone formulations) has not been as effective against BMSB as the pre-mix found in Leverage 360. An updated reference list of BMSB control products can also be found via the prior link.

A spray of one of the effective materials is likely to provide effective residual control for up to 1 week in low to moderate population sites. Reaching that point, you will then need to reapply another material if migration is still taking place, or just continue monitoring if you believe (hope?) you have cleaned up the problem. One strategy is to start with an application directed to fruit trees within the first 90 feet of the outer orchard rows. However, you will want to treat the entire orchard where BMSB sightings, or their damage, extend into the orchard interior, or where you also need to refresh apple maggot and codling moth control.

Application of the above effective materials may also be effective against other pests when applied at the higher rates for BMSB control (bifenthrin and endosulfan are labeled for BMSB but not for AM and CM control). As the BMSB season progresses, a 4–5-day interval may be needed in sites where high migrations are taking place, especially if materials with low efficacy ratings are used.

Other Upcoming Pest Events Still to Come	Base 43°F	Base 50°F
	Ranges (Normal +/- Std Dev)	
Apple maggot flight peak	2103-2657	1408-1838
Codling moth 2nd flight peak	1931-2735	1278-1892
Comstock mealybug 2nd gen. crawlers subside	2735-2771	1794-1958
Lesser appleworm 2nd flight peak	2131-3105	1422-2156
Obliquebanded leafroller 2nd flight peak	2593-3011	1758-2098
Oriental fruit moth 3rd flight begins	2295-2863	1553-1991
Oriental fruit moth 3rd flight peak	2662-3236	1831-2243
Peachtree borer flight subsides	2478-3126	1672-2180
Redbanded leafroller 2nd flight subsides	2182-2742	1471-1891
Redbanded leafroller 3rd flight begins	2594-2976	1768-2070
San Jose scale 2nd flight subsides	2673-3419	1813-2429
San Jose scale 2nd gen. crawlers emerge	2746-2852	1916-2104
Spotted tentiform leafminer 3rd flight peak	2578-3030	1754-2116