



Healthy Fruit, Vol. 26, No. 13, June 26, 2018

Jon Clements, Author (unless otherwise noted) and Editor

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Current degree day accumulations

UMass Cold Spring Orchard, Belchertown, MA	25-Jun
Base 43 BE (NEWA)	1258
Base 50 BE (NEWA)	854

Upcoming pest events

Coming events	Degree days (Base 43)	Meaning?
Apple maggot 1st catch	1226 to 1690	Almost time to think about putting AMF traps up, although fruit is not at risk (yet)
Cherry fruit fly 1st catch	755 to 1289	Does this mean we might expect to start catching SWD in traps at similar timing?
Codling moth 1st flight subsides	1276 to 1834	Still a window for first generation control but closing rapidly; be prepared to monitor for 2nd generation flight
Lesser appleworm 1st flight subsides	1002 to 1538	Is this a problem in MA orchards? Likely not because of PF sprays for PC?
Lesser appleworm 2nd flight start	1429 to 2108	?
Lesser peachtree borer flight peak	853 to 1767	If used, mating disruption should be in place
Oblique-banded leafroller summer larvae hatch	1038 to 1460	Time in a week or two for Altacor, Delegate or similar if indicated
Oriental fruit moth 2nd flight peak	1454 to 1951	Hang pheromone traps or replace pheromone to monitor flight

Peachtree borer flight peak	1028 to 2004	If used, mating disruption should be in place; alternately, trunk directed sprays of Lorsban...
Redbanded leafroller 2nd flight start	1204 to 1557	Ideally, monitor situation with pheromone traps, but verdict still out how much a problem this pest is in MA orchards?
Spotted tentiform leafminer 2nd flight peak	1388 to 1783	Would not be a bad idea to hang pheromone traps to see where you stand?
White apple leafhopper 1st gen adults peak	1162 to 1414	?

Ag-Radar summary

Key insect life cycle and management dates

Note: for 2018, we have ten Massachusetts orchard locations subscribed to AR: Amherst, Belchertown (2 locations), Brookfield, Deerfield, Easthampton, Groton, Leominster, Northboro, and Westhampton. The website for looking at AgRadar for these locations is: <http://extension.umaine.edu/ipm/ag-radar-apple-sites/>. What follows is the AgRadar summary for the Belchertown location.

Dogwood Borer (DB) -- First dogwood borer egg hatch roughly: June 22. Peak hatch roughly: July 27.

Codling Moth (CM) -- Codling moth development as of June 26: 1st generation adult emergence at 97% and 1st generation egg hatch at 73%. Insecticide targeted against plum curculio and apple maggot may also prevent codling moth damage. If targeted codling moth control is needed, key management dates are (have passed).

ObliqueBanded Leafroller (OBLR) -- 1st generation OBLR flight begins around June 7, Thursday. Where waiting to sample late instar OBLR larvae is not an option (= where OBLR is known to be a problem, and will be managed with insecticide against young larvae): Early egg

hatch and optimum date for initial application of B.t., Delegate, Proclaim, Intrepid, Rimon, Altacor, Belt, pyrethroid or other insecticide effective against OBLR (with follow-up applications as needed): June 22, Friday. Where waiting to sample late instar OBLR larvae to determine need for treatment is an option, or to check on results from earlier sprays: Optimum sample date for late instar summer generation OBLR larvae: July 1, Sunday. If first OBLR late instar larvae sample is below threshold, date for confirmation follow-up: July 4, Wednesday.

Oriental Fruit Moth (OFM) -- 2nd generation OFM flight begins around: June 28, Thursday. 2nd generation - first treatment date, if needed: July 4, Wednesday. 2nd generation - second treatment date, if needed: July 16, Monday.

Redbanded Leafroller (RBLR) -- 2nd RBLR flight begins around June 28, Thursday. Peak catch and approximate start of egg hatch: July 11.

Spotted Tentiform Leafminer (STLM) -- 2nd STLM flight begins around: June 16, Saturday. Rough guess of when 2nd generation sap-feeding mines begin showing: July 3, Tuesday. Optimum first sample date for 2nd generation STLM sapfeeding mines is July 11, Wednesday.

Preliminary McIntosh Harvest Date Forecasts -- Date to apply ReTain to delay first harvest for apples which without treatment would be ready for storage harvest on September 6 is from Thursday August 9 to August 16. Date to apply ReTain to delay maturity for 2nd, 3rd or 4th pick of those apples, without delaying start of harvest maturity, is from Thursday, August 23 to August 30. Begin measuring actual McIntosh starch-iodine index no later than Saturday, August 18. The Michigan formula estimates that non-spur McIntosh will reach starch index 4.0 and start the optimum harvest window for long term storage on Thursday, September 6. Using the Champlain Valley NY formula from Cornell Bulletin 221 '[Predicting Harvest Date Windows for Apples](#),' McIntosh maturity is forecast to reach starch index 6.0 in Belchertown-ColdSpring MA on Saturday, September 15. (Yup, we are already talking about harvest.)

Upcoming meetings

TUESDAY, July 10, 2018. Massachusetts Fruit Growers' Association Annual Summer Meeting, UMass Cold Spring Orchard, 391 Sabin Street, Belchertown, MA. 10 AM to 3 PM. For more information, and to pre-register: <http://massfruitgrowers.org/2018/2018summermeeting.html>

INTERNATIONAL FRUIT TREE ASSOCIATION Summer Tour, **July 22-25, 2018**, Coast Capri Hotel, Kelowna, British Columbia. For more information and to register: <https://www.ifruittree.org/>

The way I see it

Jon Clements

Other than the fire blight situation here and there, which will require some kind of post-mortem autopsy to see what went wrong, I again don't have much to say this week except: [Program information and pre-registration](#) is here for the **Massachusetts Fruit Growers' Association Annual Summer Meeting** in Belchertown on July 10. We have invited Dr. Srdjan Acimovic and Dr. Poliana Francescato from Cornell! Between them and Dr. Jaime Pinero here at UMass we have diseases, insects, and horticulture well covered! Should be a great day, hope you plan on coming. You can sign-up any day now and pay for lunch/attendance using a credit card! Please don't wait until the last minute so we can have the right amount of lunch here to fee you! Oh, the other big news, SWD has made it's presence known. More on that below from Dr. Pinero.

Insects

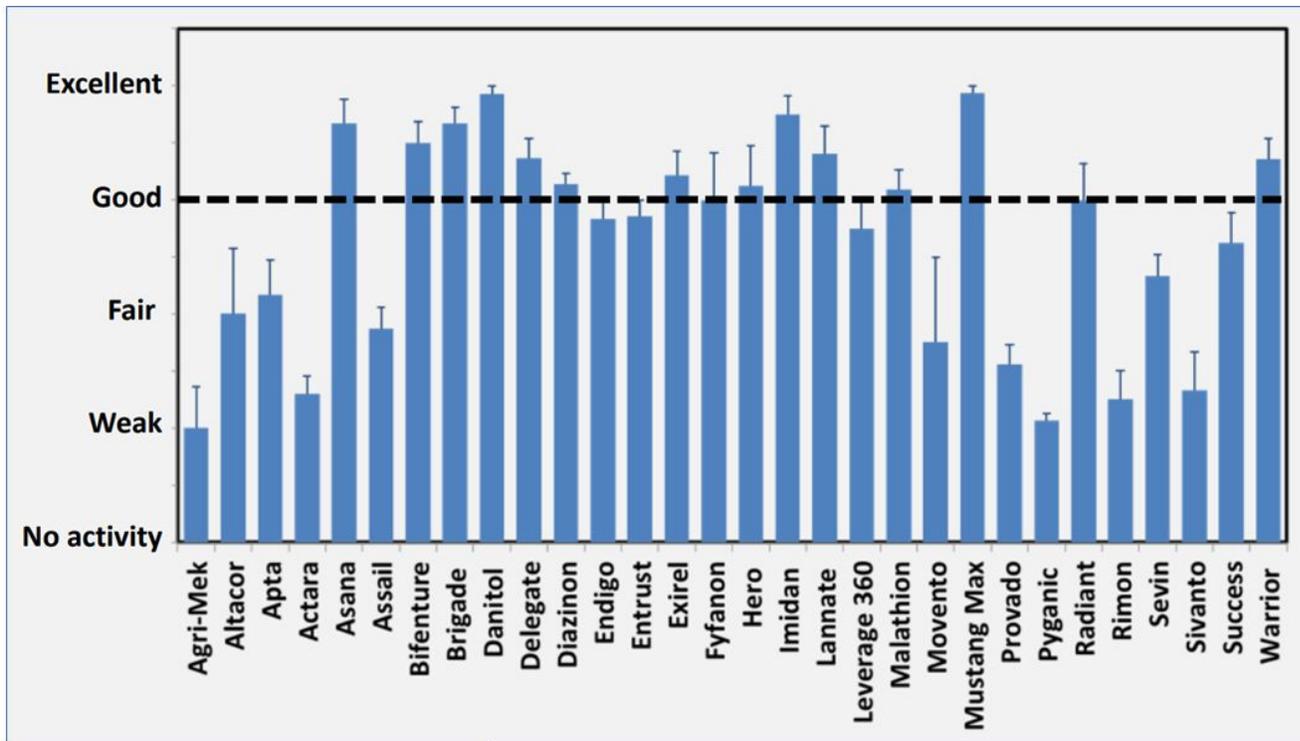
Jaime Pinero

Spotted wing Drosophila (SWD) update with notes on insecticide efficacy and rainfastness on fruit crops.

SWD adults have been found in CT, MA, and RI. In MA, SWD adults were found in monitoring traps at two locations (5 males and 2 females in two traps in Plymouth County, and 3 males and 2 females in two traps in Hampshire County). Fruit growers with susceptible fruit (e.g., cherry) need to start their spray program against SWD.

The New England Tree Fruit Management Guide includes insecticide recommendations for SWD in stone fruit (<https://netreefruit.org/stone-fruit/cherries/spray-table/6-summer>). Products with excellent rating in terms of efficacy are organophosphates, pyrethroids, and spinosyns (spinetoram - Delegate, and spinosad - Entrust [Entrust is OMRI-listed]). EXIREL™, a member of the anthranilic diamide class of insecticides with a novel mode of action, has also shown good efficacy against SWD.

Expected insecticide effectiveness against SWD. The following chart shows summary rankings of insecticide efficacy against SWD. Information was collected from 10 states (CA, OR, WA, MI, ME, NY, NJ, NC, GA, FL), 20 state x crop combinations. The Y-axis indicates the level of SWD control reported for each insecticide.



Source: <https://swdmanagement.org>

Insecticide rainfastness. Some rainfall events are forecasted for western Massachusetts for the next 10 days or so. Thus, providing information on the relative “rainfastness” of some insecticides used in fruit production was deemed necessary. The following information comes directly from the lab of Dr. John Wise (Michigan State University).

Critical factors that influence impact of precipitation on a pesticide’s performance include:

(1) The plant-penetrative attributes of the various compounds. Some pesticide chemistries, like organophosphates, have limited penetrative potential in plant tissue, and thus are considered primarily as surface materials. Some compounds, such as carbamates, oxadiazines and pyrethroids, penetrate plant cuticles, providing some resistance to wash-off. Many newer compounds, such as spinosyns, diamides, avermectins and some Insect Growth Regulators (IGR), readily penetrate plant cuticles and have translaminar movement in leaf tissue. Others, like the neonicotinoid insecticides, are systemic and can have translaminar (moves from top surface to bottom of leaf) as well as acropetal movement in the plant’s vascular system (moves from center to growing tips of leaves). Penetration into plant tissue is generally expected to enhance rainfastness of pesticides.

(2) The inherent toxicity of an insecticide to the target pest and the persistence of the compound in the environment. In some cases, a compound may be susceptible to wash-off,

but its environmental persistence and inherent toxicity to the target pest compensates for the loss of residue, thus delaying the need for immediate re-application.

(3) The amount of precipitation. In general, organophosphate insecticides have the highest susceptibility to wash-off from precipitation, but following light rainfall their high field-rate toxicity to most target pests overcomes the necessity for immediate re-application. Neonicotinoid insecticides are moderately susceptible to wash-off with residues that have moved systemically into plant tissue being highly rainfast, and surface residues less so. Carbamate, IGR and oxadiazine insecticides are moderately susceptible to wash-off and vary widely in their toxicity to the range of relevant fruit pests. Diamide, spinosyn, avermectin and pyrethroid insecticides have proven to be moderate to highly rainfast on most fruit crops.

For most insecticides, a drying time of two to six hours is sufficient to “set” the compound in or on the plant. With neonicotinoids, for which plant penetration is important, drying time can significantly influence rainfastness. For neonicotinoids, up to 24 hours is needed for optimal plant penetration, thus the time proximity of precipitation after application should be considered carefully. Spray adjuvants, materials intended to aid the retention, penetration or spread on the plant, can also improve the performance of insecticides.

Dr. Wise prepared the following charts. Excellent crop- and pest-specific information that includes expected level of pest control in selected fruit crops based on each compound’s inherent toxicity, maximum residual and wash-off potential from rainfall can be found in the original article:

http://msue.anr.msu.edu/news/rainfast_characteristics_of_insecticides_on_fruit

Rainfastness rating chart: General characteristics for insecticide chemical classes						
Insecticide class	Rainfastness ≤ 0.5 inch		Rainfastness ≤ 1.0 inch		Rainfastness ≤ 2.0 inches	
	Fruit	Leaves	Fruit	Leaves	Fruit	Leaves
Organophosphates	Low	Moderate	Low	Moderate	Low	Low
Pyrethroids	Moderate/High	Moderate/High	Moderate	Moderate	Low	Low
Carbamates	Moderate	Moderate/High	Moderate	Moderate	Low	Low
IGRs	Moderate	Moderate/High	Moderate	Moderate	Low	Low
Oxadiazines	Moderate	Moderate/High	Moderate	Moderate	Low	Low
Neonicotinoids	Moderate, Systemic	High, Systemic	Low, Systemic	Low, Systemic	Low, Systemic	Low, Systemic
Spinosyns	High	High	High	Moderate	Moderate	Low
Diamides	High	High	High	Moderate	Moderate	Low
Avermectins	Moderate, Systemic	High, Systemic	Low, Systemic	Moderate, Systemic	Low	Low

Highly rainfast = ≤ 30% residue wash-off

Low rainfast = ≤ 70% residue wash-off

Moderately rainfast = ≤ 50% residue wash-off

Systemic = Systemic residues remain within plant tissue

Insecticide persistence, plant penetration and rainfastness rating			
Compound class	Persistence (residual on plant)	Plant penetration characteristics	Rainfast rating
Organophosphates	Medium - Long	Surface	Low
Carbamates	Short	Cuticle Penetration	Moderate
Pyrethroids	Short	Cuticle Penetration	Moderate - High
Neonicotinoids	Medium	Translaminar & Acropetal	Moderate
Oxadiazines	Medium	Cuticle Penetration	Moderate
Avermectins	Medium	Translaminar	Moderate
IGRs	Medium - Long	Translaminar	Moderate
Spinosyns	Short - Medium	Translaminar	Moderate - High
Diamides	Medium - Long	Translaminar	Moderate - High

Recommendations should not supersede insecticide label restrictions or farm-level knowledge based on site-specific pest scouting, but rather are meant to compliment a comprehensive pest management decision-making process.

Do you have any suggestions for articles on arthropod IPM? Please let me know!

Contact info: jpintero@umass.edu; (413) 545-1031 (campus office); (808) 756-2019 (cell).

Diseases

See notes about fire blight management in Hawkeye's corner...

Horticulture

Jon Clements

- If you are not already putting [foliar calcium sprays](#) on with cover sprays, you should be.
- Ditto for adding 2 oz. NAA to cover sprays to [enhance return bloom development](#) of apples (until mid-late July)
- Irrigation ON. Rainfall we have been getting is good for a couple days this time of year when transpiration is very high. Have you looked at the [NEWA Apple Irrigation](#) model?
- Spot [weed control](#) applications (protect trunks of young trees from direct contact herbicide application!)
- [Stripping of leaders on 1st-leaf trees](#) to preserve leader growth
- Earliest sweet cherry and Jubileum tart-sweet cherry harvest has begun, we are off to the races!



Jubileum tart-sweet cherry harvested on 25-June, 2018 at UMass Orchard in Belchertown, MA.

Red flesh, dark red juice. 4.4 grams weight, 12-row size, 15.1 brix, very good flavor but very light yield...

Hawkeye's corner (notes from the field)

Liz Garofalo

****Spotted Wing Drosophila**** has been captured in monitoring traps and positively identified in Massachusetts in two Counties; Hampshire and Plymouth. Mary Conklin has once again provided us with an up to date, comprehensive list of crop protectants for [SWD \(resistance\) management](#). First steps for management include: maintain open canopies and clean understories to increase air flow and light penetration. Remove cull fruit and refrigerate harvested fruit ASAP. For those of you who have strawberries, renovate or mow, to minimize breeding sites that will increase pest pressure on cherry (and blueberry, etc.). Ed. note. Cherries are at high risk for SWD infection. Assume if you have ripening cherries, they will be infested. Chemical protection is necessary. Blueberries are next.



The purpose of the wire mesh mouse guard is to keep the **voles** away from trunks by good ground to wire contact. When **weeds** grow up into the guard, the contact with the ground is broken, allowing the sneaky little critters access to tasty trunks while providing protection from any predators that might be on the lookout for a tasty treat of their own.

Potato leafhopper nymphs are now present, so, if you have young trees, be sure to protect them from feeding.



Wooly apple aphid is also active now, though, not generally considered an issue in a managed commercial orchard.



In this photo you see what appears to be damage caused from last year's feeding and this year's colony developing.



Looks like **fire blight** is here to stay this year, at least for now. There appear to have been three separate strikes in this Gala tree. The lower one is moving quickly from an outer shoot (probably initiated from a blossom that subsequently dropped) to shoots closer in toward the trunk. Ed. note. Based on ALL the Decision Support Systems/Applications we have available to use -- ask me about the details if you are interested -- there were three to four times during bloom when fire blight infection was possible (although marginal) and streptomycin application was/may have been warranted. It was never really black and white. Did you apply strep 3 to 4 times? If not, having some fire blight is NOT a big surprise. How it plays out from here will be interesting. If it's any consolation, Washington State is experiencing a significant fire blight outbreak this year, I understand 100's of acres are being pushed out if they have fire blight. Does the fact we have just south of 30 million bushels of apples from the 2017 apple crop still in storage have anything to do with that? Maybe? Remember, fire blight is a manageable disease. BUT, you need to be on

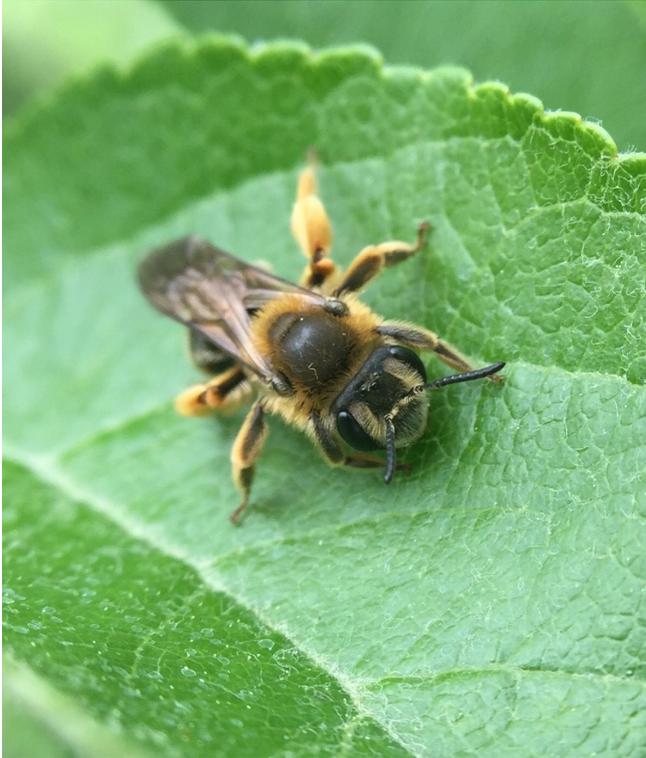
top of it at all times. (Or you lose?) At this time, if you see fire blight strikes in your orchard, our best advice would be to:

- Prune out infected shoots, but only if that is manageable. There is a great debate at which point too much fire blight becomes unmanageable to prune out, you be the judge. If you do prune it out, do it on dry days, cut way back beyond where you see the symptoms, put in the orchard middles, and let it dry up and DIE quietly.
- There is also great debate about sanitizing pruners between cuts. IF you take care to cut way back, and do it on a dry day, the risk of spreading fire blight between pruning cuts is minimal. (But not non-existent.) Recently questioned is the practice of dipping pruners in bleach or alcohol between cuts, but maybe wiping with disposable disinfectant wipes may be preferable.
- Apply streptomycin within 24 hours of any trauma event in the orchard, including hail and wind-driven rainstorms.
- Prohexadione-calcium (Apogee, Kudos) may be of some benefit in terminating shoot growth and making your trees less susceptible to spreading fire blight.
- See [An Annual Fire Blight Management Program for Apples](#) for more details

And, a reminder, not all “shepherd's crooks” are caused by fire blight! **Nectria** (a fungus, rather than a bacterium) looks remarkably like fire blight, minus the characteristic blackened veins and ooze.



With nectria, you can also see salmon-orange spore on affected shoots. The good news is that, generally speaking, nectria only affects already damaged wood. Except in the case of Rome Beauty, which, for some reason, seems to be especially prone.



Don't forget to check out [Ag-Radar's](#) Honey Bee Activity Chart!

Guest article

No Guest article this week...

Facebook Me



Mackenzie May is at [Tougas Family Farm.](#)



1 hr · Instagram ·

Tuesday morning with a 🍒 on top 🍷



Like

Comment

7



Sean Michael What is in season for picking right now? Strawberries are just ending, aren't they?

Like · Reply · 58m



Mackenzie May End of strawberries, cherries just starting and some places (Nourse in westborough) have raspberries right now

Like · Reply · 33m · Edited

1



Jon Clements And then there are blueberries, and then there are peaches, and then there are apples!

Like · Reply · 1m



Write a comment...



Useful links

UMass Fruit Advisor: <http://umassfruit.com>

Scaffolds Fruit Journal: <http://www.nysaes.cornell.edu/ent/scaffolds/>

Network for Environment and Weather Applications (NEWA): <http://newa.cornell.edu>

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[Acimovic Lab at Hudson Valley](#)

[Peter Jentsch's Blog](#)

The next Healthy Fruit will be published on or about July 3, 2018. In the meantime, feel free to contact any of the UMass Fruit Team if you have any fruit-related production questions.

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