



Healthy Fruit, Vol. 26, No. 15, July 17, 2018

Jon Clements, Author (unless otherwise noted) and Editor

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Upcoming pest events

Coming events	Degree days (Base 43 BE)	Meaning?
Current accumulation, Belchertown, MA	2004	
Apple maggot 1st oviposition punctures	1605 to 2157	Baited yellow sticky or red spheres should be out to monitor; Early varieties susceptible to injury,

		particularly Gravenstein, Ginger Gold, and a bit later Honeycrisp
Codling moth 2nd flight start	1583 to 2230	Pheromone traps should be refreshed with pheromone and new sticky bottoms to monitor effectively for 2nd generation
Codling moth 2nd flight peak	1954 to 2684	Pheromone traps should be refreshed with pheromone and new sticky bottoms to monitor effectively for 2nd generation
Lesser appleworm 2nd flight start	1429 to 2108	?
Oblique-banded leafroller 1st flight subsides	1630 to 2048	Time for Altacor, Delegate or similar if indicated, to target hatching larvae, in cooler locations; scout for signs of caterpillar feeding; consider monitoring for 2nd generation
Oriental fruit moth 2nd flight subsides	2026 to 2524	Hang pheromone traps or replace pheromone to monitor flight
San Jose scale 2nd flight subsides	1998 to 2354	?

Ag-Radar summary

Key insect life cycle and management dates

Note: for 2018, we have ten Massachusetts orchard locations subscribed to Ag-Radar: 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.

Apple Maggot Fly (AMF) -- Rough guess of peak AM trap captures is: August 1, Wednesday.

Estimated dates for first and peak trap capture are only general guidelines because the effect of rain on soil conditions is not included in the calculation.

Dogwood Borer (DB) -- First dogwood borer egg hatch roughly: June 22. Peak hatch roughly: July 26.

Codling Moth (CM) -- Codling moth development as of July 17: 2nd generation adult emergence at 15% and 2nd generation egg hatch at 2%. 2nd generation 7% CM egg hatch: July 23, Monday, = target date for first spray where multiple sprays needed to control 2nd generation CM. 2nd generation 30% CM egg hatch: August 2, Thursday = target date where one spray needed to control 2nd generation CM.

Spotted Tentiform Leafminer (STLM) -- Second optimized sample date for 2nd generation STLM sapfeeding mines, if needed: July 15, Sunday. Third optimized sample date for 2nd generation STLM sapfeeding mines, if needed: July 25, Wednesday.

White Apple Leafhopper (WAL) -- 2nd generation WAL found on apple foliage: August 2, Thursday.

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

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

Great turnout last week at Massachusetts Fruit Growers' Association Summer Meeting at the UMass Orchard in Belchertown, thanks to all who attended. In [Horticulture](#) below, I summarized the talks by our two guest speakers from Cornell, Poliana Francescato and Srdjan Acimovic. We were lucky to have them here sharing their knowledge. Also on the agenda were two UMass

student interns -- Cam and Lindsey -- who talked about iPiPE. Both Cam and Lyndsey had a busy week last week, and Lindsey put this [slide show](#) together that summarized their activity.

Otherwise, it's just kind of hot, and many orchard chores are caught up. Remember to avoid spraying when it gets too hot (above 85 F. is a good cut-off point), keep mowing and irrigating when and where necessary. Unfortunately we have seen some sunburn/heat injury on apple fruit (pictured below) which most likely occurred back around the first of July when both temperature (mid-upper 90's) and sunlight intensity combined to produce the sunburn injury on exposed apples. If you want to read more about sunburn, and fruit surface temperature considerations, see this article at Washington State University:

http://www.tfrec.wsu.edu/pages/web4/Apple_sunburn and this experimental [calculator for modeling apple fruit skin temperature](#). (See screen snapshot below, and note that sunburn is likely to occur if the fruit surface temperature rises above 115 degrees F.) Most growers are not prepared to deal with sunburn, however, there are various spray-on products -- Raynox (Valent) comes to mind -- which definitely help the situation (if it occurs again). Good luck...

calculator for modeling apple fruit skin temperature

Please note, this model is for illustration purposes only to show the relative effects of different factors on the fruit skin temperature of apples. It should not be used to make actual orchard management decisions.

It is based upon the energy balance model developed by WSU researchers.

The program code assumes a time of 2 PM.

Skin temperature at 2PM is 117

Air temperature Relative humidity %

Wind

Sun and clouds

Month

Fruit size diameter (in.)

A sunburn protectant has been applied has not been applied

Calculated for 1-July, 2018 at the UMass Orchard in Belchertown, MA
http://www.tfrec.wsu.edu/pages/webdev/Energy_calculator



Sunburn/heat injury to yellow skin apples, 9-July 2018

Insects

Jaime Pinero

Insecticides against apple maggot fly (AMF)

High adult AMF activity has been reported in commercial orchards throughout Massachusetts that have received rainfall over the past couple of weeks. Effective AMF control relies on timely and thorough application of insecticides BEFORE females lay eggs inside the fruit. Below are some notes on insecticides that are listed in the New England Tree Fruit Management Guide for AMF control <http://netreefruit.org/apples/spray-table/9-summer>.

Insecticide (class; IRAC group)	Effectiveness	Application rate	Comments
Assail 30SG (neonicotinoid; 4, 4A)	High	8 oz./A	Considered to be only slightly toxic to predatory mites.
Belay (neonicotinoid; 4, 4A)	High	6 fl. oz./A	Moderately toxic to predatory mites.
Imidan 70W (organophosphatate; 1)	High	2.125 to 5.75 lb./A	Considered to be only slightly toxic to predatory mites.
Avaunt (oxadiazine; 22)	Moderate	6 oz./A	Recommended for low-pressure situations. Moderately toxic to predatory mites.
Exirel (anthranilic diamide, 28)	Moderate	13.5 to 20.5 fl. oz./A	Active against adult AMF but labeled as suppression-only. For best performance, use with an effective adjuvant. Relatively safe to predatory mites.

The timing of sprays against AMF usually coincides with codling moth control applications, and as a result a single insecticide spray can often be used to manage both of these pests. It is important to remember that while some of the newer chemistries (Altacor[®], Delegate[®]) provide effective management of codling moth, they will only provide AMF suppression in low pressure orchards.

Delegate[®] is not listed in the New England Tree Fruit Management Guide against AMF. However, when applied at low rates for lepidopteran control, Delegate will suppress AMF. Since sugars have a phagostimulant effect on AMF, then the addition of sugar at 2 lbs. per 100 gallons of water is likely to increase the efficacy of Delegate[®], particularly if AMF populations are low.

The neonicotinoids Belay[®] and Assail[®] have limited lethal action on adult AMF but provide strong curative activity on eggs and larvae.

Looking for organic management options? Research has shown that one of the most effective OMRI-listed treatments is the combination of Surround[®] WP (kaolin clay) tank-mixed with pyrethrins (Pyganic[®] EC 1.4/5.0). When used separately, Surround and Pyganic are only moderately effective, but when applied together their efficacy increases. Applications of 25-50 lbs of Surround per 100-200 gallons per acre form a white "particle film" barrier on treated surfaces. Thorough coverage must be maintained by multiple applications, usually every 7-10 days, for effective control. Modes of action of Surround include repellency and deterrence to egg-laying.

Also, remember that AMF are attracted to the red color of ripening apples, so a white apple is less visually attractive to them.

Always follow the pesticide label directions. Remember, the label is the law.



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

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

Diseases

Ed. note. This morning I was asked the question “So what’s the deal with sooty blotch/fly speck (SBFS)? NEWA says High risk, consultant somewhat dismissive, Penn State says fungicide should be done every 14 days. Five weeks since we last sprayed, should we be concerned?” I think the short answer is yes. NEWA says High because we are clearly in a time period when with high humidity, especially accompanied by rainfall, will cause SBFS to gain a foothold on fruit and ultimately result in symptoms. Thus, fungicide coverage is necessary. (Maybe the consultant was saying, “What, are you brain dead? Of course you need to be worried about SBFS now!”) The every 14 day fungicide spray schedule is a rule of thumb, if heavy rain occurs, fungicides may wash off and not be effective, re-spraying is necessary after 1.5 to 2 inches of rain

depending on fungicide. So again, the answer is YES, you should be concerned! Cornell has a nice [Fact Sheet on SBFS here](#). Recommended fungicides might include Topsin, Sovran, Flint, one of them combined with Captan. More [here](#) in the New England Tree Fruit Management Guide.

Horticulture

Jon Clements

For those of you who missed the MFGA Summer Meeting last week in Belchertown, and for those of you who need a refresher, here are some of the take-home messages presented by Srdjan Acimovic and Poliana Francescatto during their talks which were “New Rules for Apple Scab and Fire Blight” and “Bud Flower Formation on Apples” respectively.

Srdjan Acimovic - “New Rules for apple scab and fire blight”

- **Fire blight infection requirements:** Open flowers; accumulate enough heat units in bloom for inoculum to reach threshold; wetting event after this point to wash bacteria flower down in flower; average temperature above 60 degrees F.
- **High density plantings** - NO fire blight tolerance; susceptible rootstocks, M.9, M.26; Geneva rootstocks resistant; susceptible varieties - Mutsu, Fuji, Gala, Ginger Gold, Cripps Pink, Idared, Paulared, Rome; trees less than 6 to 8 years old at high risk! NO fire blight tolerance (see Spray Antibiotics in Bloom 2019)
- **Fire blight Management - Pruning & Sprays - Late Spring & Early Summer** - LOW number of clusters/ strikes (5-15): Prune out rapidly, sanitize tools?; 18-24” below visible symptom edge; Or to older wood (12”); Prevent further spread; Drop cuttings in the middle, let it dry, chop with flail-mower, or remove; Spray copper, Apogee; If done early – effective; Scout and cut on a cool dry day.
- **Fire blight Management - Pruning & Sprays - Late Spring & Early Summer** - HIGH number of clusters/ strikes (25-30): Spray Apogee high rate, copper with 1-3lbs/A of hydrated lime; Slow migration of bacteria to the larger limbs; Prevent further spread; Severe pruning on a cool dry day; Every day/hour delay in spray allows FB spread; Pruning promotes shoot growth – more infections; Scout every week and cut.
- **Spray Antibiotics in Bloom 2019 - Considerations** - Use models (NEWA, RIMpro) to time strep sprays and avoid control failures; Precise timing = high efficiency ; Bacteria grow fast in flowers at warm weather (> 65 F); Antibiotic protects only blossoms that are open at the spray time; After drying, antibiotic will not redistribute; Spray just before wetting (all open flowers protected during infection); MID-BLOOM: enter Streptomycin

Spray Date: in NEWA = need for additional treatment; Reapplication protects newly opened flowers before the next rain.

- **Apple Scab** - Use RIMpro; no rest spraying; disease models = best tool to time sprays, can save money!

Poliana Francescatto - “Bud Flower Formation on Apples”

- **Flower initiation** in Gala spur buds peaks at 85 to 90 days after full bloom (DAFB), August; in Fuji spur buds peaks at 65 to 70 DAFB, July; in Honeycrisp spur buds peaks at 47 to 50 DAFB, early July. Varieties that are prone to biennial bearing (Honeycrisp and Fuji) seems to initiate flower formation much earlier than the annual cropping varieties (Gala). A late thinning is too late to help flower formation!
- **Factors that affect flower formation** - Regulated by a complex network that implies endogenous and environmental signals. But, flower induction is not controlled by temperature and day length. It can occur on the same tree at widely varying times. Key factors that can interfere flower formation: Carbohydrate availability (sugar); Hormones (BA, ethylene, ABA; Auxin GA); and interaction of factors.
- **Indirect factors that can help promote flower bud formation** - Early Thinning (seeds - GA); Variety; Rootstock; Tree training and pruning (light); Irrigation and fertilization; Girdling; Climate conditions; Use of plant growth regulators.
- **Use of PGR's to Enhance Return Bloom** - EARLY THINNING Honeycrisp!!! NAA as thinner @ bloom, PF, 10-12 mm, 15-18 mm; high dose NAA (20 ppm?) 25 DAFB, 32 to 40 DAFB; Fuji - Ethephon at higher dose, 35 to 40 DAFB, 47 to 54 DAFB
- **Flower formation summary** - Varieties widely differ in the time of flower induction/initiation. For better flower bud formation a right balance of crop load, pruning, irrigation and fertilization is necessary. Avoid excessive crop loads For the biennial bearing varieties, early thinning (bloom, PF) is so far the best option to assure good return bloom. Plus you gain in fruit size. Knowing the timing of flower induction/initiation of each variety is very important when applying PGRs (NAA/ethephon). PGRs summer spray will not work on heavy loaded trees.

Hawkeye's corner (notes from the field)

Liz Garofalo

Harbingers of sorrow...

While **brown marmorated stink bug (BMSB)** trap captures remain low across Massachusetts, populations can be seen building in known hot spots.



BMSB adults in an unsprayed crabapple at UMass. This hotspot was ID'd last fall. We now have a trap placed in the espaliered (also unsprayed) apple "block" next to these trees.



Adult BMSB feeding on crabapple.

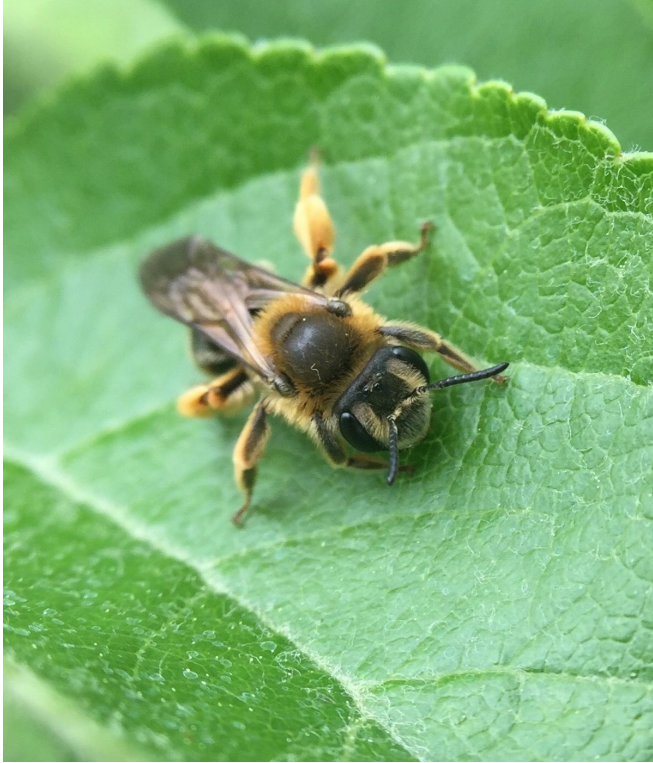


Later instar BMSB nymph *also* feeding on crabapple.

Not to be outdone by BMSB as most obnoxious invasive insect pest, **gypsy moth** is still moving around (although not feeding thank goodness!).



Flightless female gypsy moth caught in the act of egg laying in the forested edge next to the orchard (Cold Spring Research Orchard).



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

Guest article

No Guest Article this week...

Facebook Me



Poliana Francescatto is with Srdjan Acimovic and Jon Clements ***
in Belchertown, Massachusetts.

July 10 at 9:14 AM · 🧑🏻‍🤝‍🧑🏻

Annual Summer Meeting of the Massachusetts Fruit Growers' Association.



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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>

Follow me on Twitter (<http://twitter.com/jmcextman>) and Facebook (<http://www.facebook.com/jmcextman>)

[Acimovic Lab at Hudson Valley](#)

[Peter Jentsch's Blog](#)

The next Healthy Fruit will be published on or about July 31, 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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