Healthy Fruit, Vol. 28, No. 4, April 14, 2020

Prepared by the University of Massachusetts Amherst Fruit Team

Contents

Current degree day accumulations

UMass Cold Spring Orchard, Belchertown, MA (Since January 1)	13-April
Base 43 BE (NEWA, since January 1)	184
Base 50 BE (NEWA, since January 1)	64

According to the NEWA Degree Days prediction, by April 20 we will have reached 210 DD's Base 43 BE. Half-inch green apple bud stage should occur 150-221 DD's Base 43 BE. Yea, I know, it's dragging...

Current bud stages

Current bud stages. 13-April, 2020, UMass Cold Spring Orchard, Belchertown, MA

				
McIntosh apple Half-inch green	Honeycrisp apple Quarter-inch green+	Crispie pear Bud burst	Redhaven peach Bud burst	Rainier cherry Swollen bud-bud burst

More 2020 bud stages here…

Upcoming pest events

Coming events	**Degree days (Base 43 BE)**
Green apple aphids present	111-265
Green fruitworm peak flight	91-226
Rosy apple aphid nymphs present	134-244
Spotted tentiform leafminer 1st catch	120-217
McIntosh half-inch green	149-199

Upcoming meetings

New Fruit Team YouTube channel! We are working on posting videos (much editing, big learning curve!) from our first Zoom Twilight meeting from April 9. You can find the channel using this link: UMass Extension Fruit Team

UNH Tree Fruit Webinar for Commercial Orchardists. Wed, 04/22/2020. 5:30pm - 7:30pm. This replaces the monthly in-person Tree Fruit Twilight Meeting that we have had in the past. NH Pesticide Credits: 2. Participants must register prior to the webinar to receive pesticide credits. Cost: Free. More information and to register...

The way I see it…

Jon Clements

Baby it's wet out there! We actually have eight -- count them 8! -- rain gauges at the UMass Orchard in Belchertown. (Actually there are 10, but I will only report on 8. One is not working and another only reports data for the current day.) Past 24 hours: 1.16 inches; 1.16 inches; 1.00 inches; 1.13 inches; 1.13 inches; 1.12 inches; 1.13 inches; 1.07 inches. You get the idea…

Apples are pretty much at tight cluster, but there is a disparity of stage. Peaches are bud burst up to early pink, again a range. Apricots in bloom and petals coming off already. Otherwise, nothing moving too fast. Climate Prediction Center predicting above average chance of below normal temperatures for period April 21-27. (And above average rain, like we need it?) At this rate now I would not expect apple bloom before the first week in May which is approaching the average date. Who would have thought a month ago bloom would be near normal?

I find it interesting Jaime Pinero wrote about rosy apple aphids below and according to Upcoming pest events from Scaffolds (and reprinted above) they should be present 134-244 DD's (Base 43 BE) and we are at 184 as of 13-April so he is right on the ball. I will say the most trouble I have seen with them at the UMass Orchard is in Golden Delicious and Jonagold.

Clean of scab orchards should really not have had to spray a fungicide for scab yet as ascospore maturity is still very low (10%). OK, that being said, how many of you have NOT sprayed for scab yet? It is a risk not taken lightly, no one wants scab, but given the low ascopsore maturity, cool temps, and wet orchard grounds, I wish we have not sprayed any fungicide. Have you? In retrospect, the infection period yesterday (13-April) was marginal, might not have been a bad idea to have protectant fungicide on and still not too late for some kickback fungicide. (Vangard, Scala, Syllit?) Isn't this time of year fun?

Pruning should be wrapping up, and if it dries out plant trees ASAP. (Don't rush that in wet soils though.) Keep those graft unions high, and get the trees supported and irrigated (should it actually dry out) ASAP.

I know this is what you have to put up with for spray conditions! But most clean of scab orchards really should not have needed a fungicide spray (yet)!

Insects

Jaime Piñero

Rosy Apple Aphid. Of the aphid species that can be found on apple trees, rosy apple aphid (RAA) causes the most severe damage and is the most difficult to control. RAA eggs are laid in the fall on twigs, bud axils, or in crevices in the bark. The eggs hatch between silver tip and half-inch green.

The nymphs, as soon as they hatch, seek out the opening buds of the apple, seeming to prefer the fruit buds. They feed on the outside of the leaf bud and fruit bud clusters until the leaves begin to unfold. Then they work their way down inside the clusters and begin sucking the sap from the stems and newly formed fruits. Their feeding causes the leaves to curl, affording the aphids protection from insecticide applications and some natural enemies.

A cool, wet spring favors aphid development because it provides conditions unfavorable for parasites and predators of aphids. The maximum period of productive activity often coincides with the period when young fruits are beginning to set and grow actively.

The body of RAA has a waxy coating and usually a slight purplish or rosy tinge. As the aphids grow, their color changes from dark green to rosy brown or purple and they acquire a powdery white covering.

Monitoring. Starting at tight cluster, sample 5 to 10 trees per block. Sensitive varieties such as Rome, York Imperial, Golden, and Stayman should be selected, if present. For each block, examine 5 clusters from each of 20 trees for dwarf and semi dwarf plantings. For larger trees, examine 10 fruit clusters from each of 10 trees. A cluster is considered infested if more than 20 aphids are present. Check the interior portion of the tree – where rosy apple aphids usually appear first. Cortland, Ida Red and Golden Delicious are all susceptible cultivars to monitor for RAA.

Thresholds. Chemical control is recommended if more than 5% of fruit clusters are infested and few predators are identified. Monitor for aphid predators around RAA colonies. The presence of beneficial insects may make chemical control unnecessary.

Control. RAA colonies may be present at green tip, but usually not noticeable until half-inch green. If warranted, insecticide application must be made before RAA feeding causes leaves to

curl, typically at the pink stage. If you believe you have potentially damaging RAA populations, remember that post-bloom control of RAA is less effective.

The table below was extracted from the New England Tree Fruit Management Guide:

IRAC group	Product	Rate/ Acre	REI-hours	PHI-days	EFFICACY	COMMENTS
1B	*Diazinon 50WP	2 to 4 lbs. (1 lb. per 100 gal. dilute)	96	21	High	Minimum interval is 14 days. RAA may not be on label. Multiple alternate diazinon products.
1B	*Lorsban 4E	1.5 to 4 pt.	96	Prebloom only	High	Only one application of chlorpyrifos per year allowed. Lorsban canopy application against RAA only allowed before bloom.
1B	Lorsban 75WG	2 to 2.7 lb.	96	Prebloom only	High	See above.
3A & 4A	*Leverage 360 (L)	2.4 to 2.8 fl. oz.	12	7	High	Minimum interval 14 days.
3A & 28	*Besiege (SC)	6 to 12 fl. oz.	24	21	High	Minimum interval 10 days.
4A	*Actara (WDG)	4.5 oz.	12	35 for rates > 2.75 oz./Acre, 14 for rates < 2.75 oz./Acre.	High	Minimum interval 10 days.
4A	*Admire Pro (L)	2.8 fl. oz.	12	7	High	Minimum interval 10 days.
4A	Assail 30SG	2.5 to 4 oz.	12	7	High	Minimum interval 12 days.
4A	Assail 70WP	1,1 to 1,7 oz.	12	7	High	Minimum interval 12 days.
4A & 6	*Agri-Flex (L)	5.5 to 8.5 fl. oz.	12	35	High	Must be mixed with nonionic spreading, wetting, or penetrating adjuvant (such as horticultural oil at 1 gal/A). Do not combine with sticker adjuvant.
4A & 28	*Voliam Flexi (WDG)	6 to 7 oz.	12	35	High	Minimum interval 10 days.
6 & 28	*Minecto Pro (L)	10 to 12 fl. oz.	12	28	High	Minimum interval 21 days.
7C	Esteem 35WP	3 to 5 oz.	12	45	High	Minimum interval 14 days.
28	*Exirel (SC)	13.5 to 20.5 fl. oz.	12	3	High	Minimum interval 7 days. For best efficacy combine with spreader or other effective adjuvant.

*Restricted Use Pesticide

Weekly report of insect pest captures in monitoring traps at CSO

Period: 4.8 -4.14

Insect	Average captures/trap	Notes
RBLR	46	
OFM	0	
CM	0	
Spotted tentiform leafminer	3	
Tarnished plant bug	0.05	1 TPB in 20 traps
European apple sawfly	0	

Monitoring for internal Lepidoptera and time of control. The table below was prepared to help you determine when to set up traps for monitoring Oriental fruit moth (OFM), codling moth (CM), and oblique-banded leafrollers (OBLR). The timing of controlling the first and second generation larvae is based on accumulation of degree days after biofix.

The **BIOFIX** is the date when degree-days begin to be accumulated, usually associated with a biological event, such as the **first sustained trap catch** of males in pheromone traps. The term "sustained catch" often causes some confusion. If one moth is collected in a trap, followed by a period of no captures before resumption of more or less continual captures, then that early male is ignored. The "sustained catch" is the beginning of the continual period of moth activity. This means, catches on two consecutive trapping days. Obviously this can't be determined on the day of the capture, rather only after the overall pattern of flight is seen. But since this event is only the beginning of accumulating degree days, and not the treatment signal, the grower has time to make this evaluation. In practical terms, there may not be an important difference between first catch and first sustained catch. For example, if 1-2 males are captured followed by an interval of no catches caused by cool weather, then very few degree-days will accumulate in the days between first catch and first sustained catch.

Moth species	Overwintering stage	Expected 1st flight peak	When to set up monitoring traps	Control of 1st generation larvae	Control of 2nd generation larvae
OFM	Full-grown larva (ready to pupate)	Bloom	Pink (5-6 feet high)	350-375$_{45°}$ DD after biofix (55-60% egg hatch)	1,450 - 1,500 $_{50°}$ DD after biofix
CM	Full-grown larva (ready to pupate)	Around petal fall	Bloom (5-6 feet high)	220-250$_{50°}$ DD after biofix*	1,260$_{50°}$ DD after biofix
OBLR	Second or third instar larva (feeds on water sprouts)	About 3 weeks after petal fall (mid-June)	Third week in May (upper third canopy)	360-450$_{43°}$ DD after biofix (55-60% egg hatch)**	2,750$_{43°}$ DD after biofix

*In low-pressure orchards, or if mating disruption has been used for 2-3 years, you can wait until we hit 350 DD (65% of egg hatch occurs by this time).

**The petal fall insecticide spray should control overwintered larvae. Orchards that have low OBLR pressure can wait until about 600 DD, based on results from scouting.

- Monitor traps daily or 3 times per week until biofix is set.
- On biofix date, start running degree-day developmental models to predict larval emergence.

Use of a biofix starting point means keeping up with degree days over a shorter period of time and often provides a more accurate prediction.

If you are doing mating disruption, then here are some suggestions regarding types of lures to use for monitoring:

- For CM, use CM-DA combo lure (combination of CM sex pheromone and pear ester). This lure is more attractive to both male and female moths, increasing the sensitivity of the traps to detect CM activity.
- For OFM, use standard pheromone lure.
- An effective trap distribution pattern is 1 trap per species for every 5 acres in the disrupted orchard.

- Adding a few traps in orchards outside the disruption area has proven to be a good indicator of the outside population pressure if suitable locations exist, preferably upwind of the disrupted area.

Diseases

Liz Garofalo and Dan Cooley

Bud stage development in Mac in Greenfield, MA April 14

Apple scab weekly update:

	Ascospore Observation Method and Spore Count	
Date	Petri Plate Assay	Funnel Trap
4/7/2020	0	21
4/14/2020	1	0

It's no big surprise that after yesterday's monster rain there were very few spores to be found today.

Bear in mind, the "bank" of spores available for discharge and infection is still relatively low at this point in the season.

State: Massachusetts

Weather station: Belchertown-2

Date of Interest: 4/14/2020

Calculate

Apple Scab Results for Belchertown-2

The Ascospore Maturity degree day model begins at 50% green tip on McIntosh flower buds. To recalculate ascospore maturity for your orchard, enter your green tip date:

Green Tip Date: 3/31/2020 Click if greentip has not occurred

Ascospore Maturity Summary

	Past	Past	Current	5-Day Forecast				Forecast Details
Date	4/12	4/13	4/14	4/15	4/16	4/17	4/18	4/19
Ascospore Maturity	5%	7%	8%	8%	9%	10%	11%	13%
Daily Ascospore Discharge	0%	3%	<1%	0%	0%	0%	0%	0%
Cumulative Ascospore Discharge	3%	6%	6%	6%	6%	6%	6%	6%

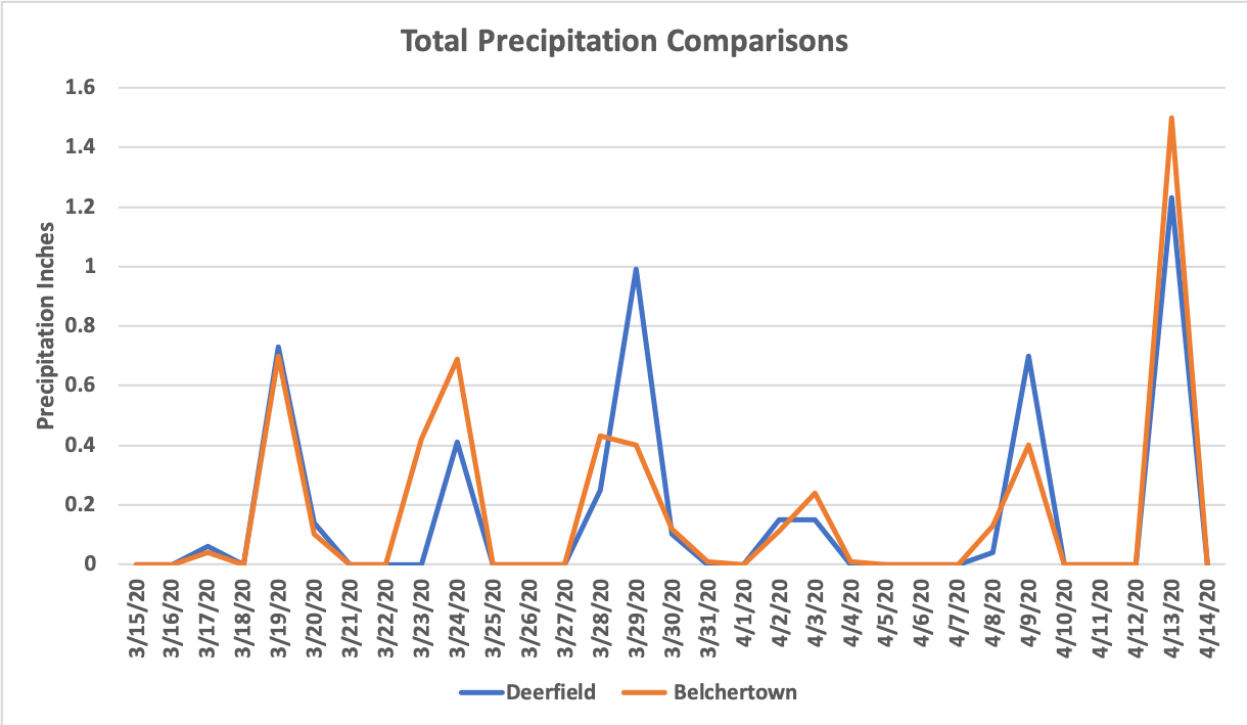
Ascospore Maturity Graphs

Infection Events Summary

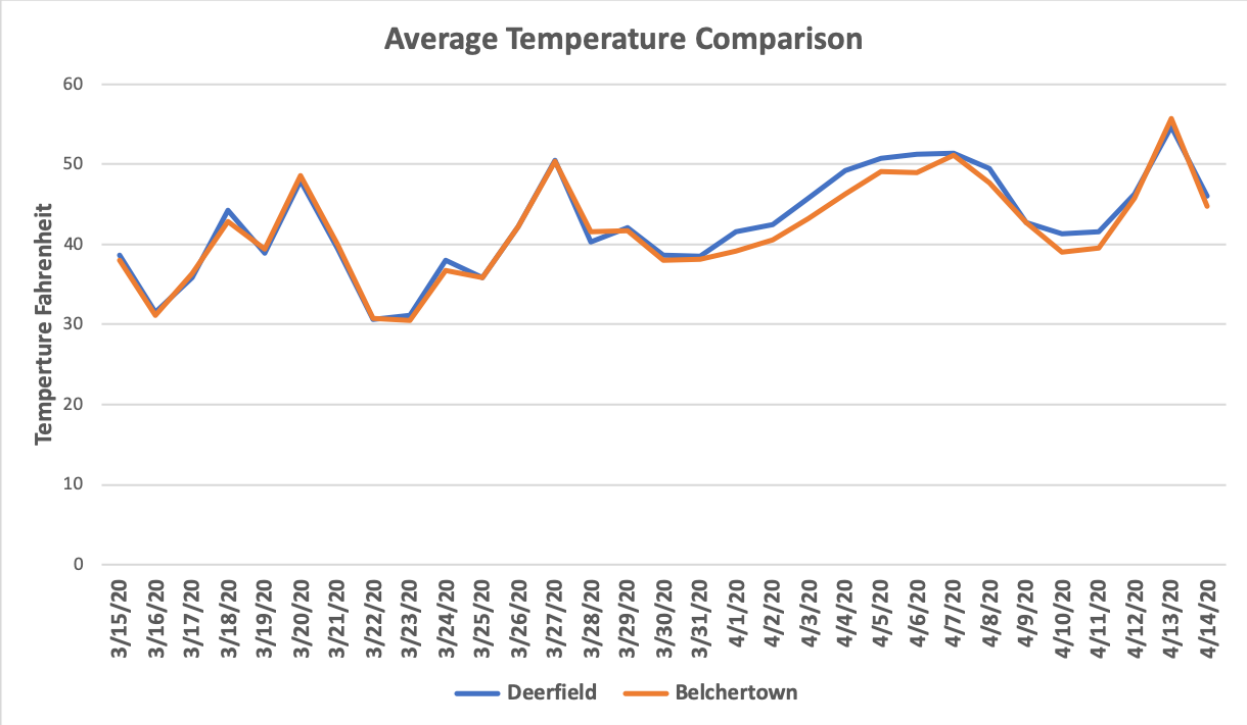
	Past	Past	Current	5-Day Forecast				Forecast Details
Date	4/12	4/13	4/14	4/15	4/16	4/17	4/18	4/19
Infection Events	No	Combined	Yes	No	No	No	No	No
Average Temp (F) for wet hours	-	56	52	40	38	41	41	45
Leaf Wetness (hours)	0	18	6	5	5	2	2	2
Hours ≥90% RH	0	18	0	0	0	0	0	0
Rain Amount	0.00	1.49	0.03	Trace	0.01	Night 28% Day 32%	Night 13% Day 9%	Night 50% Day 53%

NEWA Indicates that during yesterday's rain event only 3% of the total seasonal spores were discharged in Belchertown (4% in Deerfield). RIMpro estimates slightly less daily ejection with 1.82% ejected in Deerfield and 2.92% ejected in Belchertown. Historically, NEWA has been shown to be more conservative in its estimations of risk. That is, NEWA is more likely to estimate an infection event to be more severe.

The total precipitation in Deerfield from March 15 to April 14 is 4.95" and in Belchertown, it is 5.30". Belchertown received 0.35" more rain than Deerfield.



The overall average temperature in Deerfield from March 15 to April 14 is 42.55℉ while the overall average temperature in Belchertown is 41.81℉. Overall, Deerfield was .74℉ warmer than Belchertown.



Powdery mildew (PM) overwinters as mycelium in infected buds. These begin to sporulate and are wind blown to new tissue where spores can cause new infections. Optimal temperature ranges for spore germination is 60℉-80℉. Germination and mycelial growth slows at temps between 40℉ and 50℉. This suggests that infection risk is not currently *high*, given the current temperatures and forecast temperatures are much the same (low 50s) If you have had issues with PM in the past, including a material effective against this disease in a scab cover may be necessary. Generally this would begin ~tight cluster. See the New England Tree Fruit Management Guide spray table for materials effective against both PM and scab.

Horticulture

Jon Clements

Not much to report, too wet to be out in the orchard. (Or is it?) But, if you continue to prune Honeycrisp through pink bud stage, consider watching this video on precision pruning. At least gives you some food for thought...

Small Fruit Update

Sonia Schloemann

Crop Conditions: Pollinators are flying on warm days. Be aware of this when making spray applications. See How to Reduce Bee Poisoning from Pesticides from Oregon State Univ. for some excellent guidance on pollinator toxicity ratings of pesticides.

Strawberries: Regional reports suggest that while winter injury seems to be low this year (except where mulch blew off), the lack of snow cover in many areas has left plants vulnerable to deer and turkey damage. Plants are now showing early new growth and row-covered fields have some flower trusses just visible in the crowns. Check these fields often for Two-spotted Spider mites and aphids. New fields are being planted as soil conditions allow.

Brambles: Winter injury continues to look low. Sometimes it takes a little while to express itself with buds initially growing but then collapsing from damaged vascular tissue. So far so good this year. Prune out any damaged tips back to where good bud expansion is seen. Generally raspberry green tissue is at ¾ +" green. Blackberries are a little further along. No new cane emergence seen yet. Check for evidence of Anthracnose and Spur/Cane blight infections and apply spring fungicides as recommended. Early infections from overwintered inoculum can be the most damaging. See the New England Small Fruit Management Guide for recommended materials and rates.

Blueberries: Bud development varies a bit depending on variety and location but many places are reporting buds at bud-burst (when scales open up and spread out). Mummy Berry is still high on the radar now. If you had MB infection in your planting last year, be vigilant about

getting fungicide coverage as the green leaf tissue becomes exposed. Mulch application now can also help by covering the overwintering inoculum and suppressing spore release. 3-4" of mulch is needed for this to be effective.

Winter Moth emergence in Southeastern New England is nearly complete (>90% from H. Faubert in RI). Heather Faubert at URI Extension recommends scouting by: "Collecting at least 20 flower buds, pull buds apart and look with a magnifying glass for small caterpillars or insect frass. It's much easier to find frass than caterpillars. See pictures below." Growers in areas where this pest has been a problem should begin to monitor for flower bud infestations from possible in-field WM populations and/or from young caterpillars that balloon into the field from surrounding hardwood trees. Infestation levels have been much lower in recent years because of the effect of a released natural enemy (*Cyzenis albicans*), but it is still worthwhile to monitor for hot spots of this pest. If WM is found infesting over 5% of buds examined, a spray application may be warranted. See the New England Small Fruit Management Guide for recommended materials and rates?

Gooseberries/Currants: Fully leafed out. Blossoms visible and may be open in some areas.

Haskap/Honeyberry: Full bloom. Frost protection is not likely to be needed as blossom tissue is hardy to 20˚F. Some cultivars are hardy to 15˚F.

Winter Moth damage to apple buds (left) and blueberry buds (right). (Photos: H. Faubert, URI taken in 2019)

Photo of the week: What's this?

Hawkeye's corner (notes from the field)

Liz Garofalo
No field visits for this week (yet…).

Ed. note: Well, not for Hawkeye, but jmcextman was out. Look at this, right on time? What is it? On 'Redfree' apple.

Guest article

No guest article this week...

Facebook Me

Useful links

UMass Fruit Advisor: http://umassfruit.com

Scaffolds Fruit Journal: http://www.nysaes.cornell.edu/ent/scafolds/

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 April 21, 2020. In the meantime, feel free to contact any of the UMass Fruit Team if you have any fruit-related production questions.

Thank you sponsors…

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