



Healthy Fruit, Vol. 28, No. 6, April 28, 2020

Prepared by the University of Massachusetts Amherst Extension Fruit Team

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Current degree day accumulations

UMass Cold Spring Orchard, Belchertown, MA (Since January 1)	27-April
Base 43 BE (NEWA, since January 1)	216
Base 50 BE (NEWA, since January 1)	73

According to the NEWA Degree Days prediction, by Friday, May 1, we will have reached 247 DD's Base 43 BE. Pink apple bud stage should occur 206-257 DD's Base 43 BE.

Current bud stages

Current bud stages. 28-April (in the AM), 2020, UMass Cold Spring Orchard, Belchertown, MA

				
McIntosh apple Early tight cluster	Honeycrisp apple Early tight cluster	Crispie pear Green cluster+	Redhaven peach Pink	Rainier cherry Early white bud

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
Obliquebanded leafroller larvae active	158-314
Pear psylla 1st egg hatch	174-328
Pear thrips in pear (and apple) buds	118-214
Rosy apple aphid nymphs present	134-244
Spotted tentiform leafminer 1st catch	120-217
McIntosh pink bud stage	267-316

Upcoming meetings

UMass Extension Veg Program Zoom Meeting

Wednesday, April 29th, 3-4pm

Registration required: [Click here to register and receive the sign-in information.](#)

This week's topic: COVID-19 business relief programs and assistance

Learn about the Paycheck Protection Program, the Economic Injury Disaster Loan Advance Payment Program, and the Farmers to Families Food Box Program. Information will be presented by the following people but there will be ample time for Q&A and discussion, so bring your questions.

Panelists:

- Tom Smiarowski, UMass Risk Management
- Ashley Randle, Deputy Commissioner, MDAR
- Michael Botelho, Produce Safety, Market Access & Certification Prog. Director, MDAR
- Ed Davidian, State Executive Director, USDA Farm Service Agency
- Brad Mitchell, Deputy Executive Director, Massachusetts Farm Bureau Federation

This meeting will be recorded and available for later viewing.

UMass Fruit Team Twilight Zoom Meeting

Thursday, April 30. 5:30-7:00 PM

1 Pesticide credit

Pre-registration is required

Register in advance for this meeting:

https://umass-amherst.zoom.us/meeting/register/tJwucOigrzkrHdXT_I7CA9WIs5SdurCqbGco

After registering, you will receive a confirmation email containing information about joining the meeting. 1 pesticide recertification credit available.

AGENDA

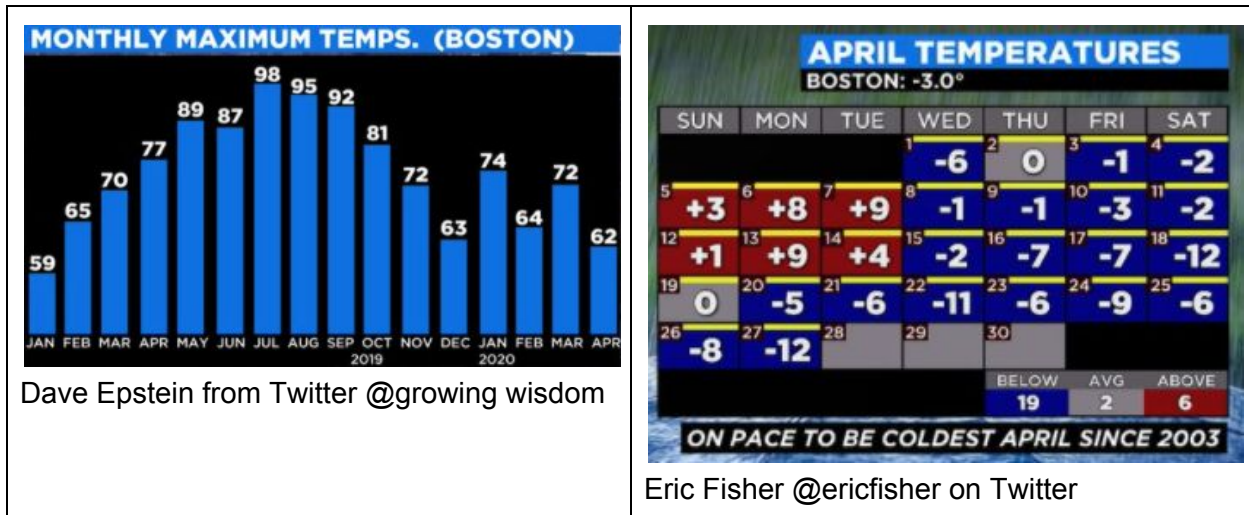
- 5:30 pm: Technical difficulties addressed for those needing assistance.
- 5:35: Welcome and Intro (S. Schloemann); Test polling question; Brief discussion of how this meeting will go; PYO update
- 5:50 Insecticide Updates (J. Piñero); General overview and updates
- 6:00 Insect updates (H. Faubert); Winter moth, pear thrips, TPB and other pre-bloom insect updates

- 6:10 Disease updates (L. Garofalo and D. Cooley); Scab, powdery mildew, brown rot (Dan available for fungicide support)
- 6:20 Bloom thinning and pollen tube growth model (J. Clements)
- 6:35 Duane Greene; Prohexadione-calcium (Apogee and Kudos) updates; Promalin on frost damaged apples and a brief mention on preparing for the upcoming thinning season
- 6:50 Q & A (10+ min, as needed)
- 7:00pm Conclude official meeting.

The way I see it...

Jon Clements

Rewind to last week. Not much change. Not sure I have ever seen daffodils and forsythia in bloom for so long, it's been going on for three weeks. Still predicting some apple bloom no later than May 10. Peaches are opening but oh so slowly, hopefully we will get some decent weather over the next week to set a crop.



Still time to put on a pre-bloom foliar nutrient spray, and given the extended period where the apple buds are running on stored carbohydrates with little photosynthesis, a shot of nitrogen, boron, and zinc is recommended. The “old” recommendation is to apply foliar urea @ 3 lb. per 100 gallons dilute spray along with the equivalent of 0.1 to 0.2 lb. boron (Solubor at 1 lb. per 100 gallons), and zinc (at label rates). There are many formulated micro-nutrient foliar spray products available too, for example Miller Nutri-Leaf, use at label recommended rates. Apply through the pink bud stage. See the UMass Fact Sheet [Prebloom Nutrient Applications for Apple Trees](#) for more information. Note that this particular foliar nutrient spray is untested in pears and stone fruit, I would tend to use one of the formulated products on those fruits. I would also wait for a warmer day (60 degrees) to apply any nutrient spray.

Otherwise, see you at the UMass Fruit Team Zoom Twilight Meeting on Thursday at 5:30 PM. To receive pesticide license recertification credit, you need to pre-register for that meeting [here](#).

Insects

Jaime Piñero

Weekly report of insect pest captures in monitoring traps at CSO (Belchertown, MA)

[Period: 4.21 - 4.27](#)

Insect activity continues to be low. The first OFM adults were captured on 4.26.2020.

Insect	Average captures/trap	Notes
RBLR	16	Pheromone-baited trap
OFM	4	Pheromone-baited trap
CM	0	Pheromone-baited trap
Spotted tentiform leafminer	53	Pheromone-baited trap
Tarnished plant bug	0.05	Unbaited white sticky cards
European apple sawfly	0	Unbaited white sticky cards

Monitoring and management of pest mites in the early growing season, with notes on predatory mites

If you had problems with **European red mite (ERM)** and/or **two-spotted spider mite (TSM)** in previous years, then it is not too early to start thinking about monitoring and management options for these pests. Here, I provide a brief overview of the biology, monitoring and management of ERM and TSM. Focus is on the early apple-growing season. ERM is considered by many growers to be their most important and sometimes most difficult pest to control.

Remember: In many cropping systems, like tree fruits, spider mites are secondary pests. They only become a management issue when pesticides are applied to control other pests. This is

typically attributed to the non-target effects of many pesticides on spider mite natural enemies, especially predatory mites, which result in disruption of biological control.

Monitoring: The action threshold for mites varies with time of year. ERM should be monitored and managed in much the same way as TSM. Counts of the two species should be combined to determine whether thresholds are exceeded. Mites tend to build up during periods of hot, dry weather. Mite populations tend to build up in "hot spots" rather than uniformly throughout a block. Hot spots tend to form on trees adjacent to dusty, dirt roads and in certain cultivars such as Red Delicious and Empire. The table below provides more information about mite biology and monitoring.

	European Red Mite (ERM)	Two-spotted spider mite (TSM)
Overwintering stage	Eggs	Orange-colored adult females
Overwintering sites	Overwintering eggs are laid on twigs and small limbs, especially in the crevices, and roughened bark of apple trees	Orchard ground cover
Timing of egg-hatch	Egg hatch begins at Tight Cluster, is about half complete by Pink, and is complete by Petal Fall.	With the arrival of warm weather in the spring, these mites leave their places of hibernation and start wandering about looking for food plants.
Feeding sites during spring	Young mites move to newly opened leaves where they feed, mature, and reproduce.	Weeds and grasses (mites move to fruit trees (underside of leaves) in the summer

<p>Early-season monitoring</p>	<p>TSM should be monitored and managed in much the same way as ERM. Counts of the two species should be combined to determine whether thresholds are exceeded.</p> <p>Monitoring of ERM eggs can be done by visually inspecting the bases of twigs and spurs on 5 to 10 selected trees with a hand lens. Look for clusters of tiny (less than 1/50 inch), red spheres. See pictures below.</p> <p>Mite injury during the weeks following Petal Fall can damage fruit crop. Monitor mite populations by examining underside of fruit cluster leaves through May and June. Action threshold is 1-2 motile (not eggs) mites per leaf or 30% of leaves/ with one or more mites</p>
<p>Early-season management</p>	<p>Delayed dormant oil can be applied from tight cluster through pink. Use a selective pesticide program that is based on thresholds to preserve mite predators. Some pesticides are toxic to beneficial mites and act as a repellent or irritant to ERM (pyrethroids), while others can increase egg laying (some neonicotinoids). A selective pesticide program may be less harmful to beneficial mites and prevent or delay the need for miticide applications.</p>

The following table was extracted from the 2020 New England Tree Fruit Management Guide, and the information presented applies to the PETAL FALL stage.

INSECT	IRAC	PRODUCT	RATE/ ACRE	REI- HOURS	PHI- DAYS	EFFICACY	COMMENTS
European red mite	6	*Agri-Mek SC	2.2 to 4.2 fl. oz.	12	28	High	Add horticultural oil (not dormant oil).
	10A	Apollo 4SC	4 to 8 fl. oz.	12	45	High	Tank mixing with oil improves control. Primarily an ovicide.
	10A	Onager 1EC	12 to 24 fl. oz.	12	28	High	One application per season. Primarily an ovicide.
	10A	Savey 50DF	3 to 6 oz.	12	28	High	One application per season. Primarily an ovicide.
	10B	Zeal 72WS	2 to 3 oz.	12	14	High	One application per season.
	25	Nealta	13.7 fl. oz.	12	7		Apply at the first sign of mites, and before the population increases. Do not make more than 1 application before using an effective miticide with a different mode of action.
	12B	*Vendex 50WP	1 to 2 lb.	48	14	Low	
	20B	Kanemite 15SC	31 fl. oz.	12	14	High	
	21A	Nexter 75WS	4.4 to 5.2 oz.	12	25	High	
	21A	Portal 0.4EC	2 pt.	12	14	High	
	23	Envidor	16 to 18 fl. oz.	12	7	High	
	none	Acramite 50WS	.75 to 1 lb.	12	7	High	

The pictures below can aid in the identification of overwintered eggs of ERM:



Identification tip: Masses of eggs may be laid together. *Photo by Jack Kelly Clark*



Identification tip: Masses of eggs may be laid together. *Photo by Jack Kelly Clark.*



Identification tip: Eggs are slightly flattened, red, and have a small stalk. The stalk is approximately the length of the diameter of the egg, arising from the top, and can be seen with a hand lens. *Photo by Jack Kelly Clark.*

Some notes on the predatory mite *Amblyseius fallacis*.

In sprayed orchards, this predatory mite generally assumes prominence because it is more tolerant of organophosphate-based spray programs than are many of the other species in the family. Several studies have shown that it was the only predatory mite to remain common in sprayed orchards throughout the year.

Populations of predatory mites (e.g., *Amblyseius fallacis*) populations can be monitored at the same time growers are scouting for spider mites since they occupy the same habitat. Initial populations in the spring may be assessed by selecting 10 apple leaves from suckers beneath each of 10 randomly selected trees in a block. Examine the surface for *Amblyseius* moving across the leaf surface. They move faster than pest mites. Research conducted in Michigan has yielded tentative thresholds for predicting success of biological control by *Amblyseius*:

A ratio of predators to prey of at least 1:10 presents a good probability of biological control

- Higher ratios increase the probability of success, in particular on cultivars such as 'Red Delicious' where the mites are known to reproduce more.
- Lower predator to prey ratios (e.g., 1:20) may result in successful control on apple varieties that are less conducive to spider mite reproduction than 'Red Delicious'.



***Amblyseius fallacis* devouring a two-spotted spider mite**

Diseases

Liz Garofalo and Dan Cooley



4/28/2020 Mac bud stage development. Greenfield, MA

Apple bud leaves continue to painstakingly, *slowly*, unfurl. You have to look twice just to make sure anything has actually changed. Ascospores, on the other hand, just keep marching along.

Apple scab weekly update:

Date	Ascospore Observation Method and Spore Count		
	Petri Plate Assay	Funnel Trap	Total Count
4/7/2020	0	21	21
4/14/2020	1	0	1
4/20/20	162	117	279
4/28/20	95	44	139

We have had three days of rain since the last spore count date. While the spore bank is depleted, at least a little, with each rain event, more spores continue to mature every day (probably every hour, but that seems a little like splitting hairs... or splitting spores). There are a fair number of spores currently mature and with today and tomorrow's sunny, relatively warm weather, more will mature. All of these will be ready to eject during the next rain event, forecast for Wednesday night through Fridayish. Yeah, I said "ish". No no wise person ever wrote a forecast in stone. As you can see in the NEWA apple scab risk forecasts below, orchards across

the state are set for, and apparently are in the middle of, a four-day long infection event. Now, that having been said, technically, if the leaves are dry, the next rain will be a new, discrete infection event.

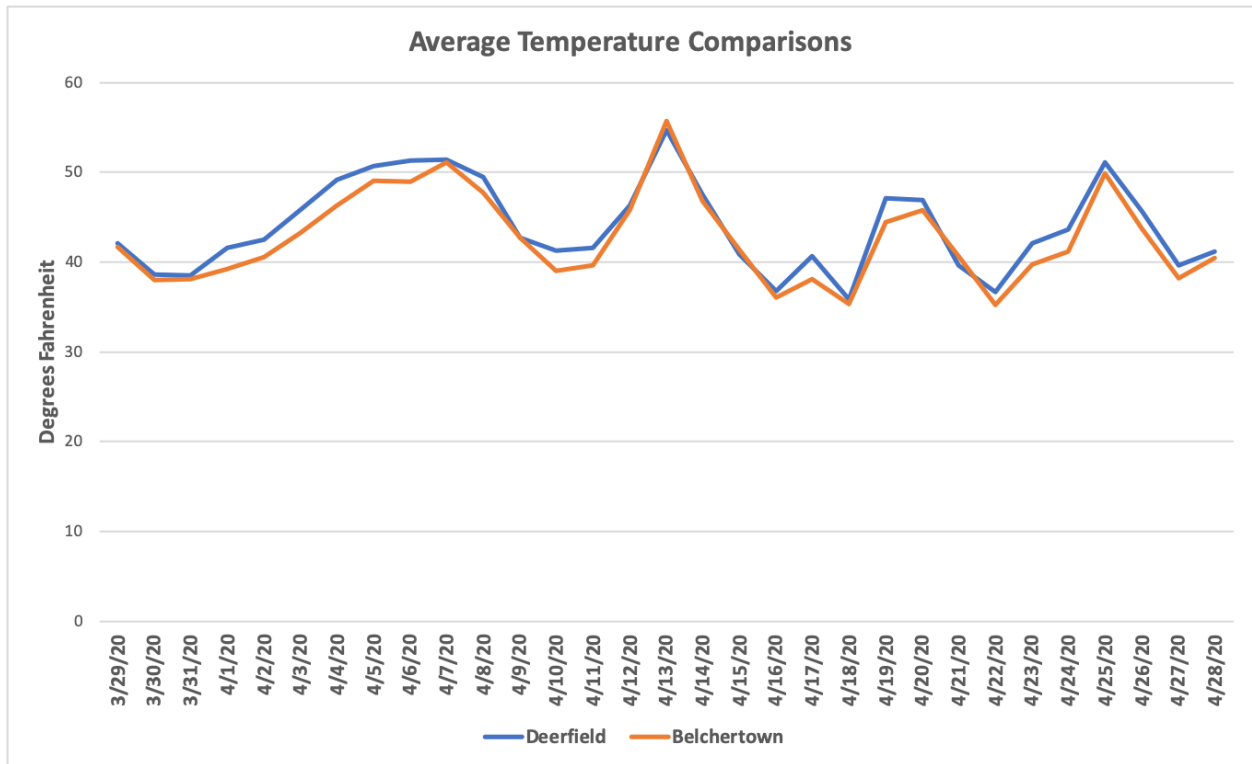
Apple Scab Results for Deerfield										Apple Scab Results for Belchertown-2										Apple Scab Results for East Bridgewater (CN Smith Farm)									
The Ascospore Maturity degree day model begins at 50% green tip on McIntosh flower buds. To recalculate ascospore maturity for your orchard, enter your green tip date: Green Tip Date: 3/30/2020 Click if greentip has not occurred										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										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: 3/28/2020 Click if greentip has not occurred									
Ascospore Maturity Summary										Ascospore Maturity Summary										Ascospore Maturity Summary									
Date	Past	Past	Current	5-Day Forecast			Forecast Details			Date	Past	Past	Current	5-Day Forecast			Forecast Details			Date	Past	Past	Current	5-Day Forecast			Forecast Details		
	4/26	4/27	4/28	4/29	4/30	5/1	5/2	5/3		4/26	4/27	4/28	4/29	4/30	5/1	5/2	5/3		4/26	4/27	4/28	4/29	4/30	5/1	5/2	5/3			
Ascospore Maturity	27%	28%	31%	35%	39%	45%	-	-	Ascospore Maturity	21%	22%	25%	28%	32%	37%	-	-	Ascospore Maturity	33%	35%	38%	42%	46%	51%	-	-			
Daily Ascospore Discharge	3%	3%	<1%	12%	5%	<1%	-	-	Daily Ascospore Discharge	2%	2%	2%	8%	4%	<1%	-	-	Daily Ascospore Discharge	4%	3%	<1%	8%	4%	<1%	-	-			
Cumulative Ascospore Discharge	18%	21%	22%	34%	39%	39%	-	-	Cumulative Ascospore Discharge	16%	18%	20%	27%	32%	32%	-	-	Cumulative Ascospore Discharge	29%	32%	33%	41%	45%	46%	-	-			
Ascospore Maturity Graphs										Ascospore Maturity Graphs										Ascospore Maturity Graphs									
Infection Events Summary										Infection Events Summary										Infection Events Summary									
Date	Past	Past	Current	5-Day Forecast			Forecast Details			Date	Past	Past	Current	5-Day Forecast			Forecast Details			Date	Past	Past	Current	5-Day Forecast			Forecast Details		
	4/26	4/27	4/28	4/29	4/30	5/1	5/2	5/3		4/26	4/27	4/28	4/29	4/30	5/1	5/2	5/3		4/26	4/27	4/28	4/29	4/30	5/1	5/2	5/3			
Infection Events	Combined	Combined	Yes	Combined	Yes	No	-	-	Infection Events	Combined	Combined	Yes	Combined	Yes	No	-	-	Infection Events	Combined	Combined	Yes	Combined	Yes	No	-	-			
Average Temp (F) for wet hours	46	40	40	51	48	-	-	-	Average Temp (F) for wet hours	42	38	38	51	49	-	-	-	Average Temp (F) for wet hours	42	41	39	49	48	-	-	-			
Leaf Wetness (hours)	13	24	8	16	21	-	-	-	Leaf Wetness (hours)	11	24	10	16	21	-	-	-	Leaf Wetness (hours)	18	24	10	16	21	-	-	-			

4/28/2020 NEWA infection risk estimation for (L to R) Deerfield, Belchertown and East Bridgewater. According to NEWA, each site is in the midst of a multiday infection even. Note that the "Daily Ascospore Discharge" estimated for tomorrow in Deerfield is highlighted in yellow and forecast to reach 12%. While there is no key to explicitly state this, one might assume that yellow indicates a moderate infection event. On that same day, 4-29, NEWA estimates that both Belchertown and East Bridgewater will experience 8% "Daily Ascospore Discharge".

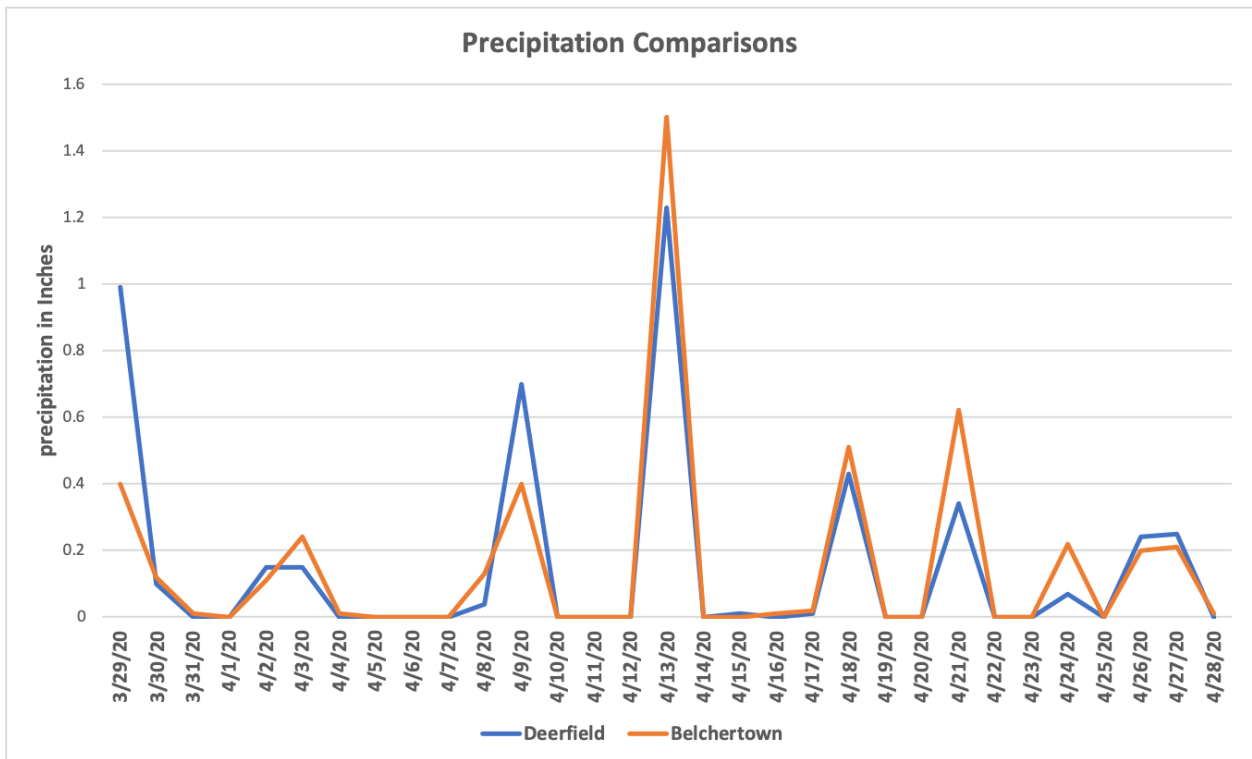
NEWA is estimating 12% of the total ascospore bank discharge for 4/29 in Deerfield, and 8% for Belchertown and East Bridgewater. RIMpro estimates that the upcoming rain event will account for 11.55% the total ascospore bank discharge in Deerfield and 10.90% in Belchertown. In RIMpro these numbers amount to an "extreme" infection event with RIM values exceeding 600.

Over the last several weeks, I have tracked Belchertown and Deerfield weather conditions side by side, along with Mac apple phenology. So far, the measurements have been close enough to one another for me to feel fairly confident that ascospore development was not thrown out of whack when the leaves had to be moved from Belchertown, where the overwintered to Greenfield, where I overwintered. As such, this will be the last week I post the site by site comparisons and next week will proceed with just the weather information from Deerfield. But for this week, the following information for your viewing pleasure:

The overall average temperature in Deerfield from March 29 through April 28 was 43.98°F, while in Belchertown it was 42.71°F. A difference of 1.27°F.



Total precipitation in Deerfield between March 29 and April 28 was 4.71 inches and 4.72 in Belchertown.



Either way, it's time to cover up, and, if you had scab last year, kick back. Clean to low inoculum orchards may still want to stick to the capto-zeb preventative schedule, while orchards with a history of scab should consider a protective captan or mancozeb coupled with a curative fungicide application. Indar (FRAC 3), Approvia (FRAC 7) or Flint (FRAC 11) are all viable options. *However*, when using materials like these that are prone to resistance development - ROTATE ROTATE ROTATE. There may not be fungal resistance to these materials now, but we want to keep it that way!

Powdery mildew (PM) Temperatures are still a little low for new infections from PM. If you had issues with this last year, however, and your temps are trending upward to the 60s, Flint and Indar are both listed with “high” efficacy against PM, and Approvia is listed with “moderate” efficacy. Remember 60°F is the low end of the “optimal” temperature range for PM development, so, it infections are possible, they are just slow moving for now.

Brown rot I have been seeing photos of stone fruit in bloom from all over. Given the temperatures, open blossoms and wetness duration, brown rot fungicides should be going on your peaches, apricots, cherries and whatever other stone fruit you have in bloom in your orchard. Do not let these cool temps fool you into a false sense of security! Brown rot infections can initiate as low as 50°F with 18 hours wetting. Current conditions provide for slow infection development, but infection nonetheless. Your first step should be to remove blighted twigs and shoots from last year, and the mummies too. This will reduce your overall infection potential. Check out the [New England Tree Fruit Management Guide](#) for a fairly comprehensive list of materials effective against brown rot, including Captan (FRAC M4), Indar (FRAC 3) and Rovral (FRAC 2).

Horticulture

Ed. note: I was going to write something up on bloom thinning using caustic thinning sprays, however, I think I will put that off until next week. I am going to repeat Dr. Greene’s article from last week on using Prohex-Cal on apples beginning at pink for growth control, fireblight suppression, and suppression of bitter pit (in Honeycrisp). Likely the earliest timing for this will be sometime next week.

Use of Prohexadione-calcium (Apogee and Kudos) in 2020

Duane Greene

Tree development has proceeded almost to the point where growers can consider making their first application of prohexadione-calcium (Pro-Ca). Recent research has shown the value of

early application for both greater growth control and for initiation of early control of shoot blight.. It requires between 10 and 14 days after application for Pro-Ca to start to inhibit growth. Since shoot growth in an apple shoot begins early, often at bloom, the earlier growth can be checked the greater overall reduction in growth that will be possible. If the initial application is made at pink, no more than 6 oz per 100 gal. may be applied at this timing.

The label suggests that there are two time periods when Pro-Ca can be applied. The first is early at the pink stage of flower development. The second time period is when shoot growth has reached 1 to 3 inches in length which is generally during the bloom period. The greatest reduction in shoot growth will be achieved when Pro-Ca is applied at the pink stage since reduction in shoot growth is achieved early before rapid shoot growth starts. If less aggressive growth reduction is chosen, then wait about a week after the pink stage to make the first application. Those who wish to have a less dramatic reduction in shoot growth may wish to make the initial application during the late bloom period. Follow up application(s) will be needed to maintain growth control throughout the season. The number of applications will vary depending on the vigor of the orchard. Generally, 6 oz/100 gal is a sufficiently high rate to use initially although lower rates are typically used in follow up applications.

There are two formulations of Pro-Ca available, Apogee and Kudos. They both have the same percent active ingredient and they may be used interchangeably. There are small differences between these formulations but in my estimation they are comparable.

An important use of Pro-Ca is to help control shoot fire blight. Pro-Ca has no direct inhibitory effect on the fire blight bacteria. The structure of the shoots treated with Pro-Ca is altered and thus providing a barrier for penetration of fire blight into the shoot. Therefore, in order for Pro-Ca to provide any protection from fire blight it must first cause growth reduction in shoot growth. Application of Pro-Ca at pink does not inhibit blossom blight but what it does do is alter the structure of the developing shoot thus providing earlier protection against shoot blight. If Pro-Ca is used for shoot blight control on young trees, an undesirable reduction in tree growth may occur.

Ed. note: recent research out of Cornell has shown that Prohex-Cal application beginning at pink *may* help reduce bitter pit in Honeycrisp, while delaying application(s) until after bloom *may* actually increase incidence of bitter pit. Just something to think about. Also note that Apogee application at pink for fire blight shoot blight suppression can be made only if the applicator has the [2EE supplemental label](#) for early application in their possession. The Kudos label, however, allows application at pink.



McIntosh apple at pink bud stage on 6-May, 2019

Small Fruit Update

Sonia Schloemann

Crop Conditions:

There has been little change in crop status since last week due to the cold weather. Things are moving slowly. Some farms experienced 2-3 frost/freeze nights last week (early Thursday morning being the coldest), and may see damage to row covered strawberries as a result. Most other berries are not yet developed enough to be susceptible to cold damage but that could vary with location and variety. You can cut buds lengthwise in half in blueberries or raspberries to see if there is any dark tissue inside if you are concerned. Repeated rain events have left soils pretty saturated and this may lead to compromised root systems in some crops and locations. More rain forecast for later this week.

Hawkeye's corner (notes from the field)

Liz Garofalo

No field visits for this week. But, soon, perhaps... Stay tuned!

Guest article

No guest article this week...

Facebook Me



Mark Longstroth

14 mins · 🌐



Our Southwest Michigan Fruit update. Fruit are moving slowly with this cold April. We have had some hard freezes which have damaged the early blooming stone fruit. Apricots, Japanese plums and sweet cherries are blooming now and have suffered some damage. There is still fruit left in good sites and for the late blooming varieties. Tart cherries were also hurt. Michigan is a big state and these injuries only occurred in the southwest and southern Michigan and damages are less as you move northward as the more northern areas were not as far along. Apples, blueberries and peaches in SW Michigan suffered little injury. Grapes do not seem to have been damaged



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Southwest Michigan fruit update – April 28, 2020

Freezes last week caused little additional damage to fruit crops. This week will be cooler with rain for the next few days.



1



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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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The next Healthy Fruit will be published on or about May 5, 2020. 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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