



Healthy Fruit, Vol. 29, No. 6, May 11, 2021

Prepared by the University of Massachusetts Amherst Fruit Team

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Current degree day accumulations

UMass Cold Spring Orchard, Belchertown, MA (Since March 1)	10-May
Base 43 BE (NEWA, since March 1)	444
Base 50 BE (NEWA, since March 1)	210

According to the NEWA Degree Days prediction, by May 17 (next Monday) we will have reached 536 DD's Base 43 BE. McIntosh petal fall should be occurring 439 to 523 Degree Days Base 43 BE.

Current bud stages

Current bud stages. 10-May, 2021, UMass Cold Spring Orchard, Belchertown, MA

				
McIntosh apple Late bloom-early petal fall	Honeycrisp apple Full bloom+	Gala apple Late bloom	Crispie pear Petal fall	Redhaven peach Petal fall ++

More 2021 bud stages [here...](#)

Upcoming pest events

Coming events	Degree days (Base 43 BE)
Codling moth 1st catch	395-562
European red mite egg hatch complete	368-470
Green fruitworm flight subsides	267-499
Lesser appleworm 1st catch	276-564
Lesser appleworm 1st flight peak	364-775

Oriental fruit moth 1st flight peak	331-533
Spotted tentiform LM sapfeeding larvae present	343-601
Spotted tentiform leafminer mines forming	367-641
White apple leafhopper nymphs on apple	302-560
McIntosh petal fall	439-523

Upcoming meetings

Pending final UMass approval and continued improvements in COVID test results...

The UMass Extension Fruit Team will be holding its first-in-a-while **IN PERSON Twilight Meeting**, May 19, 2021 at the UMass Cold Spring Orchard, 4:00pm-5:30pm. Since this is our first in-person meeting in a while, please bear in mind there will be some new protocols in place. For example, there will be no food available, the University will require masks and social distancing, pre-registration will be required and we will be requiring symptom screening. We will be doing our best to make this as smooth a process as possible and are looking forward to seeing you all! Please use this link to pre-register: <https://docs.google.com/forms/inpersontwilight>

The way I see it...

Jon Clements

Apples are entering petal fall, slowly, at the UMass Orchard. It was as close to a snowball bloom across the board as I have seen in awhile. Average temperatures are well below normal, highs should be 70 degrees this time of year. I certainly have not seen a lot of bee/pollination activity with all the cool weather and wind, your mileage may vary. I keep thinking if we set an apple crop it will be a miracle, but those apple trees are pretty good tricksters. Some growers have applied bloom chemical thinning sprays, I'd expect modest results. A full petal fall chemical thinning spray is particularly warranted, the timing for that looks like this weekend, but the

inclusion of carbaryl in that spray might be problematic given the lingering state of bloom. Please read Duane Greene's thinning article in Horticulture. That's about all I got for now...oh wait, one more thing, there was some serious discussion last week about interpreting the fire blight models in NEWA when there was arguably a marginal risk of fire blight infection. Dan Cooley addressed the subject at our Zoom twilight meeting last week, but if you missed it or want to review his presentation, you can watch it (again?) here: <https://youtu.be/CxYwLz514JU> And/or read my blog post: <http://jmcectman.blogspot.com/2021/05/fire-blight-prediction-models-words-and.html>

Insects

Jaime Piñero

Weekly report of insect pest captures in monitoring traps at Cold Spring Orchard (Belchertown, MA)


Period: 5.4 - 5.10.2021

Insect	Average captures/trap	Notes
Tarnished plant bug	0.08	Unbaited white sticky cards
European apple sawfly	0	Unbaited white sticky cards
Plum curculio	2	Odor-baited traps (deployed on 4.15.21)
Oriental fruit moth	75	Pheromone delta trap (captures: 39, 111)

Tarnished plant bug (TPB). We just experienced another week with very low TPB activity. One TPB was captured at the Cold Spring Orchard for the past seven days, and zero TPBs were captured in traps in the nine monitored orchard blocks throughout MA.

European apple sawfly (EAS). Another no-show - thus far.

Oriental fruit moth. BIOFIX was set on April 26 at CSO. One trap caught 39 OFM from May 3 to May 7, while a second trap caught 111 OFM in one week (Apr. 30 - May 7), for a weekly average of 75 OFM/trap. Thus, this seems to be a period of high OFM activity.

	<	04/30	05/03	05/07
OFM-CSO OFM		24	2	39

Ready for the petal fall spray against PC? Plum curculio (PC). PC activity continues to be low: 8 PCs have been caught in 4 monitoring traps since the previous week. Under these weather conditions, frequent PC monitoring is advised. Fruitlets should be monitored beginning at petal fall to determine if egg-laying injury is occurring. Keep in mind that PC females are more likely to lay eggs in king fruit (in a few weeks, they will actually show the opposite behavior: they will start laying eggs in the smaller fruit). If fresh oviposition scars are observed, a first cover spray should be made to the entire block. A full-block spray by the time of petal fall is needed given the ability of overwintered PCs to penetrate into the interior of the blocks.

After the petal-fall spray, continue to monitor for fresh scars. If more are found, a second cover spray targeting perimeter-row trees will be needed. Cool, wet weather will prolong PC activity. Thus, given that for the next 10 days or so the weather will continue to be cool and wet, you may consider application of materials that have good rainfast properties.

If you plan to use Carbaryl as a thinner, then this material can provide some level of protection against PC at petal fall. But don't rely on this insecticide alone to do the job since its level of efficacy is considered to be 'moderate' only. There are other materials that would be more effective at controlling PC, which can be applied once the fruit reaches 6-8 mm in diameter. A couple of growers I know use Sevin XLR Plus (at the highest label rate) for PC control **ONLY WHEN** PC pressure is moderate and the timing of application would coincide with the period of thinning. If this is done, however, I would recommend following up with frequent fruit monitoring in case some egg-laying activity takes place after the sprays. If no fresh egg-laying scars are found up to 7 days after the Sevin spray, that would suggest that most of the PC population may have been controlled. Keep in mind that carbaryl is very toxic to bees so the earliest time of application is at petal fall.

Some weeks ago I discussed Verdepryn (active ingredient: cyclaniliprole; an IRAC group 28 anthranilic diamide¹ insecticide; REI= 4 hours) a new insecticide registered for pome and stone and berry fruits. This product could be applied at petal fall, when the 6-8 mm fruit are more susceptible to PC attack. Use of Verdepryn at the higher rate (8.2 to 11 fl oz/A) is expected to provide the best results. Note that Verdepryn is highly toxic to bees exposed to direct treatment or residues on blooming plants. According to the label, Verdepryn "...has been determined to have a short residual toxicity (RT25) time (Residual Time to 25% Bee Mortality). Foliar application of this product is prohibited from onset of flowering until flowering is complete unless: The rate is limited to 0.036 to 0.054 lbs. a.i./A and the application is made in the time period between 2 hours prior to sunset and 8 hours prior to sunrise". Consider this restriction if

you decide to use Verdepryn for PC control at petal fall while some trees may still have some open flowers. Make sure to read the product label for additional restrictions before applying this product. The guest article provides information on rainfast characteristics of various types of insecticides, including diamides, on fruit.

¹*Diamide insecticides have proven to be moderate to highly rainfast on most fruit crops. Spray adjuvants, materials intended to aid the retention, penetration or spread on the plant, can also improve the performance of insecticides. Consider using a methylated seed oil (MSO) like Dyne-Amic, or use a good penetrating adjuvant. However, which one you chose to use does not appear to be all that important because research has shown little difference between this type of adjuvants tested.*



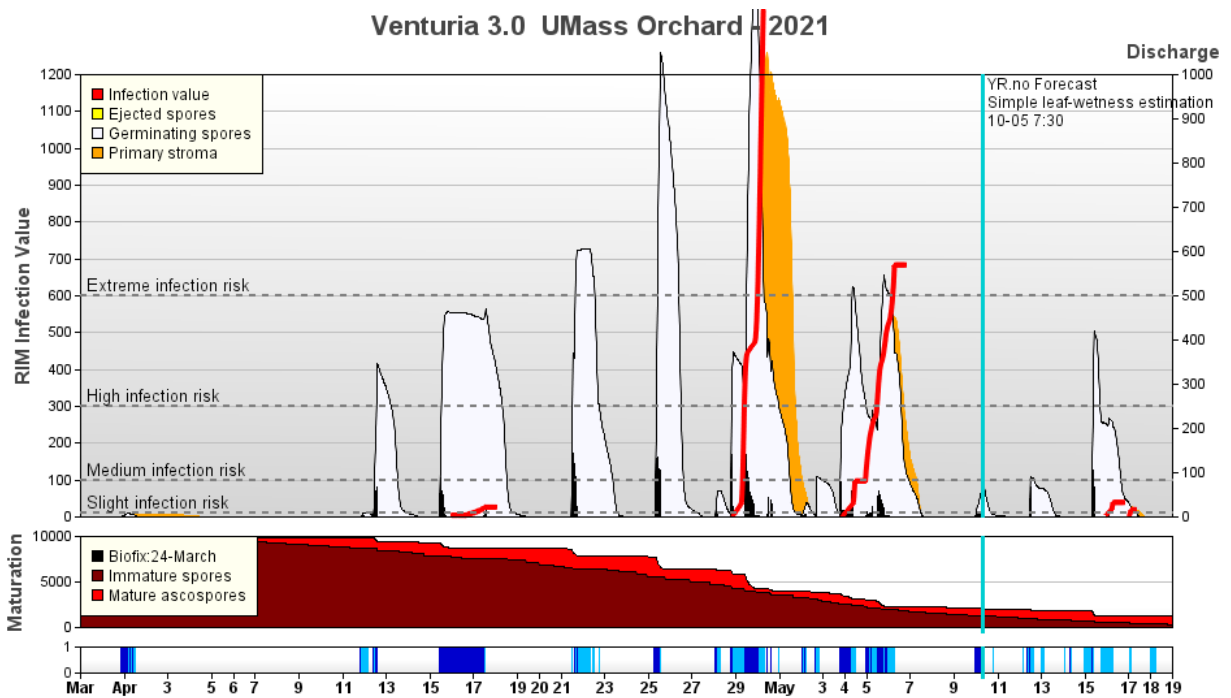
Invasive pest monitoring. Monitoring traps for spotted lanternfly (SLF) (10 locations), BMSB (10 locations), and SWD (5 locations) are being set up this week. We will keep you informed about invasive pest activity. Depicted below: trunk trap baited with wintergreen oil lure used for SLF monitoring.



Diseases

[Liz Garofalo](#) and Dan Cooley

Apple scab is a moving target we can really only see clearly after the fact. So far this year, according to the DSSs, things have been fairly low key. There was a saying in Security Forces that the job consisted of long stretches of boredom punctuated by sudden extreme activity (OK, so, I'm paraphrasing a little, gotta keep it G-rated here). This year's primary scab season has seemed a little like that. Dry early spring conditions brought on a number of what should/could/would have been infection events that don't seem to have amounted to any infection- with the exception of two, according to [RIMpro](#); 4/29->5/2 and 5/4->5/6. RIMpro's apple scab "Spot Tracer" estimates that lesions from the first significant infection event (4/29) will be visible around May 16. These events that did not materialize are still shown in the model output and appear as white shapes on the graph with no (or next to no) RIM value line associated with them.



The above image reflects RIMpro’s current (5/10) primary scab forecast including events that have already occurred. The information contained in the graph to the left of the “today’s date” line (this is the vertical teal line that runs through the whole graph) incorporates site-specific information collected from the weatherstation on farm, Cold Spring Orchard in this case. This is what we call the “past cast” as it is representative of the weather that was recorded by sensors, rather than weather that is forecast and therefore changeable.

[NEWA](#) also estimates that there have been two “significant” infection events so far this year, one with an estimated 28% daily ascospore discharge and the other 27% estimated daily ascospore discharge. Both DSS also agree on the dates of these infection events. The NEWA system still caches each infection event that was estimated to occur based on the green tip date the system generates prior to this date being manually entered by the user. Therefore the total number of infection events that NEWA logged is more than we are likely to actually see in the field.

2021 Primary Apple Scab Infection Events Estimated by NEWA for Cold Spring Orchard		
Start Date	End Date	Daily Ascospore Discharge
3-24-21	3-26-21	0%
3-28-21	3-29-21 (green tip)	0%
3-31-21	4-1-21	<1%
4-15-21	4-17-21	6%

4-28-21	4-30-21	28%
5-2-21	5-6-21	27%

2021 Primary Apple Scab Infection Events Estimated by NEWA for Cold Spring Orchard

The above table shows each infection event estimated by NEWA for the 2021 primary apple scab season at Cold Spring Orchard in Belchertown, MA. Dates with strikethrough text are those that were estimated based on NEWA's forecast green tip date. Actual green tip date for Cold spring was 3-29-21.

Each DSS estimates approximately 25% of the total seasonal ascospore potential remains. I am also still seeing a fairly large number of ascospores in the lab; 1,369 in the funnel trap and 305 in the petri plate assay. This all points to the potential for another significant infection event should we get favorable conditions in the forecast.

Notes from the field

[Liz Garofalo](#)

[Obliquebanded leafroller \(OBLR\)](#) larvae are currently active in apple buds. Time to get out and scout!



Examine 10 bud clusters per tree for OBLR larvae and apply Bt insecticide if find more than 3% infested clusters.

Horticulture

Jon Clements

Thinning Recommendations for Petal Fall

Duane Greene

The weather during the past week has ranged from cool to cold. Flower development was very slow. My assessment of flower development yesterday was that on many varieties, trees were at some stage of petal fall (1 to 4 flowers in a cluster). The weather forecast for the next 6 days shows promise that more favorable thinning weather is on the way. Given the poor thinning conditions we experienced over the past 2 weeks, you should take full advantage of this opportunity. If you made hormone thinner applications during the past week, it is unlikely that these have had much of an effect because of the cold temperatures. The pollination weather during this bloom period has been poor. Fruit development has not proceeded enough to get a good sense about fruit development from earlier pollination. At this point it is a judgement call where each grower will depend on bee flight observation in their orchard and the experience that you have had in your orchard in the. I am going on the assumption that pollination will be sufficient for a full crop so initiation of thinning now is in order. It has been my experience in the past that we tend to underestimate initial fruit set under marginal weather conditions.

Petal Fall Thinning

Petal fall is a nebulous period between full bloom and when fruit start to size which usually is about 5 mm. When fruit reach 5 mm, it is advisable to start to use the carbohydrate model located on NEWA to help guide your decisions. Over the next week it appears that there will be no red flags issued by the model. I suspect that that the model will suggest applying the normal amount of thinner or perhaps increase the rate that you normally apply.

Thinners to Use

I am recommending the same thinners this week that I recommended last week: NAA, NAD (Amid-Thin) and carbaryl. I am still recommending at least 10 ppm NAA or 8 oz/100 gal of NAD. The 7-day forecast suggests that high temperatures might reach the 70s by the weekend. Carbaryl (1pt to 1 qt/100 gal) is a conservative choice, especially if the weather is not very warm and these thinners are not as potent when applied at petal fall. I am still recommending the addition of carbaryl with NAD and NAA for added thinning, however, care should be exercised with the use of carbaryl to avoid application when flowers are open in an orchard, since carbaryl is very toxic to bees.

For those that are concerned about the extent of pollination, flowers that were pollinated last weekend and before should start to grow. Any receptacle (fruit) that is at least 5-6 mm in size has been fertilized and will give you an indication of potential early set. Less reliable, but nonetheless instructive, is the number of flowers in a cluster where the calyx are closing upward. Unpollinated flowers generally have their calyx flat.

Thinning and fruit set factors (in order of importance)

The following factors influence fruit set and the effects of chemical thinning and should be considered when making thinning decisions. For example, when a weak “snowball” bloom occurs, generally fruitlets thin easier and/or fruit set is lighter.

Adapted from ‘Apple Thinning Guide,’ Phil Schwallier, April 1996, Great Lakes Publishing (no longer available)

Increased thinning response	Decreased thinning response
Bloom	
Heavy or “snowball” bloom Quick or short bloom Injured bloom or missing flower parts Little or no foliage present on bloom	Light bloom Normal bloom period (good cross pollination) Healthy or large showy bloom Abundant foliage present during bloom
Bees & pollination	
Poor bee activity Poor pollination and fertilization	Good bee activity Good pollination and fertilization
Pink & bloom weather	
Cool, wet, or cloudy weather Excessive hot temperatures Cold or frosty temperatures Excessive moisture	Warm, mostly dry or sunny weather Warm temperatures No frost Mostly dry, but also adequate moisture
Grower management factors	
Previous heavy crop Heavy fruit set on easily thinned varieties Low levels of N and/or other nutrients Wetting agent High chemical concentration Soft spray water Easy to thin varieties	Previous light crop Light fruit set Adequate levels of N and other nutrients No wetting agent Lower chemical concentration Hard spray water Hard to thin varieties
Tree factors	
Excessive shading and/or crowded trees Close tree spacing Injured or diseased tree parts Young trees Winter injury	Well pruned and or trained trees (open trees) Wide tree spacing No diseased or injured tree parts Mature bearing trees No injury

Mostly upright growth Low vigor Light pruning Non-spur type trees	Mostly lateral growth Moderate vigor Heavy pruning Spur type trees
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The weather during and just after the thinning application is the most important factor to consider in predicting thinning response!

Increased thinning response	Decreased thinning response
Weather during and after thinner application	
Slow drying conditions High humidities Frosty nights High maximum temperatures Mostly warm to hot temperatures (70 to 80 degrees F.)	Fast drying conditions Low humidities No frost Lower maximum temperatures Mostly cool temperatures (<70 degrees F.)

Guest article

Precipitation can impact the performance of insecticides on fruit crops, but some compounds resist wash-off.

(based on 'rainfast characteristics of insecticides on fruit' by Dr. John Wise, Michigan State University)

With the prevailing cool and wet weather, growers often question whether an application they have made will be effective if rainfall occurs too soon after the application. Rainfall occurring after application can have a significant effect on the residual activity and efficacy of pesticides. A pesticide's rainfastness, or its ability to withstand rainfall, is an important factor affecting the efficacy of foliar-applied pesticides. Generally, it is best to avoid pesticide application when rainfall is likely; however, weather can be unpredictable, so it is best to choose a product with good rainfast characteristics.

Factors that can influence the impact of precipitation on the performance of insecticides are:

(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) 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) 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.

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	Moderate	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
Moderately rainfast = ≤ 50% residue wash-off
Low rainfast = ≤ 70% residue wash-off
Systemic = Systemic residues remain within plant tissue

For additional information, consult the original article here:

https://www.canr.msu.edu/news/rainfast_characteristics_of_insecticides_on_fruit

Facebook Me



Arthur Kelly ▸ Massachusetts Fruit Growers

May 9 at 12:00 PM · 🌤️



What's wrong with this picture?



👍 Peter Mitchell, Franklyn Carlson and 3 others

10 Comments Seen by 76

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Andre Tougas

Honeycrisp? 🍏👍 2

Like · Reply · 2d



Arthur Kelly

Andre Tougas yes

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Useful links

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

[UMass Extension Fruit Team YouTube Channel](#)

[UMass Fruit Loop IPM Podcast](#)

[Scaffolds Fruit Journal \(1995-2020\)](#). With the retirement of Dr. Art Agnello from Cornell University, this publication has come to an end. See Peter Jentsch's blog below.

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 May 18, 2021. 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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