



Healthy Fruit, Vol. 29, No. 7, May 18, 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)	17-May
Base 43 BE (NEWA, since March 1)	546
Base 50 BE (NEWA, since March 1)	271

Current bud stages

Current bud stages. 18-May, 2021, UMass Cold Spring Orchard, Belchertown, MA

				
McIntosh apple 5-6 mm	Honeycrisp apple 6-7 mm	Gala apple 4-5 mm	Crispie pear Fruit set+	Redhaven peach Shuck split+

More 2021 bud stages [here...](#) (Note: this will be the last Current bud stages for 2021)

Upcoming pest events

Coming events	Degree days (Base 43 BE)
Codling moth 1st flight peak	562-890
Lesser appleworm 1st flight peak	364-775
Lesser peachtree borer 1st catch	476-666
Pear psylla hardshells present	493-643
Plum curculio oviposition scars presents	485-589
San Jose scale 1st adult catch	443-623

San Jose scale 1st flight peak	560-736
Spotted tentiform leafminer mines forming	367-641
White apple leafhopper nymphs on apple	302-560
McIntosh fruit set	507-593

Upcoming meetings

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

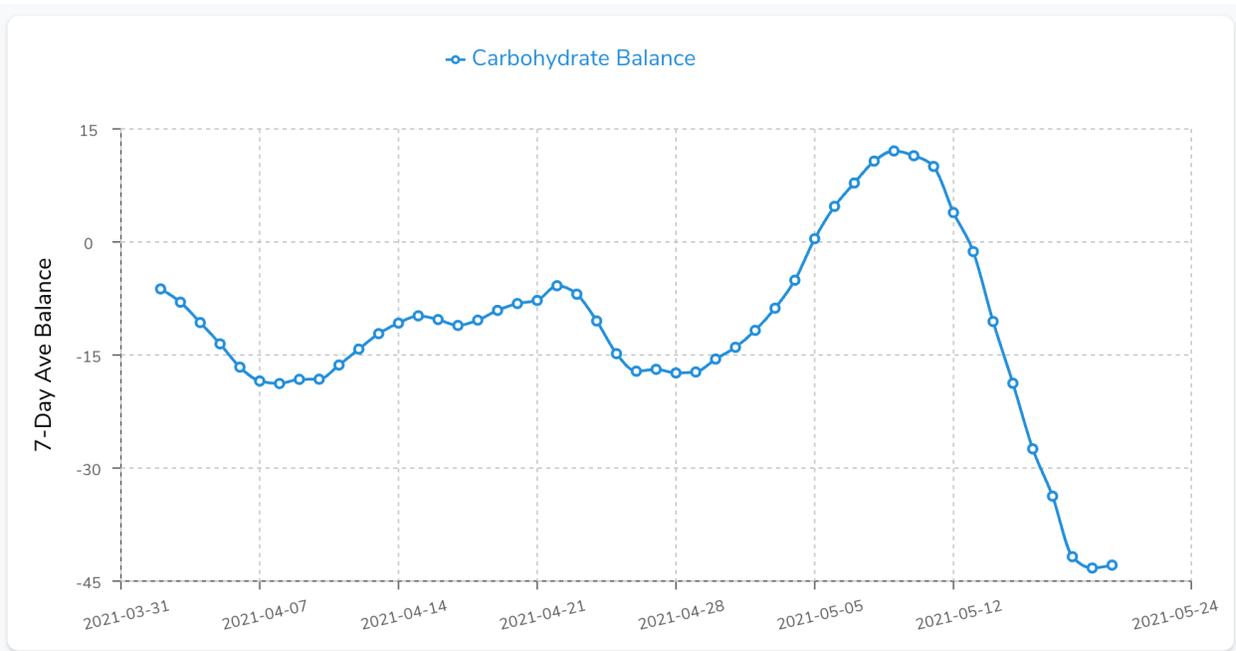
As Duane notes below in [Horticulture](#), this week into the weekend will be the ideal time to apply a chemical thinner. From bloom, the thinning “sweet spot” is app. 200 to 250 Degree Days Base 4 degrees C. (39 degrees F.). That is indicated by the outlined cells in the 4 degrees C. DD column below, those being May 21-23 at the UMass Orchard in Belchertown, inputting a bloom date of May 2. Expect apple fruitlet size to center around 10 mm. at this time. Note also the carbohydrate model is indicating a modest deficit and some “Caution” when you are determining chemical thinning rates. I would take this under advisement, and might for example, back off from 4 oz. NAA per acre to 3 oz. Your call. Note the carbohydrate model is on NEWA 3.0, dev.newa.cornell.edu. Make sure you create an account and select the closest NEWA weather station to you when running the carbohydrate model.

[Forecast Details](#)

Thinning efficacy:

Mild Good Very Good Excessive

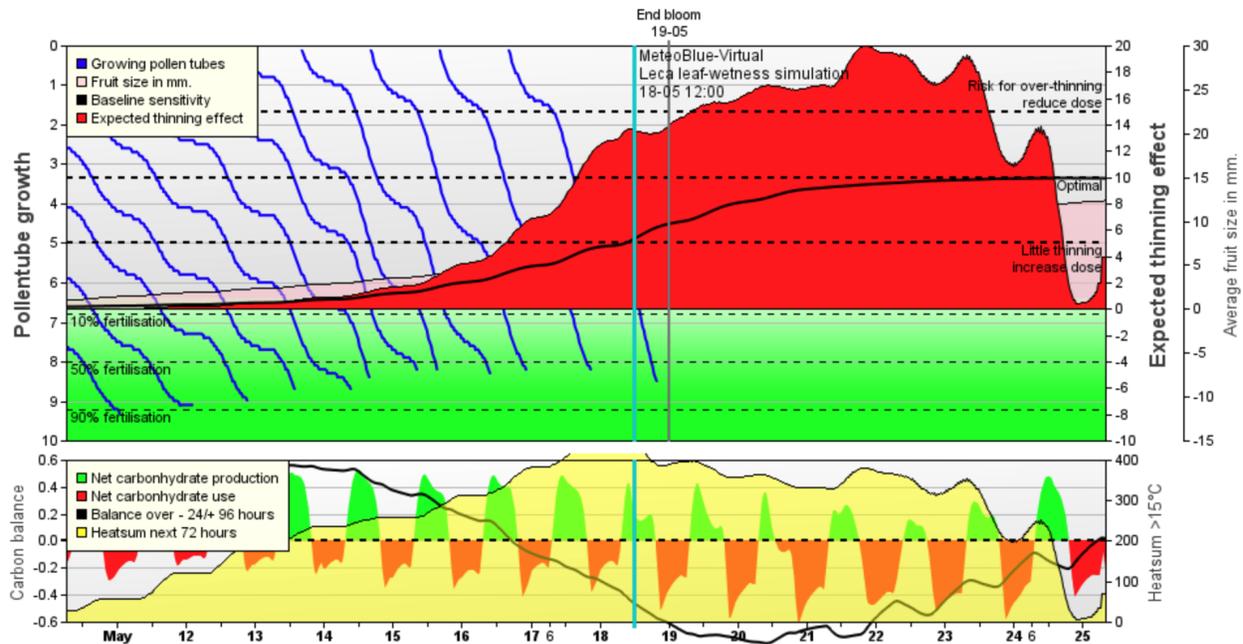
Date (2021)	Max Temp (°F)	Min Temp (°F)	Solar Rad (MJ/m ²)	Tree Carbohydrate Status (g/day)		Accum 4°C DD since bloom <small>Cell Border ≥ 200 Cell Border ≤ 250</small>	Thinning Recommendation
				Daily	7-Day Weighted Ave		
May 16	73	55	20.3	-24.78	-27.45	128	Apply Standard Chemical Thinning Rate L
May 17	74	47	19.2	-12.37	-33.73	139.8	Apply Standard Chemical Thinning Rate L
May 18	82	51	17.1	-42.43	-41.76	154.9	Decrease Chemical Thinning Rate by 30% C
May 19 Forecast	85	54	24	-39.05	-43.26	171.8	Decrease Chemical Thinning Rate by 30% C
May 20 Forecast	84	57	21.2	-48.08	-42.88	189.1	Decrease Chemical Thinning Rate by 30% C
May 21 Forecast	80	57	16.5	-47.55	-	205.4	-
May 22 Forecast	76	58	11.1	-59.89	-	220.9	-
May 23 Forecast	80	57	21	-29.09	-	237.1	-
May 24 Forecast	77	60	22	-19.86	-	253.4	-



I also have a RIMpro account that uses “virtual” weather data in a “Apple Thinning” model. Although I hesitate to include it here, I pasted it below. A bit busy, I know. BUT, it pretty much

mirrors the NEWA carbohydrate model and suggests that in upcoming days the trees will be very susceptible to a chemical thinner application. Duly noted.

RIMpro Apple Thinning - UMass Orchard-MB - 2021



Finally, if you are up to measuring apple fruitlets and applying the fruitlet growth rate model to assess chemical thinning efficacy and the need for follow-up chemical thinning applications, check out my cookbook “Recipe” for baking this [here](#). If using the Malusim app, be sure to set everything up first in malusim.org, then you will be ready to measure fruitlets in the field. Let me know if any questions or need help. It may be the one most important things you can be doing now. For a horticulturist, aside from harvest, this is indeed a very busy time of the year and your chemical thinning spray(s) are likely the most important one or two sprays you do all year! Got a headache yet? But good luck out there...

Insects

Jaime Piñero

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

Period: 5.11 - 5.17.2021

Insect	Average captures/trap	Notes
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Tarnished plant bug	0	Unbaited white sticky cards
European apple sawfly	0	Unbaited white sticky cards
Plum curculio	0	Odor-baited traps (deployed on 4.15.21)
Oriental fruit moth	15	Pheromone delta trap

Tarnished plant bug (TPB). Zero TPBs were captured in traps at CSO and in the nine monitored orchard blocks throughout MA.

European apple sawfly (EAS). No EAS were captured this week.

Codling moth (CM) and obliquebanded leafroller (OBLR). While no CM adults have been trapped at CSO, the first CM adult was caught in one of the three additional monitored locations. The table below provides information about trap deployment and timing of sprays against CM and OBLR

Moth species	Overwintering stage	Expected 1 st flight peak	When to set up monitoring traps	Control of 1 st generation larvae	Control of 2 nd generation larvae
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** (first sustained moth catch) is set
- ✓ On **biofix** date, start running degree-day developmental models to predict larval emergence

Plum curculio (PC). For most growers, this is petal fall spray week. This past Friday we conducted branch tapping (entire trees) and recovered very few PCs. Odor-baited traps at CSO showed zero PC captures in the last 4-5. Combined findings suggest that the peak of PC immigration has not taken place yet, so the weather this week provides some flexibility for the timing of the petal fall spray. Depending on temperature, overwintered PCs remain active for

2–6 weeks after petal fall. Fruit damage is usually most common in border rows next to sites where adults overwinter. After the petal fall spray, some growers apply insecticides to the perimeter of the blocks only.

Growers are often unsure how many additional sprays will be necessary to maintain protective chemical residues to prevent subsequent damage throughout the PC oviposition cycle. An oviposition model that estimates when insecticide sprays after petal fall are no longer necessary to protect fruit from PC damage has been developed, and it has proven effective in most years. This model is based on the assumption that residues from sprays applied after petal fall need to be maintained on fruit and foliage only until PC adults stop immigrating into orchards. Data show that this corresponds to the time when about 40% of the oviposition cycle is complete. This is predicted by the model to occur at 308 DD (base 50°F) after petal fall of McIntosh. If you want to use this model, you can start accumulating DD base 50 starting at petal fall using the NEWA Apple Insect Models [page](#). Enter the petal fall date for your area (see snapshot below, for Belchertown), and record the DD accumulated up to that moment:

Plum Curculio Results for Belchertown-2

At petal fall, fruit become susceptible to feeding and oviposition injury. Control measures are only needed until 308 degree days have accumulated since petal fall.

90% petal fall on McIntosh apple:

Petal Fall date above is estimated based on degree day accumulations or user input. Enter the actual date for blocks of interest and the model will calculate the protection period after petal fall more accurately.

Accumulated degree days (base 50°F) petal fall through 5/17/2021: 53 (0 days missing)

No additional sprays will be necessary whenever the date of accumulation of 308 DD50 DD falls within 10–14 days after a previous insecticide spray.

NOTE: It seems that there have been some issues with the production of AVAUNT. This product will actually be replaced by the newer formulation AVAUNT Evo (see label [HERE](#)). AVAUNT EVO may not be available for the moment either. Hopefully you have Imidan or another effective insecticide on hand.

Oriental fruit moth (OFM). Captures at CSO are subsiding, as shown in the table below. The seasonal pattern of OFM activity is shown in the figure on the right.

	<	05/07	05/14	05/18
OFM-CSO OFM		39	9	6



Spotted-wing drosophila. Monitoring traps have been deployed at five locations. No SWD have been captured yet. We will keep you informed.

Rosy Apple Aphid. We have observed some spotty infestations by rosy apple aphid at the UMass Cold Spring Orchard. Of the aphid species that can be found on apple trees, rosy apple aphid causes the most severe damage and is the most difficult of the three to control.

The body of this aphid has a waxy coating and usually a slight purplish or rosy tinge. Currently, second-generation nymphs (ALL FEMALES) are working 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.

DAMAGE. These aphids cause a decrease in tree vigor because of foliage loss and damage to the fruit through dwarfing, misshaping, and staining. The rosy apple aphid injects a toxin with its saliva that causes the leaf to curl and the fruit to be distorted. A single stem mother located on the underside of a leaf near the midrib will cause the leaf to fold almost as tightly as the outer wrappings of a cigar. The presence of only a few stem mothers can cause a severe curling of all leaves surrounding an opening flower bud; within such curls ideal protection is afforded to the rapidly developing aphids.

'Cortland', 'Ida Red', and 'Golden Delicious' are the varieties most frequently showing fruit injury. Fruit adjacent to rosy apple aphid colonies are stunted, puckered at the calyx end, and ridged like a pumpkin.

CONTROL (post-petal fall): Because the curled leaves protect the aphids, then the best control will be achieved with a systemic insecticide. One recommended systemic insecticide is MOVENTO at a rate of 6 to 9 fl. oz. Click [here](#) to access the MOVENTO LABEL.

Ambrosia beetle activity has been observed (see Notes From the Field for photos) in MA. This pest typically attacks stressed trees and has also been observed causing damage in apparently healthy trees. Ambrosia beetles are attracted to ethanol, a volatile given off by

stressed trees. Water stress, either too much or too little, has been shown to be a key contributing factor to the development of tree stress, especially in dwarf, high density plantings where this beetle can cause severe damage.

In mid to late- May adult female's peak flight occurs as they seek suitable trees to burrow into and build their galleries. Inside these galleries, the beetle lays her eggs and cultivates a fungus on which adults and larvae feed. Since the beetle does not feed on the tree itself, systemic insecticides are not particularly effective. While it may be very gratifying to poke a thin piece of wire into the newly formed hole and squish the beetle, this may not be the most efficient management tactic.

Where infestations are found, affected trees should be removed and burned to prevent further infestation. Where infestations have been found in the past, treatment of this pest must occur while adults are in flight (now, in MA), before they have entered into tree trunks or branches and built their protective galleries. Targeted truck applications of insecticides Lorsban and some pyrethroids like Warrior and Mustang Max are effective at reducing but not entirely eliminating pest pressure potential. Keep in mind that while these materials have proven effective against borers, they have also been shown to be highly toxic to honeybees and other beneficial insects so care must be taken when applying these and other insecticides.

Diseases

[Liz Garofalo](#) and Dan Cooley

Apple scab is winding down, but don't count it out just yet. While the forecast holds the potential for rain, it is slight, and leaf wetness is not forecast to last long enough for scab infection. Fire blight is a whole other story. NEWA currently estimates that ascospore maturity is at ~95% in Belchertown and more most eastern MA areas. As NEWA sees it "essentially all ascospores will be released after a daytime rain of greater than 1/10 inch with average temperature above 50°F." Again, since leaf wetness is not forecast to last very long, no infections are predicted over the next week. Depending on where you are, the chance of a shower varies, but generally goes up to around 20% to 30% over the weekend. If you get enough rain to release spores, over 1/10 inch, and if leaves dry quickly, then that's the end of scab season - according to NEWA.

Backing up this model estimate, a grand total of 12 ascospores were observed in the funnel trap, none in the Petri-plate assay. This has dropped dramatically from last week, when there were 1,369 in the funnel trap and 305 in the Petri-plate assay.



Apple scab ascospore indicated by blue arrow, **Marssonina** conidia indicated by red arrows. This week the first Marssonina conidia of the season were observed in the home lab funnel trap, none were observed in the petri plate assay.

RIMpro for Belchertown, on the other hand, is estimating that ascospore maturity has reached only 80%, and won't reach 95% for another week. Based on looking at these estimates and comparing them to NEWA's for a number of years, we'd say that it's best to keep scab fungicide coverage up for at least the next 7 days. By then, primary season will most likely be done, and the question will be, "Do we have any primary infections?"

Lesions from the last real scab infection, May 4 to 6, should start showing up just about now in most areas in MA. It would be a good idea to check older leaves on trees in those parts of the orchard where scab most often shows up. We have seen a few lesions on unsprayed trees at Belchertown, although none have been observed yet in unsprayed McIntosh a little further north in Greenfield, MA.

Fire Blight. Nothing has changed since the Healthy Fruit Alert we put out on Saturday. Temperatures will remain high enough to create a high risk of fire blight on trees with open blossoms if there is any rain, or even heavy dew. Be prepared to spray streptomycin on high-risk blocks, particularly sensitive cultivars and rootstocks in high density plantings, and cider varieties.

Given that temperatures are forecast to be above normal for at least the next 7 to 10 days, it is worth treating those high-risk blocks with materials that will reduce the risk of shoot blight. First up would be Apogee or Kudos (prohexadione Ca) applied at 1-3 oz/100 gal at late bloom to

petal fall, and repeated every 2 to 3 weeks until buds set. Also consider an application of Actigard or Lifegard at maximum label rates to induce more resistance to shoot blight.

Notes from the field

[Liz Garofalo](#)

Caught in the act!



Left: Two **ambrosia beetles** attempt to burrow into the rootstock of a newly grafted apple tree.
Right: Characteristic ~1mm hole from a beetle burrowing into the trunk.

It's getting hot in here... As temperatures climb, insect pest pressure also increases.



Left: **Pear psylla** nymph “hard shell” stage feeding on pear fruitlet. Right: Adult **plum curculio** “plays dead” to avoid predation.

Pollinator protection.



With petal fall insecticide applications going on in many locations around the area, mowing down flowering weeds like the purple deadnettle pictured above is an important step in protecting both honey bees and native pollinators. Purple deadnettle, a winter annual, can be distinguished from henbit by its more pointed, less deeply lobed leaves and by its tendency to cluster leaves and flowers at the ends of its stems. A second benefit to removing bloom in annual weeds like purple dead nettle is the potential reduction in the weed seed bank. If blossoms are destroyed before seed is set or matured, that flower no longer has the ability to contribute further to the weed population in a planting.

Horticulture

Jon Clements, Editor

Apple Thinning Suggestions for May 18, 2021 (Duane Greene)

After many days of cool, blustery conditions the weather has finally changed to more favorable conditions for thinning, and just in time. It appears that there will be an extended period of favorable weather to apply thinners during the coming week.

Yesterday I walked the UMass Orchard and looked at the potential fruit set on many varieties. All appeared to be quite similar, differing mainly in how much they have developed. The king

fruit on McIntosh measured slightly less than 7 mm and the king fruit on Gala were about 5 mm. Because of the protracted bloom period, the size and development of fruit in a cluster did differ. It appeared that there were between 1 to 4 viable fruit developing in each cluster. An interesting observation also was that the king flower did not appear to set in some clusters. They had short pedicels as well. This may be due to cold damage earlier in the spring when the king flower were more advanced thus more susceptible to cold damage. Also, the king flower opens first, and it may not have been pollinated because of the adverse weather conditions. What does this mean and of what relevance does it have thinning this week? One of the goals in a chemical thinning strategy is to try to establish difference in fruit size within a cluster, thus making it easier to thin with subsequent sprays. It appears that the pollinating conditions may help us during the thinning season.

An appropriate attitude entering into this week is to assume that this may be your last and best opportunity to thin. None of us know what the weather is going to be next week. The Carbohydrate Model on the NEWA site suggests that thinners should be reduced by 30%. The carbohydrate deficit for the next 3 days forecasts a deficit of about -45 g, which I consider to be an ideal situation to thin. With that deficit I would be tempted to use the standard rate you would normally use, but for thinning choices you must depend upon the experience you have had in your orchard.

Thinner Choices

You have several choices for thinners at this stage of the thinning season.

- NAA. This is a favorite thinner for many since it has a long history of effectiveness. All growers use this to some extent since it is very useful especially on more difficult to thin varieties. I consider it to be a standard that is appropriate for use in all orchards.
- NAD. This is a mild thinner that rarely overthins and is liked by many growers. This is the last time you should use NAD with confidence since later applications may result in pygmy fruit formation. Later applications (10+ mm) have not been completely researched, but how late you can use NAD and on which cultivars it will produce pygmy fruit, are still incompletely researched.
- MaxCel. You can probably use MaxCel now, especially since the temperatures are warm and they are predicted to remain warm. I generally wait to use this until at least 10 mm, a stage some trees may reach by the weekend. Since MaxCel can increase fruit size due to increasing cell division, MaxCel may be used alone as a mild thinner with the idea of increasing fruit size.
- Carbaryl alone and combinations. Now that the petals are off in most orchards and the bees have been removed, carbaryl can be used. Carbaryl is a very popular thinner, if for no other reason than it does not over-thin. I would recommend using this alone on the easier to thin varieties. However, perhaps it is most useful as a companion to the other thinners previously mentioned. Because NAD is a mild thinner, I suggest adding carbaryl to increase thinning strength. I like to add it to NAA so that a slightly lower rate of NAA

may be applied, conferring a bit more safety but with efficacy. Carbaryl is almost a must addition to MaxCel to increase thinning capability. When MaxCel is used alone it is a mild thinner, but when combined with carbaryl its strength is comparable to NAA.

Refer to the Tree Fruit guide for [recommendations for specific varieties](#).

This is an extremely important time during the chemical thinning season. Treat it as if it is your last good chance (and it may very well be best that you will have). Early thinning results in removal of fruit early and this will favor good return bloom.

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	Previous light crop Light fruit set Adequate levels of N and other nutrients No wetting agent

High chemical concentration Soft spray water Easy to thin varieties	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 Mostly upright growth Low vigor Light pruning Non-spur type trees	Well pruned and or trained trees (open trees) Wide tree spacing No diseased or injured tree parts Mature bearing trees No injury Mostly lateral growth Moderate vigor Heavy pruning Spur type trees

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

Do these five things for the best NEWA experience

[Your NEWA Blog](#), May 14, 2021, Dan Olmstead

NEWA 3.0 has a lot of great new features. Do these five things to be sure you have the best experience.

Use the right web browser

[NEWA 3.0](#) is programmed for use with Chrome, Firefox, and Edge. Use one of these browsers on your desktop, laptop, tablet, or smart phone device for the best experience. Safari, Opera and others might work but results are not guaranteed.

Create a user account

[Create a personal NEWA 3.0 user account](#) to save your farm data, choose favorite stations, select preferred models and more. This will reduce the amount of time you spend in front of the computer so can get back to your other work more quickly. [Click here to learn more.](#)

Customize your personal experience

[Customize your NEWA 3.0 experience](#) by selecting and saving your favorite stations and models. The next time you log in, everything is automatically saved and ready to go. [Click here to learn more.](#)

Learn to use your dashboard

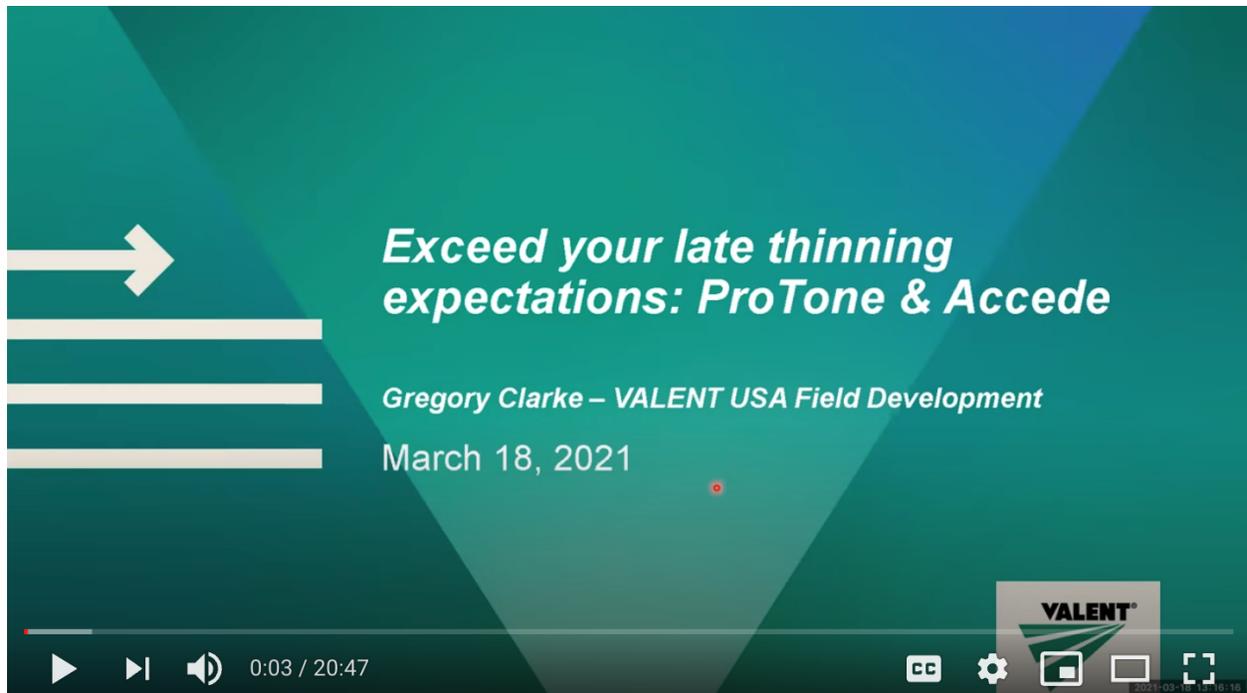
[Learn to navigate and get around your personalized NEWA 3.0 dashboard.](#) Quickly access your favorite stations and preferred models instantly without having to remember anything. [Click here to learn more.](#)

Contact the NEWA Help Desk

[Contact the NEWA Help Desk](#) any time you have questions or need to report a problem. We want to make NEWA 3.0 better and your eyes help us do this. Many times our users encounter a problem long before the programmers or managers. A quick note to support@newa.zendesk.com will immediately bring your inquiry or concern to our attention. [Click here to learn more.](#)

Facebook Me

No Facebook Me, but I want to point you to this YouTube video wherein Dr. Gregory Clarke, Valent Biosciences, talks about Protone and the new product Accede as late chemical thinning options for apples...<https://www.youtube.com/watch?v=0jg551yjLFI>



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 25, 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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