Volume 26, 2018
UMass Extension
Healthy Fruit
Prepared by the University of Massachusetts Fruit Program

Healthy Fruit, Vol. 26, No. 7, May 15, 2018

Jon Clements, Author (unless otherwise noted) and Editor

Contents

Current degree day accumulations

UMass Cold Spring Orchard, Belchertown, MA	14-May
Base 43 BE (NEWA)	464
Base 50 BE (NEWA)	248

Current bud stages

Current bud stages. May 14, 2018, UMass Cold Spring Orchard, Belchertown, MA

				
McIntosh apple Early petal fall	Honeycrisp Bloom	Crispie pear Petal fall	Redhaven peach Petal fall	Rainier sweet Late petal fall - fruit set

Upcoming pest events

Coming events	**Degree days (Base 43)**	**Meaning?**
Codling moth 1st catch	398 to 566	1st sustained trap catch = biofix set to start DD model for insecticide timing
Lesser appleworm 1st catch	276 to 564	Does anyone know if this pest is a problem in MA orchards, or is it taken care of with petal fall sprays?
Lesser peachtree borer 1st catch	480 to 671	Hang pheromone traps to monitor presence/absence?
Oriental fruit moth 1st flight peak	333 to 536	Pheromone traps should be hung to establish biofix; petal fall spray likely to resolve
Pear psylla hardshell nymphs present	493 to 643	Early season pear psylla management should have prevented these; if not, you are looking at season-long battle now with insecticide(s)

Plum curculio oviposition scars presents	485 to 589	Monitor for signs of activity during warm, muggy weather; fruit not particularly susceptible until it reaches 7 mm size; be proactive with petal fall insecticide
San Jose scale 1st catch	438 to 614	I have never been successful trapping these with pheromone traps; continue to monitor for sign of SJS infestation
Spotted tentiform leafminer leaf mines forming	367 to 641	If present, treatment may be warranted
McIntosh petal fall	439 to 523-415	Happening...

Upcoming meetings

From Heather Faubert @ URI:
Come join Sonia Schloemann (UMass) and me at **Ward's Berry Farm**, 614 South Main St., Sharon, MA on **Thursday May 24, 2018** at 5:30 PM. Guest speaker: Dale Ila Riggs, The Berry Patch in Stephentown, NY, will speak on exclusion netting to protect fruit against spotted wing drosophila and other pests. Sonia Schloemann, UMass Small Fruit Specialist and Heather Faubert, URI, will speak on current blueberry topics such as pruning, nutrition and insect management. Meeting is free with annual dues payment of $40, or $20 for non-RIFGA members. Light dinner will be served. Two hours of pesticide recertification credit available. Registration is not necessary.

The way I see it

Jon Clements

Where do I start? Let me count the ways…

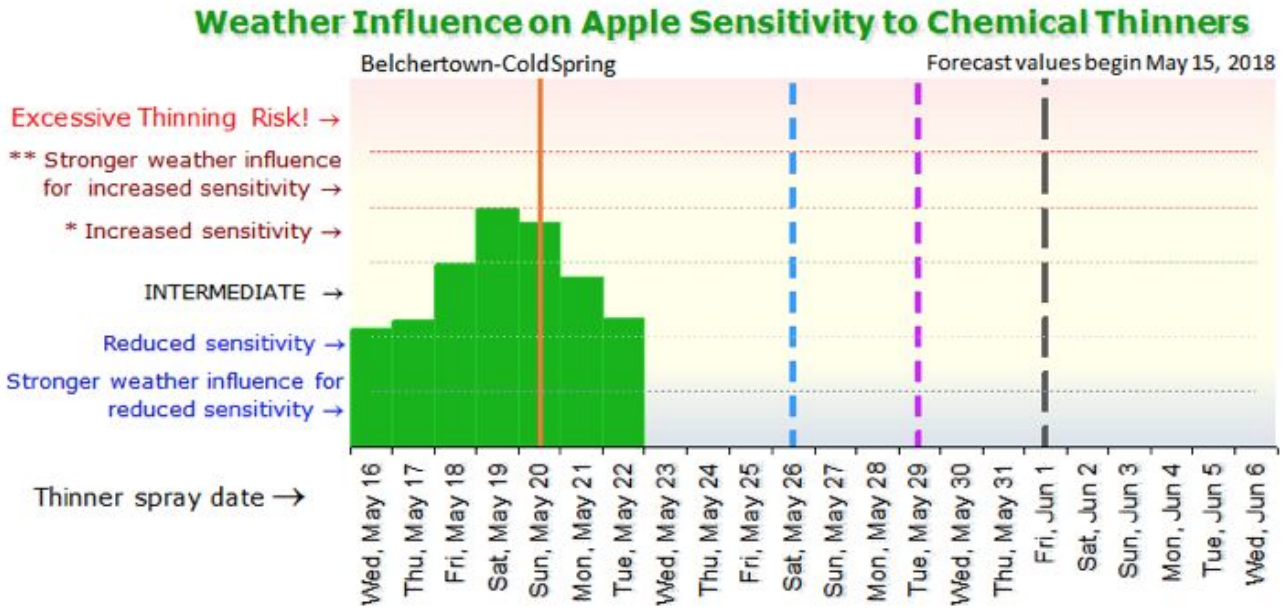
1. Apple scab and fire blight are both very active right now and of concern. Fire blight more gray area than apple scab, which is black and white, we are in the peak of apple scab season. Fire blight conditions are marginal, but could become severe with the right weather. Remember, you need open bloom during which sufficient heat units are accumulated, and a wetting event, which could be light rain or heavy dew to trigger blossom fire blight infection. All the key ingredients might be there on an orchard

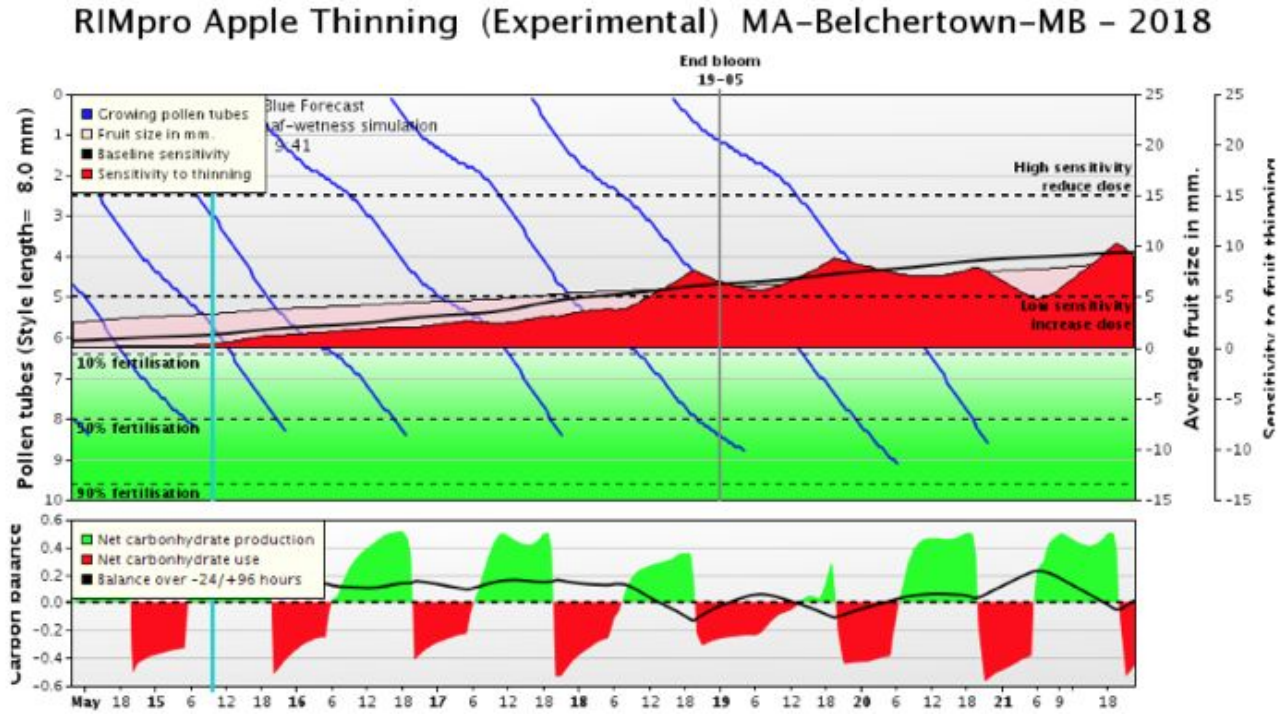
case-by-case basis, so be read to spray antibiotic if the right conditions present themselves in your orchard.

2. I/we have access to no less than four orchard decision support applications (DSA's) at many locations in Massachusetts. These include NEWA (47 locations, available to anyone), SkyBit E-Weather (9 locations, only available to subscribers), RIMpro (9 locations, only available to subscribers), and now Ag-Radar (9 locations, available to anyone). I can barely keep up with what's going on in Belchertown. (But it's highly entertaining!) Those of you who have seen the light and are using one (or more) DSA's at your orchard site, I hope they are helpful. If you have not, or aren't, take a look at them. Let me know if any questions?
3. Our newest DSA is Ag-Radar with 9 locations in Massachusetts. Ag-Radar uses SkyBit E-Weather site-specific weather forecasts (and history) and uses the data in numerous, helpful models on apple diseases, insects, thinning, and more to help you make decisions in your orchard. Choose the site closest to your orchard and check out Ag-Radar.
4. Two smartphone apps that you might find useful, MyIPM and Eco App. MyIPM's primary function is to help manage fungicide and insecticide resistance on multiple crops, but also has much useful information on pest ID and biology, control strategies, and recently added a comparison of the environmental and human health impacts (via the Pesticide Risk Tool) of the insecticides and fungicides recommended in the app. Eco App was designed to be a quick guide for choosing crop protectants used by Eco Apple growers, however, it can be used by anyone wanting to have a more limited selection of insecticides and fungicides that are allowed under the Eco Apple IPM certification protocol. Pesticides are selected by bud stage and pest that needs control. Both apps can be found on Play and Apple stores, you might have to be a little creative in how you search to find them.
5. Speaking of smartphone apps, Cornell has beta-released a new precision apple orchard management web and smartphone app called MaluSim which I have been beta testing with them. Incorporated in the app are four precision orchard management tools -- Spray Records (really only with the intent of keeping track of thinning applications, but could be expanded in the future); Fruit Growth Rate Model; Irrigation Model; and Carbohydrate Thinning Model. These are mostly already found on NEWA, the Fruit Growth Rate Model being the exception. The Fruit Growth Rate Model is a key component of precision thinning, and the app allows you to sequentially enter fruit growth measurements and it does all the calculations for you to show what percent and number of apple fruits are going to set compared to the desired crop load. Handy! (Well, easier said than done.) On the web (desktop) and iOS (iPhone, IPad) fruit growth measurements have to be entered manually by keyboard, however, the Android app uses voice input to record measurements. Cool! Assuming it works. Why we need beta testers. If interested, let me know and I can get you the download information.
6. Time to get serious about apple chemical thinning. Please read Duane's comments below. I have most every reason to believe apple fruit set is going to be good. At this time, I would say chemical thin aggressively at petal fall. Here are two snapshots of the upcoming chemical petal fall thinning window, one from RIMpro, one from Ag-Radar. They agree more-or-less, here is my take: this weekend (or just prior to) is going to be a good time to apply (weather permitting) petal fall NAA (Fruitone-L, PoMaxa, Refine) at 4 to 8 oz. per acre (depending on tree size) with or without carbaryl (1 pt. to 1 qt. depending on tree size) depending on variety and how gutsy you are. (And if bees are out of orchard.) Be gutsy. Bonus: carbaryl will help with early plum curculio activity. Some

later blooming varieties (Gala, Honeycrisp) may not be out of bloom yet, but still hit them with NAA.

7. I'm sure I missed something important but I need to move on… :-)





Insects

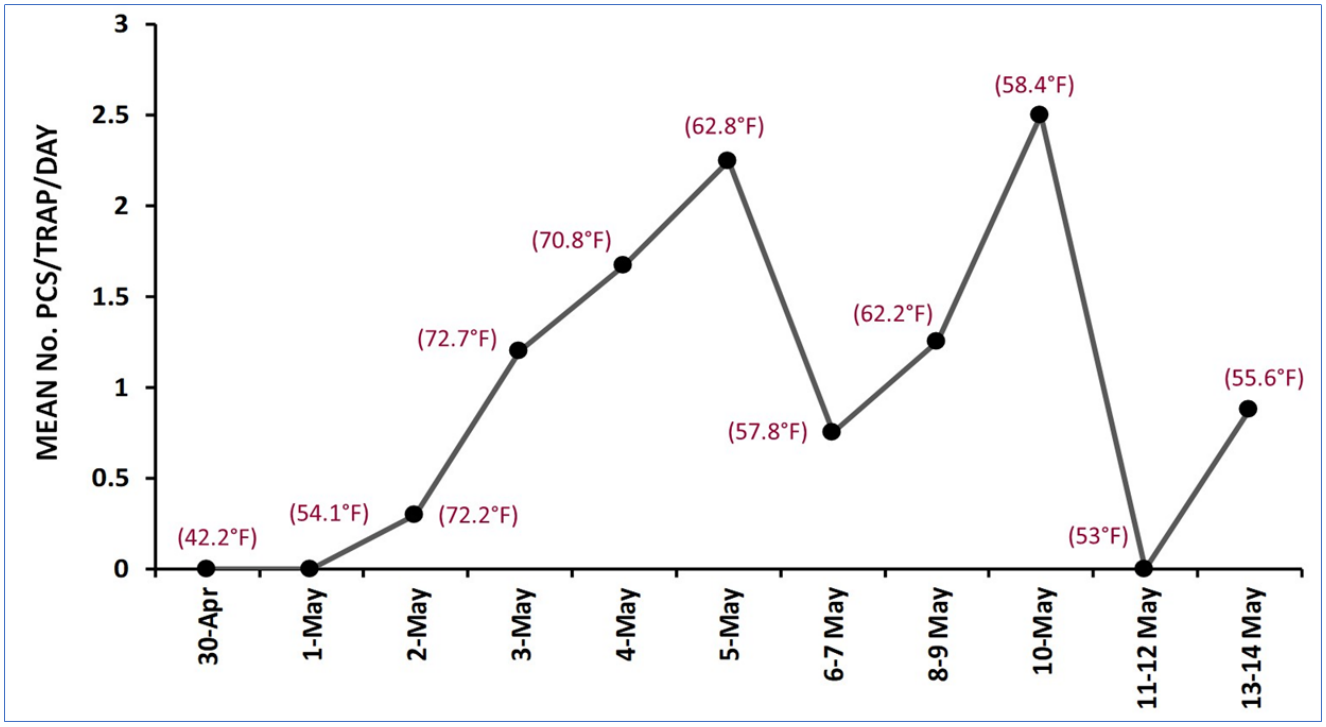
Jaime Pinero

Effect of air temperature on plum curculio immigration: 2018 season

It has been nearly two weeks since odor-baited traps captured the first PCs at the UMass Cold Spring Orchard (Belchertown, MA). The first PC was captured on May 2nd, 2018. Since then, and with the moderately warm (but not high) temperatures that have prevailed in the area, PCs have continued to colonize orchards on a gradual manner. This means that air temperature has not been conducive for a sizeable or 'large ' extent of PC immigration into orchards.

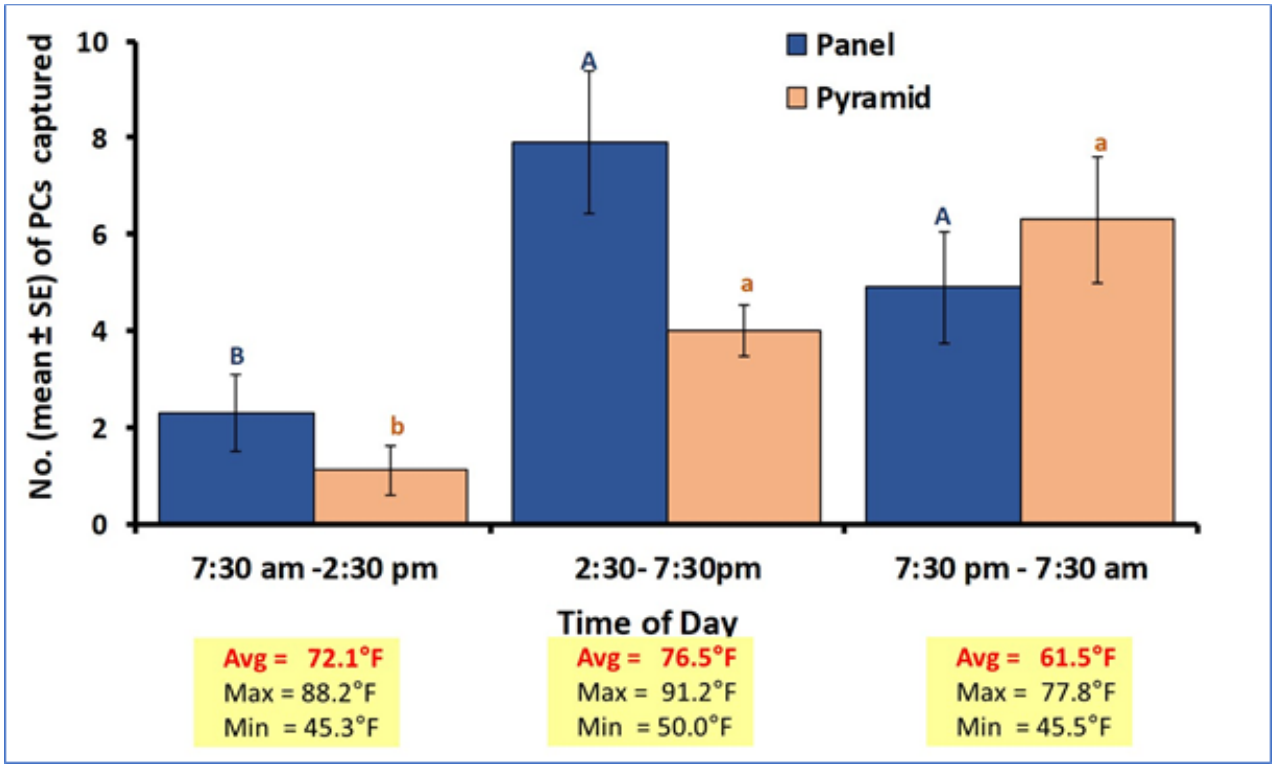
On this year, trap capture patterns indicate that PCs are approaching orchard trees more by means of **crawling** rather than by flight. With petal fall approaching soon, it is believed that PCs will continue to colonize orchards in a gradual manner. The graph below shows the mean number of PCs captured by black pyramid traps according to date. Mean air temperature for each period is presented in red font, in parentheses. Note that PC captures are not so related to air temperature. That is one benefit of using black pyramid traps: they are effective at monitoring for PC even during cool days.

Seasonal pattern of PC captures in black pyramid traps, May 2018



Below is a graph showing the effect of **time of day** and associated air **temperatures** using data collected at the peak of PC immigration in the year 2000. That spring was characterized by comparatively high temperatures for an extended period of time. Mean, maximum and minimum temperature values registered for each time period are depicted in the yellow boxes.

PC captures in traps according to time of day (year 2000)



As you can see, panel traps (blue bars) coated with Tangletrap (sticky material) captured nearly twice as many adults from 2:30 to 7:30 pm as from 7:30 pm to 7: 30 am, and nearly 4 times as many as from 7:30 am to 2:30 pm.

In contrast, pyramid traps (orange bars) captured fewer adults from 2:30 to 7:30 pm than from 7:30 pm to 7:30 am. Very few PCs were captured from 7:30 am to 2:30 pm.

Bottom line: PCs are much likely to fly during warm afternoons, and they are more likely to approach trees by crawling during cool days and also at night.

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

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

Diseases

Dan Cooley

Fire Blight Risk

Figuring out whether to treat for fire blight has been difficult this year. The risk factors vary quite a bit from orchard to orchard. It has been very warm, then cold, then humid and warm. This week,

NEWA is showing High or Extreme Risk for Tuesday, Wednesday and Thursday in a number of places. Yet RIMpro is not showing risk in most areas. Which is correct?

To try to answer that, it's probably worth listening to the guy who adapted Cougarblight and MaryBlyt to NEWA. Last week Kerik Cox wrote a piece on fire blight management in Scaffolds, and in it discussed NEWA, as follows.

As you consider model outputs from NEWA or other forecasting models, here are some things to consider before making applications of antibiotics or other costly materials for blossom blight:

1 - Predictions and forecasts are theoretical. The theoretical models predicting disease risk use the weather data collected (or forecasted) from the weather station location. These results should not be substituted for actual observations of plant growth stage and disease occurrence determined through scouting or monitoring.

2 - Consider the history of fire blight in the planting. If there was not fire blight the previous season or if you have never had fire blight, do not let excessive model predictions or extension alerts (including this article) "intimidate you" into applying unnecessary antibiotics each time an alert is released. Consider the timing of the last application and potential for material depletion as well.

3 - Consider the age of the planting and the susceptibility of variety and rootstock. These factors play a large role in the development of fire blight. None of the models consider these factors. If you have a young planting of a highly susceptible variety, it may be more important to protect these blocks based on model predictions than a 15-year-old 'McIntosh' planting on resistant rootstocks, which may not warrant the same level of protection during bloom. A listing of susceptible cultivars and rootstocks is linked from the NEWA model page for fire blight.

4 - The models only identify periods of weather that are favorable for infection. All wetting events are now color-coded light blue in NEWA to draw attention to the weather factors that promote bacterial ingress into the flowers. Despite words like "extreme" and "infection" colored in vibrant red, the models only predict favorable weather conditions. If favorable weather for infection is not predicted in the current forecast, if the apple variety is not highly susceptible, if there is no prior history of fire blight, and if the trees aren't being pushed into high vigor with nitrogen, the actual risk of fire blight infection may be low to non-existent.

5 - Weather forecasts can vary and change daily. When this happens, the model predictions will change drastically, and the risk will change as well. Bacteria double about once every 20 minutes under optimal conditions; for fire blight bacteria this is warm (>60°F) wet conditions. The models use degree hours, not degree days, to accommodate the rapid growth rate of these pathogens. Check the fire blight predictions, especially those in the forecasts, frequently. The 1- and 2-day forecasts are the most reliable; those at 3-, 4- and 5-days are less reliable as predictors. NEWA

uses the National Weather Service forecasts. Compare these to your favorite local weather forecast provider.

	Past	Past	Current	5-Day Forecast	Forecast Details			
Date	5/13	5/14	5/15	5/16	5/17	5/18	5/19	5/20
Cougarblight 4-Day DH	Low 122	Caution 197	High 313	High 339	Extreme 508	High 390	Caution 263	High 424
Infection Potential EIP value	Moderate 53	High 46	High 82	Moderate 81	Infection 129	Low 63	Low 37	Moderate 81
Wetness Events								
Rain Amount	0.00	0.00	0.62	0.00	0.00	Night 12% Day 39%	Night 63% Day 65%	Night 59% Day 38%
Dew	Yes	Yes	Yes	Yes	Yes	No	No	No
Leaf Wetness (hours)	11	6	18	0	4	0	0	0
Hours >90% RH	9	8	9	0	4	0	0	0
RH max/min	96/50	91/36	95/58	84/53	93/44	77/58	85/73	84/57
Temp avg F	53	64	69	59	65	58	59	67

Above, NEWA output for a site in Massachusetts generated on May 15

Basically, Dr. Cox is saying that NEWA tends to exaggerate fire blight risk, and that you should adjust its evaluations to fit your orchard, paying particular attention to variety, rootstock, history of fire blight and the accuracy of weather forecasts.

Weather forecasts in particular vary, depending on where they're from. In Belchertown, we are looking at different sources of data, both virtual and from a weather station. Depending on which source is used, the same model suggests different risks.

If I were looking at the NEWA chart above, and had a block of Gala on M9 next to pears that had fire blight last year, I'd apply a strep treatment tomorrow, May 16, to that block and the pears. I'd wait until tomorrow because the weather forecast may change, which would change risk. In addition, a strep application tomorrow will cover the whole high risk period, May 15 to 17.
On the other hand, if I had a block of Macs on M7 and hadn't had fire blight in the orchard, I wouldn't spray, even though NEWA is trying hard to convince me to.

The bottom line is the bottom line: how much does a strep spray cost vs. what is the risk and the potential damage from fire blight? Generally, streptomycin is not that expensive compared to the damage that it can cause in some situations, like a high-density block of susceptible trees.

Horticulture

Jon Clements

This little tidbit from **Dan Donahue**, Cornell's Hudson Valley Horticulture team:

> *There has been a number of requests from growers about how to de-fruit newly planted and trees that should remain non-bearing for another year. Here is the recipe: Where*

you desire to totally eliminate the crop try a heavy rate of Maxcel (64 ounces) + carbaryl (2pts) + Oil (1pt) /100 gallon TRV dilute when fruit size is 8-10mm. I have received reports of trees being strongly shocked by this mixture, with growth set back slightly, but it does work.

Chemical thinning suggestions from Duane Greene

Apple phenological development is somewhere between bloom and petal fall in many areas in Massachusetts. As outlined last week this is an extremely important time to apply thinners in a chemical thinning strategy. This is also the safest time to apply a chemical thinner since excessive thinning is rarely experienced and erratic responses to erratic weather are much less likely to happen. If there is such a thing, thinning at bloom or petal fall should be much less stressful to orchardist stress than thinning later. If you have not applied a thinner at bloom or petal fall it is strongly recommend even given the changeable weather predicted for the next several days. At petal fall treatments that have worked well in the past are NAA at 10 ppm plus or minus carbaryl and Amid-Thin at 8 oz/100 gal plus a surfactant and carbaryl. A thinning spray containing only carbaryl is an extremely mild thinning treatment and you can expect only a modest thinning response. The important thing to do now is to get the spray on. There are several days where there is the possibility of rain. Last week I mentioned that as a general rule you will get at least 80% of the thinning activity of a thinning spray following rain if the spray has had an opportunity to *completely* dry.

Perhaps before you receive the next Healthy Fruit some orchards will be at the 6 mm fruit size stage. At that time you can assess initial set and make an initial assessment of how aggressive your thinning program should be during the 7 to 15 mm thinning period. Starting when fruit reach 6-7 mm fruit growth will be rapid and the energy required for fruit growth will be high. It is at this fruit size that guidance provided by the Carbohydrate Thinning model, located on NEWA can be very useful. The thinners most useful and effective at this growth stage are NAA, MaxCel, carbaryl and combinations of NAA or MaxCel with carbaryl. MaxCel is a relatively weak thinner when used by itself but when combined with carbaryl it is one of the most potent thinning combinations available. In order for MaxCel to be effective, warm temperatures will be required following application (70° F or higher). Guidance for use of these thinners will be provided next week when weather forecast will be known with greater clarity closer to the time of application.

Hawkeye's corner (notes from the field)

Liz Garofalo

Gypsy moth, yep, they're still about and will continue move into the orchard. As you can see in the picture below, the caterpillars are sizing up as time passes, which means, they are moving

inexorably towards being far harder to manage (fat and squishy gypsy moth larva are more resistant to pesticides). Good news! Dipel, or other B.t. is still effective at the current growth stage.

The good, the bad and the beautiful…

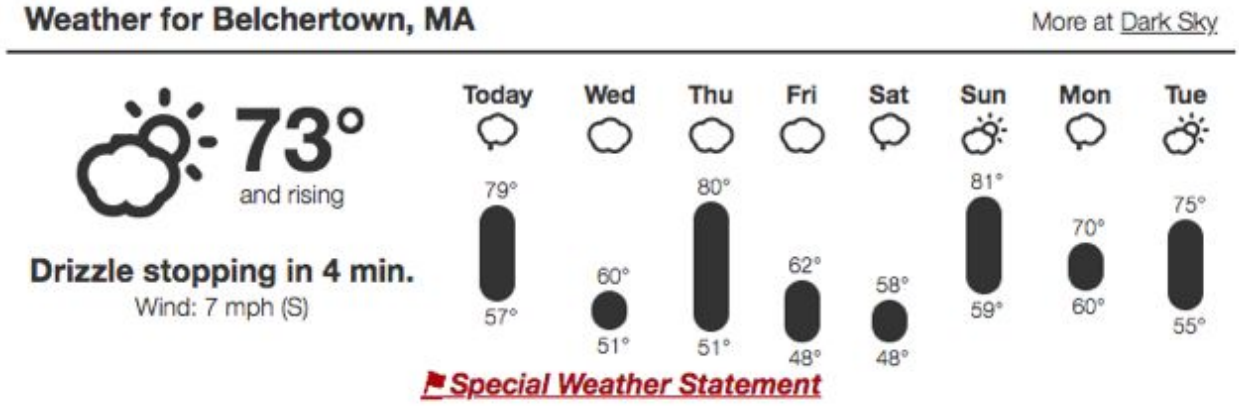
Assassin bug lays in wait to pounce on its next meal

Green pug moth attempts to make a meal of apple leaf

Gypsy moth caterpillar feasting on apple bloom

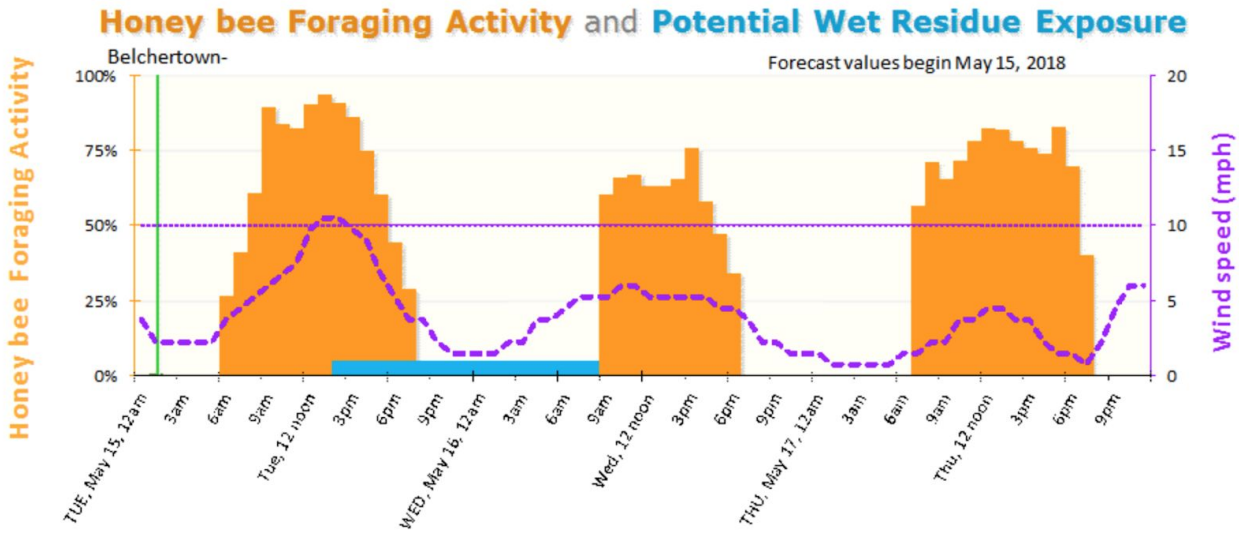
Native pollinator, doing her stuff

What else can I say? It's a bit of a mixed bag this week. Apple scab and fire blight are still looming on the horizon. We are up to 80% chance of rain for Tuesday afternoon, according to NOAA, and with Monday's gorgeous weather, ascospores have matured and are ready for release…



Plum curculio egg laying can *already* be seen in high pressure blocks…

Oh! One more thing. As Jon mentioned above, AgRadar is up and running for the season. One of the features provided is a honey bee activity/avoidance model. It provides handy guidance for when to make pesticide applications that reduce non-target insect exposure. Basically, the graph shows you when bees are active (orange), wind speed (purple dotted line), and when residues (blue) are still able to cause harm.



Guest article

No Guest article this week...

Facebook Me

Ed. note: we don't have them here yet, or at least we don't think we do?

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 May 22, 2018. In the meantime, feel free to contact any of the UMass Fruit Team if you have any fruit-related production questions.

Thank you sponsors…

Orchard Equipment and Supply Company, Inc. Conway, Massachusetts

Nourse Farms