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UMass Extension

Healthy Fruit

Prepared by the University of Massachusetts Fruit Team

Healthy Fruit, Vol. 31, No. 7, May 16, 2023

Prepared by the University of Massachusetts Amherst Fruit Team

Jon Clements, Editor

Current degree day accumulations

UMass Cold Spring Orchard, Belchertown, MA (NEWA, since January 1, 2023)	15-May
Base 43 BE	559
Base 50 BE	284

Current bud stages

Current bud stages. 16-May, 2023, UMass Cold Spring Orchard, Belchertown, MA (more current bud stages here). This will be the last Current bud stages for 2023.

			
Rubymac apple *King fruit 10 mm*	Honeycrisp apple *King fruit 8-9 mm*	Gala apple *King fruit 6-7 mm*	Crispie pear *App. 12-15 mm*

Upcoming meetings

Every Tuesday at noon (12 PM), beginning April 11 - UMass Fruit Team Open Office Hour. Bring your own lunch. Join Zoom Meeting here: https://umass-amherst.zoom.us/j/97712996237

June 7, Wednesday – Rhode Island/Massachusetts tree fruit twilight meeting, 6:30 PM, more information forthcoming…

June 13, Tuesday – The CT Pomological Society will hold a summer field day with venders/exhibitors, free dinner, educational program. Our speakers include Evan Lentz, UConn; Dr. Jaime Pinero, UMass; Colleen Kisselburgh, Arthur Carroll Insurance; and Micheale Williams, Bishops Orchards. Pesticide credits have been applied for. This event begins at 4 pm on Tuesday June 13, at Belltown Hill Orchards, 483 Matson Hill Rd, South Glastonbury, CT. Registration is required for dinner. To register please click this link https://bit.ly/42lcTZv

The way I see it

Jon Clements

The way I see it is when will May get over? Between scab (which has not been too bad really), fire blight (which has has various levels of risk, including high-extreme), thinning (abysmal weather first week in May followed by last week with very nice weather and bee activity), and now plum curculio, are we having fun yet? The recent weather has admittedly been rather delightful. As discussed during today's open office, things are pretty straight forward, high risk of scab infection this weekend, fire blight risk is kind of marginal (although keep an eye on the models and whether it rains or not), but the exception being thinning. Most orchards should have applied an aggressive petal fall thinning spray, now it is wait and see with a 10-12 mm thinning window coming up sometime next week. Be patient, observe, measure fruitlets, but it appears to me earlier blooming apples like McIntosh may not have good set, while apples in bloom last week (Gala and Honeycrisp) are looking better. Everyone is different of course so it is hard for me to make these kinds of blanket statements and be correct. Can't wait until June 1…

Entomology

Jaime Piñero

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

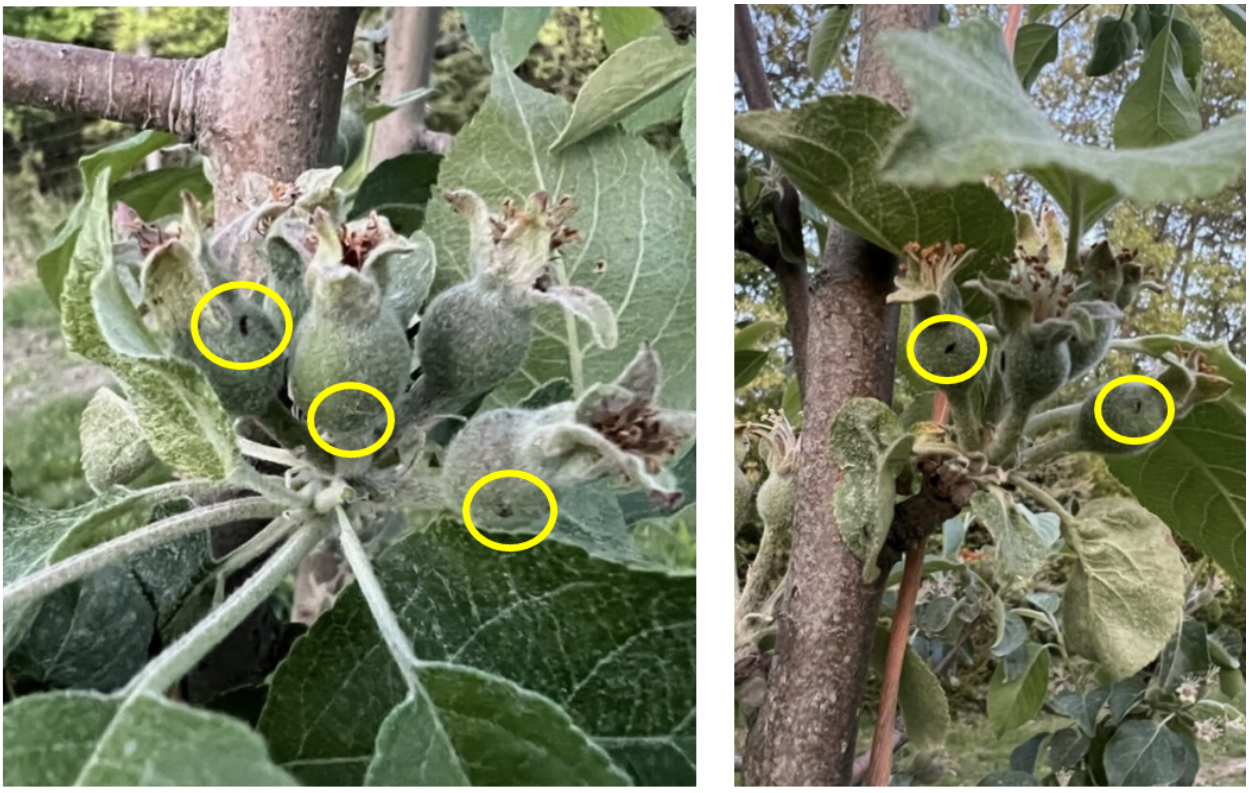
Trap-capture data at the UMass CSO. **Period: May 10-16**

Insect	Average captures/trap	Notes

Obliquebanded leafroller	0	1 Pheromone-baited delta trap
Codling moth	2	1 Pheromone-baited delta trap
Oriental fruit moth	27	1 Pheromone-baited delta trap
Redbanded leafroller	21	By-catch (OBLR pheromone lure)
Plum curculio	—	2 odor-baited black pyramid traps
Plum curculio	0.96	26 unbaited black pyramid traps

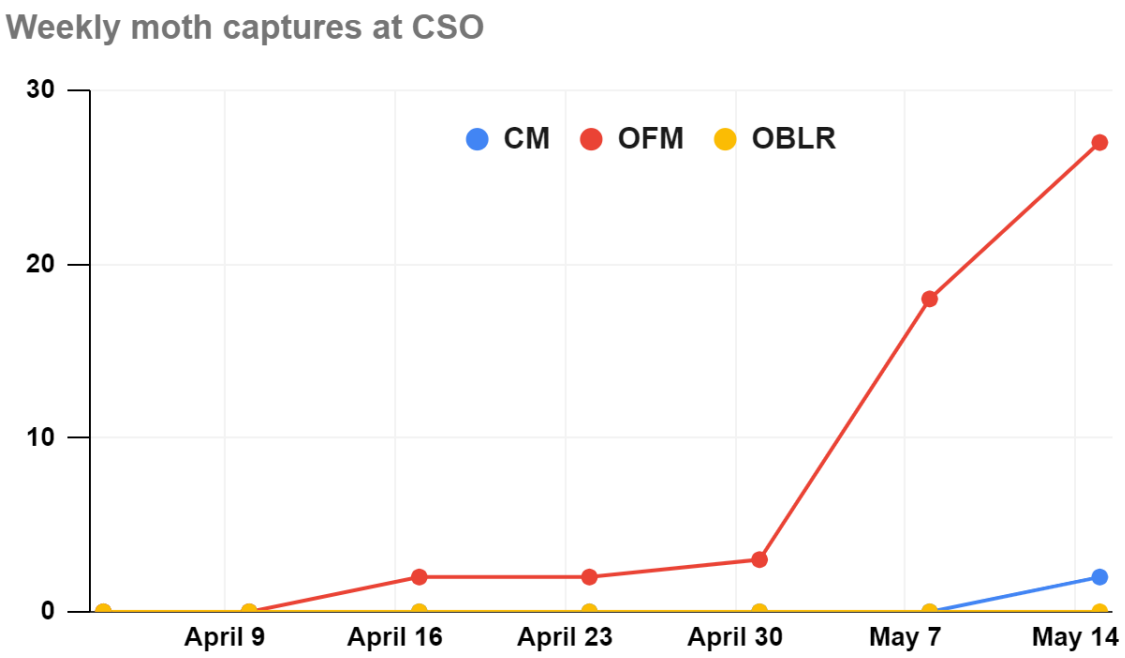
While no high **PC** captures in traps have occurred at CSO, adult females have been laying eggs for the last 4-5 days. Cool evenings are not preventing PC females from laying eggs.

Red Astrachan-grafted branches are providing a good focal point for PC monitoring - see pictures (courtesy of Andre Tougas).



Red Astrachan (multi-cultivar grafting project).– PC injury observed on 5.14.23.
Photo credits: Andre Tougas

OFM activity continues to increase and **CM** just became active at CSO (see chart below).



Rosy apple aphid (RAA). Rosy apple aphid has been found at the UMass CSO. Of the aphid species that can be found on apple trees, rosy apple aphid causes the most severe damage and is the most difficult to control.

The body of RAA 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.

In summer, it moves to alternate herbaceous hosts, such as broadleaf and narrowleaf plantain. The third generation is produced in June and early July. Although in the past the majority of this generation developed wings and migrated to plantain, recent evidence shows that the biology of this pest has changed and populations in orchards may no longer need to go to the alternate host plantain but can breed continuously on apple.

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. The recommended systemic insecticide is MOVENTO at a rate of 6 to 9 fl. oz.

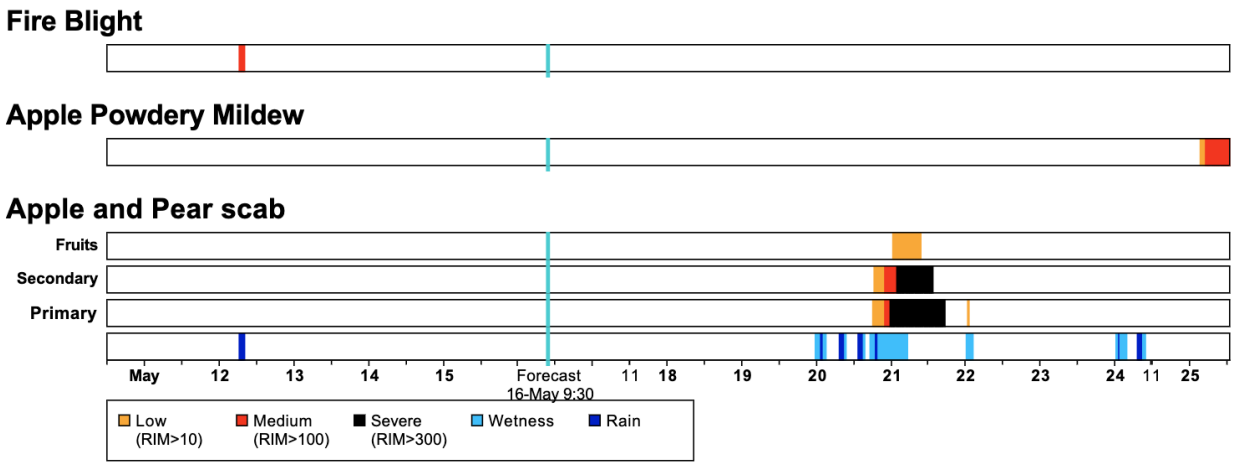
Click here to access the MOVENTO LABEL.

Insect pest activity in other orchards: **CM** has been active in a few orchards since May 1st. That date was set as BIOFIX in a couple of orchards. The first **EAS**-infested fruit was recorded in one orchard.

Pathology

Jon Clements

RIMpro orchard outlook for Belchertown below. LOW (non-existent?) fire blight risk. HIGH to EXTREME scab risk this weekend. Found scab lesions in unsprayed trees and mildew keeps popping up. Scab sprays should include something effective for mildew (almost anything other than Captan or mancozeb fungicide). That's all I got, dry weather is good for at least one thing.



RIMpro “orchard outlook” output for Belchertown. Only thing to be on lookout for is scab this weekend, could be a “biggie.”

	
Scab lesions showing up on unsprayed McIntosh, most likely from infection periods 24- or 30-April.	Powdery mildew keeps making an appearance, here on Rubymac McIntosh

Horticulture

Jon Clements

Apple - fruit setting at 8-10 mm McIntosh, 6-8 mm Gala and Honeycrisp

Below picts taken morning on 16-May.

		
Honeycrisp	Rubymac McIntosh	Buckeye Gala

Apple fruitlet thinning

What to do, what to do? Chill out for a bit. As mentioned, many orchards have applied an aggressive petal fall thinning spray. Trees are not experiencing a carbohydrate deficit. It might take a while with this weather to see the thinning effect (if any). It's looking like the 10-12 mm thinning spray will be going on sometime next week. Not seeing a carbohydrate deficit, so it's likely to be a safe window to be fairly aggressive with this thinning spray. NAA, carbayl, and 6-BA will be the chemical thinning options. By next Tuesday, during the open office/lunch bunch at noon, we should be able to give a good recommendation. In addition, see Duane Greene's observations which follow.

Irrigation

Don't underestimate the need for irrigation with this dry weather. According to the NEWA Apple Irrigation Model, in Belchertown, in a tall-spindle orchard planted 3 by 14 feet, and a green tip date of 6-April, the current water balance (deficit in this case) is -28,574 gallons per acre. And in the Malusim app, it gives an Irrigation Recommendation of 622 gallons per hour (per acre I assume) for 2,481 minutes (that's 40 hours!) Now that is kind of stupid, that is because no irrigation has been applied to date so it is cumulative to make up all that deficit. Daily ET (evapotranspiration) has been hovering around 2,500 gallons per acre, so if you were to keep up with that, you could irrigate for 4-5 hours per day (assuming you are applying 622 gallons per hour). Now that makes more sense! But still, that is 4-5 hours *every day* barring any rain!

Thinning Recommendations for May 16

Duane Greene

The 2023 thinning season remains challenging. The weather has not been conducive to allow thinners to work well. We have been receiving thinning recommendations from NEWA from the start of the thinning season. Of the 20 daily recommendations we have received for Belchertown, 20 out of 20 have suggested to increase thinning rate by 30%. The carbon balances have been generally neutral or positive. Low temperatures have averaged over the past week in the mid 40's and daytime highs in the low 70's. If you're thinner applications went

on during a couple of favorable thinning windows you may have achieved some thinning, but much thinning is left to do.

The next 4-5 days will undoubtedly present similar challenges. Tomorrow temperatures are supposed to go no higher than the low 60's and the following days will not be much warmer. Rain is forecast for Saturday or Sunday possibly. The next thinner application may be before the rain event. There are a lot of "ifs" in the next 5 days. Regardless of what you decide to do, there is much thinning to be done under weather conditions that are not conducive to thinning.

What Thinner Should You Use?
Everyone should be at petal fall or close to it and the bees are out of the orchard, so we can now add carbaryl to the list thinners available for use.

Carbaryl – is a very popular thinner for use at petal fall and in subsequent thinner applications. It is a mild thinner so the likelihood of over-thinning with carbaryl is remote. I like to include carbaryl as a companion to be applied with NAA, Amid-Thin and particularly MaxCel to achieve more thinning.

NAA – is a very popular thinner and it remains the thinner of choice for many orchardists. As fruit size and their diameters increase to 8+ mm it is especially effective.

Amid-Thin W – is traditionally applied at bloom or at petal fall. The Amid-Thin label states that it can be applied within 5-7 days after petal fall. If we define petal fall as when fruit reaches 5-6 mm, Amid-Thin is in the fruit size range where it can be used. Amid-Thin is effective when used at this time. The reluctance to use it at larger fruit sizes is that it can cause pygmy fruit, especially on Delicious. There is no clear consensus on varieties that it is safe to use it on.

MaxCel – has become a very popular thinner. It is, however, not as effective as a thinner if cool weather follows application. I suggest that you wait until next week to consider using this thinner.

Guest article

agronomy

MDPI

Article

Using the Nematode, *Steinernema carpocapsae*, to Control Peachtree Borer (*Synanthedon exitiosa*): Optimization of Application Rates and Secondary Benefits in Control of Root-Feeding Weevils

Colin Wong [1], Camila Oliveira-Hofman [1,†], Brett R. Blaauw [2], Dario Chavez [3], Ganpati Jagdale [4], Russell F. Mizell III [5] and David Shapiro-Ilan [1,*]

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Research article summarized by: Matthew Bley (mbley@umass.edu), a graduate student at Stockbridge.

Introduction. The Peachtree borer (PTB), *Synanthedon exitiosa*, is a lepidopteran pest of stone fruits. PTB have a single generation per year, mating in late-summer to early-fall and lay eggs on substrate near the plant host. Once the eggs hatch, the larvae bore into the host plant and its root system, where they will pupate and emerge next year mid summer. This destructive life cycle leads to reduced vitality and increased susceptibility in mature trees; young trees can become completely girdled and eventually die. For more information regarding PTB biology and management please refer to fact sheets from New England Tree Fruit and University of New Hampshire.

Management of PTB has become increasingly challenging due to a short window of opportunity where the adults, eggs, and larvae are accessible for control. Insecticide-based control strategies have long relied on the use of Chlorpyrifos, an organophosphate insecticide which has had all food tolerances revoked by the EPA as of February 28, 2022. For more information regarding Chlorpyrifos' Uses and Return Programs, please visit the hyperlinked Iowa State websites.

The entomopathogenic nematode (EPN) species, *Steinernema carpocapsae*, has been found to control PTB similarly to Chlorpyrifos insecticides. EPNs are aquatic parasitic roundworms that infect, kill, and reproduce inside of their hosts, serving as potent biological controls for soil-dwelling insect pests. Due to their aquatic nature, sufficient irrigation is needed to prevent dehydration and promote mobility. This research paper investigated EPN application with a sprayable gel (Barricade®) to help maintain soil moisture if irrigation is not available. Lower

application rates of both EPNs and the sprayable gel were compared in an effort to reduce input costs for commercial use.

Methodology. Trials took place at four different locations from 2018 to 2020. Treatments were applied in the early fall each year to target young PTB larvae shortly after hatching from eggs. Nematodes and Barricade® gel were mixed in-tank, constantly agitated, sprayed at 60 PSI (~kPa), and applied with a handgun applicator. Barricade® can be applied post-EPN application or applied as a tank mix along with the EPNs. Applications were made to the trunk of the tree and near the ground. Three different concentrations of EPNs were tested: 0.5, 1.0, 1.5 million per tree. Two different concentrations of Barricade® were tested: 2%, and 4%. A treatment of Chlorpyrifos (Lorsban 4E) at 2.33 L per hectare was used as a positive control.

Results. There was no significant difference between EPN treatments at 0.5 million/tree and 1.5 million/tree compared to the Chlorpyrifos treatment. Barricade® gel was found to be an equally effective in establishing nematodes at both 2% and 4% rates. Applying EPNs at 0.5 million/tree with 2% Barricade® gel mixed in-tank is an acceptable management strategy for PTB and Lesser peachtree borer. At a cost of 25$ per acre, this management strategy is an economic approach for PTB. Interestingly, these EPN treatments were noted to reduce emergence of secondary weevil pests, which defoliate and feed on roots.

Barricade® gel is not an organic approved material and PTB infestation in the organic location was too low to complete the second year of planned trials. More information is needed to assess the viability of this control in an organic setting at this time.

Citation: Wong, C.; Oliveira-Hofman, C.; Blaauw, B.R.; Chavez, D.; Jagdale, G.; Mizell, R.F., III; Shapiro-Ilan, D. 2022. Using the Nematode, Steinernema carpocapsae, to Control Peachtree Borer (Synanthedon exitiosa): Optimization of Application Rates and Secondary Benefits in Control of Root-Feeding Weevils. Agronomy 12, 2689. https://doi.org/10.3390/agronomy12112689.

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The next Healthy Fruit will be published on or about May 23, 2023. 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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