



Healthy Fruit, Vol. 31, No. 4, April 25, 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)	24-April
Base 43 BE	325 (*365)
Base 50 BE	134

*forecast 30-April, this coming Sunday. Note that McIntosh bloom should be approximately 344-415 DD's Base 43 BE.

Current bud stages

Current bud stages. 24-April, 2023, UMass Cold Spring Orchard, Belchertown, MA (more current bud stages [here](#))

				
Rubymac apple 10% king flowers	Honeycrisp apple Early pink	Gala apple Very early pink	Cripps pink apple Mid-late pink	Crispie pear Bloom

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>

Wednesday, April 26 - UMass Fruit Twilight Meeting, Mann Orchards Riverside Farm, 445 Merrimack St, Methuen, MA. 4:30 PM. Two (2) pesticide recertification credits available, but you must be there starting at 4:30 to receive the 2 credits! There will be a \$20 fee for those receiving pesticide credits. *A light dinner will be served compliments of Mann Orchards at the store up the road (27 Pleasant Valley St, Methuen) at 6:30, so make sure you come to the Riverside location first at 4:30 for the orchard visit and sprayer calibration.*

Thursday, May 4 - UMass Fruit Twilight Meeting, Riiska Brook Orchard, 101 New Hartford Road, Sandisfield, MA. Details TBD.

The way I see it

Jon Clements

The way I see it is not so great, mostly on account of the weather. Ho hum. Could be better. It could be worse? Many Massachusetts orchards will be coming into apple bloom over the next week, let's hope we sneak in a day or two with some sun and temperatures in the mid-60's. That is the best we can hope for and should allow the bees to get the job done. Bloom is going to be a week to 10 days ahead of average. Let's hope it warms up post-bloom with some sun so we get good fruit set on those flowers that have been pollinated.

I hope you can join us at Mann Orchards Riverside Farm on Wednesday, April 26 for a co-sponsored (UMass Extension, Massachusetts Fruit Growers' Association, and Essex County Fruit Growers) twilight meeting hosted by Josh and Bill Fitzgerald. George Hamilton will be there at 4:30 demonstrating airblast sprayer calibration followed by an orchard tour with Josh and Bill and Jon and Jaime (from UMass) talking about pruning, and current pest management issues. Followed by a light supper which is always good compliments of Mann Orchards. Be sure to read the details above! There will be a \$20 charge per person receiving pesticide credits. See you there.

Frank Carlson passed away on March 31, he will be missed by all of us for his company, as an advocate for Massachusetts (and beyond) orchards, and his insight after many years of experience. There will be celebration(s) of Frank's life at Carlson Orchards, 115 Oak Hill Rd., Harvard, MA on Friday May 5 from 3 to 6 PM and on Saturday, May 6 from 1 to 5 PM. In lieu of flowers, donations may be made to the UMass Cold Spring Orchard Research and Education Center via www.tinyurl.com/Cold-Spring-Orchard.

Entomology

Jaime Piñero

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

For the past 7 days, very low levels of insect pest activity were recorded due to cold temperatures. Plum curculio (PC) is not expected to show high levels of activity for the next 7 days. Periods of cool, rainy weather with maximum temperatures below 70°F are not suitable for PC curculio activity.

Trap-capture data at the UMass CSO.

Period: April 19-25

Insect	Average captures/trap	Notes
Obliquebanded leafroller	0	Pheromone-baited delta trap
Codling moth	0	Pheromone-baited delta trap
Oriental fruit moth	2	Pheromone-baited delta trap
Redbanded leafroller	0	Pheromone-baited delta trap
Plum curculio	0	2 odor-baited black pyramid traps

Insect pest activity in other orchards: 6 TPB captured in 122 white sticky cards deployed in 10 commercial blocks. Feeding injury by TPB is very low:

CSO: 400 flower clusters inspected (over 1,000 individual flowers): no TPB injury.

Orchard A: 400 flower clusters inspected (over 1,000 individual flowers): no TPB injury.

Orchard B: 400 flower clusters inspected (over 1,000 individual flowers): no TPB injury

Orchard C: 400 flower clusters inspected (over 1,000 individual flowers): 1 TPB feeding injury (bleeding site).



Residual Time to 25% Bee Mortality (RT25) Data. In 2019, the EPA recently released a study looking at the “residual time” i.e. amount of time that pesticide residues on plants are still considered lethal, that is required to kill 25% of a population. The study insect is the honey bee, primarily.

How is the RT25 calculated? The honey bee toxicity of residues on foliage study is a laboratory test designed to determine the length of time over which field weathered foliar residues remain toxic to honey bees, or other species of terrestrial insects.

- The test substance is applied to crop foliage, the foliage is harvested at predetermined post-application intervals (*i.e.*, aged residues), and test adult bees are confined on foliage with aged residues for 24 hours.
- Three different durations of time that residues are aged between application and harvest are typically used (*e.g.*, 3, 8 and 24 hours post-application).
- The test substance is usually evaluated at the maximum application rate specified on the product label.
- If mortality of bees exposed to the foliage harvested 24 hours after the application is greater than 25%, bees should continue to be exposed to aged residues on foliage samples collected every 24 hours (*i.e.*, 48, 72, 96, 120 hours, *etc.* after the application) until mortality is 25% or less.

Why is the RT25 important? The RT25 is the length of time post-application that insecticide residues on foliage are toxic to 25% of honey bees tested. This information can help applicators choose pesticides that are safer for honeybees.

Pesticide companies have started to include RT25 information in their labels. Growers can take this information into account when selecting insecticides that may need to be applied soon after bloom is finalized.

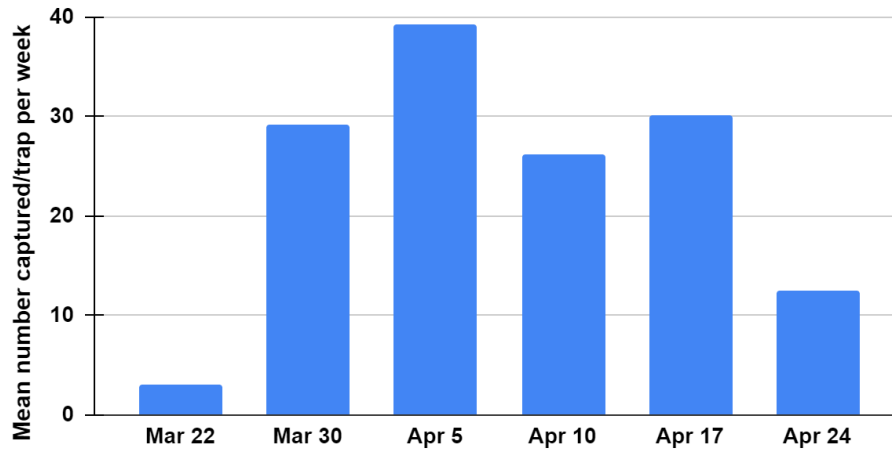
To access a table that shows the RT₂₅ values for many insecticides click [HERE](#). Some examples:

Active Ingredient	IRAC group	RT ₂₅ (hours)
Indoxacarb (Avaunt)	22A	24
Phosmet (Imidan)	1B	72
Cyclaniliprole (Verdepryn)	28	<3
Chlorantraniliprole (Altacor)	28	3
Cyantraniliprole (Exirel)	28	3
Acetamiprid (Assail 30 SG)	4A	<i>Not available</i>
β-cyfluthrin (Baythroid XL)	3	240
Fenpropathrin Danitol 2.4EC	3	192

NOTES: RT₂₅ values are a function of several factors including application rate, physical-chemical properties, dissipation, crop, and pesticide formulation. Thus, there is considerable variability in RT₂₅ values within a single formulation, between formulations, between crops, and across application rates.

Pear psylla update. The peak of overwintered pear psylla activity has already passed. At this moments, most of the eggs have been laid. The egg, shaped like a grain of rice, is attached to the host by a small protrusion extending from the rounded end. The egg is creamy white when laid but turns yellow to orange as it develops.

Captures of pear psylla - traps deployed on March 16, 2023



[Scouting](#): summer treatment threshold for pear psylla is one nymph/ three leaves. Examine 25 spurs (one per tree) and terminal shoots per orchard to determine the threshold average.

Pathology

Jon Clements

Rain around bloomtime = entering accelerated phase of apple scab ascospore maturity = **apple scab risk HIGH** = both protectant and kickback fungicides in tank mix between rain events. See fungicide options below from Penn State Guide.

Personal Discomfort Index (PDI) = low (although I do wish there was a bit more sun and it was a bit warmer) = **fire blight risk LOW** (practically non-existent). Right now. That could change with warmer weather, stay tuned in.

Pesticide recommendations for apples, pink through bloom.

CHOOSE one of the following:

FRAC Group	Pesticide	Recommended Rate Per Acre
3	Cevya ^a	4–5 fl oz
3	Indar 2F ^a	8 fl oz
3	Procure 480SC ^a	12–16 oz
3	Rally 40WSP ^a	10 oz
3	Rhyme ^a	4–6.5 fl oz
3	Topguard ^a	13 fl oz
3	Trionic 4SC ^a	12–16 fl oz
3 + 9	Inspire Super ^a	12 fl oz
7	Aprovia ^a	5.5–7 fl oz
7	Excalia ^a	3–4 fl oz
7	Fontelis ^a	16–20 fl oz
7	Kenja 400SC ^a	12.5 fl oz
7	Miravis ^a	3.4 fl oz
7	Sercadis ^a	3.5–4.5 fl oz
7 + 9	Luna Tranquility ^a	11.2–16 fl oz
7 + 11	Luna Sensation ^a	4–5.8 fl oz
7 + 11	Merivon ^a	4–5.5 fl oz
7 + 11	Pristine ^a	14.5–18.5 oz
9	Scala SC ^a	7–10 fl oz
9	Vanguard WG ^a	5 oz
11	Flint Extra ^a	2.9 fl oz
11	Sovran ^a	4–6.4 oz
M2	Lime sulfur ^b	2.5–3% solution

In combination with one of the following:

FRAC Group	Pesticide	Recommended Rate Per Acre
M3	Manzate Pro-Stick ^c	3 lb
M3	Ziram 76DF	3 lb
M4	Captan 80WDG ^{d,e}	2.5–3 lb

OR select one of the following to be applied alone:



FRAC Group	Pesticide	Recommended Rate Per Acre
M2	Sulfur	7–10 lb
M3	Manzate Pro-Stick ^c	6 lb
M3	Ziram 76DF	6 lb
M4	Captan 80WDG ^{d,e}	5 lb

During the noon open office/lunch bunch call today the subject came up about how to treat (spray) peaches that have no crop. My best advice is to maintain a nominal fungicide program during the spring period to suppress brown rot and other canker development. Captan or Topsin-M WSB would be good choices, nothing too fancy. For bacterial spot – if you are growing susceptible varieties – it would be wise to keep a normal bactericide program going so the leaves don't get too spotted and then defoliate early. (Not good.) For more information: <https://blogs.cornell.edu/enychp/tree-fruit/peaches/tree-fruit-blog-managing-peach-blocks-with-no-crop/>

Horticulture

Jon Clements

Apple - pink to early king bloom

	
Honeycrisp 'early-mid pink'	Rubymac 'some king bloom open'

Not too late to apply prohexadione-calcium (Apogee [2EE label] or Kudos), pink (pre-bloom) application for growth control, fire blight (shoot) suppression, and bitter pit suppression (Honeycrisp, Jonagold). Although there is disagreement if this actually works or not to reduce bitter pit. For details see: [HRT-2022-Suggestions for the use of prohexadione-calcium on apples](#)
Or see Guest article below.

Apple trees could always use some spring tonic: [Prebloom Nutrient Applications for Apple Trees](#)

NAA (Fruitone-L, Pomaxa, refine) or NAD (Amid-Thin W) should be applied to Honeycrisp in particular beginning at bloom, and any other variety you feel is going to need some thinning this year. Read the respective labels for details and rates. It's be nice to wait until it warms up into the 60's to make this application, and wait until you have a good full bloom. Honeycrisp will especially benefit with this bloom timing in terms of initiating fruit bud development for the following year and getting them out of the biennial habit. More NAA applications will be required later too, but that is another story.

Guest article

Research article: **Field and Cage Studies Show No Effects of Exposure to Flonicamid on Honey Bees at Field-Relevant Concentrations**

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

Short note from J. Pinero: Flonicamid, a pyridinecarboxamide, is structurally similar to nicotine and several neonicotinoids. It has been mistakenly classified with the neonicotinoid insecticides. However, the mode of action of flonicamid is different from that of other neonicotinoids. Flonicamid is a systemic insecticide with selective activity against thrips and hemipterous pests, such as aphids and whiteflies. True neonicotinoids belong to IRAC group 4A whereas flonicamid belongs to IRAC group 29.

Introduction

As many are aware of, neonicotinoids are a controversial group of pesticides owing to their impact on pollinators, specifically honey bees. Infamous neonicotinoids such as imidacloprid and clothianidin have been found to alter honey bee colony behavior at concentrations as low as 5 parts per billion (ppb). Exposure to these neonicotinoid pesticides can happen at many instances during honey bee foraging (AKA pollination events), subsequently exposing the colony.

Flonicamid, trade name Beleaf, is a pyridinecarboxamide registered for pome and stone fruits and grouped as a neonicotinoid (IRAC group 29). However, its mode of action is different compared to other neonicotinoids, inhibiting stylet penetration rather than overstimulating the nicotinic acetylcholine receptor. Flonicamid is a systemic insecticide designated for control of Aphids, Whiteflies, Thrips, and other hemipterous pests (Scale, Leafhoppers, Stink bugs, Plant bugs, Mealy bugs). Recently, Flonicamid has been detected at sublethal concentrations in honey samples (20 ppb) and stored pollen samples (42 ppb) in southern California honey bee colonies. The purpose of this paper was to determine Flonicamid's effects on colony behavior by measuring the colony's weight, foraging activity, temperature, and carbon dioxide (CO₂) management.

Results

Flonicamid concentrations in the honey were found to increase throughout the experiment, attributable to the dehydration of honey over time. In the field studies, concentrations of 50 and 250 ppb Flonicamid was not found to alter hive weight, adult mass, daily CO₂ levels, or daily temperature. It should be noted that multiple colonies were lost due to Varroa mite populations, which increased in spite of Amitraz and thymol applications in July and October respectively. In cage studies, average syrup consumption and survival were different in replicates. The authors attributed this to an additional 'pollen patty' being fed in the second replicate.

This study found that exposure to field-realistic concentrations of Flonicamid had minimal impact on honey bee pollinators. There was no observable difference in the colonies growth, behavior, food consumption, or thermoregulation of workers. Sublethal effects of Flonicamid on other traits such as learning, mobility, disease resistance, and learning behavior of individual bees was not

measured. This study does not support the idea that Flonicamid is harmless to honey bees. When considering the use of Flonicamid, consider that health effects on other pollinators and beneficial insects may be different.

Citation: Meikle, W.G., and Weiss, M. 2022. Field and Cage Studies Show No Effects of Exposure to Flonicamid on Honey Bees at Field-Relevant Concentrations. *Insects*, 13, 845. <https://doi.org/10.3390/insects13090845>

Useful links

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

Network for Environment and Weather Applications (NEWA): <http://newa.cornell.edu>

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[The Jentsch Lab](#) (Peter Jentsch, Poma Tech)

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[Tree Fruit Horticulture Updates](#) (Sherif Sherif at Virginia Tech)

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The next Healthy Fruit will be published on or about May 2, 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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