



Healthy Fruit, Vol. 27, No. 2, April 16, 2019

Jon Clements, Author (unless otherwise noted) and Editor

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Current degree day accumulations

UMass Cold Spring Orchard, Belchertown, MA	15-April
Base 43 (NEWA, since March 1)	98
Base 50 (NEWA, since March 1)	37

Note that apple green tip should occur app. 100 DD (Base 43), although obviously there is a range. Zestar! is nearly half-inch green (15-April) in Belchertown. Macs were “officially” at green tip 12,13-April.

Current bud stages

Current bud stages. April 15, 2019, UMass Cold Spring Orchard, Belchertown, MA

				
McIntosh apple 1/4-inch green	Honeycrisp apple Green tip +	Bartlett pear Swollen bud	Redhaven peach Swollen bud	Regina sweet Early swollen bud

More 2019 bud stages [here...](#)

Upcoming pest events

Coming events	Degree days (Base 43)
Green apple aphids present	111 to 265
Green fruitworm peak flight	95 to 229
Obliquebanded leafroller larvae active	158 to 314
Pear psylla 1st egg hatch	174 to 328
Rosy apple aphid nymphs present	134 to 244
Redbanded leafroller 1st catch	110 to 176
Spotted tentiform leafminer 1st catch	119 to 227
McIntosh half-inch green	150 to 221

Upcoming meetings

Fruit Twilight Meeting. Tuesday, April 16, 2019. [UMass Cold Spring Orchard](#), 391 Sabin Street, Belchertown, MA. 5:30 PM. Pesticide recertification credit available. Light supper/refreshments will be served \$20 meeting attendance fee collected at the door. Questions? Jon Clements (413-478-7219). No pre-registration necessary.

The way I see it...

- **This WILL be your last Healthy Fruit (HF)**, unless you go to the UMass Extension Bookstore (<http://umassextensionbookstore.com>) and purchase a new [2019 subscription to HF](#) (\$65, e-mail delivery only) in the next week or two. Alternately, you can send me (Jon Clements, 393 Sabin St., Belchertown, MA 01007) a check for \$65 (tips accepted) made out to 'University of Massachusetts.' Make sure you note it is for Healthy Fruit subscription, and includes your e-mail address. You can also use [this mail-in form](#) to order Healthy Fruit and other UMass fruit publications. You can ignore this of course if you have already sent in your payment. Thanks.

- **Another growing season has finally begun**, albeit with lots of extra moisture to go around. Try to wait until the ground has dried out a bit to begin any field work, including spraying if possible. Unfortunately, it looks like another soggy period coming up later this week, and this might be the first important scab infection period of the season.

- **Fruit Twilight Meeting** tonight (April 16) at the UMass Orchard in Belchertown. 5:30 PM. Orchard tour will be cider grafts, promoting branching on 1-year old wood, Evercrisp/G.41, NC-140-Geneva apple rootstocks, and current pest management situation as appropriate. Might look at some brambles? How about Apogee/Kudos at pink. Will avoid peach pruning. Inside we will have BBQ pork sandwiches and sides cooked by Outlook Farm, and using NEWA to assess current pest management situation. Liz will supply Cider. (Maybe.)

No panicking (yet) but clearly there was some **floral bud damage to peaches** this winter. I am seeing lots of good (I think) buds too. Your mileage will likely vary. I am going to stop pruning peaches until bloom now.



“Good” Redhaven peach floral buds



Not so “Good” Redhaven peach floral buds?

New England Tree Fruit Management Guide available online

• The New England Extension tree fruit specialists -- which include myself, Dan Cooley, Jaime Pinero, and Elizabeth Garofalo at UMass. Mary Concklin at UConn, Heather Faubert at URI, Terry Bradshaw at UVM, George Hamilton and Anna Wallingford at UNH, and Glen Koehler and Renae Moran at UMaine -- have officially launched, and updated for 2019 -- an online edition of the New England Tree Fruit Management Guide. Note that it is easy to print any of the sections, if you want to have old-school reference, for example, to hang on your spray shed wall. Also, it is quite mobile-friendly so make a home screen shortcut to here: <http://netreefruit.org>. Finally, if you really, really want a printed version, order here: <https://www.umassextensionbookstore.com/products/29>.

Insects

Jaime Pinero

Tarnished Plant Bugs have become active at the UMass Cold Spring Orchard.

On April 14th, 2019, TPB adults were captured in white sticky cards (two TPB adults in six traps) deployed at the UMass CSO. While TPB feeds on apple buds, flowers and developing fruit, TPB does not usually reproduce on the apple trees themselves. **Keep in mind:** Despite control efforts, a small amount of fruit injury is often inevitable. Most damage is shallow and undetectable, however, and generally not noticed in normal grading procedures. Below is information on TPB damage, monitoring, and management, taken from the NE Tree Fruit Management Guide (<https://netreefruit.org>):

Damage

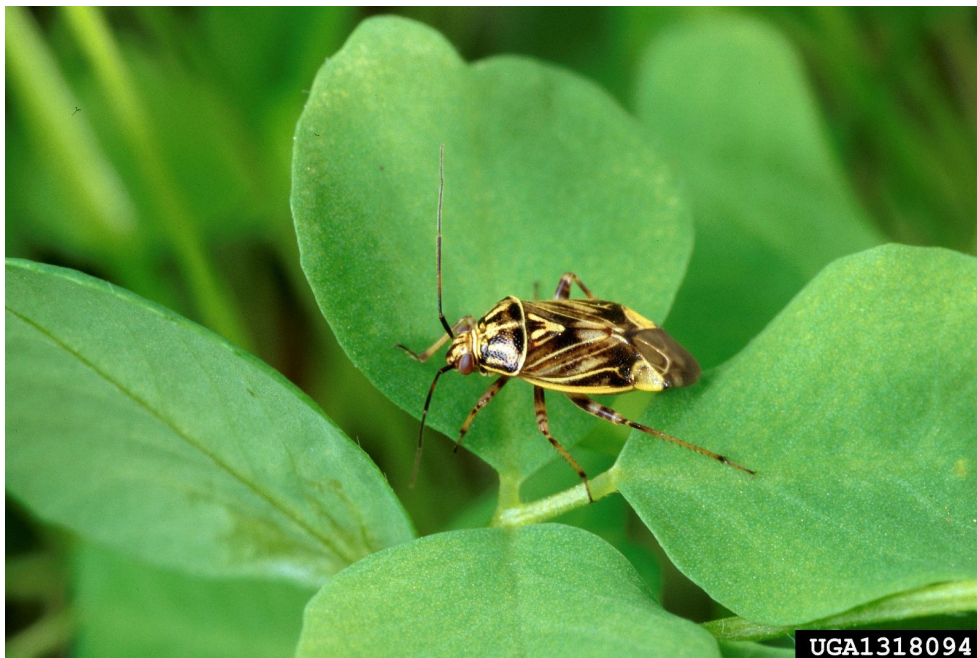
- Damaged buds exude clear, and later amber, liquid ooze
- Flowers attacked prior to petal fall will abort
- Fruitlets stung after calyx may fall off the tree during June drop, those that remain on tree have a dimple or a deeply sunken conical area at harvest
- Damage is often confined to fruit calyx.

Monitoring

- White sticky traps (one trap per 3 acres; at least 3 traps per monitored block) at silver tip.
- Action threshold: cumulative average of 5 TPB per trap by Tight Cluster or 8 TPB by Pink.
- Examine 10 terminals per block for bleeding buds. Action threshold is 2-3 bleeding sites per 10-terminal sample.

Management

- Control may be enhanced by spraying insecticide on a warm, sunny, calm day when TPB are most active.
- Avoid mowing or using herbicide between Pink and Petal Fall because disturbance of alternate hosts in the groundcover may cause TPB to move into apple trees.
- The petal fall spray targeting plum curculio will take care of remaining TPBs.



The Science Behind Feeding Injury to Fruit Caused by Bugs.

The Hemiptera or true bugs are an order of insects comprising some 50,000 to 80,000 species of groups such as the cicadas, aphids, planthoppers, leafhoppers, scale insects, and stink bugs. The saliva of insects in the order Hemiptera performs multiple physiological functions including extra-oral digestion, detoxification, evasion of host defenses, and protection against microbes. For example, the aphid's watery saliva secreted during phloem feeding contains compounds that prevent clogging of areas where aphids actively suction the phloem.

Tarnished Plant Bug. TPBs cause direct damage by feeding on plant tissues, typically on plant parts with high rates of cell division, including buds, flowers, and maturing fruit. TPB feed by sucking sap from plants via piercing-sucking mouthparts and simultaneously inject enzyme-containing saliva (digestive enzymes) into the feeding site to aid in the breakdown of plant tissues.

TPB usually spends two thirds of their time probing/lacerating tissue and one third in ingestion. After injection of saliva within the plant tissue, the insect then stands and waits for the liquefying of the cell contents, and then quickly ingests the slurry.



Early-season fruit injury by Tarnished Plant Bug. Picture: Ontario Apple IPM

Stink bugs. In general, there are two types of saliva produced by stink bugs. First, the watery saliva is involved with digestion of plant food and contains digestive enzymes among other protein components that liquefy plant tissue. Second, “gel” saliva is the basis for the formation of the salivary sheath. The salivary sheath forms a hardened lining around the feeding stylets and the plant tissues. The sheath is necessary to prevent loss of plant juices during feeding by allowing the insect to form a seal around the stylets and the plant tissue. The sheath adheres to plant surfaces but not to the surface of the stylets. When the insect is finished with a feeding bout, the sheath remains in the plant tissues when the insect withdraws its feeding stylets. A new sheath is formed during each successive feeding bout. This explains the hardened ‘corky’ areas around feeding sites.



Starting from left, external BMSB damage to nectarine, external injury to apple, and internal evidence of surface feeding. Note sunken areas on the surface. Picture: Doug Pfeiffer, Virginia Cooperative Extension.

Symptoms of fruit injury caused by stink bugs.

Cat-facing. In peaches, early stink bug damage develops into cat-facing injury, as a result of the surrounding undamaged fruit flesh growing around the damaged feeding site.



Late-season apple injury. The damage caused by stink bug feeding on apples in the mid- to late season is a depressed, discolored area on the fruit skin. The discoloration appears as a water-soaked to dark green area on both red and green colored cultivars. On red-colored fruit, the discoloration sometimes appears darker red. The area of discoloration is approximately 1 cm in diameter for each feeding site and is roughly circular, but in the case of multiple feeding on the same fruit, the damage may appear larger and irregular. Immediately beneath the depressed, discolored fruit surface is dark, corky flesh that extends about 0.5 to 1 cm into the fruit. Although there is a puncture site that provides proof of feeding, this may often be visible only under magnification.

As a reminder, these are characteristic symptoms of late-season feeding injury by stink bugs in apple.

1. The edge of the depression on the fruit surface from stink bug feeding is gradual
2. The corky flesh is always immediately beneath the skin in stink bug damage
3. There is always a puncture site from stink bug feeding

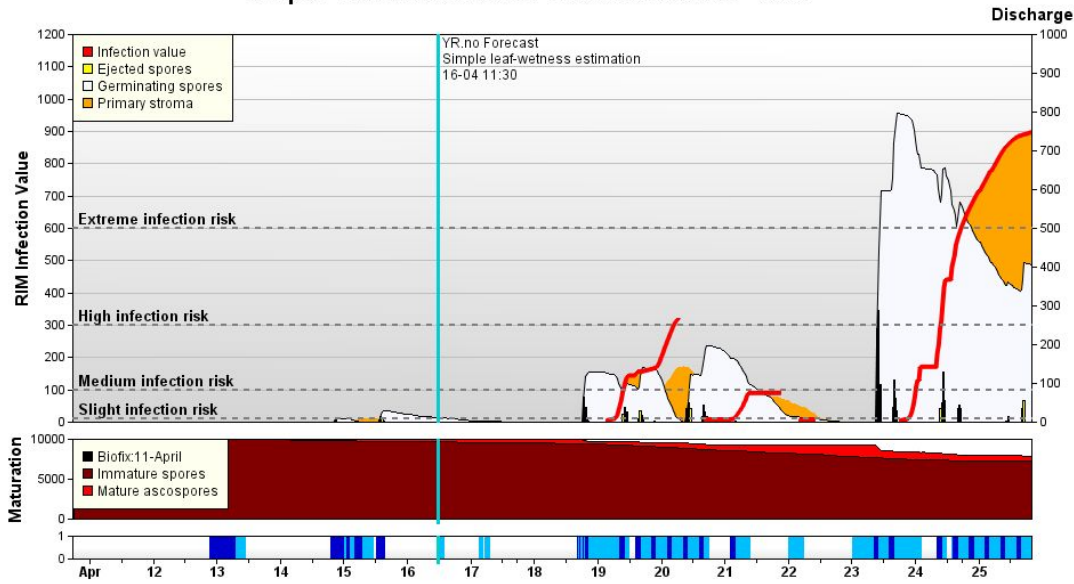
Diseases

Liz Garofalo

Apple Scab

To date no ascospores have been observed in lab released tests. However, decisions support systems (DSS) are beginning to estimate infection events to be occurring. These estimations begin as a result of the Green Tip biofix being entered into the system by the end user (you) or, in the case of the RIMpro advisory service the UMass Extension Fruit team is once again running this year, by the DSS advisor (me). Both NEWA and RIMpro are forecasting a multi-day infection event beginning on April 19. For locations with more than the first flush of green tip, a protective spray is warranted. In spite of not seeing any spore in the lab yet this year, the weather, both last fall and this spring has been too wet for me to comfortably recommend any further delayed scab treatment.

RIMpro-Venturia location: MA-Belchertown - 2019



RIMpro apple scab forecast for Belchertown, MA 4/16/1

Ascospore Maturity Summary								
	Past	Past	Current	5-Day Forecast			Forecast Details	
Date	4/14	4/15	4/16	4/17	4/18	4/19	4/20	4/21
Ascospore Maturity	2%	3%	3%	4%	5%	6%	8%	9%
Daily Ascospore Discharge	0%	2%	0%	0%	0%	3%	1%	0%
Cumulative Ascospore Discharge	<1%	3%	3%	3%	3%	6%	7%	7%

[Ascospore Maturity Graphs](#)

Infection Events Summary								
	Past	Past	Current	5-Day Forecast			Forecast Details	
Date	4/14	4/15	4/16	4/17	4/18	4/19	4/20	4/21
Infection Events	Combined	Yes	No	No	Combined	Combined	Yes	No
Average Temp (F) for wet hours	61	57	49	47	55	59	56	50
Leaf Wetness (hours)	3	13	1	2	5	24	10	6
Hours ≥90% RH	10	15	0	0	0	10	9	4
Rain Amount	0.05	0.91	0.00	0.00	0.00	Night 74% Day 74%	Night 69% Day 46%	Night 42% Day 23%

Download Time: 4/16/2019 12:00

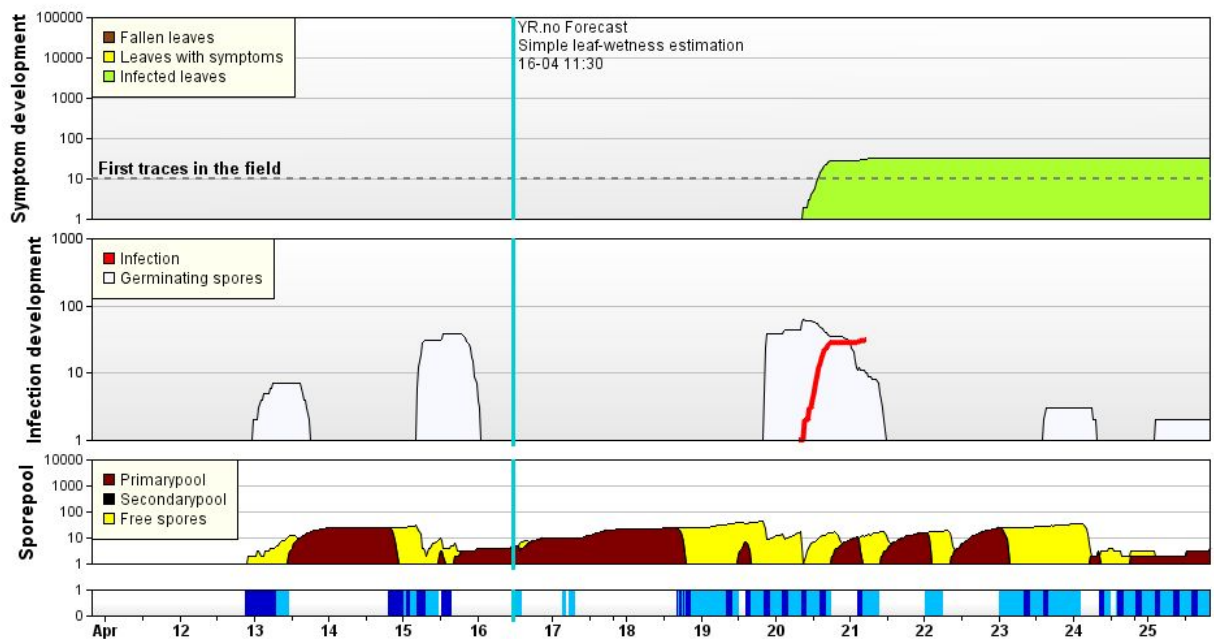
Infection events, shown in red above, are based on the [Revised Mills Table](#) and are calculated beginning with 0.01 inch of rain. The word "Combined" means the wetting event on this day is being combined with another wetting event using the following rule: two successive wetting periods, the first started by rain, should be considered a single, uninterrupted wet period if the intervening dry period is less than 24 hours. **When an infection event is in the 5-day forecast, the actual weather data logged may or may not**

NEWA apple scab forecast for Belchertown, MA 4/16/19.

Marssonina coronaria

This pathogen has been cropping up more and more over the last few years. We first thought it was only an issue in unsprayed trees, then only organic orchards. However, it has been showing up in orchards throughout the Northeast with no apparent regard for management practices. The fungus overwinters in fallen leaf litter, much like apple scab. In Europe, and the United States, the sexual phase has not been documented. We are able to identify the asexual conidia under the microscope so should be able to pinpoint when spore are available. Again, thus far, none have been seen in the lab. Also, RIMpro has a model for that! In the next edition of Healthy Fruit, I will spend a little time explaining the various graphics in greater detail, but, for now, the interesting thing to take note of is the red line indicating an infection is forecast to occur during the same time frame as the next forecast apple scab event. Research done in China, where this pathogen has been more significant, has shown, among other things, mancozeb fungicides to be effective in managing this pathogen. HOWEVER, it is not labeled for use against *Marssonina*, so, be sure you are using this material only as its label intends! *The label is the law and the above information is intended only to inform, not imply recommended use.*

RIMpro-Marssonina MA-Belchertown - 2019



RIMpro *Marssonina* forecast for Belchertown, MA 4/16/19. Red upright line indicates an infection is estimated to occur on 20 April.

Horticulture

Jon Clements

Plant trees as soon as you receive them and soil conditions are right; soak roots for up to 24 hours in a water with a bit of nutrient solution; roots just barely in the ground, graft union 4-6 inches above ground!

Finish apple pruning using primarily thinning cuts! Leave stubs in tall-spindle plantings for renewal shoot growth (within reason, longer stubs are better, 1-2 inches?) Hold off on peach pruning as long as you can, until it's dry and warms up -- I like to prune peaches during bloom.

Not too early to think about a **pre-emergent herbicide application**. Alion on older trees is the gold standard, pre-emergent control of both grasses and broadleaf weeds. Prowl H2O is good on grasses, Chateau on broadleaves. Consult the [tree fruit herbicide table](#) in New England Tree Fruit Management Guide. Gallery is a MUST on new plantings!

To promote branching on 1-year old wood, mix 4 oz Maxcel or Exilis in 16 oz (1 pt) white latex paint, brush or roll-on to 1-year old wood where branching is desired. A good way to prevent blind wood on leaders of young apple trees. For more young tree branching information, see Fact Sheet [F-140 Branching Young Apple Trees with Plant Growth Regulators](#)

Small Fruit Update

Sonia Schloemann

CROP CONDITIONS: The ground is still pretty cold and wet in most areas so things are moving a bit slowly. If you haven't done so yet, calibrate sprayers before season starts. Order scouting supplies (traps, pheromones, etc.) and anticipated spray materials and store properly.

Strawberries: Mulch is off and growth is beginning to push in the crowns. See last week's [IPM Berry Blast](#) for information on scouting for cyclamen mites. Early season herbicide applications can be made now. See the [Strawberry Weed Management](#) section of the New England Small Fruit Management Guide (NESFMG) for recommended materials and rates. Planting new fields will begin when soil conditions improve enough to allow for tractor work. **Brambles:** Green tissue is becoming visible on floricanes brambles. Primocane types have been mowed and are pushing some new growth in some areas. This is also a good time for early season weed management for Brambles. See the [Bramble Weed Management](#) section of the NESFMG for recommended materials and rates. **Blueberries:** Bud development is mainly at budbreak with some early varieties/locations a little further along. This is a key time to watch for mummy cups from [Mummy Berry](#) beneath the bushes. In areas where mummy berry was a problem last year **and** it's possible to apply mulch now (where it's not too wet!), you can cover cups with mulch. Next week we'll start watching for early strikes if the weather is conducive to infection. See the [New England Small Fruit Management Guide](#) for treatment recommendations. Finally, early season weed management is also still possible now. See the [Blueberry Weed Management](#) section of the NESFMG for recommended materials and rates.



Berry Bud Stages 4/16/19 - Strawberry, Raspberry, Blueberry

Hawkeye's corner (notes from the field)

Liz Garofalo

We're off to the races!

Pear psylla (below left) are out and laying eggs. This pest overwinters as an adult, these are darker than adults from summer generations. We should be seeing winter adults continue to emerge and lay eggs for several weeks. The adult pictured below was spotted in Belchertown today, so, if you have pears in the warmer parts of the state, it's time to get out and check. Apply oil at 2% rate to deter egg laying. You can kill the adults if you manage to hit them with the oil while you spray, however, this is meant primarily to deter egg laying. Remember when applying oil to watch out for freezing temperatures within 24 hours of the application, both before and after as this can cause phytotoxicity.



Stink bugs (above, on right) are also on the move, but, thankfully, we aren't seeing brown marmorated stink bug (BMSB) yet, unless you count in homes and other buildings where they overwinter (which you might indeed count if there are many!). See Jaime's insect section above for great information on stink bugs!

Guest article

No Guest article this week...

Facebook Me

(Tweet Me this week...)



Jon Clements @jmcextman · Apr 13

Painting multi-leader Cider grafts with Maxcel (4 oz) plus white latex paint (16 oz) to promote bud-break on what I think otherwise might end up blind wood
#NECAP (NorthEast Cider Apple Project)



1 ↻ 11 ||



Jon Clements @jmcextman · Apr 11

IPM for SWD in cherry starts with a good pruning to promote air circulation and drying...



1 ↻ 5 ||

Useful links

[27th Annual March Message \(2019\) to Tree Fruit Growers \(Google Doc\)](#)

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

Scaffolds Fruit Journal: <http://www.nysaes.cornell.edu/ent/scaffolds/>

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

Follow me on Twitter (<http://twitter.com/jmccextman>) and Facebook (<http://www.facebook.com/jmccextman>)

[Acimovic Lab at Hudson Valley](#)

[Peter Jentsch's Blog](#)

The next Healthy Fruit will be published on or about April 23, 2019. In the meantime, feel free to contact any of the UMass Fruit Team if you have any fruit-related production questions.

Thank you sponsors...



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