



Maine Tree Fruit Newsletter

Friday, May 13, 2022 Vol 29:11

Apple bud stages

The heat has accelerated bud toward into Bloom. As for Friday, May 13, budstage is more consistent across locations than normal for this time of year. The table on the right shows McIntosh bud stage dates at Highmoor Farm in Monmouth.

Location	Bud Stage Observations, Reports
Sanford	Wed. May 11. Zestar at King Bloom? Thur. May 12. Zestar Full Bloom. McIntosh King Bloom starting. GingerGold at complete King bloom
Highmoor Farm, & Monmouth area, Buckfield	Thur. May 12. Zestar King Bloom. Honeycrisp, McIntosh. Cortland & Snowsweet at Full Pink. Golden Delicious at Pink Friday May 13. McIntosh at Late Pink, Honeycrisp at Full Pink. Some south facing blocks of McIntosh & Honeycrisp at King Bloom
Levant (near Bangor)	Friday May 13. McIntosh Late Pink.

Date	Observed & Predicted McIntosh bud stages
Today's date highlighted. Bloom start/end dates in brown.	
Wed, Apr 20, 2022	50% Green Tip
Thu, Apr 21	
Fri, Apr 22	
Sat, Apr 23	
Sun, Apr 24	
Mon, Apr 25	
Tue, Apr 26	
Wed, Apr 27	
Thu, Apr 28	Half-inch Green
Fri, Apr 29	
Sat, Apr 30	
Sun, May 1	
Mon, May 2	
Tue, May 3	
Wed, May 4	
Thu, May 5	early Tight Cluster
Fri, May 6	Tight Cluster
Sat, May 7	
Sun, May 8	
Mon, May 9	
Tue, May 10	Open Cluster
Wed, May 11	
Thu, May 12	full Pink-extended
Fri, May 13	late Pink
Sat, May 14	King Bloom
Sun, May 15	
Mon, May 16	Full Bloom
Tue, May 17	
Wed, May 18	
Thu, May 19	
Fri, May 20	
Sat, May 21	
Sun, May 22	95% Petal Fall
Mon, May 23	
Tue, May 24	100% Petal Fall

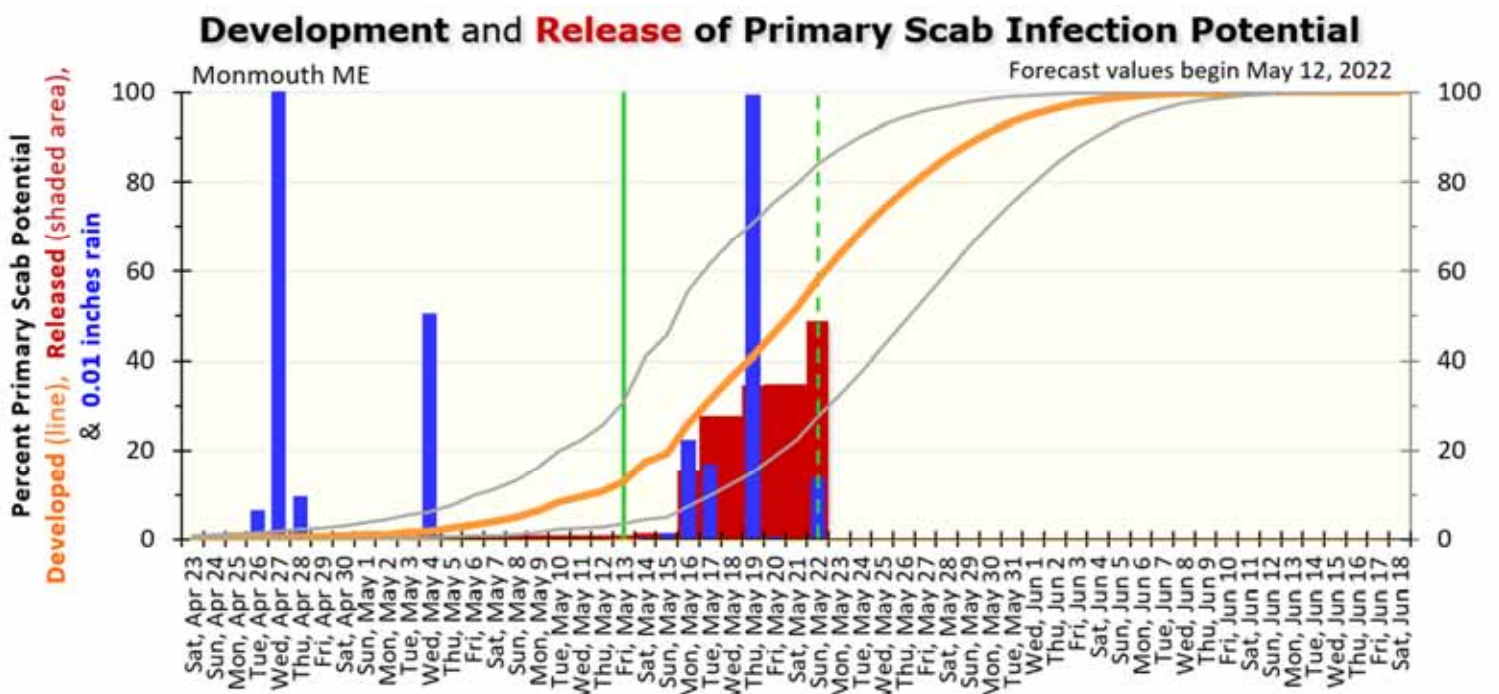
Apple Scab

I adjusted the dry switch in the scab ascospore maturity model to be less aggressive at shutting down maturation. That and the hot weather is advancing estimated scab spore maturity ahead of the table sent earlier this week. The dry weather leading up to the next rain may cause a portion of the estimated portion of mature spores to not be release until a following rain. None of these details really matter. No matter how you tweak it, this is the heart of apple scab infection season and susceptible trees need to be protected with fungicide coverage.

Weather data for Monmouth ME. Forecast values begin May 12, 2022					
Date	Observed and Forecast Inches Rain	Cumulative Scab Degree Days	1 in 20 chance that cumulative ascospore maturity is less than:	Estimated Cumulative Ascospore Maturity	1 in 20 chance that cumulative ascospore maturity is greater than:
Wed, April 20	0	9		1%	5%
Thu, April 21	0.00	16		1%	5%
Fri, April 22	0.01	32		1%	6%
Sat, April 23	0	45		1%	7%
Sun, April 24	0	57		1%	8%
Mon, April 25	0	72		2%	10%
Tue, April 26	0.06	88		2%	11%
Wed, April 27	1.07	99		2%	13%
Thu, April 28	0.10	108		3%	14%
Fri, April 29	0	117		3%	15%
Sat, April 30	0	132		4%	17%
Sun, May 1	0	150	1%	5%	19%
Mon, May 2	0	165	1%	6%	22%
Tue, May 3	0	186	1%	7%	25%
Wed, May 4	0.51	200	1%	8%	28%
Thu, May 5	0	222	2%	10%	32%
Fri, May 6	0	241	2%	12%	36%
Sat, May 7	0	256	3%	14%	39%
Sun, May 8	0	271	3%	16%	42%
Mon, May 9	0	290	4%	18%	47%
Tue, May 10	0	312	6%	22%	51%
Wed, May 11	0	312	6%	22%	51%
Thu, May 12	0	312	6%	22%	51%
Fri, May 13	0	312	6%	22%	51%
Sat, May 14	0.00	312	6%	22%	51%
Sun, May 15	0.01	312	6%	22%	51%
Mon, May 16	0.23	342	8%	27%	58%
Tue, May 17	0.17	370	10%	32%	64%
Wed, May 18	0	396	13%	38%	69%
Thu, May 19	0.99	417	16%	42%	73%
Fri, May 20	0.01	441	19%	48%	77%
Sat, May 21	0	464	23%	53%	81%

The chart below shows the relative risk of scab infection based on spore maturity, tissue area, tissue sensitivity, wetting period duration, precipitation amount, and temperature during the wetting period. Absolute risk is determined by the relative infection risk (i.e. portion of season's total infection potential on any given day) multiplied times the absolute number of spores per square meter of orchard. While the relative risk varies from 1% to 100%, but really only up to a maximum of about 50-60% for any single infection period. Thus the relative infection risk varies by a factor of up to 60X.

The number of spores per square meter of orchard can vary from a low of possibly 10 per square meter to a high of over 1,000,000 spores per square meter. Thus the spore density ration can vary by a factor of up to 100,000X. That is why leaf removal and sanitation for spore reduction is so important. The tiniest proportional slice of relative scab infection risk in a high scab "dirty" orchard is orders of magnitude more risk than the biggest infection period of the year in a low scab "clean" orchard.



Blue columns show 100ths of inch rain for each date.

Rising thick orange line = cumulative primary scab infection potential developed by that date.

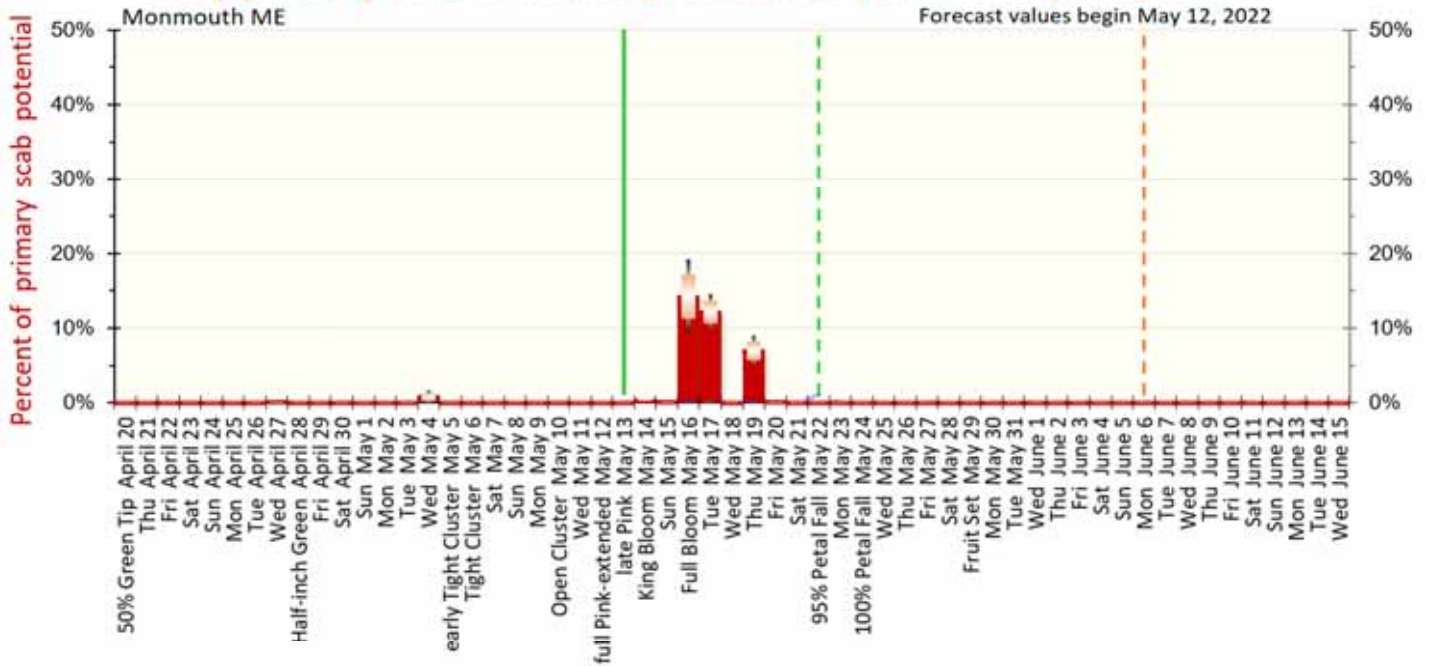
Rising thin gray lines = 90% confidence interval for estimate of cumulative infection potential developed, but not necessarily released, by each date.

Solid red area under orange line shows estimated cumulative percent primary scab infection potential released by end of that date. The red area is below the orange line unless a warm soaking daytime rain allows full expression of infection potential.

Vertical line = today's date and beginning of forecast values. Vertical dashed green line = end of forecast range.

Note: This is a relative, not absolute, measure of scab infection severity. In high scab blocks even a small portion of the year's scab potential can cause significant infection! This chart represents risk from primary spore releases only. If primary scab is not controlled, secondary spores can greatly magnify infection potential for later infection periods.

Daily primary scab infection potential as percent of yearly total



Top of wide red bar shows best estimate of primary scab ascospore infection potential.

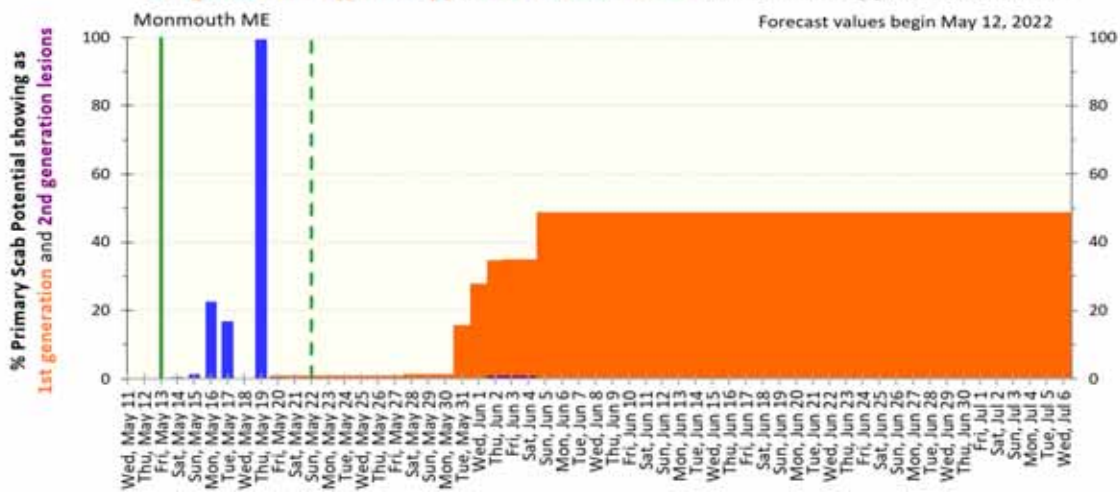
White-to-light red shaded narrow boxes overlaid on red bars show range expected to contain the true value most of the time (68% confidence interval). Thin vertical black bars show 90% confidence interval.

Vertical green line = today's date. Vertical dotted green line = end of forecast range.

Vertical orange dotted line = date of final significant primary scab infection period (estimated 99+% cumulative spore release, and 95% chance of at least 95% cumulative spore release).

Infection potential rating is for scab ascospores (i.e. primary scab) only. Uncontrolled infections can produce secondary scab spores that magnify infection risk beyond what is indicated by this chart, starting 9-17 days after the infection period.

1st generation (primary) & 2nd Generation Scab Lesion Appearance Dates



Orange area shows the percent of potential 1st generation apple scab infections that have had time to become visible. Absence of visible scab infections after 100% of primary scab potential has had time to appear as 1st generation lesions is good news, but it is not conclusive verification of successful scab control. Light infestation of 1st generation lesions can be difficult to detect. Infections delayed but not killed by fungicide application, or by partial resistance of older leaves, may appear later.

Purple area shows the percent of 2nd generation apple scab lesions that have had time to become visible. Absence of visible scab after 90-100% of primary scab infection potential has had time to appear as 2nd generation lesions indicates that primary scab control was successful. However, scab scouting should continue to detect later emerging lesions.

Blue columns show 100ths of inch rain for each date.

Vertical green line = today's date and beginning of forecast values.

Vertical dotted green line = end of forecast range. Date lines may be beyond range of chart.

Fire Blight

Updated and Increased Fire Blight Risk Analysis

Zestar, Gingergold and other early cultivars reached King Bloom a day or two earlier than McIntosh. Honeycrisp would normally reach King Bloom about a day later than McIntosh but the heat has accelerated and concentrated bud development resulting in Honeycrisp reaching King Bloom at the same time as McIntosh in at least one block observed Friday May 13.

The updated weather forecast and slightly earlier than expected King Bloom dates in some locations, and reviewing the effect of a 90F high temperature on the reproductive rate of Fire Blight bacteria escalates the concern about possible blossom blight infections.

Just a few days ago it looked like the heat was going to end with the opening of King Bloom. Thus, those flowers even if inoculated with bacteria at time of opening would not have had many heat units to drive bacterial reproduction. But now the heat is last a day or more beyond the opening of King Bloom in many locations.

In addition, the high temperature for Saturday is close to 90F. The effect of such high heat on the bacterial reproduction rate is greater than linear. On a day with a high temperature of 90F the number of FB heat units in the Cougar Blight model is about 3.5X times greater than at 80F. The actual daily high temperatures at Highmoor Farm are 81F on Friday, May 13 and 86F on Saturday May 14. In both the CougarBlight and the Eastern FB models a 5 degree F difference results in a doubling for FB infection potential.

Normally, heat units of 3-4 days in a row are required to drive FB blossom blight infection event. In this situation, any flower that is open by 6am Saturday morning will accumulate enough heat units in a single day to create infection risk IF they are inoculated early in the day. The safe assumption is that bacteria enter the flowers as soon as they open.

It is still true that the models tend to overestimate fire blight risk in the first few days after King Bloom, but under these conditions putting that assumption to the test is a scary proposition, especially if there was any FB in the orchard last year. And most orchards had at least a few FB strikes last year. So this year FB has found a new to create torturous math.

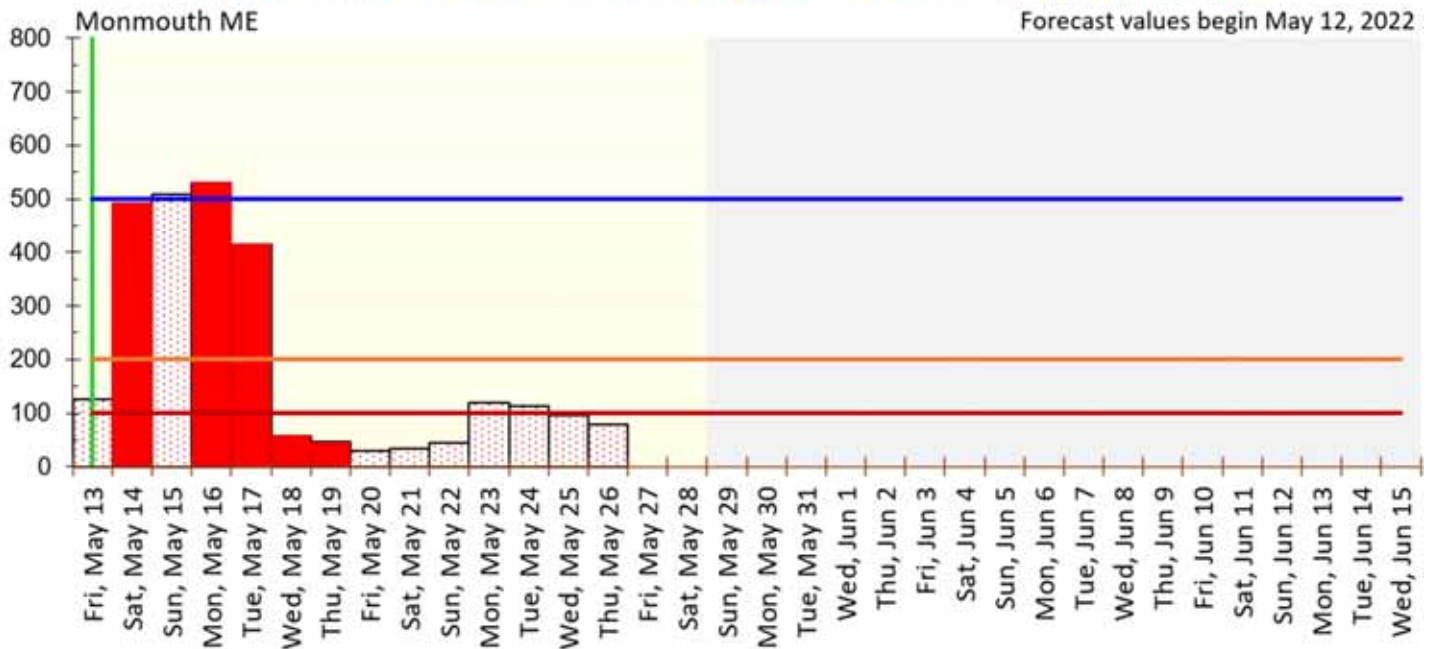
But thinking down the road a few days makes the case for being ready apply streptomycin on short notice much clearer. While as is usually case with hot spring weather, it is difficult to forecast when showers will occur, it is almost certain that there will be some rain in the next few days, especially by late Monday. It does not take much at all the drive FB infections. Once accumulated, those heat units remain in effect until the flower ages and nears the end of its reproductive viability. Even if there is not a drop of rain on Saturday or Sunday, those heat units and those flowers open on Saturday will still be FB targets when the rain arrives on late Monday. The ideal timing for streptomycin is within 24 hours before the rain starts. Spraying in the evening is preferable because recent research shows that the FB infection process peaks between 10pm and the early morning hours when relative humidity is highest.

Spraying strep in the middle of a sunny day is less preferable, but is infinitely more effective than not spraying streptomycin at all. Don't let the perfect be the enemy of the good. Other recent research shows that FB grows much better at relative humidity of ca. 60-70% or higher and is less 'active' at lower relative humidity. Usually during a warm/hot spring day, the relative humidity gets down below 50%. And that is the case on Friday and Saturday May 13 and 14. But Sunday and Monday May 15 and 16, the relative humidity (at Highmoor Farm at least) is forecast to remain above 70%, and for most hours above 80% until late morning on Tuesday May 17. It won't be nearly as warm on Sunday and Monday, but those heat units will already be in the bank, then followed by ideal relative humidity conditions for two days ending with rain on Monday evening.

If there was ever going to be a significant early bloom infection period, this would be it. The coincident timing of King bloom, the rain, and the relative humidity forecast is too dangerous to dismiss. As far as I know, this is the first time a King Bloom FB infection period required prevention. If you have only enough streptomycin for one application, which has been the standard recommendation until now, using it at the beginning of bloom will leave you without a necessary tool if the more typical FB infection period at the end of bloom should arise. So the new recommendation is going to have to be, have two applications of streptomycin on hand before bloom in case there are two blossom blight infection periods during bloom. Maine is becoming more like Michigan, Pennsylvania, and New York. No disrespect to the fine folks in those states, but I was happy with Maine the way it was.

If you use up your streptomycin supply, getting a replacement supply is necessary. Just because FB occurred early does not mean it won't come back around for a mid or late bloom repeat performance.

Fire blight heat units vs. High infection risk thresholds



Values do not appear until McIntosh King Bloom date is within forecast range.

Vertical green line marks date of latest update.

Solid Red columns show fire blight heat units on days with rain, and is an estimate of the favorability of weather for fire blight blossom infection on that day. Red dotted white columns show fire blight heat units on days without rain. These columns indicate potential severity fire blight blossom infection if accompanied by rain or heavy dew.

Gray background indicates dates with reduced risk because most cultivars should have lost open blossoms. However, young trees and late blooming cultivars may still have open blossoms and susceptibility to fire blight blossom infections on those dates.

Colored horizontal lines = High infection risk (if flowers present) heat unit thresholds for type I, II and III site risk categories.

Blue horizontal line = Category I sites (No FB within one mile last year or this year). High threshold is 500, Extreme threshold is 800.

Orange horizontal line = Category II sites (FB within 1 mile last year, but not active within 1 mile this year). High threshold is 200, Extreme threshold is 350. Exceptional threshold is 500.

Red horizontal line = Category III sites (Active FB within 1 mile this year). High threshold is 100, Extreme threshold is 200. Exceptional threshold is 300.

Heat units and thresholds are from Cougar Blight 2010 model by Tim Smith, Wash. State Univ.. See Cougar Blight table for daily values.

Weather data for Monmouth ME. Forecast values begin May 12, 2022

This table shows estimates of RELATIVE daily fire blight blossom infection risk based on weather conditions. Rating criteria are derived from the work of Dr. Paul W. Steiner and Gary W. Lightner at the University of Maryland.

ABSOLUTE risk depends on the amount of fire blight bacteria in the area, the number of open flowers, age (trees < 6 years old most vulnerable), cultivar and rootstock susceptibility. Relative infection risk may be overstated for first few days of bloom because fire blight bacteria may not have been distributed to open flowers.

Individual cultivar may start bloom a day or two later, or finish a day or two earlier, than full range of open blossom dates shown. Gray shading indicates dates when most trees will have lost open blossoms, but late blooming cultivars or young trees may still have open flowers and be susceptible to blossom blight.

Fireblight infection can occur without rain if there is "heavy" dew. If there are enough heat units for infection but no rain, if leaves are expected to be wet for 2 or more hours, then infection risk is reported with "if dew" attached. Infection potential "dew risk" days is not well understood. Infection potential may increase with high relative humidity prior to and during infection events, and be reduced by an extended period of low relative humidity.

Shoots near overwintered fire blight cankers would start showing obvious symptoms around Tuesday, June 21

if canker blight infection spreads to other shoots, symptoms on those secondary shoot infections would become obvious around Thursday, June 30

<p>Open blossom dates for common cultivars. "Date" is from 8am to 8am the following day, not midnight to midnight.</p>	<p>Cumulative Fire blight bacteria potential (FBP). 100% = minimum threshold level for infection. Note some fire blight researchers use caution when values exceed 70% of threshold. Cumulative % FBP, (single day value), Inches Rain, Leaf Wet Hours Values are for 8am to 8am.</p>	<p>In absence of rain, 3 or more hours of leaf wetness is counted as possible dew conditions for adequate wetting, which may overstate risk on such days. See Cougar Blight model for additional comments.</p> <p>Eastern Fire blight Model Rating Infection Requirements: 100% FBP (>198 degree hours > 65F), & > 0" rain, or > 0.1 inch rain on previous day. SEVERE RISK = 200% FBP and wetting.</p>	<p>Dates Blossom Blight (& Shoot Blight) would be obvious if infection occurred</p>
<p>possible early cultivar King Bloom: May 13</p>	<p>45% (45%), 0.0", 8 hrs.</p>	<p>No blossom infection</p>	
<p>McIntosh King Bloom: Sat, May 14</p>	<p>140% (95%), 0.02", 8 hrs.</p>	<p>INFECTION RISK</p>	<p>June 6, (June 18)</p>
<p>Sun, May 15</p>	<p>144% (4%), 0.0", 22 hrs.</p>	<p>INFECTION RISK</p>	<p>June 6, (June 19)</p>
<p>Mon, May 16</p>	<p>155% (11%), 0.24", 18 hrs.</p>	<p>INFECTION RISK</p>	<p>June 7, (June 19)</p>
<p>Tue, May 17</p>	<p>156% (2%), 0.16", 7 hrs.</p>	<p>INFECTION RISK</p>	<p>June 7, (June 19)</p>
<p>Wed, May 18</p>	<p>156% (0%), 0.05", 2 hrs.</p>	<p>INFECTION RISK</p>	<p>June 8, (June 20)</p>
<p>Thu, May 19</p>	<p>11% (0%), 0.95", 23 hrs.</p>	<p>No blossom infection</p>	

Weather data for Monmouth ME. Forecast values begin May 12, 2022

This table shows estimates of RELATIVE daily fire blight blossom infection risk based on weather conditions. Rating criteria are from the Cougar Blight 2010 model developed in Washington and Oregon by Dr. Timothy J. Smith.

ABSOLUTE risk depends on the amount of fire blight bacteria in the area, the number and age of open flowers, tree age (1-5 years old most vulnerable), cultivar and rootstock susceptibility. Ratings are for flowers that have NOT received an application of streptomycin or other fire blight suppression material. You can use the daily heat unit values between application date and a subsequent wetting event to estimate heat unit accumulation for flowers that received antibiotic treatment. Relative infection risk may be overstated for first few days of bloom because fire blight bacteria may not have been distributed to open flowers. Individual cultivars may start or finish bloom a day or two earlier or later than the range of open blossom dates shown. Gray shading indicates dates when most trees will have lost open blossoms, but late blooming cultivars, "straggler" or secondary bloom (e.g. Cortland and Golden Delicious), or young trees may still have open flowers and be susceptible to blossom blight. Infection of a few late blooms can provide a foothold for fire blight to colonize an orchard.

Fireblight infection can occur without rain if there is wetting caused by dew. If there are enough heat units for infection but no rain, if leaves are expected to be wet for 2 or more hours, then infection risk is reported with a "dew risk" label. Infection potential on "dew risk" days is not well understood. Infection potential may increase with high relative humidity prior to and during infection events, and be reduced by an extended period of low relative humidity.

Fire blight blossom infection risk varies with block history. If you do not know orchard history, use category II as default assumption.

I = No active fire blight within 1 mile of the orchard in last two years. Requires 500 – 799 heat units for HIGH rating, 800 – 999 for EXTREME!, and 1000+ for EXCEPTIONAL!

II = Fire blight was present within 1 mile of the orchard within last 2 years, but not currently active in the area this year. Requires 200 – 349 heat units for HIGH rating, 350 – 499 for EXTREME!, and 500+ for EXCEPTIONAL!

III = Active fire blight cankers within 1 mile of the orchard this year. Requires 100 – 199 heat units for HIGH rating, 200 – 299 for EXTREME!, and 300+ for EXCEPTIONAL!

If blossom infection occurred May 14, then blossom blight would be noticeable by June 6, and shoot blight by June 18.

Open blossom dates for common apple cultivars. "Date" is from 8am to 8am the next day, not midnight to midnight.	Cumulative Heat Units (single day units) Inches Rain, & Leaf Wet Hours 8am to 8am next day	I - No active FB within one mile of the orchard in last two years	II - FB active within one mile of orchard in last two years, but not this year	III - Fire blight currently active within one mile of orchard.	Date blossom blight (and shoot blight) symptoms would be obvious if infection occurred
possible early cultivar King Bloom: May 13	125 HU (125) 0.0", 8 hrs	Low (lack of heat)	Caution (dew risk)	HIGH (Dew risk)	June 3, (June 16)
McIntosh King Bloom: Sat, May 14	492 HU (366) 0.02", 8 hrs	Caution	EXTREME!	EXCEPTIONAL!	June 6, (June 18)
Sun, May 15	508 HU (16) 0.0", 22 hrs	HIGH	EXCEPTIONAL!	EXCEPTIONAL!	June 6, (June 19)
Mon, May 16	531 HU (23) 0.24", 18 hrs	HIGH	EXCEPTIONAL!	EXCEPTIONAL!	June 7, (June 19)
Tue, May 17	415 HU (10) 0.16", 7 hrs	Caution	EXTREME!	EXCEPTIONAL!	June 7, (June 19)
Wed, May 18	58 HU (9) 0.05", 2 hrs	Low (lack of heat)	Low (lack of heat)	Caution	
Thu, May 19	46 HU (3) 0.95", 23 hrs	Low (lack of heat)	Low (lack of heat)	Unlikely (lack of heat)	

Early season insects

There was a typo/missing words in previous newsletter. The correct wording is: “In most orchards in most years, a prebloom insecticide to control these pest species is not needed.” I would also add that unless there is some extremely unusual situation that I have never seen occur, there is never a need for two prebloom insecticide applications in a Maine apple orchard.

Only 2 Tarnished Plant Bug (TPB) were found on 11 traps across three blocks at Highmoor Farm on Thursday, May 12, with McIntosh buds at full extended Pink, and Zestar at King Bloom. The cumulative captures since Green Tip on those traps are

Block set 1 (McIntosh, Honeycrisp, Gala, Golden Delicious): 4/4 = average 1.0/trap.

Block set 2 (Honeycrisp, Cortland, Golden Delicious, McIntosh, Zestar): 2/3 = average 0.7/trap.

Block set 3 (Honeycrisp, Snowsweet, Northern Spy, Pristine) 0/3 = average 0/trap.

The treatment threshold at Pink is an average of 8 per trap. Thus, none of the blocks at Highmoor Farm were even close to the trap treatment threshold.

In addition, checking 200 fruit clusters per block (600 total) found no tarnished plant bug or caterpillar activity. Only two buds that might have been damaged by feeding (out of approx. 3000). The bud feeding threshold is roughly 2-3 per 100 fruit clusters.

Without no apparent insect activity, Highmoor is going to begin insecticide treatment at Petal Fall.

Pesticide Re-registration Review

The following pesticide active ingredients have been under regularly scheduled re-registration review process for the past few years, with final decisions due by October 2022. Since these materials have made it through previous reviews under the standards tightened by the 1996 Food Quality Protection Act, the expectation is that unless something new comes up, they should make it through the review process this time also.

Active ingredient	Example Product	Active ingredient	Example Product	Active ingredient	Example Product
Boscalid	Pristine	Fenpyroximate	Portal	Myclobutanil	Rally
Chlorophacinone	Rozol Vole Bait	Ferbam	Ferbam Granuflo	Napthalene-acetic Acid	Fruitone N
Difenoconazole	Academy	Flonicamid	Beleaf	Oxyfluorfen	Goal
Diphacinone	Ramik Brown	Fluazifop butyl	Fusilade	Spirodiclofen	Envidor
Diphenylamine	Shield DPA	Mancozeb	Koverall, Dithane	Tebuconazole	Luna Experience
Diuron	Karmex	Metconazole	Quash	Zinc Phosphide	ProZap ZP Oat Bait
Dodine	Syllit	Metiram	Polyram	Ziram	Ziram Granuflo

MOFGA Tree Fruit Workshops

1) Top Working Fruit Trees. May 15 @ 9:00 am - 12:00 pm

<https://www.mofga.org/event-calendar/top-working-fruit-trees-2/>

In person in Damariscotta.

Fee: \$45; \$30 for MOFGA members. Free for Journey person program participants, veterans and BIPOC (Black, Indigenous, People of Color)

Scholarships available – apply at <https://mofga.formstack.com/forms/scholarship>

Learn to topwork (graft) new disease-resistant, cider, dessert or heritage varieties onto your existing trees! Top working is the type of grafting that is done when you have an established tree and you'd like it to produce a different variety of fruit. Registration is limited to 15 participants and the workshop will be held outdoors. COVID protocols will be finalized closer to the event date.

2) Low Intervention Fruit Tree Care. June 2 @ 5:30 pm - 7:00 pm

<https://www.mofga.org/event-calendar/low-intervention-tree-care-copy/>

0 – \$25. Sliding scale from \$0-\$25. Please pay what you are able.

Join us for this workshop on low-intervention, yet effective, methods of organic fruit tree care. Edgar Evenkeel, orchardist & arborist, will talk about how to grow fruit organically with few interventions and no spraying. Aimed at beginner and backyard fruit growers. The presentation will be followed by a Q&A period – so bring all your questions about growing fruit trees! This session is directed at beginners and focused on low-intervention methods; if you would like to learn more about advanced growing using sprays, amendments, and more (or have more experience with fruit trees) consider attending our June 8th webinar.

3) Holistic Practices in the Maine Heritage Orchard. June 8 @ 6:30 pm - 8:00 pm

0 – \$25. Sliding scale from \$0-\$25. Please pay what you are able.

Join MOFGA's Orchard Coordinator, Laura Sieger, for an online presentation about the holistic approaches to orchard care that she and others use at the Maine Heritage Orchard in Unity. These techniques involve the use of organic sprays and amendments, and these approaches are generally a bit more intensive than low-intervention approaches. This session is aimed at intermediate level orchardists or backyard fruit growers. Presentation will be followed by a Q&A period — so bring all your questions about growing fruit trees!

4) Maine Apple Camp. Friday, August 19 @ 4:00 pm – Sunday, August 21 @ 1:00 pm

<https://www.mofga.org/event-calendar/mac2022/>

\$150 – \$400. Sliding scale for the full weekend. Please pay what you are able.

Please also keep in mind our need to cover our rental costs for this facility.

Saturday only (adults): \$100. Children (ages 8-15): \$75. Children under age 8: Free

Participants in MOFGA's Journey person program & Black Indigenous People of Color: Free Scholarships available – apply at <https://mofga.formstack.com/forms/scholarship>. Application deadline: July 10.

Join us for a weekend of all things apples, cider and orchards! Learn about innovative orcharding methods, identifying and preserving heritage varieties, foraging wild fruit, cider making and lots more. Meet other orchard and apple enthusiasts while spending the weekend on a beautiful lake in mid coast Maine! Pilgrim Lodge in West Gardiner, Maine. See website for details.

* For questions about these events, email events@mofga.org

PFAS update

1) From 'Forever Chemicals' and Risks to Farms. Chris Clayton. Progressive Farmer, May 9, 2022. <https://www.dtnpf.com/agriculture/web/ag/livestock/article/2022/05/06/michigan-farm-cautionary-tale-pfas>

"Rep. Chellie Pingree, D-Maine, spent most of her allotted time April 28 on a House Appropriations Subcommittee hearing asking Agriculture Secretary Tom Vilsack to visit the farmers in her state who have found PFAS contamination. High levels of PFAS have shut down dairies, and at least some organic vegetable farmers have voluntarily stopped selling produce after water levels showed high concentrations of PFAS chemicals.

"We are finding it all over our state," Pingree said. "Some of the farmers don't have the time to wait for the state, so they are paying for their own testing. They are finding extremely high levels of contamination in their bodies and in their children's bodies. So, I just can't say enough how hard it is to witness what is going on."

In an interview with DTN, Pingree credited Maine lawmakers for agreeing this year to spend \$100 million to help farmers whose ground has been contaminated. [edit – I think the actual amount budgeted was \$60 million]. Decades of using sewage sludge as a fertilizer has ruined farms, Pingree told DTN.

"I don't know what else to do to help my state other than get the federal government involved," Pingree said.

Vilsack last week agreed with Pingree that a national standard for PFAS is needed, as well as better research to understand what should be considered acceptable levels of PFAS chemicals. Vilsack also said USDA needs a more comprehensive program for producers. USDA right now has a program for the dairy industry, "But we don't necessarily have something for produce," Vilsack said.

Maine's congressional delegation had written USDA back in March, calling for aid to help their producers and strategies to deal with PFAS remediation.

The problems facing farmers in Maine, Michigan and a few other states are going to become a more widespread issue, especially as departments look to set more federal standards for PFAS contamination, Pingree said.

"We are dealing with a teeny, tiny tip of the iceberg here," Pingree said. "I think, unfortunately, Maine and Michigan are two of the states where we have been responsible and supportive of our farmers and worried about our consumers. So that's why we are moving forward on this, but it's like pushing a boulder uphill to get the sort of understanding and cooperation around the country, or from USDA, to be able to support our farmers."

2) From: Emerging Issues in Food Waste Management Persistent Chemical Contaminants. U.S. Environmental Protection Agency Office of Research and Development EPA/600/R-21/115. August 2021. <https://www.epa.gov/system/files/documents/2021-08/emerging-issues-in-food-waste-management-persistent-chemical-contaminants.pdf>

"Food in the United States The range of PFAS concentrations reported in food studies within the United States are contained within Table 1. In general, food packaging was not tested as part of these studies, unless otherwise noted. As part of the 2018 U.S. Total Diet Study, FDA tested for 16 PFAS in food samples purchased in 2017 (and analyzed in 2019) from U.S. grocery stores. Determination of whether the foods were produced in the U.S. or imported was not provided."

"No PFAS were detected in samples of produce, dairy, and grain products (FDA, 2020d)."

<MDL in table below = Below method detection limit

TABLE 1. CONCENTRATIONS OF PER- AND POLYFLUOROALKYL SUBSTANCES IN FOOD FROM EXAMPLE STUDIES (RANGE REPORTED)

Sample	Country	Concentration* (µg/kg)														Reference					
		Sum	PFOA	PFOS	PFBA	PFPeA	PFBS	PFHxA	PFHpA	PFHxS	PFNA	PFDA	PFDS	PFUdA	PFDoA		PFTriDA				
Food in the United States																					
Fruits and vegetables	US	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	-	-	-	-	FDA (2018)			
Sample	Country															Reference					
		PFTeDA	PFHxDA	PFHpS	PFPeS	NaDONA	HFPO-DA	11Cl-PF3OUdS	9Cl-PF3ONs	4:2 FTS	6:2 FTS	8:2 FTS	PFODA	PFNS	PFOSA		MeFOSAA	EiFOSAA	FHEA	FOEA	FDEA
Food in the United States																					
Fruits and vegetables	US	-	-	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	-	-	-	-	-	-	-	-	-	-	-	FDA (2018)

Studies done so far indicate that tree fruits are less likely to have PFAS at levels of concern than animal products and many other food types. But it is too early to reach conclusions. As noted in the EPA report:

“Comparisons across studies should be viewed with caution as different studies can use different sampling techniques and analytical methods.”

“PFAS occurrence data depend on which PFAS are analyzed in a study. Long-chain PFAS are reported to bioaccumulate in seafood, meat, and the roots of vegetables (Ghisi et al., 2019; Herzke et al., 2013; Vestergren et al., 2013; Houde et al., 2011), while short-chain PFAS are reported to accumulate in leafy vegetables and fruits (Ghisi et al., 2019; Herzke et al., 2013).”

“For emerging PFAS, hazard/toxicity data to support quantitative risk assessments may be limited or may not exist.”

Additional Research Needs: “Expansion of PFAS analytical methods to identify more than the 30–50 compounds under the current methods, given that there are more than 4,700 individual PFAS documented.”

Under FIFRA, registered pesticides must be reviewed by EPA at least every 15 years to determine whether they continue to meet, or do not meet, the FIFRA standard for registration (U.S. EPA, 2021m).

Closing Words

“If a ripe apple could tell its own story ... it would be the story of the sunshine that smiled upon it, of the winds that whispered to it, of the birds that sang around it, of the storms that visited it, and of the motherly tree that held it and fed it until its petals were unfolded and its form developed.”

~ Lucy Larcom, 1824 – 1893, Beverly, MA

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