



Maine Tree Fruit Newsletter

Friday, May 10, 2022 Vol 29:9

Apple bud stages

The table shows observed and projected McIntosh and Cortland apple bud stages at Highmoor Farm in Monmouth. Honeycrisp, Gala, and Golden Delicious bud stages have been a couple of days behind. But the warm temperatures coming later this week may bring all cultivars into King Bloom about the same time.

Horticulture notes from Highmoor Farm –

(written Friday, May 6. I apologize for not getting these sent sooner.)

Highmoor Farm Bud Stages

McIntosh – approaching Tight Cluster

Honeycrisp – Half-inch Green

Peaches – Green Bud, the stage before pink

Plums and Cherries nearing first Bloom

Apricots – in Bloom



















Winter bud survival
















Peach buds in most orchards have already been damaged by cold temperatures. The large peach orchard at Highmoor Farm has about 10% survival and the smaller orchard about 50%.

Similar rates of survival have been seen in the orchards visited this winter and spring. The cold snap in January killed buds in orchards at lower elevations.

Other types of fruit trees appear to have good winter survival.

From: “Critical Spring Temperatures for Tree Fruit Bud Development Stages - Fruit & Nuts”, Mark Longstroth, Michigan State University.

Pome Fruit (Apples and Pears)									
Apples									
Apples	Silver tip	Green Tip	Half inch green	Tight Cluster	First Pink	Full Pink	First Bloom	Full Bloom	Post Bloom
Old temp	16	16	22	27	27	28	28	29	29
10% kill	15	18	23	27	28	28	28	28	28
90% kill	2	10	15	21	24	25	25	25	25
Pears									
Pears	Bud scales separating	Blossom buds exposed	No name	Tight cluster	First White	Full White	First Bloom	Full Bloom	Post Bloom
Old temp	18	23	No data	24	28	29	29	29	30
10% kill	15	20	No data	24	25	26	27	28	28
90% kill	0	6	No data	15	19	22	23	24	24

Peaches								
Peaches	Swollen Bud	Calyx Green	Calyx Red	First Pink	First Bloom	Full Bloom	Post Bloom	
Old temp	23	--	--	25	--	27	30	
10% kill	18	21	23	25	26	27	28	
90% kill	1	5	9	15	21	24	25	
European Plums								
European Plums	First Swelling	Side White	Tip Green	Tight Cluster	First White	First Bloom	Full Bloom	Post Bloom
Old temp	--	--	--	--	23	27	27	30
10% kill	14	17	20	24	26	27	28	28
90% kill	0	3	7	16	22	23	23	23

Hardiness in flower buds can be altered by temperatures in the previous several days, so hardiness levels at each bud stage are not exact. The weather has been cool, so hardiness should be good at this time. After the upcoming warm spell, the opposite could be true. Orchards north of Bangor should still be able to tolerate freezing at this stage.

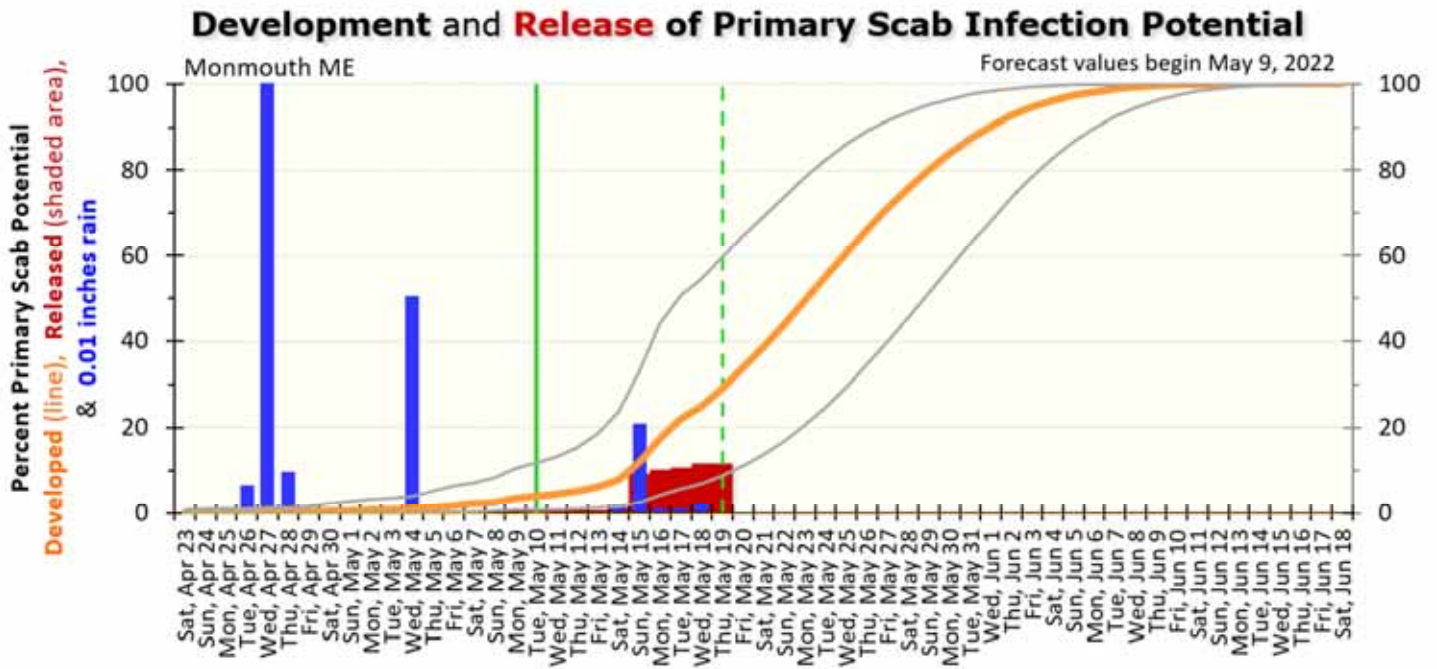
If borderline freezing temperatures are forecast, using irrigation to wet the soil can provide 1 or 2 degrees F protection. The soil should be wet the day before overnight low temperatures are expected. Wetter soil has a larger thermal mass to hold daytime temperature longer into the nighttime- early morning hours of minimum temperature. Wetter soil can also increase humidity in the air around the trees which can provide a small amount of protection against plunging temperature vs. dryer air.

Apple Scab

Conditions have not been conducive to major apple scab infections, but that is about to change with the warming weather, foliar expansion, and apple scab ascospore maturation.

Scab degree day accumulation stops if there is < 1/8th inch rain for 7 days, and resumes when 7 day rain total exceeds 1/8th inch.					
Weather data for Monmouth ME. Forecast values begin May 9, 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	57		1%	8%
Tue, April 26	0.06	57		1%	8%
Wed, April 27	1.07	67		2%	9%
Thu, April 28	0.10	77		2%	10%
Fri, April 29	0	86		2%	11%
Sat, April 30	0	100		3%	13%
Sun, May 1	0	119		3%	15%
Mon, May 2	0	134		4%	17%
Tue, May 3	0	134		4%	17%
Wed, May 4	0.51	148	1%	5%	19%
Thu, May 5	0	170	1%	6%	23%
Fri, May 6	0	189	1%	7%	26%
Sat, May 7	0	203	1%	8%	29%
Sun, May 8	0	218	2%	10%	31%
Mon, May 9	0	238	2%	12%	35%
Tue, May 10	0	238	2%	12%	35%
Wed, May 11	0	238	2%	12%	35%
Thu, May 12	0	238	2%	12%	35%
Fri, May 13	0	238	2%	12%	35%
Sat, May 14	0.02	238	2%	12%	35%
Sun, May 15	0.21	263	3%	15%	41%
Mon, May 16	0.01	290	4%	18%	47%
Tue, May 17	0.01	318	6%	23%	53%
Wed, May 18	0.02	336	7%	26%	57%

Factoring in spore maturity plus tissue area, sensitivity, precipitation amount and temperature provides a better estimate of apple scab infection risk than ascospore maturity alone. With temperature-driven, rapid growth, the closer a protective fungicide application is to the start of the rain the better.



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.

If the dry conditions continue, as happened last year, ascospore maturity is expected to slow or stop even with warm temperatures. In a latest case scenario, trees could reach Petal Fall with only about 10-15% of the season's total apple scab infection potential release, leaving the rest to occur as soon as soaking rains occur after Petal Fall. That scenario increases direct infection risk to young fruit. Maximum protection would be needed for the late infection periods in that scenario.

Rain forecasting after a hot weather spell is notoriously fickle. Expect the yes/no forecast, and amount of rain to change as the forecast evolves. The infection risk shown in the chart reflects very low amounts of rain in the current Monmouth forecast. With daily rain above 0.5 inch, those red bars would be twice as high. In a low-scab orchard, 10% of the seasonal infection risk is a rough guess for when protection is really needed. So even with light showers, the upcoming weather will bring a significant infection period.

The fickleness of spotty rain showers following hot weather is what makes fire blight forecasting such a nail biter.

The heat in this case is coming before Full bloom, and even before King Bloom. While the accumulated heat units at Highmoor Farm will be enough to trigger warnings from the fire blight models, the missing factor is that by occurring so early in the bloom period, there will not have been time for fire blight bacteria, if present in the orchard, to be carried into open blossoms and begin multiplying. Thus the models tend to overestimate fire blight risk in the first few days after King Bloom.

A blossom blight infection period at the very beginning of bloom has much lower risk than the more typical fire blight infection events at or after 95% Petal fall that cause infections on the tail end of the main bloom cohort and especially on late straggler blossoms.

If your orchard had active fire blight last year, **any** blossom blight infection period deserves attention. But the situation is less clear for an orchard that had no fire blight last year. In that situation, the risk Saturday – Monday is likely less than indicated by the chart below. Every year fire blight seems to present another version of difficult, nebulous interpretation. Usually it is infection conditions that occur so late that the question is “How many open blossoms are still available for infection?”. This year the issue is “How many of those heat units really count towards bacterial multiplication?”

Honeycrisp and other cultivars on which blossoms open a day or two later would have less infection risk than shown.

Cultivar susceptibility is another issue. The following table is from the 2022 Michigan State University Extension Fruit Management Guide. <https://shop.msu.edu/products/bulletin-e0154> (well worth \$35).

Data are from W.W. Shane. Ratings from a single event can sometimes be skewed by the relative blossom timing of different cultivars. However the infection conditions in SW Michigan in 2000 may have been severe over enough days to dilute any such skewing.

Severity of fire blight on apple trees on M7a or M7 EMLA rootstock in southwest Michigan following a severe epidemic in 2000.

The rating scale is **6 = severe, 1 = low**, Averaged from at least three trees of each cultivar.

Cultivar	Severity Score	Cultivar	Severity Score	Cultivar	Severity Score
Gingergold	6.0	McIntosh strains	3.3	Enterprise	2.0

Pink Lady	6.0	Liberty	3.0	Royal Court	2.0
York strains	6.0	Macoun	3.0	Honeycrisp	2.0
Fortune	5.8	Jonagold strains	2.9	Empire strains	2.0
Paulared	5.0	Cameo	2.8	Zestar	1.7
Jonathan strains	5.0	Pristine	2.8	Red Del. strains	1.5
Suncrisp	4.5	Jonamac	2.7	Nova Spy	1.5
Gala strains	4.4	Braeburn strains	2.7	Mollies Del.	1.5
Rome strains	4.2	Winesap/Staymen str.	2.6	Williams Pride	1.5
Melrouge	4.0	Corodel	2.5	Nova Mac	1.3
Arlet	4.0	Acey Mac	2.5		
Golden Del. str.	3.4	Pinova	2.0		

A two-year study done in Washington State evaluated fire blight shoot infection length on 94 cultivars grown on M.111 rootstock. Multiple shoots per tree were inoculated. This study reflects response to shoot blight, not susceptibility to blossom blight. Most cultivars had a susceptible response to fire blight in one or both of the test years. Cultivar responses were relatively consistent between years.

The classification scheme was based on four reference cultivars.

HS = Highly susceptible (Jonathan),
MS = Moderately susceptible (McIntosh),
I = Intermediate,
mr = Moderately resistant (Delicious)
hr = Highly resistant (Russian seedling)

Data in the table below are from

Kostick, S.A., Norelli, J.L., & Evans, K.M. 2019. Novel metrics to classify fire blight resistance of 94 apple cultivars. *Plant Pathology* 68, 985-996. <https://doi.org/10.1111/ppa.13012>

Cultivar	Classification	Cultivar	Classification	Cultivar	Classification
Winter Banana	HS	Pink Lady	MS, I	Fuji	mr
Ginger Gold	HS	Honeycrisp	MS, mr	Golden Del.	mr
Jonathan	HS	Sunrise Magic	MS, mr	Red Delicious	mr
Gala	HS, MS	Rome Beauty	MS, mr	Aurora Gold Gala	mr
Granny Smith	HS, MS	McIntosh	MS, mr	Empire	mr
Spartan	HS, mr	Jonagold	MS, mr	Tsugaru	mr, hr
Pinova	HS, mr	Splendour	I, mr	Russ. Seed. 12740-7a	mr, hr
Zestar	MS, I	Cosmic Crisp	mr	Enterprise	mr, hr

Single value = same classification both years.

If classification differed between years, the most sensitive rating is show first.

Pink is the time to begin preemptive protection against potential fire blight shoot blight arising from overwintered cankers and from new blossom blight infections this year. The following table and summary slide is from a webinar in November 2020 by Dr. Kari Peter of Penn State University.

Fire blight: Management options for Bloom through early/late June (severe disease pressure years)

➤ **Monitor rainfall post-bloom = tree growth**

Growth stage	Option 1 (young)	Option 2 (young)	Option 2 (older trees)
Pink (~3 – 5 d from bloom)	+ Actigard (1 – 2 oz/A) to fungicide	+ Actigard (1 – 2 oz/A) to fungicide	+ Apogee/Kudos 2-6 oz/A to fungicide
10-20% Bloom	Serenade Opti 20 oz/A or Serenade ASO 4 qt/A or Double Nickel 2 qt/A + Actigard 1 - 2 oz/A	Serenade Opti 20 oz/A or Serenade ASO 4 qt/A or Double Nickel 2 qt/A + Actigard 1 - 2 oz/A	Serenade Opti 20 oz/A or Serenade ASO 4 qt/A or Double Nickel 2 qt/A + Apogee/Kudos 2-6 oz/A
48 hours later	Streptomycin 1.5 lb/A (Option: + Actigard 1 - 2 oz/A)	Streptomycin 1.5 lb/A (Option: + Apogee/Kudos 2-4 oz/A)	Streptomycin 1.5 lb/A
Full Bloom	Streptomycin 1.5 lb/A + Actigard 2 oz/A	Streptomycin 1.5 lb/A + Actigard 2 oz/A	Streptomycin 1.5 lb/A + Apogee/Kudos 2-6 oz/A
5-7 days later	Cueva 2 qt/A	Cueva 2 qt/A	Apogee/Kudos 2-6 oz/A + Regalia 2 qt/A
7 days later	Cueva 2 qt/A	Apogee/Kudos 2-4 oz/A + Regalia 2 qt/A	(Option: Cueva 2 qt/A)
7 days later	Cueva 2 qt/A		Apogee/Kudos 2-6 oz/A + Regalia 2 qt/A

“Preventing Fire Blight Mayhem” take home messages



- Don't have strep resistance: USE STREP = it's the best
 - Limit to 4 x per year (save 1 spray for potential hail event)
 - If protracted bloom and want to switch: Use oxytetracycline
- Actigard: It's worth the cost, it's worth the investment
 - Start at pink = it takes 48 hours for it to turn on the defenses
 - Repeat applications; during blooms = every couple of days; no more than 7-10 day intervals; use at petal fall
 - 1-2 oz/A = repeated applications = builds signal = packs a bigger punch
- Apogee/Kudos
 - Takes 10-14 days to kick in
 - Start early pink or bloom: 2 – 12 oz/A, depending on size of tree
 - Will need multiple applications
 - Aim every ~10 – 14 days
- Fire blight present?
 - Cut out fire blight, “paint” cut with Actigard solution
 - Follow up with Actigard foliar applications
 - Be careful of pruning too much = will make situation worse
- Need to manipulate trees?
 - Treat trees first! = Copper is ideal

Early season caterpillars

Tight cluster to Pink is the best time to monitor and if needed, control, prebloom caterpillar apple and pear bud feeders. In most orchards in most years, a prebloom insecticide to control these pest species is not needed. Because the damage is done before fruit development, the result of feeding by these species is missing fruit vs. damaged fruit at harvest. A little of prebloom caterpillar feeding can be written off as “free thinning”, but if numerous they can substantially reduce yield. A rough threshold for early season cluster feeders is 3% of clusters infested.

Winter moth:



Left & above - Winter moth larvae. Photo credits: Univ. Rhode Island

The earliest apple bud feeders are Winter moth (WM) and Green Pug Moth (GPM). WM larvae are pale green, with a single yellowish-white stripe along each side of the body. They move in an arching “inch-worm” motion. WM larvae continue feeding through Petal Fall and can damage young fruit. WM has a wide host range and can build up to high numbers, though its range in Maine seems to be largely restricted to southern coast.



Green pug moth larva at 1cm (0.4”). Photo: R. Brzozowski

Green pug moth larvae also feed on flower clusters. Geographically, like WM they usually occur near the coast. But not always. Locally, they are more common near woods borders. They are rarely abundant enough to require control, and because they pupate before fruit set, they only cause bud thinning and not fruit damage that persists until harvest. More details on GPM are in the January 15, 2022 newsletter. While rarely a pest in Maine, there was a case of serious crop reduction in a non-coastal Maine orchard due to GPM feeding in 2021.

Green Fruitworm (GFW) eggs are laid on opening buds early larvae feeding during bloom and late stage larvae feeding on young fruit either causing fruit to drop or if they hand on, to have severe deformity. GFW larvae are similar to WM, but larger, reaching 1.5 inches prior to pupation vs. 1.0 inch for W. GFW tend to curl into a ball when disturbed and do not move with an inchworm motion.



Above green fruitworm larva Photo: Utah State Univ.



Right: GFW feeding damage on young apples.
Photo: S. Schoof, North Carolina State Univ.

Gypsy moth, Eastern tent caterpillar, Forest tent caterpillar, and Browntail moth caterpillars may also be found feeding during bloom.

Obliquebanded leafroller (OBLR) overwinter as young larvae that become active around Tight Cluster and feed until about 3 weeks after Petal Fall. OBLR larvae are yellowish to green with brown to black head capsules. Unless extremely numerous, control at Petal Fall should be sufficient.

Insecticide application at late Tight Cluster – Early Pink allows spray coverage to reach the larvae directly and to coat tissues being fed upon. Some foliar damage will already have occurred by early Pink, but most of the feeding is done by the late stage larvae on flower clusters during bloom, and for some species on young fruit in the first weeks after Petal Fall.

There are many effective insecticide options for these caterpillars: insect growth regulators (Confirm, Intrepid), spinosyns (Delegate, Entrust), diamides (Altacor, Exirel, Verdepryn), Bt w/ or w/o Spear-Lep (Dipel, Javelin, Xentari etc.), pyrethroids (Asana, Baythroid, Danitol, Declare, Delta Gold, Lambda Cy, Mustang Maxx, Perm-Up, Pounce, Pro-axis, Tombstone, Warrior etc.), and pyrethroid combinations (Besiege, Endigo, Gladiator, Leverage, Minecto Pro, Voliam Flexi).

Bt has the advantage of being safe enough on bees to use during bloom. For the other insecticides, spraying during bloom, even at night with time enough for residue to dry before morning, is discouraged in order to preserve essential insect pollinators. Bt has the disadvantage of a relatively short residual activity of 5 days at most.

OBLR has a wide host range and can arise from unsprayed brambles, maple and other hardwood trees near the orchard. Early OBLR feeding prior to fruit set is of low consequence. But it is useful to know what the damage looks like as an indicator for more damaging feeding that continues until about 3 weeks after Petal Fall. Feeding after fruit set either causes fruit to drop or to remain on the tree with large deformations that match GFW damage. If such damage is noticed, there is a second control window for the summer generation of OBLR larvae hatch in mid-July and create webbed nests inside fruit clusters which causes feeding gouges on the surface of fruit that introduce rots and leave fruit unsaleable.



Eastern Tent Caterpillar nest.
Photo: Maine For. Serv.



Above – OBLR feeding injury to young apple.
Photo: Ont. Ministry Food & Agric.

The summer generation OBLR larvae are well protected inside fruit cluster webbing, and the egg hatch is spread over a couple of weeks, making control difficult. Reducing clusters to a single fruit helps reduce damage as OBLR prefer to establish feeding sites between abutting fruit. If there was unacceptable amount of OBLR damage the previous season, control at Pink or Petal Fall with an insecticide with a high efficacy rating is more likely to be successful than treating the late July larvae. Intrepid at Petal Fall is said to be especially effective for OBLR control.



Below – Early & late season feeding injury.

Bottom – OBLR feeding web and extensive late season feeding damage. Photos: Ont. Ministry Food & Agric. & G. Koehler



Tarnished plant bug & Mites

Tarnished Plant Bug (TPB) feeding prior to Tight Cluster may cause a fruitlet bud to abort but does not result in lasting damage that shows up at harvest. TPB feeding from Pink to Petal fall may cause a dimple in fruit that lasts to harvest. Whether or not such damage is economically consequential depends on the market. Damage of this type rarely approaches 1%. TPB damage at or after Petal Fall can be addressed by choosing material that is rated effective for TPB control. Even if TPB feeding is causing economic damage is apparent, the economic cost/benefit ratio is skewed because insecticidal control is not thoroughly effective.

White TPB traps provide some insight on TPB activity. On 11 traps set at Green Tip across 3 widely spaced blocks at Highmoor Farm in Monmouth, an average of 0.36 TPB per trap were caught as of Friday May 6 when bud stage was at Tight Cluster on McIntosh and Cortland, and Half Inch or HIG+ on Honeycrisp, Gala, and Golden Delicious. A threshold established decades ago that really should be reevaluated given the changes in tree size, bushels per acre, pesticide cost vs. fruit value, estimated that control was warranted if more than 3-5 TPB per trap were captured by Tight Cluster and 5 – 8 per trap by late Pink. TPB are not active at cool temperatures so trap captures may increase with temperatures this week. And every block is different, so there is not much that can be extrapolated from one location to represent orchards around the state.

Reducing broadleaf weed cover and not during bloom prior to a PF insecticide application may help reduce damage. Knowing what the TPB damage level was the previous harvest is important information to guide management this year.

As for mites, it is too early for Twospotted spider mites to be active on apple foliage, and Apple rust mites are only a problem if late summer populations reach hundreds per leaf. Short of that they serve a supportive role as alternate prey for predators that consume the more significant European Red Mite (ERM). Oil application at GT, HIG, TC or Pink serve to smother overwintered ERM eggs that begin hatching around Tight Cluster. If applying oil after TC the rate should be reduced to 1% to avoid potential phytotoxicity. The lower rate is likely to still be effective because as temperature and metabolic activity rise, it takes less oil to smother the eggs or just hatched nymphs. A good time to assess the ERM situation is counting the percentage of fruit cluster leaves with ERM present in the first 2 weeks after PF. Treatment may be needed if more than 30% of those leaves have living hatched ERM present, or if there is an average of 0.5 ERM per leaf. If needed, the early summer miticides Apollo, Onager and Savey, Zeal, Agri-Mek have the best effect during the first two weeks after PF and can provide season-long control. Other miticides would also be effective, but are best reserved for rescue treatment if needed later.

Thinning

The New England Tree Fruit Management Guide has been updated, but will not be printed this year. Printer friendly sections are available at <https://netreefruit.org/>

From the Guide: **Protone** - a relatively new chemical thinning option for apples and pears:

“ABA is a naturally occurring compound that plays a critical role in regulation of several physiological processes in a plant, especially those related to stress. If a plant is stressed or if it is sprayed with ABA stomata close, resulting in a significant reduction in photosynthesis. This in turn results in a carbon deficit in the plant. In the case with pome fruit, this happens for a long enough period during the time when developing fruit are competing for photosynthate (7-15 mm) fruit abscission will be initiated. Special attention should be paid to the weather conditions that occur especially the three days following application. If the weather is cloudy and or the temperatures are warm to hot, thinning will be favored because these conditions will increase the carbon deficit within the tree. Protone is OMRI organic certified.”

Apples. Label recommendations for the use of Protone® on apples include using 1 to 2 applications from 5-12 mm fruit size. Starting out I would recommend using mid-concentration rates at the 10-12 mm stage. A good nonionic surfactant is recommended for use with this product. In the past we used Regulaid with ABA with good success. This may be used with MaxCel (not NAA) for added thinning.

Protone may cause some leaf yellowing and leaf abscission. The severity of this is cultivar dependent. A small amount of 6-BA (MaxCel) may help reduce leaf yellowing and abscission.

Pears. Protone is cleared for use on pears for thinning. Pears are more sensitive to ABA than are apples. Everything being equal, a greater thinning response may be expected when used on pears. Some leaf abscission and leaf yellowing when used on pear can be seen. Based upon experience with Bartlett pears, 6-BA (MaxCel) was unable to reverse this yellowing and leaf abscission effect when used in conjunction with Protone.

There is another new thinner available, **Accede**, that is labeled for use in VT and CT for thinning apples and peaches during fruit set. It is probably too new for use this season.

Calibration aids & small orchard sprayers

The Spot-On SC-1 nozzle flow rate monitor costs \$165. A 5% error on a \$1,000 acre spray material bill is \$50/acre just for the materials, whereas the dollar value of improved vs. deficient efficacy at pest control, growth regulator, nutrient application could be far more. The SC-1 model is sized for individual gallon per minute rates of up to 1 GPM, which is the best range for most orchard sprayers

<https://innoquestinc.com/product/spoton-sprayer-calibrator-model-sc-1/>

Used (i.e. free) Dairy inflators can be used to isolate flow from a single nozzle and capture it in a milk jug and then poured into a measuring beaker to get a timed flow rate per minute per nozzle. Any nozzle that deviates more than 5% from its same-sized partners should be replaced. If the delivery rate is off, the pattern is also likely to be off.

Dr. Jason Deveau, sprayer technology expert with the Ontario Ministry of Agriculture, and cofounder of Sprayer101.com did a comparison of water sensitive papers for evaluating spray coverage. https://sprayers101.com/3_wsp/

SpotOn Paper performed well. A 50-pack of 1 x 3 inch cards costs about \$25 from various vendors e.g.

<https://gemplers.com/products/spoton-spray-pattern-test-paper?variant=21171941638233>
or <https://www.dultmeier.com/products/search/14878>

The Sprayer101.com site has a video on using water sensitive paper at <https://sprayers101.com/adjust-airblast-1/>

The site also has an article that may interest folks with too many trees to efficiently spray with a backpack sprayer, but not enough orchard to justify paying for a full size airblast sprayer: “**Airblast for small acreage specialty crops**”, <https://sprayers101.com/small-acreage/>

These tow-behind sprayers may be of interest. No endorsement is implied

* NorthStar Tow-Behind Trailer Boom Broadcast and Spot Sprayer - 61-Gallon Capacity, 5.5 GPM, 12V DC.

https://www.amazon.com/dp/B07K4T1W68/ref=sspa_dk_detail_6?psc=1&pd_rd_i=B07K4T1W68&pd_rd_w=MpxLf&pf_rd_p=0c758152-61cd-452f-97a6-17f070f654b8&pd_rd_wg=H3N2U&pf_rd_r=0N7KKFNJMM4H12JGN39G&pd_rd_r=cf7d1f7d-e7ae-4fc5-b684-847f920498f8&s=lawn-garden&spLa=ZW5jcnlwdGVkUXVhbGlmaWVyPUEyRVVTUzUzRIAzNkIHJmVuY3J5cHRIZEIkPUEwNDE5MzA0MUK3WUIWNjJWQTM5SiZlbnNyeXB0ZWRBZEIkPUEwOTMzODgzMjU5RzVLTkhTVTdLJndpZGldE5hbWU9c3BfZGV0YWlsJmFjdGlvbj1ibGlja1JlZGlyZWNOJmRvTm90TG9nQ2xpY2s9dHJlZQ==

* PetraTools Battery Powered 13 Gallon Pushcart Sprayer (Prime), Heavy Duty Commercial Sprayer with Custom Built Cart

https://www.amazon.com/dp/B08BJ11KL4/ref=syn_sd_on-site_desktop_99?psc=1&pd_rd_plhdr=t&spLa=ZW5jcnlwdGVkUXVhbGlmaWVyPUEyRVVTUzUzRIAzNkIHJmVuY3J5cHRIZEIkPUEwNDE5MzA0MUK3WUIWNjJWQTM5SiZlbnNyeXB0ZWRBZEIkPUEwOTMzODgzMjU5RzVLTkhTVTdLJndpZGldE5hbWU9c2Rfb25zaXRlX2Rlc2t0b3AmYWN0aW9uPWNsaWNRUmVkaXJlY3QmZG90b3RmM2dDbGljaz10cnVl

Lower price sprayers may share some of the same components, but make sure the pump is strong enough to project water vertically and horizontally far enough for wand spraying dwarf and smaller semi-dwarf sized apple trees. For larger semi-dwarf trees, (e.g. M7 or M111 or Bud118 rootstock) you may need a full sized commercial quality spray pump for effective coverage. But for smaller trees (e.g. M26, M9, G41, B9, G11, G935) one of these units could provide sufficient coverage.

Spear-Lep insecticide

Spear-Lep is a new class of bioinsecticide introduced last year. It is based on a naturally occurring peptide that is highly specific for lepidopteran larvae with very low risk to beneficials. Being from a new mode of action (IRAC group 32) gives it utility for resistance management as alternate for other chemical groups.

Spear-Lep requires tank mix with a Bt product (*Bacillus thuringiensis* toxin). The Bt product disrupts the gut wall of caterpillars that feed upon treated tissue. This allows the peptide active ingredient in Spear-Lep to act as a neurotoxin (nicotinic acetylcholine receptor disruptor). Spear-Lep has a 0 day PHI a 4-hour REI, and is exempt from maximum residue level criteria. It is said to have low risk of phytotoxicity. OMRI/organic certification does not appear on the label but based on its active ingredients it seems like it could be eligible. However, other formulation ingredients can prevent a product being OMRI certified.

As a Bt dependent insecticide, Spear Lep is likely to only be effective against foliage feeding caterpillars like Obliquebanded leafroller (OBLR) and other leafrollers, Green fruitworm, Winter moth, Green pug moth, Gypsy moth and other early season caterpillars. Codling moth (CM) larvae are also Lepidopteran (Moth and Butterfly) caterpillars, but because they only take one or two bites before entering an apple (and may spit those bites out without ingesting them), I would expect less efficacy against CM than OBLR.

The required combination with a Bt precursor means that Spear-Lep will be more effective on small, early stage larvae than on late stage larvae nearing pupation, a point which is made on the label. It does not have any systemic or translaminar activity, so requires good surface coverage. Combination with a non-ionic spreader/sticker is recommended. That could introduce a complication when also applying captan for which some spreader/stickers can increase phytotoxicity risk.

Maine State Pom. Soc. Summer Meeting

The Maine State Pomological Society Summer meeting is scheduled for the afternoon of Wednesday, July 27 at Highmoor Farm in conjunction with Highmoor Farm field day and the summer meeting of the Maine Vegetable and Small Fruit Growers Association. Details coming soon.

PFAS update

1) UMaine Cooperative Extension has a new set of short factsheets on “Understanding PFAS and Your Home Garden.” <https://extension.umaine.edu/gardening/understanding-pfas-and-your-home-garden/> Each factsheet provides a short direct answer to a question about PFAS and growing food, including how to conduct water and soil tests.

2) The Maine legislature passed a new law which takes effect August 8. The law prohibits distribution of any pesticide that has been contaminated by PFAS, and prohibits distributing a pesticide that contains intentionally added PFAS beginning January 1, 2030. The meaning of “contamination” is critical to distinguishing between a small amount of PFAS leachate from a container invoking an immediate prohibition, versus distribution of products with a high concentration of an intentionally added PFAS active ingredient being allowed through 2029. It is not clear how such contamination will be monitored.

3) When choosing whether to use products on the Maine PFAS-pesticide list, one consideration is the PFAS-related headlines that orchard customers are seeing and hearing in the news. The US EPA, Maine Dept. of Environmental Protection, Maine Dept. of Agriculture, Conservation, and Forestry, and Maine Center for Disease Control are all actively engaged in delineating the scope and significance of PFAS contamination, with food and agriculture being a focus area. Their timelines for achieving milestones suggests that announcements and press coverage are likely to continue throughout the summer and into the fall.

Other states are watching the Maine situation closely. Increased attention to PFAS issues in other states is another source of future headlines. Consumer Reports and The Guardian have each had feature stories about PFAS. The PFAS issue is not a “Maine thing” or a temporary “issue of the month”. It will almost certainly continue to be in the news through the coming harvest season and beyond. The list of PFAS-related article titles in the Bangor Daily News in the last few months shown below is partial, there were many other PFAS headlines not shown.

Partial list of recent PFAS articles in the Bangor Daily News

- “ Maine House votes to phase out pesticides containing ‘forever chemicals’ “
- “ EPA Unveils Strategy to Regulate Toxic ‘Forever Chemicals’ “
- “ If You’re Overwhelmed by Maine’s Murky PFAS Crisis, You’re Not Alone ”
- “ Lawsuit Seeks Money to Test Somerset and Kennebec Residents for Diseases Caused by ‘Forever Chemicals’ “
- “ No One Knows How Many ‘Forever Chemicals’ Could Be in Maine’s Organic Foods ”
- “ Potatoes may be safer from PFAS than other crops “
- “ Maine’s ‘Forever Chemicals’ Problem Has Now Spread to Chicken Eggs ”
- “ What Maine Is Doing to Protect the Food Supply from ‘Forever Chemicals’ “
- “ Maine May Have to Spend Tens of Millions Per Year to Fight ‘Forever Chemicals’ “
- “ He hunted to feed his family. Now he fears ‘forever chemicals’ have sickened them. ”
- “ More Maine fish would be dangerous to eat under new PFAS safety standard “
- “ Maine Lowers the Acceptable Level of ‘Forever Chemicals’ in Drinking Water ”

“ Forever chemicals ruined his farm. It took years for Maine to see a bigger problem. “
“ Maine farmers could face financial ruin amid ‘forever chemical’ crisis
“ Lawmakers need to help farmers deal with the devastation of PFAS contamination “
“ What You Need To Know About ‘Forever Chemicals’ in Maine’s Soil ”

Closing Words

"It was the best of times,
it was the worst of times,
it was the age of wisdom,
it was the age of foolishness,
it was the epoch of belief,
it was the epoch of incredulity,
it was the season of Light,
it was the season of Darkness,
it was the spring of hope,
it was the winter of despair,
we had everything before us, we had nothing before us,
we were all going direct to Heaven, we were all going direct the other way,
-- in short,
the period was so far like the present period that some of its noisiest authorities insisted on its being received, for good or for evil, in the superlative degree of comparison only."

~ Charles Dickens, A Tale of Two Cities, 1859

[Glen W. Koehler](#)

Associate Scientist IPM

Email: glen.koehler@maine.edu

Voice: 207-581-3882 (within Maine: 800-287-0279)

Pest Management Office, 491 College Avenue

Orono, ME 04473-1295

<http://pmo.umext.maine.edu/apple/>



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[Dr. Renae Moran](#)

Extension Tree Fruit Specialist

Email: rmoran@maine.edu

Voice: 207-933-2100 ext. 105

Highmoor Farm Ag. Exp. Station, P.O. Box 179

Monmouth ME 04259-0179

<http://extension.umaine.edu/fruit/>