



## Maine Tree Fruit Newsletter

Thursday, May 24, 2018 Vol 25:6

### Fire blight!

**The Cougarblight model forecast shows High fire blight blossom infection risk on early Saturday morning through Monday, May 26-28!**

**Weather forecasts for this weekend have warmed up. The chance for rain is hovering around 50% for each day on Saturday, Sunday and Monday.**

Note that the daily ratings for fire blight infection are from 8am to 8am the following morning. Thus, a rain that starts on Saturday at 6am will be reflected in the rating for Friday. Cougarblight model shows high blossom infection for any rain that arrives Friday night through Monday.

Rain forecasts are frustrating during fire blight weather because the requirement for hot weather brings with it iffy "in and out of the forecast" precipitation forecast for light showers. A 50% chance of precipitation forecast means that in previous situations with current conditions, in half the cases it rained and in the other half it did not. If you spray streptomycin and it turns out it does not rain during a period with 50% precip probability, you might think you wasted your spray investment. But in this case, I don't think so.

If there is a 50% chance of rain on Saturday, Sunday AND Monday, then your chance of getting through all three days with no rain is  $0.5 \times 0.5 \times 0.5 = 12\%$ . In other words, with three days in a row of iffy forecast for showers, there is probably going to be rain at some point.

It only requires only a minimal amount of rain to drive a fire blight infection, just enough to carry bacteria from the flower pistils down into the nectary. There was a case a few years ago where the amount of rain that drove an infection period was so light it did not even register on a tipping bucket rain gauge. A heavy dew can potentially drive a blossom blight infection.

Which always lead to the question, "Does spray water provide enough water to drive a fire blight infection?" The best available answer is that if the spray is applied during a dew event, it could provide just enough more water to push the amount over the threshold and drive blossom infections. Conversely, if spray is applied during dry conditions, i.e. no dew present, then the amount of water added by airblast spray coverage is not enough to drive fire blight infection. That is especially true if the water being applied contains streptomycin!

The cumulative heat units on Friday through Monday is enough to create High, Extreme, or Exceptional! Cougarblight model risk levels at most Maine locations including Fairfield – Skowhegan – Thorndike – Newport – Levant. Those and other locations north of Augusta are not rated as warm enough for fire blight blossom infection by the Eastern Fire Blight model. I have more faith in the Cougarblight model, the one that is showing high risk with any rain on Friday through Monday.

Just as the fire blight bacterium functions differently than the apple scab fungus, so does the bactericide streptomycin function differently than scab fungicides. Streptomycin application protects flowers that are open at time of application. It does not really provide forward protection, but any flower that receives streptomycin dose inside the flower presumably has its bacterial population of fire blight bacteria decimated, and thus requires another two-four days of heat unit accumulation for new bacterial reproduction to boost bacterial density to the point that the bacteria can overcome plant defenses. However, by that time, the flower has probably lost its petals and has ceased to be susceptible. So in that sense, a strep application does prevent fire blight for the next few days.

Streptomycin application requires good coverage to carry enough of the antibiotic INTO flowers. Every row spraying instead of alternate row, and spraying at less than 6X concentration are recommended. Full rate application based on 300 gallons per acre Tree Row Volume is recommended even if trees are smaller. That means 1.5 lbs. per acre for Agri-mycin, Firewall, Streptrol streptomycin products. There is no known streptomycin resistant fire blight in Maine, so there is no need to resort to kasugamycin, which is less effective and more expensive. Streptomycin alternatives like Cueva, Double Nickel, Mycoshield, and Serenade are not as effective as streptomycin, but do provide some protection. Their role is primarily as rotation modes of action where multiple fire blight sprays are made during bloom. But that does not apply to Maine. Repeated use of streptomycin during bloom has not been implicated as a cause of strep resistance. Resistance is caused by Postbloom use of streptomycin.

The standard recommendation used to be to include a penetrant like Regulaid or horticultural oil with a streptomycin application. But with current practice of applying fungicide, insecticide, thinner, and nutrients either in the same tankmix or shortly before or after a streptomycin application, Cornell University now recommends against adding a penetrant to a streptomycin application.

Trees less than six years old are more susceptible to fire blight than older trees. Trees on M29 and M9 are more susceptible. Cultivars vary in their susceptibility, with Honeycrisp, Gala and other high value cultivars with high susceptibility. Young trees that develop late bloom should have blossoms removed or be treated to prevent blossom blight. Fire blight problems in orchards start two ways. One is importation of infected trees. The other and more common channel is blossom blight. Blossom blight on late blooming young trees can be devastating to the extent of tearing out the trees and starting over.

Apogee application to reduce shoot growth will help to prevent secondary spread of shoot blight if blossom blight does occur, but does not reduce blossom infection risk.

Fire blight weather typically arrives right at the end of main bloom period. That raises the question of how many blossoms does it take per tree to make a streptomycin application worthwhile. One answer is, "How many fire blight strikes per tree would make you wish you had prevented them?" For most growers, that threshold is pretty low. Once fire blight gets started, it can be an expensive and time-consuming sanitation process to beat back down.

Streptomycin application is best made just before an infection period, but with so few new flowers opening at this point, and with temperatures dropping after Tuesday May 29, a single application on Thursday night or Friday will probably be late enough suffice for the rest of bloom. Application BEFORE infection is very much preferable to after a fire blight infection period. While the commonly stated rule is that streptomycin application is effective up to 24 hours after infection, that 24 hours starts with the beginning of the wetting event, and efficacy probably falls over sharply after the first 12 hours before becoming of little value at and beyond 24 hours.

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 15, then blossom blight would be noticeable by June 2, and shoot blight by June 13.

<b>Open blossom dates for common apple cultivars.</b> "Date" is from 8am to 8am the next day, not midnight to midnight.	<b>Cumulative Heat Units</b> (single day units) <b>Inches Rain, &amp; Leaf Wet Hours</b> 8am to 8am next day	<b>I - No active FB within one mile of the orchard in last two years</b>	<b>II - FB active within one mile of orchard in last two years, but not this year</b>	<b>III - Fire blight currently active within one mile of orchard.</b>
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Limerick

<b>McIntosh 100% Petal Fall on Fri, May 25</b>	397 HU (306) 0.02", 1 hrs	Caution	<b>EXTREME!</b>	<b>EXCEPTIONAL!</b>
<b>Sat, May 26</b>	422 HU (34) 0.12", 24 hrs	Caution	<b>EXTREME!</b>	<b>EXCEPTIONAL!</b>
<b>Late Cultivar Petal Fall on Sun, May 27</b>	360 HU (5) 0.28", 24 hrs	Caution	<b>EXTREME!</b>	<b>EXCEPTIONAL!</b>
<b>Mon, May 28</b>	353 HU (7) 0.36", 24 hrs	Caution	<b>EXTREME!</b>	<b>EXCEPTIONAL!</b>

New Gloucester

<b>Fri, May 25</b>	368 HU (296) 0.02", 2 hrs	Caution	<b>EXTREME!</b>	<b>EXCEPTIONAL!</b>
<b>McIntosh 100% Petal Fall on Sat, May 26</b>	377 HU (19) 0.12", 24 hrs	Caution	<b>EXTREME!</b>	<b>EXCEPTIONAL!</b>
<b>Sun, May 27</b>	331 HU (5) 0.23", 24 hrs	Caution	<b>HIGH</b>	<b>EXCEPTIONAL!</b>
<b>Mon, May 28</b>	327 HU (6) 0.38", 24 hrs	Caution	<b>HIGH</b>	<b>EXCEPTIONAL!</b>

Auburn

<b>McIntosh 95% Petal Fall on Fri, May 25</b>	352 HU (291) 0.03", 3 hrs	Caution	<b>EXTREME!</b>	<b>EXCEPTIONAL!</b>
<b>McIntosh 100% Petal Fall on Sat, May 26</b>	358 HU (16) 0.11", 24 hrs	Caution	<b>EXTREME!</b>	<b>EXCEPTIONAL!</b>
<b>Sun, May 27</b>	321 HU (5) 0.23", 22 hrs	Caution	<b>HIGH</b>	<b>EXCEPTIONAL!</b>
<b>Mon, May 28</b>	317 HU (6) 0.36", 24 hrs	Caution	<b>HIGH</b>	<b>EXCEPTIONAL!</b>

Vassalboro

<b>McIntosh 95% Petal Fall on Fri, May 25</b>	331 HU (274) 0.04", 4 hrs	Caution	<b>HIGH</b>	<b>EXCEPTIONAL!</b>
<b>Sat, May 26</b>	329 HU (13) 0.08", 24 hrs	Caution	<b>HIGH</b>	<b>EXCEPTIONAL!</b>
<b>Sun, May 27</b>	300 HU (5) 0.18", 9 hrs	Caution	<b>HIGH</b>	<b>EXCEPTIONAL!</b>
<b>Mon, May 28</b>	297 HU (5) 0.48", 24 hrs	Caution	<b>HIGH</b>	<b>EXTREME!</b>

Fairfield

<b>McIntosh 95% Petal Fall on Fri, May 25</b>	322 HU (268) 0.05", 5 hrs	Caution	<b>HIGH</b>	<b>EXCEPTIONAL!</b>
<b>McIntosh 100% Petal Fall on Sat, May 26</b>	317 HU (13) 0.07", 23 hrs	Caution	<b>HIGH</b>	<b>EXCEPTIONAL!</b>
<b>Sun, May 27</b>	295 HU (5) 0.17", 8 hrs	Caution	<b>HIGH</b>	<b>EXTREME!</b>
<b>Mon, May 28</b>	291 HU (5) 0.48", 24 hrs	Caution	<b>HIGH</b>	<b>EXTREME!</b>

## Apple Scab Update

Apple trees are at peak apple scab infection risk for the next few rains. Except for brief nighttime showers that dry off before dawn, if apple foliage is wet then there is apple scab infection potential. And some ascospores will release at night so in high pressure situations, even night showers that keep leaves wet for more than 6 hours bring some infection risk.

Even orchards that had no detectable apple scab infections last year still have enough inoculum to cause infections at this time because of ascospores in the air from unsprayed apple trees in the woods, along roads, in backyards etc.

Even in southern Maine, more than half of the season's total primary scab infection potential has yet to be released. In the New Gloucester and Bangor areas, 70-75% of primary scab infection potential has yet to be released. Scab season is concentrated into the next few rains. Be ready for it.

Controlling primary scab is key. If primary scab infections are allowed to occur, each lesion provides thousands of secondary spores for subsequent infections. And those spores can land on fruit, which is where the real damage happens.

This is the time to use the best available fungicide tools you have. That includes captan or mancozeb/Polyram or "cptozeb" (informal name for a combination of captan and mancozeb) combined with a DMI (Inspire Super, Indar, Rally, Rhyme, Topguard), SDHI (Aprovia, Fontelis, Luna Tranquility/Sensation, Merivon, Sercadis) or a strobilurin (aka QoI) (Flint, Pristine, Sovran). Captan and mancozeb are very effective protectant fungicides, but they do only provide surface residue, and they have limited post-infection potential.

Captan and mancozeb do provide some post-application redistribution to cover spots not directly contacted by a spray droplet. Captan has better redistribution capability than mancozeb in this regard. But mancozeb has better rain fastness, the ability to resist being washed off by rain. By combining those two protectants into a mix ("cptozeb"), you get some of both. In addition, the combination may be better than the sum of the parts because a half dose of fungicide is thought to provide more than a half the amount of protection. Thus, two half doses may be better than a single full dose.

Topsin M is usually considered a contact-protectant, but I have one source that says it has the ability to redistribute through plant tissue to protect new growth (acropetal movement). Topsin is usually reserved for summer duty against sooty blotch – flyspeck complex. After mid-June, it is too late to apply an EBDC fungicide (i.e. mancozeb, Polyram) because of their 77-day preharvest interval. Captan is weaker against SBFS than other materials, though it can provide adequate protection with the correct application interval. Strobilurins (Flint, Sovran, Pristine) are very effective against both scab and SBFS, but there are a limited number of four total strobilurin applications allowed per year. It is best to save that last strobilurin slot for the final spray of the season with Pristine, which is preferred choice for longest residual protection against SBFS from a final fungicide application until harvest.

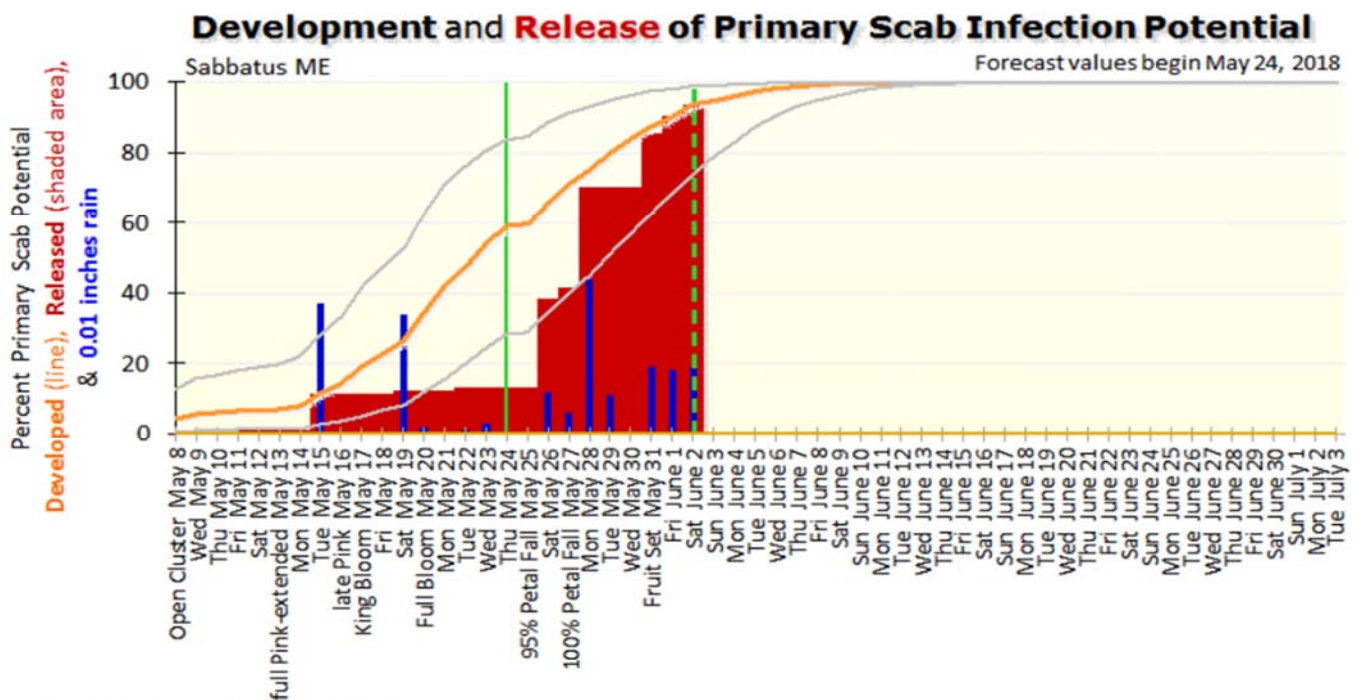
The immediate concern is apple scab. The post-infection materials, (DMI, SDHI, strobilurins) have the advantage of absorbing into foliar tissue and spreading to protect tissue that was not directly covered by a spray droplet (translaminar movement). This also extends to some extent to protecting leaf tissue that was not present at time of application (acropetal movement).

The fungicides that absorb into leaf tissue with some post application internal redistribution are some somewhat less sensitive to incomplete spray droplet coverage than the surface-only contact protectant fungicides (i.e. captan, mancozeb). However, these material still require the best possible spray coverage to get maximal effect. So high volume, low concentrate spray applications from properly calibrated spray equipment, with correct dosage and timing is still essential. And spray pattern.

Beyond gallons per acre of tank mix, it is also important to attend to spray pattern. The pesticide goes where the water goes. Where the water doesn't go, the pesticide doesn't go either. Sprayer travel speed is an important component of getting good coverage. Sitting on a tractor at 2.5 mph may be frustratingly slow, but that is the optimum travel speed for many airblast sprayers. Going 3.5 mph reduces spray time, but the deleterious effect on the spray plume is not worth it in the long run. Traveling too fast causes the spray plume to bend backwards and interferes with canopy penetration.

Absorption into leaf tissue also renders the post-infection materials less susceptible to rain removal. And of course, a main feature of the postinfection fungicides is their ability to kill the apple scab fungus AFTER the spores have germinated and penetrated into leaf tissue..., but only for a limited time. Once a new apple scab infection is fully established, the post infection materials cannot control it. In the first 2-4 days (depending on material, temperature, and susceptibility of the local scab population), the post-infection fungicides can stop recently initiated scab fungus growth.

When faced with high apple scab infection pressure, having a combination of coverage and modes of action in place on foliage is the best insurance against infection.



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 with triangle markers = 90% high and low error bar values 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 maroon line unless a warm soaking daytime rain allows full expression of infection potential.

## Apple Fruit Thinning Outlook

In Southern Maine, the long-range forecast indicates little chance for frost. Based on the pollination conditions that were favorable for excessive fruit set, I am recommending an aggressive approach to thinning. High temperature on Friday could cause substantial thinning if thinners are applied tonight or tomorrow morning. If you choose to apply thinner now, use NAA (Fruitone or PoMaxa), at a low rate in combination carbaryl (Sevin), or low rate of BA (Maxcel) with carbaryl.

For variety specific recommendations, consult the Tree Fruit Management Guide at <https://netreefruit.org/apples/plant-growth-regulators/apple-fruit-thinning>

If you use carbaryl, you must wait until trees are out of bloom and bees no longer visit the trees.

Postponing until after Friday day is another option. However, hot weather on Friday will be followed by a cool-down when thinners will be ineffective. When high temperatures remain below 65 °F, chemical thinners are not effective. The next chance for good thinning is expected Tuesday through the rest of the week when warmer temperatures are expected. This will be a better time to apply an aggressive combination of thinners since daytime temperatures will be in the mid to upper 70's. In addition, trees will be past petal fall when thinners become more effective.

Highmoor Farm apples are in full bloom today. Sour cherries and pears are at petal fall. Other stone fruits are past petal fall. There has been no sign of frost damage in our orchards.

## Maine State Pom. Soc. Summer Mtg. & Farm Tour

Mark your calendar. The date for this year's Summer Tour is July 18, at Dole's Orchard in Limington, hosted by Nancy and Earl Bunting.

Jim Schupp will attend from Penn State Univ., and he plans to talk about pruning apples and peaches, and high density systems. David Handley, from Highmoor Farm, will also be there to talk about strawberries, raspberries and other berry fruits.

We also hope to have someone from OESCO attend to talk about labor-saving tools, and someone from the Allagash Brewing Co. to talk about fruit-based brewing. More details later.

## Food Safety Modernization Act & Pets

From Mary Concklin, UConn:

“There has been much discussion around how to deal with customers who bring pets to pick-your-own farms and farmstands/farm markets. This is a particularly important issue with the new FSMA regulations in place. How do you handle service dogs or comfort animals? Wilson Farms in MA developed a sign that spells it out. Thank you to Rick Holmberg for the picture. I contacted Wilson Farms and they have graciously given permission to share this with growers. Particularly important is the Americans with Disability Act definition of service animals versus support animals. “

Follow-up message:

“Check with your local Health Dept. for their rules. The issue with FSMA and pets is contamination of produce from animal feces and urine. Of course we also don't want visitors to the farm to step in it when a pet owner doesn't clean up after their pet.

With regards to service animals, they have been trained not to pee and poop unless told so they are OK in the field.

I have been told that if someone comes to your farm with a pet that has no outward identifier as a service animal and the owner wants to take the animal in to your field, farmstand, farm market, you may ask 2 questions. Those are 'is it a service dog?' and 'what service does it provide?' That is it. You cannot ask for proof. If they say it is a service dog you can't/shouldn't argue with them.”

## Closing Words

“When everything is coming your way, you're in the wrong lane.”

~ Steven Wright

“I'm a great believer in luck, and I find the harder I work the more I have of it.”

~ Thomas Jefferson



Photo: Rick Holmberg, Wilson Farms, MA



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