



Maine Tree Fruit Newsletter

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Apple Scab Update

The rain deficit since Green Tip near the end of April, and has suppressed apple scab infection pressure. Ascospore maturation slows down or stops when the leaves on which the apple scab fungus overwinters get too dry. At Highmoor Farm in Monmouth, the first apple scab infection period of any consequence came with the rain on Tuesday, May 15.

In some locations, there was barely enough rain and duration of leaf wetness for infection to occur. Even where it was a full-scale infection period, a relatively small portion of the season's total ascospores were mature and ready to release. The first wetting event after a prolong dry period may not generate a large spore release, it may take a wetting event to restore the moisture level in overwintered leaves to allow the apple scab fungus to begin maturing spores for a subsequent release.

Even if the May 15 rain was not an impressive infection period, it did provide wetting to kick scab spore maturation back into gear. At this point, only about 17% of the season's spore load has already been released, leaving the remaining 83% to release during upcoming daytime rains.

That next rain is forecast for Saturday night into Sunday morning in the Monmouth area. In Sanford, the rain is forecast to start earlier on Saturday. For locations north of Monmouth, or closer to the coast, the rain start time varies by site. In any case, the forecast has orchards across Maine (with the exception of Presque Isle in the far north) getting the first major scab infection period of the year, with about twice the infection potential of the warm up event on Tuesday May 15.

Lack of rain reduces fungicide wash off and can allow longer interval since the previous protectant fungicide spray application. But in this situation that does not apply. That is because foliage expansion is making tender new tissue available at a rapid rate that outruns the ability of previously applied fungicide to redistribute in a subsequent rain. The next rain event is the beginning of peak scab infection risk for the year. Not the single biggest infection period, but the beginning of high-risk infection periods. Because of the dry weather earlier, scab season will be condensed into a shorter, but more intensive, infection season this year. The final major infection period will likely be a week or more after Petal Fall. So between now and about June 7 (depending on date of first soaking rain after Petal Fall) is peak scab season in the Monmouth area this year.

From Green Tip to late Pink, protectant fungicide protection against primary scab (i.e. ascospore) infection is assumed to be good for 7 days. However, during the rapid foliar growth that occurs from late Pink to Petal Fall, a safer assumption would be 5-6 days.

Using a 7-day rule, for the forecast rain this on Saturday night – Sunday evening, protective spray containing full rate captan or mancozeb applied after Sunday evening May 13 should be fresh enough to prevent new infections. If your coverage consists for half rate captan, mancozeb or Syllit combined with a strobilurin (Flint, Sovran), then you would want to cut that presumed duration of protection by about a third, leaving 5 days. Thus, for a half rate protectant fungicide, protection would need to have been applied since Tuesday evening, May 14 should last through a Saturday-Sunday evening rain.

A safer, though possibly overcautious, assumption of 5 days protection from a full dose protectant during rapid foliar expansion would call for full dose protectant coverage having been applied no earlier than Tuesday evening to last through a Sunday evening rain. Likewise, for a half dose protectant, assuming that its reliable residual efficacy is good for 4 days then calls for application on or after Wednesday evening.

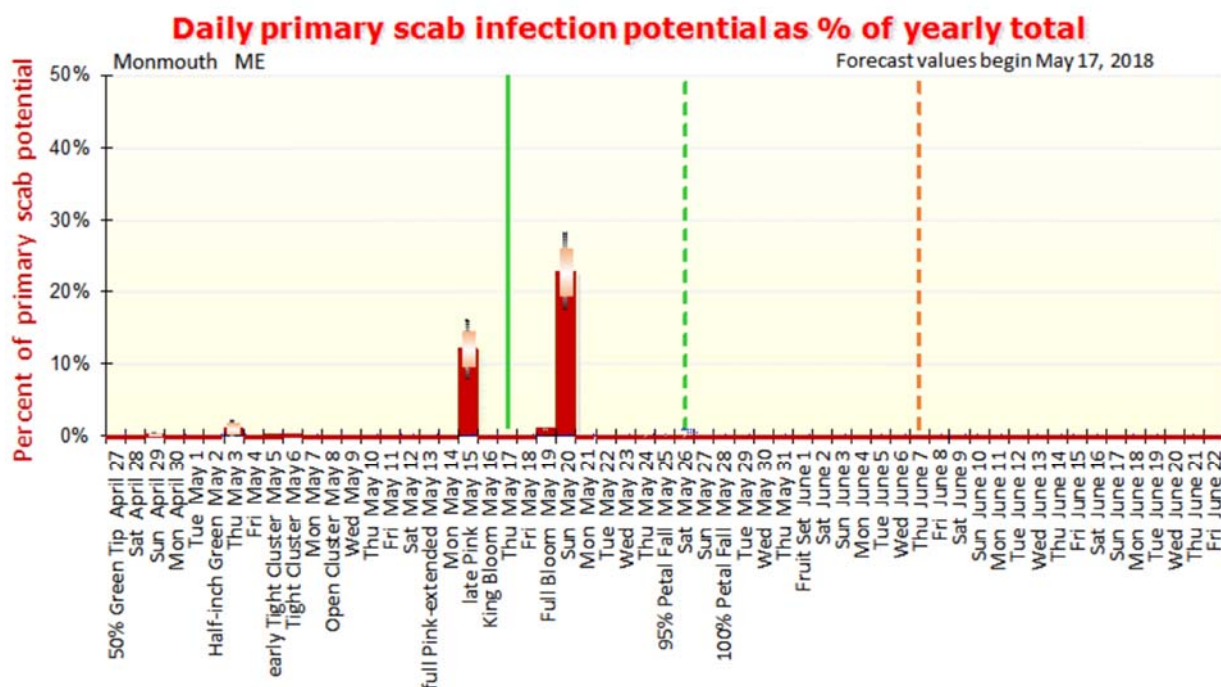
With the forecast showing over 1.5 inch rain in about 24 hours, that is another reason to play this on the safe side. Preventing apple scab is a less work and cheaper than cleaning it up once it gets established.

If the half rate protectant is combined with DMI (Inspire Super, Indar, Procure, Rally, Rubigan, Topguard) or SDHI (Aprovia, Fontelis, Merivon, Luna Sensation/Tranquility, Sercadis) then beyond the first three days after application (longer for the mixture products), most of the forward protection is coming from the half rate protectant. That puts more pressure on the half rate protectant because the DMI and SDHI fungicides do not have as much forward protection as the protectants captan and mancozeb. In that scenario, the half rate protectant is carrying the load for against scab infection pressure beyond 96 hours. And relying on half rate protectant for more than four days (96 hours) during rapid foliar expansion is a gamble. That brings us back to reliable protection from a half-rate protectant needing to have been applied no earlier than Wednesday evening.

If you get caught short on scab protection, then a postinfection application of a strobilurin, DMI, SDHI fungicide within 72 hours of the start of the infection period will provide control. Applying captan or Syllit within about 24 hours after the infection period would also work, but with the rain event lasting 24 hours, without apparent breaks in the rain in the forecast, those 24 hours are likely to be used up before you can get a spray on.

Looking beyond this weekend, the Monmouth forecast has a chance for a night shower on Tuesday evening – Wednesday morning May 23-24. This looks like one of those showers that pops in and out of the forecast with each update, so who knows what will happen with that.

The first order of business is to have protection through the forecast Saturday night – Sunday rain. The probability for some rain in that timeframe is near 100%.



Weather data for Monmouth ME. Forecast values begin May 17, 2018

These ratings are **relative** because they do not account for scab spore population density, which is the **MOST** important factor determining absolute infection risk. Estimates also do not account for any secondary scab spores that might be present from earlier uncontrolled primary scab infection periods.

Date	Observed & Forecast Inches Rain	McIntosh bud stage	1 in 20 chance that daily value is equal or less than	Portion of Annual Primary Scab Infection Potential on this day (cumulative scab infection potential in parentheses)	1 in 20 chance that daily value is more than
Fri, May 11	0	full Pink-extended			
Sat, May 12	0				
Sun, May 13	0				
Mon, May 14	0				
Tue, May 15	0.35	late Pink	8%	12% (13%)	17%
Wed, May 16	0	King Bloom			
Thu, May 17	0				
Fri, May 18	0	Full Bloom			
Sat, May 19	1.07		13%	15% (28%)	17%
Sun, May 20	0.52		5%	8% (36%)	11%
Mon, May 21	0				
Tue, May 22	0.15		1%	3% (39%)	4%
Wed, May 23	0.16				
Thu, May 24	0				
Fri, May 25	0	95% Petal Fall			
Sat, May 26	0				

Fire blight

With apples at most Maine orchards at the beginning of bloom, it is still too early to evaluate the fire blight situation. A blossom blight infection period requires three days in bloom with temperatures in the mid-upper 70s, or two days in the 80s, followed by rain. The weather since King Bloom at even southern Maine locations has been too cool for serious fire blight infection risk.

Even though Sanford shows a potentially high infection potential for orchards with currently active fire blight from the rain on May 15, that is a bit of false alarm. “Currently active fire blight” means active strikes or numerous oozing cankers in the orchard at the time of a potential infection period. There has not been infection periods or enough time for fire blight strikes to develop, so unless you have a large number of oozing cankers from last year then it is too early for fire blight to be in the “currently active” category.

The other factor that makes fire blight blossom infection risk in early bloom less than what the models appear to suggest is that in the first days, maybe even a week, after King Bloom, insects have not had time to inoculate flowers with fire blight bacteria. For infection to occur, bacteria must be deposited in flowers, and then for those bacteria to accumulate enough heat units to build up enough population to overwhelm flower defenses against infection. This is why Dr. Tim Smith, author of the Cougarblight model, downplayed early bloom infection risk, and why the worst fire blight infections are the ones at the end of bloom, even if only a few rattail blossoms are still around.

Temperatures in the forecast leading into rain this weekend are too cool for fire blight infection potential to build. As usual, the risk of fire blight blossom infection will develop near the end of bloom. In fact, it is usually the days after main bloom is over that we get bad fire blight weather. If there are enough straggler blossoms still open to give fire blight a starting place, and inoculum present, then the ingredients are there for fire blight infection to begin.

Once in the orchard, rapid sanitation is required to keep it from spreading. That requires frequent checking and rapid response. But we are not there yet. Apple scab is the priority right now.



Early stage of fire blight infection.
Photo: Tim Smith

Petal Fall Insects

It is time to plan for insect pest control needs at Petal Fall. Tarnished plant bug is normally thought of as a prebloom pest because that is when adults first appear on apple buds. Feeding after Tight Cluster results in dimpled fruit. If TPB were numerous before bloom but did not receive treatment, control at Petal Fall can prevent subsequent damage, though by then TPB may have moved on to other hosts.

European apple sawfly is a thick-waisted relative of bees, with a distinctive orange underbelly. If numerous, they can drill into fruit causing it to abort. If unsuccessful, larval feeding results in a winding scar on the apple.



European apple sawfly.

Plum curculio is the most threatening apple pest in the weeks following Petal Fall. With high population and warm wet weather, plum curculio can damage upwards of 80% of apples. However, the females hold off on laying eggs, for the most part, until fruit are about 8mm diameter (~ 1/3 inch). If you do not need timely insecticide right after Petal Fall for EAS, then the first Plum curculio spray can wait until fruit begin to size.

Roundheaded Apple Tree Borer

Roundheaded apple tree borer is the bane of backyard apple trees in Maine, killing a substantial portion of trees that do not receive insecticide protection while the trees are young. The adult female beetles emerge in June, mate, and begin egg-laying around mid-June in the Monmouth area. Egg-laying continues through August.

Roundheaded apple tree borer is not a common problem in orchards that receive canopy insecticide applications for other insect pests. A home fruit tree spray mix that contains insecticide, applied to the canopy at the labeled rate at two week intervals starting about 2 weeks after Petal Fall and continuing until mid-August has a good chance of preventing borer infestation by killing the female borers before they can lay eggs.

The only insecticide with good efficacy against trunk borers is the synthetic material chlorpyrifos, sold as Lorsban. But that may be hard to find, especially as it has been on the edge of being cancelled in recent years, though it received a reprieve recently.

If you are limited to organically certified insecticides, then a spinosad product, applied to the canopy may provide suppression. Spinosad is sold in Maine under the names Entrust and Monterey Garden Insect Spray. Neem oil is also commonly mentioned. I do not have information on the efficacy of either material against roundheaded apple tree borer. My best guess is that neither material is likely to be highly effective, but might help suppress new borer infestation with regular canopy applications.

Insecticide spray applied to the trunk will not control borer larvae that are already inside the trunk. You can try to dig them out with a stiff wire. Prevention is the key to borer problems. Keep vegetation away from the lower trunk, and be sure to remove "mouse" guards and any other tree wrap around the trunk during the summer. A whitewash applied to the trunk may discourage new borer infestation, and definitely makes it easier to detect the sawdust like frass that indicates presence of borer larval feeding.

Beyond prevention and control, keeping trees healthy and vigorously growing will help them grow through a borer attack. Once trees reach about 4 inches trunk diameter, borer damage is much less likely to result in tree death because the tree's vascular system is so much larger relative to the borer damage at that size.

Browntail moth

Browntail moth is largely contained to locations near the coast. While apple is a preferred host, browntail infestation has never occurred in a commercial orchard receiving insecticide protection against codling moth, leafroller and other caterpillar relatives of browntail moth. But in no-insecticide spray trees it can raise havoc. The following information from the Maine Forest Service is good to know in case you enter this species. It is not your usual apple-loving caterpillar.

“Why are they a problem?”

The browntail caterpillar has tiny (0.15 mm) hairs that on sensitive individuals cause a skin rash similar to poison ivy and/or trouble breathing. The microscopic hairs break off the caterpillars and are everywhere in browntail infested areas; on trees, lawns, gardens, decks, picnic tables and in the air.

The hairs can remain toxic for up to THREE YEARS so although the problem is worst from May to July, they may cause a reaction at other times of year as well. Wind or activities such as mowing, leaf-blowing, etc., can stir up the hairs, leading to a reaction. The rash and trouble breathing can last anywhere from a few hours to several weeks. It is caused by both a chemical reaction to a toxin in the hairs and physical irritation from the barbed hairs. Contact your physician if a reaction is severe.

Life cycle:

- One generation a year.
- Four life stages; egg, larval, pupal, and adult.
- Larval stage (caterpillars) lasts from August through to the following June.
- In the spring, as soon as the earliest leaf buds open, the caterpillars become active and leave their overwintering webs to feed on tender new leaves. They may devour the leaves as fast as the leaves develop.
- When young, the caterpillars return to the webs at night, but later remain out on the leaves overnight, and are fully grown by late June.
- The caterpillars then form filmy cocoons between leaves on trees, under eaves, picnic tables, decks, etc.

- Adult moths emerge from cocoons in late July and August, laying clusters of eggs on the underside of leaves. The moths are strongly attracted to light.
- Caterpillars emerge from the eggs in August and feed on the upper side of the leaves of host trees.
- In the fall, colonies of caterpillars build winter webs on the tips of branches. The webs are made from leaves tightly wrapped with white silk. There can be 25 to 400 or more caterpillars in each web.
- The caterpillars overwinter within the 2-5 inch (5-10 cm) winter webs. The webs are found most often on red oak or apple trees.

Identification: Browntail Caterpillar:

- Dark brown with a broken white stripe on each side and two conspicuous red spots on the back. They grow to 1.5 inches (3.8 cm) in length.

Look-a-like caterpillars:

- Eastern tent caterpillars have a solid whitish line down the middle of the back with a row of oval pale blue spots on each side and are covered with long brown hairs.
- Gypsy moth caterpillars have pairs of blue and red spots along their back and are covered with long brown hairs. (Gypsy moth caterpillars have hatched this week. Small larvae may blow into orchards.)



Browntail moth larva. Maine. For. Serv.

Identifying Winter Webs:

Browntail overwinters as colonies of caterpillars in white silk tightly woven around a leaf or leaves in trees or shrubs. These webs contain 25 to 400 caterpillars, are spun in the early fall, and remain firmly attached to the tips of small branches all winter. The webs are often confused with silken structures formed by other less serious species of moths.

Browntail winter web description:

- 2-5 inches (5-10 cm) long
- white silk tightly woven around a leaf or small number of leaves
- string of white silk tying leaf petiole to twig
- small brown hairy caterpillars inside dense silk web
- on branch tips of oak, apple, crabapple, cherry, shadbush and rugosa rose (occasionally other trees as well)



Overwintered nest of browntail moth larvae. Maine. For. Serv.

Look-a-like webs:

Often mistaken for browntail webs: Old fall webworm webs are formed by caterpillars in late summer, engulf the foliage and can become 2 to 3 feet (61-91 cm) long. By mid-fall the caterpillars have left the nests. During winter, the webs often hang loosely from branches.

- Hanging off of branches but NOT at branch tip • Variable length, 3-24 inches (7-60 cm)
- Loosely tied mat of white or grey silk and debris
- Not associated with a leaf - any leaves caught in the web not tied to twig
- Caterpillars not present in web in late fall/winter/spring
- On wide variety of deciduous hosts, especially ash and oak

Remnants of old tents of the eastern tent caterpillar can also be mistaken for browntail winter webs. These webs are built in the crotches of branches on wild cherry and apple trees in late April and May and may be a foot or more long when fully formed. Eastern tent caterpillars are present in their webs from late April to June.

Browntail Precautions:

- Avoid places heavily infested by caterpillars
- Take a cool shower and change clothes after activity that might involve contact with hairs
- Dry laundry inside during June and July to avoid hairs getting onto your clothing
- Use caution cleaning debris left by caterpillars because the toxin is extremely stable and remains a hazard for a number of years.
- In heavily infested areas, wear respirator, goggles, and coveralls (tightly sealed at neck, wrist, and ankles) when: * Mowing, raking, weed-whacking, * Removing webbing, or * Performing any activities that stir up browntail caterpillar hairs
- Perform the above tasks on damp days or wet down material with a hose as moisture helps minimize contact by keeping the hairs from becoming airborne.
- Consult a physician if you develop a severe reaction Browntail Control Non-chemical:
- Clip overwintering webs and destroy by soaking in soapy water or burning. (Wear gloves!) • Clip webs in the winter and very early spring: October to mid-April.
- If caterpillars are on structures hose down with water and vacuum up with a HEPA filter vacuum. Chemical:



Fall webworm nest left from last year.
Photo: Jose Soriano



Old fall webworm nest. Maine For. Serv.

- Look for a licensed arborist/pesticide applicator; licensing ensures they have specialized training and equipment to do the job properly.
- If making a DIY pesticide application on your own property, select a pesticide product carefully:
- Ensure the intended site is listed on product label,
- Always FOLLOW LABEL INSTRUCTIONS,
- Preferably, choose a product that lists browntail moth on the label.
- Treat before the end of May to prevent development of the toxic hairs.
- Pesticide use within 250' of marine waters is restricted.

Respirator Fit Test and Training

UMaine Extension, The Maine Board of Pesticide Control, and the Maine Labor Group on Health will be hosting a clinic to provide the respirator training and fit test. Join us **Thursday, May 31, at Cooper's Farm, [55 Norris Hill Rd](#)**, in Monmouth to get your respirator fit test done. Pre-registration is required and lunch is provided from 11am-12pm during a training session.

Under the revised [Worker Protection Standards](#), anyone applying pesticides that require the use of a respirator, must complete (and maintain a record of) a respirator fit test. Respirator fit tests must be completed with the same make, model, size, and style of respirator that will be used in the field. Prior to respirator fit testing, each applicator must pass (and maintain a record of) a medical evaluation demonstrating they are physically fit enough to wear a respirator.

Prior to your appointment:

Call Lynne Hazelton at the Cumberland County Cooperative Extension Office to sign up for a time slot for your test. Lynne Hazelton (207)781-6099 or lynne.b.hazelton@maine.edu. Time slots are 30 minutes long and will take place between 9am and 1pm.

*Complete your medical evaluation and receive a written medical determination that you are physically able to use a respirator ASAP. This may require a follow-up medical examination if deemed necessary by the medical provider.

Medical evaluations may be conducted with any licensed health care professional or through one of several online services. A few online options are listed here.

[3M Respirator Medical Evaluation](#)

[OSHA Medical Evaluation for Respirator Use](#)

[Dawson Compliance Online Respirator Medical Evaluation/ Clearance Test](#)

Please review this [WPS-Respirator Requirements pdf](#).

At your fit test appointment:

Bring your medical evaluation clearance form. You will not be fit-tested without it.

Bring the respirator that you use in the field. Each person should have his or her own respirator.

If the respirator you bring does not pass the fit test, you may have to purchase a new respirator with a better fit.

Beards cannot be worn with tight fitting facemasks. Please shave before coming to your fit test.

With questions about respirator fit testing or other Worker Protection Standard regulations, contact Amanda Couture (Amanda.Couture@maine.gov or (207)-287- 2731) at the Maine Board of Pesticides Control.

Closing Picture



Rain cloud over Phoenix AZ in 2016. Photo by Bruce Haffner.

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