Apple Scab – current situation

The next few days should offer opportunity for spray application without rain or high wind. It would be good to reapply fungicide coverage as soon as possible. Protectant fungicide applied before the weekend was removed by the subsequent 3+ inches of rain. Captan and mancozeb fungicides remain effective through about 2 inches of rain. Fungicide that was applied on Tuesday through Friday, May 10 – 13 was probably washed off by Monday morning. Even with the cool temperatures, another 3–5% of the year’s total scab ascospore population matures each day. Plus, even with a soaking rain, a few ascospores that were mature prior to the previous rain do not release and are available for release with the next rain. As a result, there is some risk of ascospores released after fungicide protection was depleted.

In orchards where there was excellent scab control last year and low overwintering inoculum going into this spring, and where a full-dose of captan or mancozeb was applied with good coverage on Tuesday –Friday last week, renewing protectant fungicide coverage on Wednesday May 18 before the next rain (if conditions allow that) may be sufficient. Even captan and mancozeb have a limited time range during which a fresh application can interrupt the development of scab ascospores that released before the time of application as long as the application is made before the spores can germinate and complete penetration of the leaf to begin feeding within leaf tissue.

Another potential concern is secondary spores from uncontrolled earlier primary scab infection periods. But in Maine, even in Sanford only a small portion of scab potential has had time to begin showing as primary scab lesions, and even less than that in the Monmouth area and at other less advanced sites.
Looking ahead is equally or more important than looking back. As of Tuesday, May 17, in the Sanford and Monmouth areas, about half to three-quarters of the primary scab infection potential has yet to occur, respectively. With continued rainy weather expected, another 40-50% of the year’s primary scab infection potential could occur in the coming 7 days.

But where there is a chance of higher inoculum level, or if the next application is not made before the next rain after Tuesday night, then a fungicide with postinfection activity is more likely to provide good scab control. The DMI / sterol inhibitor fungicides (Inspire Super, Indar, Rally, Vintage, Procure) have the ability to control infections that started as much as 96 hours prior to application. Cool temperatures provide a longer range of postinfection “kickback.” Where the scab population has undergone a shift towards resistant strains, these fungicides may provide little or no postinfection activity, depending on the degree of resistance. Where there is an incomplete shift towards DMI resistance, the second generation DMI fungicides Inspire Super and Indar are more likely to be effective than the first generation products. In addition to the DMI difenoconazole, Inspire Super also includes a second active ingredient cyprodinil (Vangard). If applied within 72 hours after the start of an infection the Vangard component by itself can provide postinfection control.

Out of 11 Maine sites tested for DMI resistance in recent years, 3 were judged resistant, 5 were judged shifted or partially resistant, and 3 were categorized as sensitive. (See charts on following page.) To help prevent resistance, and to provide prolonged forward protection, which the DMIs do not provide, any application of a DMI fungicide in this situation should be combined with a full rate of a protectant fungicide. This also applies to Inspire Super. Vangard is not fully effective as a protectant fungicide as temperatures rise above 50F, and it is not recommended as a stand-alone protectant beyond Tight Cluster.

Another good option is Syllit except where there are scab strains resistant to that product. Out of 11 Maine sites tested for dodine resistance in recent years, 2 were judged resistant, 4 were judged shifted or partially resistant, and 5 were categorized as sensitive. Syllit does not provide as long a range of postinfection activity, but it has better postinfection activity than captan or mancozeb. Like the DMI fungicides, Syllit has “presymptom activity,” which is the ability to stop infections that have become established but have still not developed visible scab lesions. While Syllit alone can act as a 7-day protectant, to forestall resistance and more immediately to address the possibility of existing resistance, Syllit should be combined with a full rate of another protectant fungicide.

Strobilurin fungicides (Flint, Sovran, Pristine) are another option. They have postinfection activity, but are not as effective in this regard as the DMIs. The range is shorter (about 48-72 hours) and there are qualitative differences. Strobilurins do not have presymptom activity. Resistance is also a concern with the strobilurins. Out of 11 Maine sites tested for strobilurin resistance in recent years, 1 was judged resistant, 2 were judged shifted or partially resistant, and 8 were categorized as sensitive. Strobilurin should be combined with at least a half rate of a protectant fungicide to help forestall resistance.

Another issue with strobilurins is that there is a limit of four applications per season. Strobilurins, especially Pristine, are the best material for control of the sooty blotch – flyspeck, so you want to save at least one or two applications for later this summer.
**Scab resistance testing**

Knowing the resistance status of the scab strains living in your orchard (and even in a “clean orchard,” there is always some scab around) is very useful in making treatment decisions. Testing requires expertise and money, but through the generosity of Dr. Kerik Cox of Cornell University, we have opportunity to have five more sites tested in 2011. All that is required is 50–100 leaves with fresh scab lesions that have not been covered by subsequent fungicide application. The UMaine Extension Apple IPM program will collect the leaves and send them to Cornell.

The best way to get a sample is to leave a couple of corner trees untreated during the upcoming scab infections. In about 10-14 days, unprotected leaves will begin showing active scab lesions. After we have collected the leaves, you can shut down secondary scab on those trees with a couple of captan applications. Secondary scab does not travel nearly as far as primary scab, so if controlled early the inoculum that is produced by the lesions that are allowed to develop is only likely to affect adjacent trees. I do not know where you can get such testing done commercially, but if is available at all, the cost is probably $1,000 or more per sample. For your own information, and to the number of sites for which we have information to help gauge the apple scab fungicide resistance situation statewide and across years, I strongly encourage growers who would like to have a test done to contact me at glen.koehler@maine.edu, or call 581-3882.
Getting Ready for Chemical Thinning

At Highmoor Farm, trees are at the pink stage of bloom as of May 16th, so it is time to plan for thinning. Southern orchards are at king bloom and will soon be into pollination.

Last year, many orchards had a very light crop and would be expected to produce an abundance of flowers. Rather than making this assumption, check your trees during bloom. Blocks that were not chemically thinned last year may have less than a normal amount depending on biennial bearing tendency of the varieties. You should also check trees in bloom for bee activity and note the duration of good pollination weather. Strong hives of honey bees can pollinate an orchard in a shorter amount of time than wild or native bees. In past years, we have seen our small orchards at Highmoor farm be adequately pollinated in half a day of good weather. It may take longer than this for the orchards over five acres in size.

Applying Sevin at petal fall and another thinner at 10-12 mm fruit diameter is a recommended approach for hard to thin varieties. However, we no longer thin with this strategy because of poor thinning weather that usually occurs after bloom. Instead, we apply thinners once at rates that are sufficiently aggressive to get the job done with one application and applied during warm weather. Neither approach has adequately thinned Golden Delicious or Honeycrisp, but both worked well for other varieties. We switched to this approach because of the anxiety that comes from not knowing if a thinner applied in cool weather has worked or not worked in time to apply another thinner.

Concentrate spraying with thinners is effective up to a concentrates of 4X, but inconsistent at higher concentrations or in smaller spray volumes. Chemical thinners should be concentrated so that the amount you wanted to apply per acre is the same regardless of the spray volume.

Many labels list rates in parts per million (ppm). To convert ppm to pound (lbs.) use the following equation:

\[ \text{lbs. of material} = \frac{\text{desired ppm}}{1,000,000} \times \text{gals. water per acre dilute} \times (8.345 \times \% \text{ active ingredient}) \]

For 3.5% active ingredient, use the number 0.035.

This equation was published in the Pennsylvania Tree Fruit Production Guide. Recommended rates of most thinners are listed in ozs. or lbs. in the New England Tree Fruit Management Guide, so you can double check your math. There are 16 ounces in one pound.
## Foliar Fertilizers

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<th>General Schedule for Maintenance Applications of Foliar Fertilizers in Established Orchards in Maine</th>
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<tbody>
<tr>
<td><strong>Fertilizer</strong></td>
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| Zinc sulfate (36% zinc) | Dormant to green tip | 1- 3 lbs. / 100 gallons  
Do not mix with oil.  
Do not apply after green tip. |
| Copper sulfate (22% copper) | Green tip to Quarter inch green | 2 - 4 lbs. / 100 gallons  
Copper sulfate can burn fruit and foliage when applied after quarter inch green. |
| Chelated zinc or Zinc-EDTA (variable) | Tight cluster to 3rd cover | Follow label directions.  
Some zinc products will burn fruit and foliage. |
| Solubor (20.5% boron) | Pink to 2nd cover | 0.5 - 1.0 lb. / 100 gallons in each application  
Do not mix with pesticides in water soluble plastic pouches.  
Do not tank mix with oil or calcium nitrate. |
| Epsom salts (magnesium sulfate) (10% magnesium or variable) | Petal fall to 2nd cover | 15 lbs. / 100 gallons in each application  
Not compatible with calcium chloride. |
| Calcium chloride (78% calcium chloride) | 2nd cover up to two weeks before harvest | 3 lbs. / 100 gallons in each application |
| Other calcium products (variable) | 2nd cover up to two weeks before harvest | Follow label directions. |

Apply foliar fertilizers according to leaf analysis. Do not apply fertilizers or chemicals during or just before hot weather. Concentrate sprays of more than 3X can result in fruit scarring. 1st Cover is 7 - 10 days after petal fall.

Where brand names are used it is for the reader’s information. No endorsement is implied nor is any discrimination intended against products with similar ingredients. Always consult product label for rates, application instructions and safety precautions. Users of these products assume all associated risks.
1) An **apple grower twilight meeting** is planned for 5:30pm, June 15 at Pulsifer Orchard, 24 Pulsifer Orchard Dr. in Cornish ME. Rain date is June 16. The location shown on the Maine State Pomological Society map is not accurate. The orchard is on the east side Route 160 about halfway between Limerick and East Parsonfield. It is about half mile south of where Meserve Drive / Warren Lane connects to Rt. 160 coming from Rt. 5. See the yellow rectangular Lat./Long. marker on the maps below for location. Meeting details later.
2) The Penn State Tree Fruit Research and Extension Center website (http://frec.cas.psu.edu/) has a link to a free Excel pesticide recordkeeping workbook. (Look on the right side of the page under “Online Resources”).

The workbook does not have as many functions as Cornell’s Trac Apple Excel workbook mentioned last week, but this one is free and probably meets the needs of most growers. The workbook is unlocked so you can easily edit the different chemical lists. For example to make the pull down lists easier to use, you could remove chemicals that you do not use and thus do not need in the pull down lists. You could also put the materials you use the most often at the top of the list. Because the workbook is relatively simple and unlocked, there are possibilities for integrating it with Orchard Radar, but that’s a topic for another day.

3) The Orchard Radar sites at http://pronewengland.org/AllModels/DecisionModels.htm are working fine. If you noticed odd update times lately, that is due to me tinkering and updating file. The normal update times are the new morning forecast shortly after 4am, a refresh at 5am, and then the new afternoon forecast at 3:25pm.

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