**Fruit Maturity**

- **McIntosh** starch index is 5.5. They are ready, but will improve with another week on the tree.
- **Cortland** starch index is 1.5. They have had a color change from dark to light green indicating that they are ready to pick for storage.
- **Honeycrisp** starch index is 5.2. They are ready, but will improve with another week on the tree.
- **Macoun** starch index is 3.0. They are not ready for picking.

**COMMENTS:**
- **Macs** taste good now and picking for storage should be underway.
- **Gala** is also ready for picking.
Postharvest urea canopy spray and leaf shredding for scab inoculum reduction

Research by Sam (D.K.) Sutton, Dr. William MacHardy, and William Lord at University of New Hampshire demonstrated that overwintering scab inoculum could be reduced 50–70% by fall or spring (respectively) urea applications to fallen leaves to enhance natural leaf decomposition, and 80–90% with fall or spring flail mowing.

The greatest reduction (97%) was achieved by applying urea to the leaves while still on the tree. The exact specification for this treatment is applying 40 lbs. of food grade urea fertilizer in 100 gallons of water per acre. This not only gave the best scab suppression, it eliminated the problem of having to wait until leaf fall before applying the treatment. In some years leaves do not fall until there is already snow on the ground, or leaves freeze to the ground shortly after falling. Research by Drs. James Schupp and Lailiang Cheng at Cornell’s Hudson Valley lab found that as long as tissues were well matured, postharvest foliar urea canopy application did not compromise the cold hardiness of Marshall Mac and Empire apple trees. To the contrary, the fall urea application improved reserve nitrogen levels for spring growth the following year.

Doing a fall scab assessment

Dr. MacHardy has conducted many field research trials demonstrating that early season scab sprays (beginning protection before Pink) can be skipped in low inoculum orchards. The protocol for this strategy requires a scab assessment the previous fall to objectively measure the level of scab to make sure that the level of foliar scab overwintering in the block is low enough to qualify for a delayed spray program the following spring. A slightly higher level of leaf scab can also qualify for a delayed spray program IF urea application and/or leaf shredding is done in the fall or early spring.

There are some caveats though. The fall scab assessment must be done between mid-September and early-October, the heart of the busy apple harvest season. If done too early, apple leaves may not have become senescent enough to show scab lesions repressed by natural leaf resistance. If you wait too late, apple leaf senescence leads to discoloration and spotting that makes it impossible to efficiently scan the number of leaves and shoots that must be inspected to get a valid sample.

The scab level in the canopy reachable from ground level may not reflect the scab level in the tops of tall trees, and from the ground you cannot see scab lesions in the tops of those trees. Another issue is that the protocol was based on data from orchards where only protectant fungicide (e.g. captan, mancozeb) had been used. There is concern that scab infections that were suppressed but not completely killed earlier in the growing season by sterol inhibitor (SI) fungicide application (Rally, Vintage, Procure, Indar, Tebuzol, Inspire Super) might not be visible as lesions in the fall but could reactivate during the overwintering period and contribute inoculum for spring infections. But if only one SI application was made there is less concern. This same issue of masked scab presence may also be associated with strobilurin fungicides (Flint, Sovran, Pristine).
If doing a scab assessment is only considered fully reliable in blocks of small trees where only a single SI (and possibly strobilurin) fungicide was used, then most commercial blocks would not meet the requirements. The jury is still out about the specifics on how and where to apply the results of a fall scab assessment. But don’t the perfect be the enemy of the good. A fall scab index is worth doing even while we wait for clarification of these uncertainties.

It is valuable information regardless of what you find. Finding out that a block has low enough scab to qualify for a delayed spray program the following spring has obvious advantage if the concerns about tall trees or previous fungicide use are not involved. But even if those issues are relevant, it is still useful to look around in a methodical way to gauge how much scab pressure there is likely to be next spring. If the scab count is low, that has meaning and value even if you do not use it as the basis for a delayed spray strategy.

It is also very valuable to identify which blocks have high scab. You might be surprised. If there is scab on the fruit you would know that from harvest observations. However, a block with little or no fruit scab can still have a high level of leaf scab. Being surprised about the level of overwintering scab on leaves in September is better than being surprised by an inexplicable control failure the following May or June.

Having an objective rating of the scab level this fall is also useful to identity weak points in fungicide spray coverage, timing, or dosage. Knowing which blocks have high scab pressure helps you decide where to focus effort on dormant pruning, where you will get the best bang for the buck from scab sanitation methods, and which blocks need priority for fungicide protection next spring.

To do a fall scab index is not rocket science, but it does require focused looking, familiarity with what apple scab leaf lesions look like, and a methodical walk through the block to randomly selected shoots or fruit clusters to inspect. A sample of 100 shoots and clusters per orchard is all that is required for most orchards. In a large (up to 15 acres, bigger than that should be split into two samples) and clean block (where a full 100 shoot sample is required), the assessment takes 40 minutes or less. In a 5 acre block, it can take as little as 20 minutes. Orchards with above threshold scab infections take less time to check as it becomes apparent after only a few trees that the threshold will be exceeded.

Select shoots and clusters from different rows, different cultivars, high and low in the canopy. You want to get a sample that represents the whole block. Look at each shoot or fruit cluster and quickly scan the top and bottom surface of about 15 leaves for any signs of scab. Even little tiny scab lesions count so you do have to look carefully, but quickly. In a clean orchard done at the right time, it is easier than it may sound. When every leaf is all green, there is no need to think about it, you just look carefully at the clump of leaves and seeing nothing but green, move on to the next shoot. If you inspected each leaf individually, it would take hours. But you don’t have to do that.

Once the leaves start developing “age spots”, or if there is substantial leafminer damage, you cannot scan all green leaves and doing a scab index becomes impractical if not impossible.
This can also be a problem on Honeycrisp where leaf condition can begin degrading in late summer well before harvest.

If you do see what is, or could be, a scab lesion, my method is to collect the leaf and put it in my pocket. When in doubt, call it scab. I use a clicker to keep track of the number of shoots checked, and the number of leaves in my pocket tells me how many leaves with scab I found. Keeping count in your head gets in the way of looking and it is too easy to forget the count.

Because the threshold is low (no more than 5 leaves with scab allowed per 100 shoots), checking a block with appreciable scab doesn’t take long because you find 6 scabby leaves long before you have reached 100 shoots or fruit clusters. There is an intermediate zone of 6 to 18 scabby leaves per 100 shoots that is neither below nor above threshold. If that happens, you can handle it one of three ways.

1) Take the time to increase the sample size to 200 shoots and hope for a definitive result by comparing observations against the threshold for the larger 200 shoot/cluster sample size (no more than 14 scabby leaves), or

2) By using postharvest foliar urea or leaf shredding to reduce the overwintering success of scab, the threshold rises to no more than 10 scabby leaves per 100 shoots.

3) Play it extra safe and assume that any block that is not under the threshold for the first 100 shoot/cluster sample size is over threshold.

How to apply these observations in an orchard of taller trees? Unless you are willing to climb into the upper canopy of some trees to check for scab, it is probably best to use what you find to inform your spraying setup and plans for next spring, but to forgo the idea of using a delayed sprayed program even if the results are below threshold.

How to apply these observations in an orchard where more than 1 application was made? That’s a judgment call. The easy and safest thing to say is that you should also forgo using a delayed spray strategy, and just use the information to adjust your spray program. Dr. Daniel Cooley at the University of Massachusetts has been empirically testing a shortened version of the delayed spray protocol in orchards where DMI and strobilurin fungicides have been used. The revised version uses the same fall scab assessment and threshold, but if an orchard is identified as “low PAD”, the delay the following spring is limited to skipping the first two scab infection periods, i.e. waiting until the third scab infection period, or until Tight Cluster, whichever comes first.

Dialing back from Pink to Tight cluster is a bigger change than might be immediately apparent. This is because scab ascospore maturity and the amount of susceptible leaf tissue changes a great deal between Tight Cluster and Pink, with the result that potential scab infection risk can change by a factor of 4X (400%) in the week between Tight Cluster and Pink. The recent delayed scab spray research has been under way for several years, and while not finalized yet, so far use of the delayed start has not led to any scab problems.
Flyspeck update

The rains on August 28, and again on September 5–8 degraded protection from fungicides applied prior to those dates. The current weather forecast for Sanford and Monmouth indicated that September 21-29 could be warmer and wetter than normal. If that happens, that combination would accelerate growth of the fungi that cause flyspeck and sooty blotchy on apples. The updated estimates for when flyspeck infections could become visible on fruit in high inoculum blocks are shown below. Estimated dates will continue to be updated at http://pronewengland.org/AllModels/DecisionModels.htm

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<th>Final application date</th>
<th>MONMOUTH Latest “safe” harvest date with low risk of flyspeck (assuming continuous protection prior to final spray)</th>
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<tr>
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<td>Captan or Ziram</td>
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<td>August 15</td>
<td>Sept. 9</td>
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<td>September 5</td>
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<td>September 6</td>
<td>&gt; Oct. 31</td>
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<thead>
<tr>
<th>Final application date</th>
<th>SANFORD Latest “safe” harvest date with low risk of flyspeck (assuming continuous protection prior to final spray)</th>
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<tr>
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Closing Words

If I were a bird I would fly about the earth seeking the successive autumns.
- George Eliot
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Orchard Radar weather and pest tracking models at [http://pronewengland.org/AllModels/DecisionModels.htm](http://pronewengland.org/AllModels/DecisionModels.htm)

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