We still are catching an average of less than 0.2 apple maggot (AM) fly per week in the 23 orchards and roughly 60 blocks monitored by the Extension – Maine State Pomological Society scouting co-op. Research done in Maine in the 1930s found that the last week of July was timing for peak emergence of adult apple maggot flies from the soil.

While rainfall has been below normal for the past few weeks, soil moisture conditions do not seem to be dry enough to cause delay in apple maggot emergence. In terms of cumulative degree-days, Sanford is running even with the 30-year average, and Monmouth is about 5-6 days behind the average. AM trap captures are low in both areas.

AM traps are a reliable and useful tool for gauging risk of AM damage in an orchard. This is another one of those pests that is relatively easy to control, and rarely causes damage where managed. But it also one of the most potentially damaging pests if ignored. Apple orchards with the combination of population pressure and lack of control can suffer total crop loss. If you have traps up, you can apply spray according to state guidelines, but statewide reporting is not a reliable indicator for specific locations.

The following chart was posted online by Dr. Larry Wise of Michigan State University at http://msue.anr.msu.edu/news/managing_apple_maggots_using_insecticides

As you can see, apple maggot insecticides fall into two groups in terms of residual control after a full dose application. Imidan, Assial and other neoincotinoids, and Exirel providing 10-14 days protection. That is the residual duration assumed in the Ag-Radar guidelines for weather adjusted spray intervals for apple maggot at Monmouth - https://extension.umaine.edu/ipm/ag-radar-apple-sites/me-monmouth-apple/#INSECTS and Sanford https://extension.umaine.edu/ipm/ag-radar-apple-sites/me-sanford-apple/#INSECTS

For the pyrethroid and spinosyn groups, residual protection is shorter at 7-10 days. Spray intervals for those materials are not represented in the Ag-Radar apple maggot tables, but until the AM table is updated to include the shorter residual materials, you can use the Entrust column of the Codling Moth respray tables (same links as above) to get the estimated protection depletion date for those materials based on number of days and accumulated rainfall since the application.

Regarding the pyrethroids, not all are created equal. My guess is that Asana deserves a Fair rating, not Fair-Good. It may be more sensitive to heat and UV breakdown than the other pyrethroids listed. There has been at least one control failure in Maine where Asana was the only insecticide used in the presence of very hot weather (over 90F), over 1 inch rain, and presumably a high AM population due to unsprayed apple orchards in the area.
<table>
<thead>
<tr>
<th>Compound trade name</th>
<th>Chemical class</th>
<th>Life-stage activity</th>
<th>Effectiveness rating on apple maggot**</th>
<th>Residual activity</th>
<th>Mite flaring potential</th>
<th>Effectiveness rating on codling moth**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Imidan</td>
<td>Organophosphate</td>
<td>Adults and curative</td>
<td>Excellent</td>
<td>14+ days</td>
<td>Relatively safe</td>
<td>Excellent</td>
</tr>
<tr>
<td>Asana, Warrior, Danitol, Mustang Max, Baythroid, Battalion</td>
<td>Pyrethroid</td>
<td>Adults</td>
<td>Fair-Good</td>
<td>7-10 days</td>
<td>Highly toxic</td>
<td>Fair</td>
</tr>
<tr>
<td>Delegate, Entrust*</td>
<td>Spinosyn</td>
<td>Adults</td>
<td>Fair</td>
<td>7-10 days</td>
<td>Moderate toxicity</td>
<td>Fair-Excellent</td>
</tr>
<tr>
<td>Assail, Belay, Admire</td>
<td>Neonicotinoid</td>
<td>Adults and curative</td>
<td>Good-Excellent</td>
<td>10-14 days</td>
<td>Relatively safe - Moderate toxicity</td>
<td>Good-Excellent</td>
</tr>
<tr>
<td>Exirel</td>
<td>Diamide</td>
<td>Adults</td>
<td>Good</td>
<td>10-14 days</td>
<td>Relatively safe</td>
<td>Excellent</td>
</tr>
<tr>
<td>Leverage</td>
<td>Premix (pyrethroid + neonicotinoid)</td>
<td>Adults and curative</td>
<td>Excellent</td>
<td>10-14 days</td>
<td>Highly toxic</td>
<td>Fair-Good</td>
</tr>
<tr>
<td>Endigo</td>
<td>Premix (pyrethroid + neonicotinoid)</td>
<td>Adults and curative</td>
<td>Good</td>
<td>10-14 days</td>
<td>Highly toxic</td>
<td>Good</td>
</tr>
<tr>
<td>Voliam Flexi</td>
<td>Premix (diamide + neonicotinoid)</td>
<td>Adults and curative</td>
<td>Excellent</td>
<td>10-14 days</td>
<td>Relatively safe- Moderate toxicity</td>
<td>Excellent</td>
</tr>
</tbody>
</table>

* OMRI-approved for organic production.

** Effectiveness rating of insecticides as noted in MSU Extension bulletin E0154, “2017 Fruit Management Guide.”

European red mites are now in their 4th generation, which is typically the most abundant generation of the year. As day length and temperatures begin to decline in August, an increasing portion of eggs laid by this generation will be overwintering eggs that won’t hatch until next spring. But if dry weather prevails, August ERM populations can still stress trees as evidenced by leaf bronzing. The new threshold for ERM in August is going to be 75% of middle-aged fruit cluster leaves with living hatched mites present. Since nobody wants to examine 100 leaves, the sampling procedure relies on a statistically adjusted threshold of <= 19 infested leaves out of 40 categorized as Below Threshold. To have high confidence that the leaves are mathematically over the threshold would require finding 37 or more leaves out of 40. If the count is between 20 and 36, a full 100 leaf sample would be needed to see if the infested leaf count is above or below 30 leaves. But in most cases, the mite count is either clearly below threshold or high enough that further sampling isn’t needed to reach a decision.
If control is needed, Danitol has fair efficacy as a miticide, while also serving as an effective insecticide against apple maggot and codling moth. But if the mite pressure is high and you really need a miticide, use a dedicated summer miticide effective with a higher efficacy rating against adult ERM: Agri-Mek, Abacus, Abba, Epi-Mek, Temprano (=abamectin formulations), Acramite, Envidor, Kanemite, Nealta, Nexter, Portal, or Zeal.

White apple leafhopper are present here and there, but not terribly numerous. But watch for nymphs over the next 2-3 weeks. If there is an average of more than 1 per leaf, control while they are nymphs is better than waiting until the population develops into irritating clouds of harder to control adults flitting about annoying pickers and leaving tiny tar like black excrement spots on fruit. (I know the orchard calendar says, 2 per leaf, but if you find that many now, there could be swarms of them in a few weeks.)

The moth counts in our codling moth, lesser appleworm obliquebanded leafroller and oriental fruit moth traps have declined over the last few weeks. You can’t really scout for codling moth or lesser appleworm larvae other than to count the number of apples with reddish frass in the calyx end indicating the fruit is infested, and thus too late for control. But at least counting first generation damage visible now would give you warning to prevent another wave of damage from second generation larvae that will begin hatching in early (Sanford) to mid-August (Monmouth).

A few weeks back eriophyid mite galls appeared on unsprayed plum trees. They are more an oddity than a serious pest.

Fungal, Bacterial, and Viral disease update

Overall, apple scab levels are low in most monitored orchards. But in several orchards, surprisingly numerous fresh young and thus presumably active scab lesions were detected in the past 3 weeks to the dismay of the growers not expecting such. The timing of lesion appearance was too late for first generation lesions, and is consistent with the lesions being the result of secondary spread from first generation lesions arising from the May 22 infection period. It’s just another lesson that scab monitoring really needs to continue until second generation lesions from all the primary infection periods have had time to show.
Potato leafhopper has not arrived in appreciable numbers in Maine orchards this summer, at least not in the Scouting Co-op orchards. But if it does, note that terminal leaf curling damage can be confused with fire blight. Back in June, there were a couple of cases where apple pith moth damage looked like fire blight.

I hope I don’t have viral disease to report, but there are about a dozen 40+ year-old trees in an otherwise healthy block or mixed cultivars, showing what is to me at least, an inexplicable die back. It could just be winter kill. It is not unusual to see a few branches here and there or even entire trees die from presumably low winter temperatures. But what is unusual in this case is both the distribution within the block, and an odd leaf curling that looks like epinasty caused by herbicide damage. But there is no recent history of herbicide application in the block. Two plant pathologists and I have so far not come up with a believable diagnosis yet.
If you think total precipitation and more intense rains are becoming more common, you’re right. A recent study found a 13% increase in annual precipitation in most of the Northeastern U.S., including Maine, starting in 2002 (relative to 1901-2001 average). The study also found, found a 53% increase in precipitation arriving in extreme events starting in 1996 (relative to 1901-2995 average). Increases were greatest in spring and summer for total precipitation, and in spring and fall for extreme precipitation.

Another study estimates that spring and summer thunderstorms are expected to increase in frequency in the coming decades, but that the number of days per season with hail will stay about the same.

Unfortunately, several Maine orchards suffered extensive hail damage this week, including Highmoor Farm.


One question that arises when hail damage happens is whether streptomycin application is needed to prevent spread of fire blight. If fire blight is active in the orchard at the time of the hail damage, the answer is yes. But, other than a few scattered spots, fire blight damage has been hard to find this year. In orchards where there is not detectable fire blight activity, streptomycin application after a hail event is not needed.

Another thing to keep in mind if your orchard is hit by hail, is that especially with early season damage, the resulting crop and revenue loss may not be as great as your first impression. That sound overly optimistic when you are staring a bunch of dinged fruit, but there have been several cases where what appeared to be a crop loss turned out to be not as bad as first appearances indicated. Also, giving up on fungicide and insecticide protection will likely creating more pest pressure for next season, so be careful before assuming that the orchard is no longer worth spraying.

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**Highmoor Farm / Pom. Soc. Field Day**

Wednesday, July 26, 2017, 8:30 AM to 3:00 PM
Highmoor Farm, 52 US Route 202, Monmouth, Maine 04259
Registration fee is $25.00 (includes lunch).

This year’s field day will include tours of current research projects in tree fruit, vegetables and small fruit. Special guest speaker will be Dr. Gennaro Fazio, apple rootstock expert at the USDA-ARS Plant Genetic Resources Unit, and Adjunct Associate Professor at Cornell University.

You are welcome to attend the whole day, or just come for the morning or afternoon programs and tours. Whichever you decide, please plan to be there for lunch to share some time and informal discussion with fellow farmers, research and Extension staff, and state officials. Thank you to our sponsors, Crop Production Services, Maine State Pomological Society and Maine Vegetable and Small Fruit Growers Association.
8:30 am  **Registration** coffee and donuts courtesy of Crop Production Services
9:00 am  **Welcome and Opening Remarks**
  – Fred Servello, Maine Agricultural & Forest Experiment Station
  – John Rebar, University of Maine Cooperative Extension
  – Erin Roche, UMaine Crop Insurance Education Program
9:15 am  **Food Safety Modernization Act Update** – David Handley
9:45 am  Break
10:00 am  **Apple Rootstock Research - Specialty Crops Research Initiative**
  – Gennaro Fazio, Cornell University & USDA/ARS
11:00 am  **Hiring and Retaining Good Employees** – Farmer Panel Discussion
11:45 am  **Maine State Pomological Society Business Meeting** – Aaron Libby, President
12:00 pm  Lunch
1:00 pm  **Concurrent Experiment Station Research Tour**
  **Tree Fruit Tour** – Renae Moran, Glen Koehler, and special guest Gennaro Fazio.
  New Geneva apple rootstocks; pruning techniques for high density apple, peach and cherry orchards.
  **Berry & Vegetable Tour** – David Handley and Mark Hutton.
  Pumpkin, sweet corn, broccoli and grape variety trials; pest update; reduced tillage in organic systems and permanent beds; high tunnel tomatoes, cucumbers and strawberries; compost application rates in high tunnels
3:00 pm  Adjourn

**Directions to Highmoor Farm, 52 US Route 202, Monmouth, Maine 04259 (207.933.2100)**

**Traveling North on I-95:** Drive north on the Maine Turnpike (I-95) and take Exit 86 in Sabattus. Turn left onto Route 9/Middle Road. Travel about 2 miles on Route 9 East, then turn left onto Route 132. After 4.5 miles, turn left onto Leeds Junction Road. Travel about 2.8 miles, then turn right onto U.S. Route 202 and travel about 1.3 miles up the road until you see Highmoor Farm on the right.

**Traveling South on I-95:** Take Exit 109B in Augusta. Continue west on U.S. Route 202 and travel about 15 miles. Highmoor Farm will be on the left.

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**Orchard Calendar**  Dates are for Momouth.

<table>
<thead>
<tr>
<th>Date</th>
<th>Event Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>July 21, Fri</td>
<td><strong>Apple maggot</strong> trap captures increase as emergence from soil reaches 50% (rough guess, rain factor not included in estimate). Thresholds: Odor-baited traps: 5 AM flies per trap since previous insecticide depleted Unbaited: 1+ per trap since previous insecticide depleted.</td>
</tr>
<tr>
<td>July 25, Tue</td>
<td>Date to collect leaf samples for foliar nutrient analysis (acceptable range is +/- 10 to 14 days of this date).</td>
</tr>
<tr>
<td>July 27, Thu</td>
<td>First sample date for 2nd generation <strong>Spotted tentiform leafminer</strong> sap-feeding mines (early mines fully visible but few have reached less vulnerable tissue-feeding stage). Thresholds: McIntosh &amp; stressed trees - 1 mine per leaf; Unstressed trees - 1.3 per leaf.</td>
</tr>
<tr>
<td>Date</td>
<td>Event Description</td>
</tr>
<tr>
<td>------------</td>
<td>------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>July 27, Thu</td>
<td>Date by which 3rd generation Flyspeck spores start becoming available. From this date until about 30 days before harvest is the peak risk for flyspeck infections that will show by harvest. Good date to begin scouting for flyspeck on fruit to see if there is need for intensified suppression. See Flyspeck tables for optimum spray intervals.</td>
</tr>
<tr>
<td>August 1, Tue</td>
<td>European red mite threshold until August 15 is 7.5 mites per leaf, or mites present on 86% of middle-aged leaves. See August ERM sampling table for optimum scouting intervals.</td>
</tr>
<tr>
<td>August 19, Sat</td>
<td>2nd generation Codling moth 7% egg hatch. If control needed, and Bt or other material requiring repeated applications for control is being used, this is best date for first application. See Codling moth tables for follow-up spray dates to maintain protection through 2nd generation CM egg hatch. No reliable threshold: Go by block history. Another risk indicator is pheromone trap capture above 5 to 14 codling moths per week.</td>
</tr>
<tr>
<td>August 21 to August 28</td>
<td>Rough estimate of 28 to 21 days before start of normal harvest period for untreated McIntosh fruit. Applying ReTain 3 to 4 weeks before start of harvest will delay fruit maturity for 7 to 10 days for single pick harvest.</td>
</tr>
<tr>
<td>August 24, Thu</td>
<td>2nd generation White apple leafhopper nymphs present. Threshold: 2 per leaf, lower if leafhoppers were a problem at harvest last year.</td>
</tr>
<tr>
<td>August 30, Wed</td>
<td>Rough guess at latest recommended date to begin starch iodine index monitoring for nonspur McIntosh. See ‘Harvest dates’ table for rough estimates of McIntosh maturity dates.</td>
</tr>
<tr>
<td>August 31, Thu</td>
<td>2nd generation Codling moth - best treatment date where single spray is adequate (estimated 30% egg hatch).</td>
</tr>
</tbody>
</table>

**Closing Words**

Brent Alan Mullis - November 02, 1950 - July 18, 2017


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**Putting Knowledge to Work with the People of Maine**

The following person has been designated to handle inquiries regarding non-discrimination policies: Director, Office of Equal Opportunity, 101 North Stevens Hall, 207.581.2226. If you are a person with a disability and need an accommodation to participate in a program described in this publication, please call Glen Koehler at 207.581.3882 or glen.koehler@maine.edu to discuss your needs. Receiving requests for accommodations at least 10 days before the program provides a reasonable amount of time to meet the request, however all requests will be considered.