



Apple Pest Report: Monday, July 6, 2009

Vol. 17 No. 9

Scab

Scab levels have been low in monitored blocks, which is a good thing because suppressing secondary scab would be a tough job in this weather if primary control had not been successful. With so much rain, this is a year to keep looking for secondary scab for longer than normal.

The weather outlook estimates includes above normal chance for rain during the July 12-20 forecast period.

Fire Blight

At least three Maine orchards had significant blossom blight infections this year. This is worrisome in that infection conditions were not nearly as bad as we had two years ago, but the damage impact this time is worse. This suggests that inoculum levels have gotten higher, possibly because of infections that began in 2007.

If you find fire blight in the orchard, if feasible, cut it out as soon as possible and destroy or at least remove the cuttings as fire blight bacteria can live in those tissues until they dry out. If there are too many strikes to cut out now, plan on extensive winter pruning to remove blighted terminals. Be prepared to apply streptomycin in a block with active fire blight as soon as possible if there is hail damage between now and terminal bud set later in July. Keep in mind that the preharvest interval for streptomycin is 50 days.

Two comments from "*Fire Blight*", by P.W. Steiner, T. van der Zwet, and A. R. Biggs, West Virginia University Kearneysville Tree Fruit Research and Education Center http://www.caf.wvu.edu/Kearneysville/disease_descriptions/omblight.html

– Depending on the cultivar and its stage of development at the time infection occurs, a single blossom or shoot infection can result in the death of an entire limb, and where the central leader or trunk of the tree is invaded, a major portion of the tree can be killed in just one season.

– Rootstock blight, yet another phase of fire blight, has been recognized recently and is associated primarily with the highly susceptible M.26, M.9 and Mark rootstocks. On these trees, just a few blossom or shoot infections on the scion cultivar can supply bacteria that then move systemically into the rootstock where a canker often, but not always, develops and eventually girdles the tree. Trees affected by rootstock blight generally show symptoms of decline and early death by mid to late season, but may not be apparent until the following spring.

Flyspeck and Sooty Blotch

In consultation with flyspeck researchers, I've adjusted the rules used in Orchard Radar for estimating end of fungicide protection against new flyspeck infections. The flyspeck model and depletion rules are explained at <http://pronewengland.org/AllModels/FlyspeckBackground.htm>

For orchards with normal to high flyspeck risk (due to site characteristics and block history) the residual efficacy from full dose applications of Topsin M, Flint, Sovran, or Pristine is estimated as 21 days or 2.5 inches of rain, whichever comes first. For full dose applications of captan or ziram, residual efficacy is estimated as 14 days or 2.0 inches rain, whichever comes first.

Blocks with the following characteristics can be considered as having lower risk for flyspeck:

- no history of problems with flyspeck, sooty blotch, or summer rot fungi;
- trees are located where there is good air drainage (i.e. exposed to wind or on a slope, not in an orchard low spot where morning fog persists);
- trees are at least 25 meters from dense growth of brambles and other alternate host vegetation,
- trees are well pruned with canopies that are open to air and sunlight.

For lower risk trees, alternate respray interval tables are provided using the following depletion rules.

- For full dose Topsin M, Flint, Sovran, or Pristine: 25 days or 3.0 inches of rain, whichever comes first.
- For full dose captan or ziram, 21 days or 2.5 inches rain, whichever comes first.

Unfortunately, in editing the master file that runs Orchard Radar, an unwelcomed mutation from the past reappeared. The glitch causes charts such as the hourly forecast to come out blotchy when saved as a web page. The charts are still readable, but they are ugly. It could be a while before I have time to figure out a cure. Tables, such as used for flyspeck, are not affected.

The flyspeck tables for Monmouth are available at <http://pronewengland.org/AllModels/MEmodel/RADARME-Sanford.htm#FLYSPECK>

The Sanford flyspeck tables are at <http://pronewengland.org/AllModels/MEmodel/RADARME-Sanford.htm#FLYSPECK>

One thing for sure is that flyspeck becomes more of a risk with wet weather. For the last 30 days, leaf wetness hours have accumulated at more than double the average rate in both Monmouth and Sanford. So in “flyspeck time” the previous month has provided more than two months worth of disease development. Numerous growers reported problems with flyspeck showing up on late harvested cultivars in the last three years. You can’t change the weather, but what you can do is maintain fungicide protection, use summer pruning to open up thick canopies, keep orchards mowed to reduce humidity, open up air drainage by pushing back bordering trees and other vegetation next to the orchard, make the final fungicide application as late as possible, and be ready to reapply if needed to late harvested cultivars if that is practical and if prolonged wet and warm weather in late August and early September follows what was supposed to be the final application. See the June 24 issue of the Apple Pest Report for discussion of fungicide options.

Insects and Mites

Apple maggot

Apple maggot flies are expected to begin appearing on traps in Sanford soon, and around July 17 in the Monmouth area.



Mites

With only a couple of exceptions, mite populations have been very low in most monitored blocks. That’s not surprising since rain is a natural mite suppressant. That could change over the next 2–3 weeks as the rain finally stops and third generation ERM nymphs hatch and reach maturity.

The mite sampling thresholds we use for Maine were developed in New York. For July, the NY threshold is an average of 5 living hatched mites per leaf (i.e. eggs and dead mites don’t count). Counting little tiny mites is

difficult, so the thresholds are based on the relationship between the percentage of leaves that have mites present and the average number of mites per leaf. When there are mites on 77% of middle-aged leaves, then the threshold of 5 mites per leaf is likely to be met. Use “middle-aged” leaves for mite sampling. Don’t select the youngest leaves just emerging at shoot tips, or the older leaves at the base of fruit clusters and vegetative shoots.

To sample a block, collect 5 leaves per tree from each of 8 trees spaced throughout the block. Stop and count to make sure you have 40 leaves before inspecting them. A pair of 3.5X reading glasses from the local “Dollar Store” are useful to make checking the leaves easier. Look at each leaf, especially the bottom side where the midvein joins the petiole.

You are more likely to find European red mites (ERM) than Twospotted spider mites (TSSM), especially this early in the summer. TSSM are less common on apple, but they occasionally flare up towards the end of hot and dry periods in late summer.

Individual ERM are about 0.3 mm long. It’s best to scout for mites when leaves are dry. When cool or wet it can be hard to tell living mites from dead ones. If they are alive, nudging them with a fingernail will cause them to move. If mites are “Below threshold”, the next sample should be taken when there has been enough time for mites to progress halfway through a generation cycle, which takes from 5 to 14 days, depending on temperatures. If mites are “Far Below” threshold, then the next sample can wait until mites have completed a full generation cycle.

As day length shortens in August, ERM are increasingly likely to lay overwintering eggs that will not hatch until next spring. Mite sampling should continue until mid-August to confirm that mites won’t exceed threshold before harvest.

Presence/Absence Chart for Threshold of 5 mites per leaf or 77% of leaves infested.

Number of leaves examined	column 1:	column 2:	column 3:
	if number of infested leaves is < or = to value in this column, then mites are estimated to be <u>FAR BELOW</u> threshold	if number of infested leaves is < or = to value in this column, then mites are estimated to be <u>BELOW</u> threshold	if number of infested leaves is = or greater than value in this column, then mites are estimated to be <u>ABOVE</u> threshold
40	13	19	37
60	24	39	52
80	34	55	67
100	52	76	77

The following comments on miticide resistance are by Dr. Art. Agnello, Cornell University, from the July 6 issue of the Scaffolds Newsletter:

“Because mites have many generations per year, they have a high potential to develop resistance. Some major differences between resistance management programs for fungicides vs. insecticides and miticides are:

1 - Insect and mite resistance is not promoted by using low dosages of materials; i.e., it doesn't cause a populations shift in their susceptibility, as can occur with pathogens.

2 - Frequent applications of high rates usually will not prevent or slow down the development of insect and mite resistance.

3 - Usually, high dosages are not toxic to resistant insects or mites, but they do kill a greater number of susceptible individuals. Recall that resistant mites are theoretically “less fit” or weaker than susceptible individuals. They have shorter lives, are physically smaller or weaker, produce fewer offspring, take longer to develop, and their mating success is lower. In the absence of competition from susceptible individuals, resistant pests rapidly multiply.

The key to management of resistance to insecticides and miticides is to reduce selection pressure that favors the survival of resistant individuals.

Some tactics for doing this are:

- Treat different generations with materials of different chemical classes.
- Use nonchemical control tactics where possible (e.g., biological control by encouraging predators).
- Use good miticide stewardship: apply only when necessary; use correct dosages; obtain adequate coverage; and optimize your timing.”

A resistance management principle that applies to all classes of pesticides (i.e. insecticide, fungicide, herbicide) is that reducing the number of times the pest population is exposed to a material reduces the chance for resistance. Conserving biological controls that play a major, and under-recognized, role in pest suppression not only can save pest damage and spray costs, it also helps prevent pesticide resistance. While we don't see predatory mites very often in Maine orchards, there is an abundance of other important mite predators such as ladybird beetles, minute pirate bugs, and lacewing larvae. Only using insecticides and miticides when needed helps preserve these beneficial species. When you do apply a miticide, getting good efficacy against pest species through good coverage and timing not only pays off immediately in better control, it contributes to resistance management in the long term.

As for rotating between different chemical classes between miticide applications; Acramite, Kanemite, Vendex, Vydate, and Danitol are in separate and unique IRAC (Insecticide Resistance Action Committee) groups for resistance management. Miticides that share membership in IRAC groups are:

- Agri-Mek and other abamectin products and Proclaim in Group 6;
- Apollo, Savey, Onager in Group 10A and Zeal in 10B;
- Nexter and Portal in Group 21.

Horticultural oil acts by physical means is therefore not thought to be susceptible to mites developing physiological resistance. In addition to their harsh effect on beneficials, the use of pyrethroid insecticides will hasten the development of mite resistance to Danitol. As temperatures warm, it is also worth noting that pyrethroids have reduced efficacy above 80F.

Organic growers relying on sulfur for disease control have difficulty scheduling their only available miticide (horticultural oil). While it is not registered in Maine yet, Biomite is a new organically certified, reduced risk miticide coming onto the market.

The Biomite label lists European red mite and two-spotted mite as target pests controlled, and apples and stone fruit as registered application sites. It is most effective under cooler conditions earlier in the season, which suggests that it may not be very effective on an over-threshold summer mite population, but any alternative to summer oil would be a welcome addition to the organic mite management toolbox. The label is available at <http://www.montereyagorganics.com/LABEL/Biomite.pdf>

Japanese beetles – Keep a lookout for this defoliator that seems to have a particular fondness for Honeycrisp trees. Sevin, Assail (and for apples and pears only – Calypso) are two good control options, but retreatment may be needed as new Japanese Beetles fly in.

Codling moth, Leafrollers, and other Leps

Codling moth egg hatch is well underway. Organic growers in central and southern Maine should begin targeted applications now if they haven't already.

The comments below are by Peter Jentsch, Entomologist at the Cornell University Hudson Valley Lab, in the May 12, 2008 issue of Scaffolds (<http://www.nysaes.cornell.edu/ent/scaffolds/2008/080512.html>) and from a presentation by Jay Brunner, Mike Doerr, and Keith Granger of Washington State University, online at http://extension.oregonstate.edu/umatilla/mf/sites/default/files/Brunner-MF_Part1.pdf Some of the residual efficacy statements below are from Washington, and may be longer than what can be expected in our more humid conditions.

* Resistance to organophosphates (i.e. Imidan and Guthion) by obliquebanded leafroller (OBLR) is prevalent throughout much of New York, including the Hudson Valley.

* Timing is critical for many of the new insecticides to be effective, insect developmental models are employed to determine the optimum application window. Where a caterpillar pest is known to be a problem and will be controlled using some of the new insecticides (e.g. Intrepid, Rimon, Esteem, Assail, Calypso, Altacor, Belt), 'prophylactic' applications, such as those made at egg laying or first hatch, are needed due to the mode of action of these newer insecticides.

* The use of an unsprayed sentinel tree along the edge of a block can act as an important aid in determining the degree of damage you would have experienced had you not used insecticide.

* Rimon is ovicidal but not larvicidal against codling moth. For best effect, it must be applied as the first eggs are laid, and reapplied at 10-14 day intervals. Against leafrollers it works as a larvicide. Rimon is slow acting.

* Intrepid is an insect growth regulator (IGR) that kills internal Leps and leafroller larvae by blocking molting. It also has strong codling moth ovicidal activity, whether applied before or after eggs are laid. Intrepid must be ingested by larvae to have a toxic effect, and gives up to 14 days residual activity. Intrepid has excellent residual activity that is less sensitive to weather than Bt, but like Bt, it works best when applied on a day with temperatures over 65°F, followed by three days of dry weather, to ensure feeding uptake.

* Bt products are best deployed for managing OBLR as multiple low dose applications at 7 day intervals, beginning at early larval hatch and continuing for 2–4 sprays through the entire egg hatch period. Bt activity is sensitive to weather conditions, and works best with warm, dry conditions. Bt is slow acting. In the July 6 issue of Scaffolds, Dr. Art. Agnello says that an acidifier, such as LI-700, should be used with Bt products as they tend to be more effective with a lower tank pH.

* Control of Lepidoptera larvae (caterpillars) with neonicotinoids (Assail, Calypso) does not require application before eggs are laid, but these materials should be applied by first hatch with reapplication at 10–14 day intervals. Assail is quite good against the "internal Leps" (codling moth, lesser appleworm, and oriental fruit moth), but is not effective against leafrollers. Use of a non-ionic surfactant (e.g. Biosurf, Kinetic, LI-700, Nu-Film, Silwet) is recommended with Assail. Calypso is effective against internal Leps, and while

better than Assail against leafrollers, is still a poor leafroller control. Assail and Calypso give 14-17 days residual activity.

* Actara and Provado are also a neonics, but are not useful for Lep control. Clutch is another neonic with only fair to poor activity against Leps.

* Altacor and Belt are both diamide insecticides, but they have somewhat different efficacy. They both have excellent activity against internal Leps and leafrollers. Assail is also rated Fair against leafminer, and Poor against apple maggot and leafhoppers, while Belt is not rated for these pests. Because these materials must be ingested, good spray coverage is essential for optimum efficacy. Application should begin by first hatch. Altacor gives 14-21 day residual control.

* Proclaim is effective against the Lepidopteran complex, with some miticidal activity. It should be applied by the start of caterpillar egg hatch and may be followed up with a second application in 7–14 days. Residue tests found moderate to high activity over 21 days.

* SpinTor and Entrust have the same spinosad active ingredient. Entrust is organically certified because of changes made to the inert ingredients. These products have excellent activity against leafroller when used at early hatch followed by 1–2 successive applications to cover newly hatching larvae of the summer brood. They are moderately effective against internal Leps, and have 7–10 day efficacy against apple maggot.

* Delegate (spinetoram) is an improved spinosyn that is more effective than SpinTor against internal Leps. It also has better weathering capacity with residual efficacy of 14 days, and is also effective on European apple sawfly and plum curculio for early applications, and against apple maggot for later applications.

Odds and Ends

1) John Bunker has an interesting web page on traditional Maine apple varieties at <http://www.mofga.org/Default.aspx?tabid=540#Variety%20Details>

2) A UMass graduate student is doing research on the use of bumble bee pollinators in New England agriculture. She offers thanks in advance for those who take a couple of minutes to fill out a very short and confidential survey that will significantly help the research on this important topic. The survey is online at http://www.surveymonkey.com/s.aspx?sm=s45rDEO6ZJPzwwy38uqzqA_3d_3d

Upcoming events

The **Maine State Pomological Society** will hold its Summer Meeting on **July 22, 2009** at **Highmoor Farm**, starting at **3pm**. The agenda was included in the June 24 Apple Pest Report. Cost of the meal is \$10/person. You don't need to pay ahead of time, but please email or call Ellen McAdam if you plan to attend (mcdorch@zwi.net, 324-5054).

The **100th anniversary of Highmoor Farm** will be celebrated with farm tours and glorious proclamations on **Wednesday, August 19, 2009**.

Closing words

Farmers are philosophical. They have learned that it is less wearing to shrug than to beat their breasts.

-- Ruth Stout

[Glen W. Koehler](#)

Associate Scientist IPM

Email: gkoehler@umext.maine.edu

Voice: 207-581-3882

Pest Management Office

491 College Avenue

Orono, ME 04473-1295

<http://pmo.umext.maine.edu/apple/>

Putting Knowledge to Work with the People of Maine



A member of the University of Maine System

[Nondiscrimination statement, disability resources, nondisclosure statement](#)