scaffolds

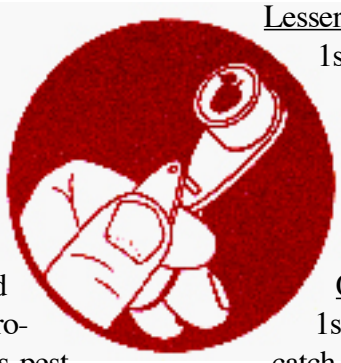
Update on Pest Management and Crop Development

F R U I T J O U R N A L

April 25, 2016 VOLUME 25, No. 6 Geneva, NY

INSECTS

HORIZON SWEEP ORCHARD RADAR DIGEST



❖❖ Beginning with today's issue, we will once again be publishing pest predictions generated by the Univ. of Maine's Orchard Radar model estimation service, provided to us by Glen Koehler. This pest management tool uses commercially available weather data as an input for apple pest occurrence and development models taken from many established university and practitioner sources. It's offered as another perspective on what's happening in the orchard to compare against our own record-generated advisories and, of course, personal observations from the field. We'll be printing only some of the short-term arthropod events; the full Orchard Radar product range covers disease and horticultural events as well. The public New England sites available for anyone to use are located at: http://extension.umaine.edu/ipm/programs/apple/pestcasts/. Growers interested in exploring this service for their specific site may wish to contact Glen personally (glen.koehler@maine.edu).

Geneva Predictions:

Roundheaded Appletree Borer
RAB egglaying begins: June 10. Peak egglaying period roughly: June 29 to July 13. First RAB eggs hatch roughly: June 25.

Dogwood Borer
First DWB egg hatch roughly: June 28.

Codling Moth
1st generation 3% egg hatch expected: June 11.

Lesser Appleworm
1st LAW trap catch: May 16.

Mullein Plant Bug
Expected 50% egg hatch date: May 18, which is 6 days before rough estimate of Red Delicious petal fall date

Obliquebanded Leafroller
1st generation OBLR flight, first trap catch expected: June 11.

Oriental Fruit Moth
1st generation OFM flight starts: May 4.

Redbanded Leafroller
1st generation RBLR peak trap catch and approximate start of egg hatch: May 6.

San Jose Scale
First adult SJS caught on trap: May 23.
1st generation SJS crawlers appear: June 21.

Spotted Tentiform Leafminer
1st STLM flight peak trap catch: May 14.

White Apple Leafhopper
1st generation WALH found on apple foliage: May 17.

IN THIS ISSUE…

THINGS TO COME

NEWA AND IMPROVED
(Art Agnello, Entomology, Geneva;
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❖❖ Many orchards will soon be progressing to the stage where some insecticidal protection is typically needed, so we would take this opportunity to point out the availability of a prediction tool that combines our historical records with the best biological projections we can offer, found on the NEWA Apple Insect Models website.

We recently completed some further improvements to this web-based, "Real-Time" Apple IPM Decision Support System, which can deliver relevant, current information on weather data and pest populations to facilitate grower pest management decisions throughout the growing season. This system tracks seasonal development of fruit bud stage, key insect pests, and diseases using Degree Day and Infection Risk models. The models indicate pest status, pest management advice and sampling options, and are linked to an interactive system that helps growers choose appropriate materials when pesticide use is recommended.

Insect pest developmental stages are calculated from Degree Day (DD) accumulations at IPM's NEWA and National Weather Service airport weather stations throughout the state, as well as a large number of sites in over a dozen other states, including MA, VT, NJ, CT, RI, PA, and DE. The insect pests addressed by this website are: apple maggot, oriental fruit moth, codling moth, plum curculio, obliquebanded leafroller, spotted tentiform leafminer, and (**NOW also**) San Jose scale. Disease predictions are available for apple scab and fire blight, and summer diseases (sooty blotch and flyspeck).

Access to the Apple Insects (and Diseases) models is through the "Pest Forecasts" list or the "Apples" link on the NEWA homepage (http://newa.cornell.edu). From the Apples homepage, clicking on the link that says "Apple Insect Phenology Models and IPM Forecasts" brings up a state map showing the available weather stations, plus pull-down menus on one side. The user selects a pest of interest, state, weather station, and the desired end date for weather data accumulation, and pest DD models and historical records are used to calculate: Tree Phenological Stage, Pest Stage(s), Pest Status, and Pest Management Information, all of which appears on a "Results" page. We have just finished updating the decision points for these advice categories by incorporating the most current 5 years' worth of temperature/degree day trends, which should result in more precise predictions. Additionally, the current DD accumulations provided on this page have now been linked to the newly reactivated NEWA Degree Day Calculator, so the results are given in the same format used by that tool: a table of the current accumulated heat units, plus the projected values according to NWS 5-day forecast data. A link gives the option of additionally viewing DD progress in graphic form.

The phenological stage can be adjusted according to field observations by selecting from a pull-down menu; this will generally change some

continued...

scaffolds
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scaffolds FRUIT JOURNAL
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of text provided in the advice boxes. Links on this page can take the user to various other online resources, such as color photos of the bud development stages, NYS IPM Fact Sheets of the pests in question, and when appropriate, sampling charts for use in conducting field samples of specific pest life stages (e.g., eggs, larvae, mines). When a pesticide spray is recommended, a "Pesticide Information" link in the "Pest Management" box takes the user to the Pest Management Education Program's (PMEP) Tree Fruit IPM home page, where a pesticide decision filter helps users pick an appropriate material to use, based on anticipated pest severity and program type.

A pesticide search returns a series of profiles of all the NY-registered products fitting the specified pest species and efficacy rating. The profile gives the common and trade names, labeled use rate, re-entry and pre-harvest intervals, and EPA registration number of each product. Also included are some general remarks on the range of product efficacy, and any known effects on beneficial species. A "Details" link in each profile box takes the user to a more extensive list of information, including notes on the active ingredient (including its mode of action classification), an overview of recommended use periods, and a link to a scanned copy of the NYS DEC-approved product label, which can be read or printed out.

All of the information presented is already available online at various other Cornell fruit sites, but this website brings these resources together in one place that is more convenient and efficient to access. Predictions provided by the website can be refined and adjusted to reflect current insect activity by user-entered events obtained through field monitoring (such as pest biofix; i.e., the first sustained flight of a pest species). The pesticide selection filter uses Cornell University product efficacy ratings and the type of management program selected by the user (i.e., conventional, reduced-risk, non-organophosphate, organic).

This website uses DD information based on either historical records or user-entered biofix data, and includes: the start, peak, or progress of the oviposition/egg hatch/crawler emergence period (for CM, OBLR, OFM, STLM and SJS); the start, peak or end of the pest's 1st, 2nd, etc., flight (for AM, CM, OBLR, OFM, STLM, and SJS); the first occurrence of adult or larval feeding, foliar or fruit damage, or mines (for OBLR and STLM). An improvement to the site we still plan to implement, in collaboration with a colleague at Penn State, is the incorporation of a least-cost product calculator function, to provide users with an estimate of how much they'll have to pay for a given pesticide choice.

We are continuing our efforts to refine and improve the accuracy of the website's pest predictions, and expand the range of sites from which weather data is able to be collected. During this process, we encourage everyone in the apple industry to check this website for themselves throughout the growing season, to see how well it forecasts pest events in specific areas of the state. We appreciate hearing of any anomalies or irregular predictions generated by using the local data to chart pest or disease development in your growing area, and hope to end up with a pest management tool that is useful and accurate for advising apple growers about what's going on in their orchards in Real Time. ❖❖

PEST FOCUS

Highland:
Increasing **Pear Psylla** eggs and nymphs in untreated trees.
Low injury levels to apples from **OBLR** and **GFW**.
Oriental Fruit Moth 1st capture today, 4/25.

DISEASES

ROTS AND KNOTS

DISEASE MANAGEMENT IN STONE FRUIT
(Kerik Cox, Plant Pathology, Geneva, and Deb Breth, LOFT-retired, Albion; kdc33@cornell.edu & dib1@cornell.edu)

❖❖ A critical period for brown rot management starts when flower buds start to show color. In peaches, if there are any fruit buds left, they should be turning pink. In Geneva, the peaches, cherries, and ornamental cherries are at 3 dead buds out of 10 sampled, on average. Regardless of the losses, there will likely be enough fruit to overwinter brown rot this winter. Hence, it will be important to keep the stone fruit clean. So far, the dry spring has not been conducive for diseases in stone fruit crops, but this will change with the late April showers.

Brown Rot and European Brown Rot
Fungicide Resistance

In NY and the New England States, resistance to the sterol demethylation inhibiting fungicides (DMIs or SIs: Indar, Rally, Tilt, Quash, Inspire Super, etc.) in populations of *Monilina fructicola*, the causal agent of brown rot, is fairly widespread. Similar to the situation with apple scab, DMI resistance in *M. fructicola* is affected by rate and intrinsic activity of the fungicide in question. Now that we have difenoconazole in Inspire Super and higher labeled rates for Indar than we had in previous years, the DMIs may still be a more viable option in early covers. Along these these lines, we have received *M. fructicola* samples for DMI resistance testing the last few years, and interestingly, the populations tested were all sensitive. Previously, we had observed instances of a slow incremental resistance to the components of Pristine (QoI & SDHI) in orchard populations in 2006–2010. However, we have not found any populations with resistance to QoI fungicides in recent years. It may be that the judicious use of these fungicide chemistries in rotation with other fungicide chemistries in recent years has led to a dilution of members resistant to either DMIs or QoIs. The recent labeling and use of Inpire Super and Merivon increases the presence of the APs and newer SDHIs in the stone fruit cover programs. The SDHI fungicide Fontelis is also effective against brown rot and other stone fruit diseases. It is important to note that both Fontelis and Merivon can even be used on sweet cherries and both have 0-day PHIs. There have been some concerns regarding more stringent tolerances for post-harvest boscalid residues by certain east coast stone fruit marketers. It may be that some groups will require tolerances lower than those set by the EPA. Hence, it may be important to position QoI/SDHI premixes in the second-to-last cover application until more is known.

Fungicide Application Schedule Considerations

Begin fungicide sprays at pink or white bud using Bravo/Echo/Equus (chlorothalonil). We are at the time of year when European brown rot is likely to play a larger role in brown rot infections. However, unless we receive cold heavy rains from white bud to shuck split, it may not be necessary to make specific applications. If European brown rot, *M. laxa*, has been particularly problematic in your operation, you may want to use a DMI or QoI fungicide early on (e.g., Indar 2F, Merivon). After the first application, continue with a Bravo/Echo/Equus (chlorothalonil) program until shuck split has passed. If we have a period of heavy rains, consider applying Rovral (iprodione), which is a different fungicide chemistry that can be used until petal fall in apricots, cherries, peaches, nectarines, plums and prunes. As you approach pre-harvest periods, rotate fungicides or fungicide premixes to maximize the number of AP, QOI, SDHI, and DMI fungicides to manage fungicide resistance in brown rot populations. In this capacity consider the following:

• Alternate DMIs (Inspire Super or Indar) with QoI/SDHI premixes (Pristine or Merivon) or SDHIs (Fontelis) during cover sprays to prevent the development of fungicide resistance. Despite the 0-day PHI and excellent activity against post-harvest rot fungi for Fontelis, Merivon, and Pristine, you may want to consider finishing the season with Inspire Super until more is known about new market-specific tolerances for SDHI and QoI fungicides.

• If allowed on the crop and if practical for your spray plan, use an AP fungicide (Scala SC, Vangard). Vangard at 5 oz/acre is labeled for a maximum of 2 sprays per season (but not on sweet cherries), or Scala at 9–18 oz/acre (but not on cherries) using the low rate in mixtures with other fungicides. Scala is labeled for use on apricots, peaches, and plums. Vangard is labeled on apricots, tart cherries, peaches, and plums. If you include Inspire Super in the cover applications, you will not need to include an AP fungicide.

• Bear in mind that if the weather is favorable for brown rot, product failures are possible, even with a little quantitative (incremental) resistance.

• For resistance management, consider the highest rates and the practices that give best coverage. No need to give the fungus a chance to survive. Do not reduce rates or practice alternate-row spraying.

• Make sure to provide the best protection in the period from petal fall to pit hardening. This is a period when stone fruits (except tart cherry) are most susceptible to infection by brown rot and other diseases. Infections during this period may not necessarily become active or apparent until the fruits get closer to ripening.

Black Knot on Plums and Cherries

The black or darkening pale tan knots present now in plums and tart cherries present a problem and will lead to infections of succulent green twigs on the current season's growth. Ascospores are available from these black, tumor-like infections as early as bud break until terminal shoot growth stops, but the main window when most of the ascospores are available and the most susceptible tissues are exposed leaf axils, present from white bud and shuck split. The end of the primary infection season can be extended through June if we have a dry spring. Only a few hours of rain are apparently required at temperatures above 55°F to result in a black knot infection, whereas much longer rainy periods are required to produce infections at temperatures below 55°F.

Knots from the current season's infections may become visible by the late summer of the year of infection but are usually not noticed until the following spring, when they begin to enlarge rapidly. The young knots the year following infection are capable of producing a few ascospores, but ascospores are often not formed until the second spring. In some situations, what is observed now is the result of an infection 2 seasons ago!

Control of this disease requires some vigilance in pruning out visible swellings from last season, as well as the black knots that have fully matured. Check your hedgerows for wild black cherry trees that also harbor black knot. It may take a few seasons to clean up an epidemic. Be sure to burn the black knots you remove from the orchard, since they will continue to contribute ascospores from the knots on the orchard floor. In severe disease pressure, you should consider an application of a fungicide as early as budburst, but under lower pressure, fungicide can be delayed until white bud. The most effective fungicide is Bravo (chlorothalonil, sold as other generics), but captan or Topsin M (only registered for brown rot blossom blight in cherries) can also be effective. Be sure to cease chlorothalonil applications at shuck split. Chlorothalonil and captan applied for black knot will also give brown rot blossom blight protection in tart cherries and plums, and are good choices for fungicide resistance management. ❖❖

GENERAL INFO

FRUIT FIELD DAY

The Cornell Fruit Field Day will be held in Geneva on Wednesday, July 20. This even, being organized by Cornell University, the NYS Agricultural Experiment Station, CALS Fruit Program Work Team and Cornell Cooperative Extension, will feature ongoing research in berries, hops, grapes, and tree fruit. All interested persons are invited to learn about the fruit research under way at Cornell University. Attendees will be able to select from tours of different fruit commodities. It will be based at the NYSAES Fruit and Vegetable Research Farm South, 1097 County Road No. 4, 1 mile west of Pre-emption Rd. in Geneva, NY. Admission is $50/person ($40 for additional attendees from the same farm or business). Pre-registration is required; walk-in registration may be available for a $10 surcharge on the day of the event. Please use the registration link below to register via credit card:

http://events.cals.cornell.edu/ffd2016

To participate as a sponsor, see the website page or contact Shelly Cowles (315-787-2274; mw69@cornell.edu).

PHENOLOGIES

Geneva:	Current	5/2, Predicted
Apple (McIntosh):	early pink	pink
Apple (Empire/Red Delicious):	tight cluster/early pink	pink
Pear (Bartlett/Bosc):	early/green cluster	white bud
Sweet Cherry:	early white bud/early bloom	bloom
Tart Cherry:	early white bud	white bud
Peach:	1/2" green (plus?)	pink
Plum:	white bud/early bloom	bloom

Highland:

Apple	(McIntosh/Empire): 80% bloom
	(Red Delicious): 90% bloom
	(Ginger Gold): 75% bloom
Pear	(Bartlett, Bosc): full bloom
Peach	(early/late): bloom

UPCOMING PEST EVENTS

	43°F	50°F
Current DD accumulations (Geneva 1/1–4/18/16):	243.7	107.6
(Geneva 1/1–4/18/2015):	125.4	60.5
(Geneva "Normal"):	219.2	105.3
(Geneva 1/1-4/25, predicted):	277.4	118.5
(Highland 1/1–4/18/16):	425.7	204.0

Coming Events:	Ranges (Normal ±StDev):	
Apple grain aphid nymphs present	128-488	63-247
Comstock mealybug 1st gen crawlers in pear buds	215-441	80-254
European red mite egg hatch	231-337	100-168
Green apple aphid present	111-265	38-134
Green fruitworm flight subsides	264-460	122-248
Lesser appleworm 1st adult catch	271-565	127-307
Obliquebanded leafroller larvae active	158-314	64-160
Oriental fruit moth 1st catch	222-326	96-164
Rebanded leafroller 1st flight peak	230-380	104-198
Rose leafhopper nymphs on multiflora rose	239-397	96-198
Rosy apple aphid nymphs present	134-244	56-116
Spotted tentiform leafminer 1st oviposition	143-273	58-130
McIntosh pink	268-316	125-159

all DDs Baskerville-Emin, B.E.

INSECT TRAP CATCHES (Number/Trap/Day)

Geneva, NY

	4/18	4/22	4/25
Green Fruitworm	9.5	19.5	18.0
Redbanded leafroller	23.0	114.5	26.5
Spotted Tentiform Leafminer	1.0*	62.5	2.5

Highland, NY

	4/18	4/25
Green Fruitworm	<0.1	0.2
Redbanded leafroller	8.4	21.6
Spotted Tentiform Leafminer	19.5	96.9
Oriental Fruit Moth	0.0	16.4*

* = 1st catch

NOTE: Every effort has been made to provide correct, complete and up-to-date pesticide recommendations. Nevertheless, changes in pesticide regulations occur constantly, and human errors are possible. These recommendations are not a substitute for pesticide labelling. Please read the label before applying any pesticide.

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