

SCAFFOLDS Fruit Journal, Geneva, NY

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Update on Pest Management and Crop Development

May 14, 2018

COMING EVENTS

	43°F	50°F
Current DD* accumulations		
(Geneva 1/1-5/14):	350.0	187.6
(Geneva 1/1-5/14/2017):	419.9	194.6
(Geneva "Normal"):	430.1	222.9
(Geneva 1/1-5/21, predicted):	512.5	301.1
(Highland 1/1-5/14):	495.1	261.8
Upcoming Pest Events – Ranges (Normal +/- Std Dev):		
American plum borer 1st catch ..	392-521	196-285
Codling moth 1st catch	398-566	201-306
Lesser appleworm 1st catch	276-564	129-305
Lesser peachtree borer		
1st catch	480-671	251-372
Mullein plant bugs 90% hatch	472-610	247-323
Oriental fruit moth		
1st flight peak	333-536	167-285
Pear psylla hard shell		
nymphs present	493-643	271-361
Plum curculio oviposition		

scars present.....	485-589	256-310
San Jose scale 1st catch.....	438-614	220-339
Spotted tentiform leafminer mines forming.....	367-641	170-342
White apple leafhopper nymphs on apple	302-560	146-308
McIntosh petal fall.....	439-523	222-285
*[all DDs Baskerville-Emin, B.E.]		

Phenologies

Geneva:	<u>Current</u>	<u>5/21,</u>
<u>Predicted</u>		
Apple (McIntosh, Red Del., Empire):	bloom	petal fall
Pear (Bartlett, Bosc):	bloom	petal fall/ fruit set
Sweet Cherry	bloom/petal fall	fruit set
Tart Cherry:	bloom	fruit set
Peach:	bloom	fruit set/ shuck split
Plum:	petal fall	fruit set
Apricot:	petal fall	fruit set

Highland:
Apple

(McIntosh): 3% fruit set
 (Golden Del.): 31% petal fall
 (Ginger Gold): 66% petal fall
 (Red Delicious): 43% petal fall

Pear

(Bartlett): 65% fruit set
 (Bosc): 59% fruit set
 Peach: 37-49% fruit set
 Sweet cherry: 8% fruit set
 Plum (Stanley): 77% petal fall

PEST FOCUS

Geneva: 1st Black Stem Borer catch 5/8 (Wayne Co., Geneva); (5/3 Orleans Co.); (5/11 Ithaca).
 Highland: 1st Codling Moth catch today, 5/14.

TRAP CATCHES (Number/trap)

Geneva

	5/4	5/7	5/10	5/14
Green Fruitworm	0.0	0.0	0.5	0.5
Redbanded Leafroller	59.0	—	56.0	49.0
Spotted Tentiform LM	3.5	15.0	8.5	7.0
Oriental Fruit Moth	1.0*	3.0	42.5	1.5
Lesser Peachtree Borer	-	-	0.0	0.0

Highland (Peter Jentsch)

	4/23	4/30	5/7	5/14
Green Fruitworm	0.5	0.0	0.0	0.0
Redbanded Leafroller	8.5	97.5	153.5	132.0
Spotted Tentiform LM	03.0*	29.0	42.5	17.0
Lesser Appleworm	1.5*	4.5	0.0	0.0
Oriental Fruit Moth	0.0	0.0	52.0*	139.5
Codling Moth	0.0	0.0	0.0	0.5*
San Jose Scale	-	-	-	0.0

* 1st catch

ORCHARD RADAR DIGEST

[Box Text: ON-SCREEN]

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:

<https://extension.umaine.edu/ipm/ag-radar-apple-sites/>. Growers interested in exploring this service for their specific site may wish to contact Glen personally (glen.koehler@maine.edu).

[H = Highland; G = Geneva]:

Roundheaded Appletree Borer

RAB egg laying begins: May 30 (H)/June 4 (G). Peak egg laying period roughly: June 18-July 2 (H)/June 24-July 7. First RAB eggs hatch roughly: June 14 (H)/June 19 (G).

Dogwood Borer

First DWB egg hatch roughly: June 17 (H)/June 23 (G).

Codling Moth

1st generation, first sustained trap catch biofix date: May 15 (H)/May 20 (G).

1st generation 3% egg hatch expected: June 2 (H)/June 8 (G).

Lesser Appleworm

1st LAW flight begins around: May 17 (G). Peak LAW trap catch: May 18 (H)/May 23 (G).

Mullein Plant Bug

Expected 50% egg hatch date: May 11 (H)/May 18 (G), which is 6 (H)/4 (G) days before rough estimate of Red Delicious petal fall date

Obliquebanded Leafroller

1st generation OBLR flight, first trap catch expected: June 3 (H)/June 9 (G).

Oriental Fruit Moth

1st generation 55% egg hatch and first treatment date, if needed: May 23 (H)/May 29 (G).

San Jose Scale

First adult SJS caught on trap: May 16 (H)/May 21 (G).

1st generation SJS crawlers appear: June 10 (H)/June 14 (G).

Spotted Tentiform Leafminer

1st STLM flight, peak trap catch: May 16 (G).

1st generation sapfeeding mines start showing: May 19 (H)/May 23 (G).

White Apple Leafhopper

1st generation WALH found on apple foliage: May 10 (H)/May 17 (G).

[Section: DISEASES]

Weekly Apple Scab and Blossom Blight Updates for NY (5/14 to 5/19/18)

(Kerik Cox & Katrin Ayer, PP&PMB, Geneva)

Below are apple scab and blossom blight predictions for NY apple regions based on the NEWA disease forecast system (<http://newa.cornell.edu/index.php?page=apple-diseases>). Information is kept concise. Alerts will also be posted to Twitter @FruitPathology with updates occurring throughout the week, which would allow notifications to send to mobile device. The various outputs are explained below the tables.

APPLE SCAB

Week of	Hudson	Wayne	Niagara	Champlain	Finger
5/14/18*	Valley			Valley	Lakes
Infection	High	High	High	High	High
Predicted	(5/14- 5/16)	(5/15) & (5/19)	(5/15) & (5/19)	(5/19)	(5/15) & (5/19)
Maturity	97%	74% & 90%	52% &	60%	87% &
Discharge	20%	34% & 18%	20% & 14%	49%	23% & 14%

* predictions are regional, the model works best under local conditions. Always check weather and crop stage before making a management decision.

Infection predicted:

- **"Low"**: <10% ascospores discharged; **"Moderate"**: 10-20% ascospores; **"High"**: >20% ascospores discharged
- **"None"** – no infection predicted for the week; **"Date"**: An infection event is predicted for the date listed. If a multi-day infection event is predicted, the first full date of the infection will be listed

Ascospore maturity: The percent ascospore maturity during the predicated infection event. If there is no infection predicted, the maturity for the end of the week is listed.

Discharge: The percent ascospore discharge during the predicted infection event. If no infection predicted, the cumulative ascospore discharge for the week is listed.

BLOSSOM BLIGHT

Week of	Hudson	Wayne	Niagara	Champl.	Finger
5/14/18*	Valley			Valley	Lakes
Infection Risk	High (5/15-19)	Moderate (5/16-17)	Low (5/17-18)	Moderate (5/17)	High (5/15-19)
Highest EIP	156	78	38	103	137
Highest 4-Day DH	619	347	193	392	555

* predictions are regional, the model works best under local conditions. Always check weather and crop stage before making a management decision.

Infection risk:

- **"Low"**: EIP and 4-day DH accumulation at/below 75 and 300, respectively; **"Moderate"**: EIP and 4-day accumulation between low and high-risk values; **"High"**: EIP and 4-day DH accumulation at or above 100 and 400, respectively with moisture predicted
- **"None"**: little to no risk predicted for the week;
- **"Date"**: The date of highest risk for the week listed.

Highest EIP & 4-Day DH: The highest EIP value and 4-day DH accumulation for the week listed.

(Kerik Cox, Plant Pathology and Plant-Microbe Biology & Juliet Carroll, NYS IPM Program, Geneva;

kdc33@cornell.edu & jec3@cornell.edu)

[Box text:]

[Section: INSECTS]

SPEED ZONE AHEAD

(Art Agnello, Entomology, Geneva; ama4@cornell.edu)

[Box text: MAY-HEM]

First, an addendum to last week's discussion of pre-bloom insect issues. One of the liabilities of re-running previous years' articles is the tendency to overlook newly registered products as potential options for consideration in addition to previously available choices, which can happen when the spring rush combines with those ever present spells of absent-mindedness (guilty as charged).

San Jose scale, a once-"secondary pest" that has been increasingly reminding us that even small, unassuming bugs can be a true challenge, has established itself as one of those management issues that now regularly requires attention at several times during the season. We used to depend on an application of oil or a broad-spectrum OP to clear up SJS infestations in the early season and then forget about them for the rest of the year, but with changes in chemical programs over the years, that approach hasn't continued to work very well, as this species has shown itself to be very resilient. However, some new products are now available that can be brought to bear against SJS, both pre-bloom and during the summer months; our trials with them

recently have shown them to be effective options against a range of pests, including scales:

- Sivanto Prime (flupyradifurone, Bayer; EPA Reg. No. 264-1141) is a butenolide registered in pome fruits against San Jose scale, aphids (except WAA), leafhoppers, and pear psylla. EPA Reduced-Risk, low bee toxicity and safe to beneficials.

- Grandevo (*Chromobacterium subtsugae*, Marrone; EPA Reg. No. 84059-17) is a microbial containing fermentation solids from a bacterium, labeled against internal feeding leps and leafrollers in pome and stone fruit. OMRI-approved, low toxicity to bees and most beneficials.

- Venerate XC (*Burkholderia* spp., Marrone; EPA Reg. No. 84059-14) is a biological insecticide derived from a bacterium; labeled in pome fruits against San Jose scale, pear psylla, stink bug and plum curculio, and in stone fruits against leafrollers and other leps. OMRI-approved, low toxicity to bees and most beneficials.

MOTH MANAGEMENT THROUGH TO BLOOM

(Peter Jentsch, Entomology, Highland;

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[Box text: TURNING THE WORM]

Over the past 2 weeks, we've seen temperatures swing between 42°F and 90°F in the mid-Hudson Valley. In short order (7 days), we went from pink to nearly full bloom in our early flowering varieties. In the air we've been seeing the moth complex of spotted green fruitworm, oriental fruit moth (OFM), redbanded leafroller, lesser appleworm (LAW), spotted tentiform leafminer (STLM) and the emergence of early instar pear psylla nymphs. We now need to consider management of the early "worm" complex during this period through bloom, with considerations for extended management through the rest of the season.

Codling moth (CM) has made its first appearance at the lab today; if you plan on using mating disruption, you need to have have your dispensers or ties on hand and out at first flight of CM. If you are looking to disrupt mating for both CM/OFM, now is the time to put mating disruption dispensers out in plantings of 5 acres or more. More details on mating disruption can be found in Breth et al., "Managing Codling Moth and Oriental Fruit Moth in Apples, at:

https://rvpadmin.cce.cornell.edu/uploads/doc_72.pdf

Upcoming applications for apple scab and fire blight management also provide an insect pest management

window. The B.t. products such as Biobit, Dipel, Javelin, and Deliver (IRAC 11 B2) also have a low impact on beneficial mites and are very effective against OBLR and the GFW complex. The B.t. products can be used through bloom as needed, and their use should be optimized by employing multiple applications at 5–7-day intervals at the low labeled rate (1 lb/A of Dipel 10.3 DF, for example). High impact of the B.t.s has been observed on cloudy warm days, which have a low impact on degradation of the product from UV light.

The early worm complex can be found in most commercial apples during the pre-bloom period, beginning with the emergence of the green fruitworm (GFW). In Highland, we traditionally have our first flight of GFW in early March, yet our first capture of this insect was on the 28th of April this season. A cool start was followed by a very cool spring, bringing us to early green tissue on April 9th, 1/2-inch green on the 23rd, early tight cluster on the 30th of April and full pink of McIntosh on the 3rd of May.

The GFW group comprises at least three different species, whose larvae feed on the foliage, flowering parts and developing fruits of pear and apple. An in-depth look at this insect complex can be found in the

NYSAES bulletin by Chapman, P.J., and Leink, S.E. 1974:
<https://ecommons.cornell.edu/handle/1813/5043>

Management

In years of heavy infestation pressure from GFW, as much as 10% fruit injury can occur. Employing adult pheromone trap captures will provide growers with information on GFW presence and the onset of adult flight. Scouting for larvae to determine levels of pest pressure should begin shortly after tight cluster. Although NY has not developed thresholds for this pest, a provisional threshold of 1 larva or feeding scar per tree has been used to begin applications in Massachusetts. A more conservative threshold should be applied in high-value apple varieties on dwarfing rootstocks in high-density planting systems. If GFW populations historically cause economic injury to fruit, management should begin from tight cluster to pink to target the pre-bloom Lepidoptera complex.

The GFW complex and OBLR are less susceptible or resistant to most older broad-spectrum products such as organophosphates and pyrethroids. The possible exception is chlorpyrifos (Lorsban, IRAC Class 1B). If Lorsban were used as a pre-bloom foliar application, it would also control San Jose scale, although we have

noted reduced control of SJS with this product by Hudson Valley growers. Asana, Pounce, Baythroid, Danitol, Warrior, all pyrethroids in IRAC Class 3, tend to have their highest efficacy against larvae at cooler temperatures (<72°F). Generally, as temperatures increase, larvae metabolize/detoxify pyrethroid a.i.s more effectively, while OPs, carbamates and newer chemistries tend to be more stable and less susceptible to this phenomenon. The B.t. products such as Biobit, Dipel, Javelin, and Deliver (IRAC 11 B2) also have a low impact on beneficial mites and are very effective against OBLR and the GFW complex, but relatively ineffective against codling moth (CM). The B.t. products can be used through bloom as needed, and their use should be optimized by employing multiple applications at 5–7-day intervals at the low-labeled rate, as noted above. Intrepid (methoxyfenozide) (IRAC 18A), another reduced-risk insecticide that is very effective against these larvae, imitates the natural insect molting hormone and works by initiating the molting process. Intrepid is quite safe to birds, fish, and most beneficial insects. Proclaim (emamectin benzoate) (IRAC 6), a second-generation avermectin insecticide related to Agri-Mek, is also an excellent insecticide against the GFW complex while having a low impact on beneficial mites. If European red mite (ERM)

has emerged, Proclaim, used with a penetrating adjuvant, would reduce early ERM populations. As a reminder, penetrating surfactants in some years can increase uptake of the fungicide Captan to cause phytotoxicity to foliage and fruit. Altacor (chlorantraniliprole) and Exirel (cyantraniliprole) (IRAC Class 28), Delegate (spinetoram) and Entrust (spinosad) (IRAC Class 5), have been used successfully against the surface-feeding and internal lep complex. However, the placement for these materials has been predominately at the onset of hatch of the summer generation larvae of OBLR, providing excellent results in NY State.

Resistance Management

As we would be managing the overwintering OBLR larvae at the same time as we would the green fruitworm complex, we should consider these applications in light of OBLR management throughout the remainder of the season. Because development of insecticide resistance is dependent on the number and frequency of applications of insecticides and the inherent characteristics of the insect species, we should limit one insecticide class (often requiring multiple applications of the same class) to a single generation of pest for resistance management purposes.

The present model for insecticide resistance management (IRM) practices then is to use a single insecticide class for a single generation of a given insect pest. For example, an IRM program against the lepidopteran complex, specifically OBLR and CM, would use effective insecticides of three different IRAC classes for each generation, throughout the season. For Timing examples:

I. Insecticide (Class A) 1 application @ TC-Pink for GFW and overwintering OBLR, or PF for OBLR, RBLR, LAW, OFM larvae

II. Insecticide (Class B) 2-3 applications @ 14d; first emergence of 1st generation CM and 1st brood OBLR larva based on degree-day models.

III. Insecticide (Class C) 1 application @ first emergence of 2nd brood OBLR larva and CM as needed based on degree-day models.

In studies from Michigan in 2008, research on codling moth neonate larvae has shown a seven- to eight-fold resistance to Imidan (phosmet), six- to ten-fold resistance to Warrior (lambda-cyhalothrin), 14-16-fold resistance to Intrepid (methoxyfenozide) and a six-fold resistance to Avaunt (indoxacarb), but no resistance to Assail (acetamiprid) and Spintor (spinosad). Given the historic failures the apple industry has experienced

managing the leafroller and internal worm complex, we should consider designing programs to maintain the effectiveness of these excellent IPM tools beginning early in the season, well before the heat of the battle begins.

ERRATUM:

It was brought to our attention that the list of County and Regional Extension Tree Fruit Specialists in the 2018 Tree Fruit Pest Management Guidelines (Table 17.6, p. 289) gives an incorrect phone number for Mike Basedow (ENY Comm. Hort. Prog., NE-NY). The correct number for Mike should be: 518-410-6823.

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