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Update on Pest Management and Crop Development

May 16, 2011

COMING EVENTS

	43°F	50°F
Current DD accumulations		
(Geneva 1/1-5/16):	421	212
(Geneva 1/1-5/16/2010):	559	304
(Geneva "Normal"):	455	237
(Geneva 1/1-5/23 Predicted):	554	296
(Highland 1/1-5/16):	526	268

Coming Events – Ranges (Normal +/- Std Dev):

American plum borer 1st catch	390-484	192-262
Codling moth 1st catch	400-578	201-313
Comstock mealybug		
1st gen. crawlers in pear	215-441	80-254
European red mite 1st summer eggs	447-555	237-309
Green fruitworm flight subsides	247-451	111-239
Lesser appleworm 1st catch	263-567	120-306
Lesser peachtree borer 1st catch	479-685	250-380
Mullein bug eggs 90% hatch	472-610	247-323
Oriental fruit moth 1st flight peak	350-552	177-295
Plum curculio		

oviposition scars present	485-589	256-310
Rose leafhopper 1st nymph on rose	239-397	96-198
STLM sap-feeders present	343-601	165-317
McIntosh at petal fall	443-521	229-279
McIntosh at fruit set	507-597	264-324

Phenologies	5/16	5/23 (Predicted)
Geneva:		
Apple (McIntosh):	bloom	fruit set
Apple (Empire):	bloom	fruit set
Apple (Red Delicious):	bloom	petal fall-fruit set
Pear (Bartlett):	95% petal fall	fruit set
Sweet cherry (Hedelfingen):	fruit set, shucks on	
Tart cherry (Montmorency):	50% petal fall	fruit set
Peach (Red Haven):	50% petal fall	shuck split
Apricot (Harrowblush):	fruit set	
Plum:	petal fall	shuck split

Highland:

Apple (Ginger Gold):	petal fall
Apple (McIntosh/Red Delicious):	80% petal fall
Apple (Golden Delicious):	petal fall
Pear (Bartlett/Bosc):	king fruit <10 mm
Peach (early – Red Haven):	fruit set, shucks on
Peach (late):	fruit set

Plum (Italian/Stanley):	fruit set, shucks on
Cherry (Sweetheart, Early):	fruit set, shucks off

TRAP CATCHES (Number/trap/day)

Geneva

	5/5	5/9	5/12	5/16
Redbanded Leafroller	10.7	5.0	2.7	7.0
Spotted Tentiform Leafminer	1.2	2.5	2.8	5.3
San Jose scale	-	3.3*	9.7	1.1
Oriental Fruit Moth	0.0	0.0	5.2*	2.5
Lesser Appleworm	0.0	0.0	0.0	0.0
Codling Moth	-	0.0	0.0	0.0
Lesser Peachtree Borer	-	0.0	0.0	0.0
American Plum Borer	-	0.0	0.0	0.0

Highland (Peter Jentsch)

	4/25	5/2	5/9	5/16
Green Fruitworm	0.0	0.6	0.1	0.0
Redbanded Leafroller	4.7	10.6	5.9	3.2
Spotted Tentiform Leafminer	10.8	37.5	30.6	12.1
Oriental Fruit Moth	0.0	5.6*	21.6	13.3
Lesser Appleworm	0.0	0.0	0.0	0.0
Codling Moth	-	-	0.0	0.4*

* = 1st catch

PEST FOCUS

Highland: Plum curculio injury observed on Ginger Gold apple.

Moth larval feeding damage observed on

foliage and fruit.

Codling moth first trap catch today, 5/16.

ORCHARD RADAR DIGEST

[Box Text: HERE 'N' THERE]

[M = Marlboro, Ulster Co.; G = Geneva]

Roundheaded Appletree Borer

RAB egglaying begins: May 30 [M]/June 9 [G]. Peak egglaying period roughly: June 20 to July 5 [M]/June 30 to July 14 [G].

Dogwood Borer

First DWB egg hatch roughly: June 24 [M]/July 3 [G].

Codling Moth

1st generation, first sustained trap catch biofix: May 11 [M]; CM development as of May 16 [M]: 1st gen adult emergence at 4% and 1st gen egg hatch at 0%.

Lesser Appleworm

1st LAW flight begins: May 17 [G].

Peak LAW trap catch: May 16 [M]/May 24 [G].

Mullein Plant Bug

Expected 50% egg hatch date: May 10 [M]/May 20 [G], which is 6 days before rough estimate of Red Delicious petal fall date.

The most accurate time for limb tapping counts, but possibly after MPB damage has occurred, is when 90% of eggs have hatched.

90% egg hatch date: May 14 [M]/May 23 [G].

Obliquebanded Leafroller

1st generation OBLR flight, first trap catch expected: June 2 [M]/June 13 [G].

Oriental Fruit Moth

1st OFM flight starts: May 11 [G].

1st generation 55% egg hatch and first treatment date, if needed: May 22 [M]/June 2 [G].

Redbanded Leafroller

1st RBLR flight peak trap catch and approximate start of egg hatch: May 12 [G].

Spotted Tentiform Leafminer

1st STLM flight, peak trap catch: May 18 [G].

1st generation sapfeeding mines start showing: May 15 [M]/May 26 [G].

Optimum sample date is around May 16 [M]/May 27 [G], when a larger portion of the mines have become detectable.

White Apple Leafhopper

1st generation WALH found on apple foliage: May 19 [G].

[Section: INSECTS]

FEASTING ON FLOWERS
(Peter Jentsch, Entomology, Highland)
[Box Text: THAT TIME OF MOTH]

So, the scout comes into the office and drops a bag full of flower clusters on the desk, stating that "Something has been eating the apple blossom clusters." Evidence of frass and webbing add to the likelihood that Lepidoptera larvae are feasting on the flowers (Fig. 1). Well, before you jump on the sprayer and charge off onto the night, take a deep breath and ask your scout (or yourself) some questions.


Fig. 1

First: What species of larva are we talking about? What quantity of damage are we looking at? Do these few clusters signify the feeding of green fruitworm (GFW), redbanded leafroller (RBLR) or obliquebanded leafroller (OBLR)? Is this the only damage observed after looking for 20 minutes, OR, is this representative of 10% cluster damage in a block, variety, or the entire orchard? You need to know these answers straight away before making a costly bloom application.

If you're staring at a handful of clusters from a 20-minute collection, with one flower per five clusters damaged, then this may not be an economic concern. The evaluation should also include the culprit in hand. If it's GFW or RBLR, then you can rest a bit easier while waiting for petal fall to control low populations of these insects. However, if the larva is obliquebanded leafroller just emerging during the warmer weather, scouting again in the latter part of the week will give you a better handle on the damage potential and whether or not to make a timely bloom application of a lepidopteran control material such as Bt (e.g., Agree WG, Biobit XL, Deliver WG, Dipel DF, or Javelin WDG) or Intrepid. In some years, OBLR (Fig. 2) tends to spend significant time feeding on foliage, allowing insecticides such as the Bts to be taken up through feeding rather than by direct contact. This coming week may offer an appropriate window for Bt use, as milder temperatures and partly cloudy skies (if it's not raining) optimize the conditions for its use.

Fig. 2

If you are intending to control the lepidopteran complex at PF, it is likely you will achieve control of GFW and RBLR larvae using Imidan, Guthion, and/or the pyrethroids. However, the OP insecticides (Guthion, Imidan) may not be effective against OBLR, as resistance to azinphosmethyl is prevalent throughout much of the state, including the Hudson Valley.

Newer chemistries have uniquely different modes of action on Lepidoptera. The **adulticides** are effective against the adult stage of the lep complex. **Ovicides** are effective against the lepidopteran egg. They must be applied prior to the egg being laid so that the egg is deposited on the insecticide, OR applied over top of the egg after being deposited, depending on the material. There are **larvicides** that are effective against the larvae either by direct contact, ingestion, or as **insect growth regulators** (IGRs), acting through contact and/or ingestion. Timing is critical for maximum effectiveness of these materials.

Intrepid (methoxyfenozide) is one of the few insecticides (together with the Bts) that can be used from pink through the petal fall period against OBLR. As an IGR, it acts to inhibit codling moth and leafroller larval molting, causing it to die within the old skin, which cannot be shed. It also has strong codling moth ovicidal activity, whether applied topically, or if eggs are laid on the residue. It has little or no contact activity and must be ingested by larvae to have a toxic effect. In some cases, Intrepid will not kill the larva but the subsequent adult will not be able to reproduce. Intrepid is very effective against the CM/OFM/LAW complex. Intrepid is also very effective against OBLR and the leafroller complex. Applications made against OBLR should be applied when temperatures exceed 65°F, followed by three days of dry weather to ensure feeding uptake from bloom to 1st cover. The excellent residual activity of Intrepid should not be influenced as dramatically by weather fluctuations as we experience with the efficacy of Bt products. Intrepid can also be used in a resistance management rotational program against leafroller larvae in the summer at early hatch.

Proclaim (emamectin benzoate) is a similar chemistry to Agri-Mek and is effective against the lepidopteran complex. It should be applied at egg hatch and may be followed up with a second application in 7–14 days. Proclaim is extremely toxic to **obliquebanded Leafroller** in both laboratory bioassays and field studies. In laboratory bioassays conducted in Washington State, Proclaim demonstrated a high level of toxicity to **codling moth** neonate larvae. However, it does not appear to be fast-acting, as larvae are able to enter treated fruit and feed before dying. In field trials, delayed mortality and only moderate suppression of fruit injury was observed, yet most of the larvae that entered the fruit later died, resulting in a very high level of activity on codling moth larvae, giving a 95% reduction in live larvae. Field-aged residue tests showed moderate to high level of activity through 21 days.

Chloronicotinyls and IGRs should be applied at 10–14-day intervals, beginning at first hatch. Chloronicotinyls (Provado, Calypso, Actara, Assail) have varying degrees of efficacy against Lepidoptera. In general, they have less mortality against adult leps than against the larvae. **Provado** has only low to moderate toxicity to codling moth in laboratory studies and provides very little suppression of fruit injury. **Actara** has little or no efficacy against the lep complex, but is an excellent plum curculio material. **Assail** is quite good against the CM, OFM, and LAW complex, but not strong against the leafrollers or plum curculio. Use of a non-ionic surfactant is recommended with Assail. **Calypso** has lepidopteran activity, also primarily limited to the internal lep complex, with excellent broad-spectrum activity, including plum curculio and European apple sawfly. The use of these materials for **Codling Moth** management of the *1st generation* is typically achieved during the 1st to 2nd cover application. A first spray date for the *2nd generation* would be applied at 1260 DD (base 50°F) from the 1st catch of the season, usually the 2nd to 4th week of July throughout the state. Reference to the NEWA apple insect prediction webpage will help in pinpointing this date for your region.

Resistance management strategies recommend that growers limit the number of chloronicotinyl applications in a season. As with the use of any one class of insecticides, the use of Calypso should be limited in a program that is already using Provado, Actara or Assail, so as to reduce the resistance potential of this important class of insecticides.

Rimon and **Esteem**, which are both insect growth regulators, should be applied as the first codling moth eggs are laid. CM often lay eggs directly onto the fruit, so application timing of these materials is critical. Esteem will also work well against the later instars of OBLR. It must be consumed to be effective as an insect growth regulator, which will inhibit larval molting into the adult stage. The **Bts** such as Dipel are more effective at managing OBLR at low rates (1/2–1 lb/A) and at 5–7-day intervals. They too must be eaten by the larvae, and should be timed at early larval hatch. The Bts are not as effective against codling moth, as the larva often burrows immediately into fruit, expelling the first few bites of the skin as they enter.

Delegate (spinetoram) has a greater spectrum of activity than SpinTor, which it replaced, showing greater efficacy, residual effectiveness and weathering capacity. It is effective up to 21 days for lep management. Using the degree-day model for **OBLR,** Delegate would be applied at first hatch, at approximately 325 DD (base 43°F) from the first sustained adult catch; again, the use of NEWA will help in determining this date in your specific area.

[Section: DISEASES]

NEW OPTION FOR CONTROLLING FABRAEA FRUIT AND LEAF SPOT ON PEARS

(Dave Rosenberger and Peter Jentsch, Plant Pathology and Entomology, Highland)

[Box Text: PEAR 'EM UP]

John Wightman at the CPS supply house in Milton recently brought to my attention a change in the label for Syllit (dodine) that now allows this product to be used on pears to control pear scab. Until recently, the Syllit label only allowed for applications to pears in the Pacific Northwest, but it can now be used throughout the country.

Dodine has been tested for its activity against Fabraea leaf spot on pears by several different researchers, and those trials showed that dodine controls Fabraea leaf spot in addition to pear scab. Thus, growers who apply Syllit for pear scab can also expect it to control or at least suppress Fabraea leaf spot. However, the current label specifies that Syllit must be applied in combination with a mancozeb fungicide. All of the mancozeb fungicides (Penncozeb, Manzate, Dithane) have a 77-day preharvest interval (PHI). As a result, under the current label, applications of Syllit are also limited to a 77-day PHI, even though Syllit itself has a 7-day PHI. The label also specifies that Syllit can be applied only three times in a season. Finally, an error on the Syllit label indicates that it can be used on pears in combinations with Captan. However, that is not the case because Captan does NOT have a label for pears because it sometimes causes russetting.

Mancozeb fungicides applied at 3 lb/A have been the preferred fungicides for controlling Fabraea leaf spot during the early part of the growing season. The first mancozeb spray should be applied at white bud on pears, with 6 additional sprays then applied at roughly 7-day intervals starting at petal fall. Control failures may occur if the spray interval is extended much beyond 7 days during late May and June, especially in wet seasons. However, the total amount of mancozeb that can be applied is limited by both the yearly maximum of 21 lb/A and by the 77-day preharvest interval specified on mancozeb labels, and the rate cannot exceed 3 lb/A if any sprays are to be applied after petal fall.

As is the case where mancozeb is used for controlling apple scab, mancozeb at 3 lb/A may fail to provide complete disease control, especially if there is more than 1.5 inches of rain during the interval between applications. Applying Syllit with mancozeb in three applications should boost the disease-control capabilities compared with using mancozeb alone. However, because Syllit can be applied only three times, that means that only three of the potential six mancozeb applications after petal fall can include Syllit. One of these mancozeb-Syllit combination sprays should be reserved for the last mancozeb spray that will be applied as the 77-day PHI approaches. Ideally, the other two applications of mancozeb plus Syllit should be timed just ahead of major rain events when more than 1.5 inches of rain are forecast for the week following the fungicide application. In the absence of any such events during May, then Syllit could be used with mancozeb in all three of the last sprays where mancozeb is applied.

In previous trials where dodine was tested against Fabraea leaf spot, the rate applied was never lower than the equivalent of what is now the full label rate of 48 fl oz of Syllit/A. It is possible that a rate of 32 fl oz (or 1 qt) per acre might suffice where Syllit is combined with mancozeb, but we do not have any data to validate the effectiveness of lower rates. We also do not know if Syllit provides any post-infection control of Fabraea leaf spot. However, since it does provide post-infection control and antisporulant activity against apple scab, it is possible that it might show similar effects (at least to some degree) for Fabraea leaf spot. Thus, it might be wise to use the Syllit-mancozeb combination in the next spray after the week-long deluge that we are currently experiencing in the Hudson Valley.

Following is a brief background on Fabraea leaf spot that was previously published in Scaffolds in 2007. Fabraea fruit and leaf spot is a fungal disease that threatens many pear orchards in the Hudson Valley and southern New England. Most pear varieties are susceptible to Fabraea, but Bosc and Seckel are the most susceptible of the commonly grown cultivars. The disease causes spotting on leaves (Fig. 3) and fruit (Fig. 4). Severe infections usually result in premature defoliation of affected trees (Fig. 5).

Fig. 3

Fig. 4

Fabraea leaf spot is one of the most "explosive" diseases of tree fruits. It often seems to appear almost overnight following rainy periods between late June and early August, but epidemics are actually initiated much earlier than that. The critical period for preventing primary infections by Fabraea is between petal fall and July first.

Fig. 5

Epidemics usually occur as a result of primary infections that become established during the three to four weeks after petal fall. These primary infections appear as nondescript, round leaf spots that usually escape notice. If fungicide protection is inadequate during June or early July, a few primary infections will provide the inoculum for a rapidly developing epidemic. Foliar symptoms can appear almost simultaneously on many leaves throughout much of the tree canopy during late June or early July.

Fabraea can build up more quickly than diseases like apple scab because scab is able to infect only newly formed leaves on growing terminals, whereas older leaves and fruit never become resistant to infection by Fabraea. Leaves and fruit on quince and pear trees remain susceptible to Fabraea leaf spot right up until harvest. Thus, when Fabraea leaf spot epidemics develop in early summer, all of the existing leaves can become infected in a short time if inoculum is present and trees are left unprotected.

During summer, continued Fabraea control can be achieved by using Sovran, Flint, and Topsin M plus Ziram. Although Sovran and Flint are effective for controlling Fabraea, they do not control the sooty molds on Bartlett fruit that develop where pear psylla honeydew was present, whereas Topsin M is very effective for preventing blackening of the fruit by fungi that grow in the psylla honeydew deposits. Including 1% spray oil in summer sprays can also help to reduce the spread of Fabraea leaf spot, but repeated applications of oil may have adverse effects on tree physiology.

Relevant literature

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