

scaffolds

Update on Pest Management
and Crop Development

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

May 21, 2007

VOLUME 16, No. 10

Geneva, NY

SCOPE
DOPE

ORCHARD
RADAR
DIGEST



Oriental Fruit Moth

Optimum 1st generation second treatment date, if needed: June 4.

San Jose Scale

First adult SJS caught on trap: May 23.

Spotted Tentiform Leafminer

1st generation sapfeeding mines start showing: May 27.

Optimum sample date is around May 28, when a larger portion of the mines have become detectable.

White Apple Leafhopper

1st generation WALH found on apple foliage: May 18.



Geneva Predictions:

Roundheaded Appletree Borer

RAB adult emergence begins: June
Peak emergence: June 15.

RAB egg laying begins: June 10. Peak egg laying period roughly: June 30 to July 15.

Codling Moth

Codling moth development as of May 19: 1st generation adult emergence at 0% and 1st generation egg hatch at 0%

1st generation 3% CM egg hatch: June 12 (= target date for first spray where multiple sprays needed to control 1st generation CM).

1st generation 20% CM egg hatch: June 20 (= target date where one spray needed to control 1st generation codling moth).

Lesser Appleworm

1st LAW flight, 1st trap catch: May 15. Peak trap catch: May 25.

Mullein Plant Bug

Expected 50% egg hatch date: May 19, which is 8 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 25.

Obliquebanded Leafroller

1st generation OBLR flight, first trap catch expected: June 13.

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**PROTECT
THE
FALLEN**

'ITS PETALS LOOSEN
AND ARE STROWN...'
(Art Agnello, Entomology,
Geneva)

❖❖ Generally favorable pollination weather has likely produced a respectable crop of most tree fruits by now, and the more advanced sites are already at (or past) petal fall, so the following is a rundown of some of the more significant pest management decisions to keep in mind.

Plum Curculio

Adults move into orchards from overwintering sites in hedgerows or the edges of woods and adults are active when temperatures exceed 60°F. Adult females oviposit in fruit during both day and night but feed mostly at night. Depending on temperature, overwintering adults remain active for 2–6 weeks after petal fall. Because adults are not highly mobile, orchards near overwintering sites, woodlands, and hedgerows are most susceptible to attack. Fruit damage is usually most common in border rows next to sites where adults overwinter. Although initial post-bloom sprays for plum curculio control should begin at petal fall, growers are often unsure how many additional sprays will be necessary to maintain protective chemical residues to prevent subsequent damage throughout the PC oviposition cycle, which varies according to temperatures and weather patterns after petal fall.

Following from the fact that PC activity and oviposition are largely determined by temperature, an oviposition model has been developed to determine when control sprays after petal fall are no longer necessary to protect fruit from PC damage. This model is based on the assumption that residues from control sprays after petal fall only need to be maintained on fruit and foliage until PC adults stop immigrating into orchards, which corresponds to the time when about 40% of the oviposition cycle is complete. This is predicted by the model to occur at 308 DD (base 50°F) after petal fall of McIn-

tosh. Most probably, this strategy works because, after 40% of PC oviposition is complete, adults usually are not moving into the orchard from outside sources, or moving around within orchards from tree to tree. Therefore, by this time, adults residing in treated trees have already been killed by insecticide residues and are unable to complete the remainder of their normal oviposition cycle.

In order to use this strategy: (1) Treat the entire orchard at petal fall with a broad spectrum insecticide. (2) Start calculating the accumulation of DD after petal fall of Macs (base 50°F). (3) No additional sprays are necessary whenever the date of accumulation of 308 DD falls within 10–14 days after a previous spray. We'll attempt to give local updates for the major fruit areas as the post-PF period progresses. In cherries and other stone fruits that are already at shuck fall, sprays should start (or should have started, as appropriate) at the first opportunity. Recall that, in addition to previously labeled products, some registration decisions made last year resulted in some additional choices you may want to consider this season: Lorsban 75WG can now be used at petal fall in apples (as well as tart cherries), and Calypso is labeled for plum curculio in apples and pears.

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European Apple Sawfly

This primitive bee and wasp relative shows a preference for early or long-blooming varieties with a heavy set of fruit. This insect is generally a pest mainly in eastern N.Y., although it has been slowly making its presence known in the more western sites, progressing even as far as Wayne Co. The adult sawfly emerges about the time apple trees come into bloom and lays eggs in the apple blossoms. Young larvae begin feeding just below the skin of the fruits, creating a spiral path usually around the calyx end. This early larval feeding will persist as a scar that is very visible at harvest. Following this feeding, the larva usually begins tunneling toward the seed cavity of the fruit or an adjacent fruit, which usually causes it to abort. As the larva feeds internally, it enlarges its exit hole, which is made highly conspicuous by a mass of wet, reddish-brown frass. The frass may drip onto adjacent fruits and leaves, giving them an unsightly appearance. The secondary feeding activity of a single sawfly larva can injure all the fruit in a cluster, causing stress on that fruit to abort during the traditional "June drop" period.

Certain insecticides that control these pests also adversely affect bees, which can pose a problem at petal fall because certain apple varieties lose their petals before others. In blocks of trees where petal fall has occurred on one variety but not the others, the variety that has lost its petals is likely to sustain some curculio or sawfly injury until the insecticide is applied. Some recently registered insecticides with activity against both plum curculio and sawfly -- Calypso, Avaunt and Actara -- may have a slight advantage over conventional OPs in this case. Another recently registered product, Assail, gives yet another option for controlling sawfly; it's not very active against plum curculio, but will do a good job against rosy apple aphid and spotted tentiform leafminer, as well as sawfly, at this timing. To minimize the hazard to honey bees, apply any pesticide only when no bees are actively foraging on blooming weeds (evening is better than early morning).

Mites

If you applied oil or a miticide during our ample prebloom mite control window this season, you're in good shape. If not, and you are concerned about early buildup in certain problem blocks, Agri-Mek, Apollo, Savey and Zeal are all appropriate choices to consider at petal fall. Because of the cool temperatures (particularly at night) that can still occur, nymphal populations are likely to be small enough to be effectively handled by any one of these materials, if they fit into your product rotation schedule (i.e., if they weren't used last year).

Obliquebanded Leafroller

Because these insects overwintered as 1st or 2nd stage larvae, they probably have taken advantage of some of our earlier warm weather to feed and grow into good-sized caterpillars, although I have to say that they haven't been especially numerous or sizeable up to this point. It would be prudent to have a quick look for late-stage larvae in problem blocks to determine whether a treatment against the overwintered brood should be included in your petal fall plans. Scout the blossom clusters or foliar terminals for larvae feeding within both the flowers and rolled leaves; a 3% infestation rate could justify an application to minimize overwintered fruit damage and help reduce summer populations.

Among the selective insecticides available, Intrepid has been successful at this timing, and B.t. products, which can be used while blossoms are still present, include Dipel, Deliver, Agree and Javelin. Proclaim, which received a NYS registration late last summer, has been shown in research trials to be very effective at the petal fall timing. Pyrethroids such as Asana, Baythroid, Danitol, Warrior or Proaxis may also be effective, depending on past use history, but be aware of their broad-spectrum effects, which can work both for and against you, according to how many beneficial mites and insects you can afford to lose. Another new/old product to consider this year is Lorsban 75WG, which had been the last of the 'unconventional' OPs to retain

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efficacy against OBLR when it was available for summer use. Now that it is registered for use in apples (and tart cherries) at petal fall, populations may be susceptible to this a.i. as a good rotational option. Spintor, a very good OBLR material, may also be elected, although we have gotten best results season-long reserving this product for the summer broods.

Oriental Fruit Moth

Biofix generally occurred around May 7–10 in western NY, and trap numbers are once again high this spring. Current degree day readings total somewhere between 93 (Sodus) and 181 (Albion) — with a median value of about 150 — towards the recommended totals of 170 (in peaches) and 350 (in apples) as the timing at which to start a protective spray program. To maximize the efficacy of 1st brood control, peach growers in western N.Y. should use one of the suggested OP or pyrethroid options from the Recommends at petal fall, backed up 10–14 days later. In apples, a number of the petal fall selection of insecticides will do an acceptable job of controlling this generation, including the OPs, pyrethroids, Intrepid, Assail, and Calypso.

White Apple Leafhopper

We haven't spotted any yet, but WALH nymphs can be numerous in some blocks at petal fall, especially in the eastern part of the state. Nymphal populations of 1 or more per leaf can result in stippling damage to the leaves. Provado, Actara, Avaunt, Assail and Calypso have proven to be effective against this pest, and a petal fall application of any of these materials also gives leafminer control. Rosy apple aphids can similarly be cleaned up with this strategy (for most of the above; not so well with Avaunt), although petal fall is often too late to prevent fruit damage that their feeding may have caused. Growers using Sevin in their thinning sprays will get some WALH control at the 1 lb rate. Alternative choices include Thionex and Lanate; Agri-Mek or Carzol used for mites now will also do the job, although Carzol will be harmful to predator mites. ❖❖

LET IT
BE
KNOWN

PROCLAIM 2(ee)

❖❖ New York has been granted a FIFRA Section 2(ee) registration for the use of Proclaim 5SWG insecticide (Syngenta Crop Protection) for the control of first generation codling moth in apples. This label recommends an application at 4.8 oz/acre at the point of codling moth egg hatch or immediately thereafter (generally estimated at 250–360 DD, base 50°F, after the 1st adult catch), and a second application 7–14 days later. The maximum allowable amount in apples is 14.4 oz per season. (Note: We have not had the opportunity to evaluate this treatment option in our research trials.) ❖❖

PEST FOCUS

Geneva:

Codling moth 1st catch 5/17.

Highland:

Plum curculio oviposition is low due to cool temps. **Lep** and **European apple sawfly** damage observed in apple. 1st **lesser apple-worm** trap catch.

GENERAL INFO

TAKE TWO

**ANOTHER DAY,
ANOTHER SPRAY
DEMO**
(Andrew Landers,
Entomology, Geneva)

❖❖ The next in the series of extension demonstrations that have been organized about using sensor-controlled precision spray systems with tower orchard sprayers will take place at Orchard Dale Farms, on Oak Orchard River Road (Between Route 18 and Green Rd., see map) on May 29 at 5:00 pm. Growers are encouraged to attend, to view the latest technology at work and to hear about the potential savings in pesticide used.❖❖



PHENOLOGIES		
Geneva:		
	<u>5/21</u>	<u>5/28 (Predicted)</u>
Apple(McIntosh):	Petal fall	fruit set
Apple(Red Delicious):	25% petal fall	petal fall – fruit set
Pear:	fruit set (5/17)	
Sweet cherry:	fruit set (5/17)	
Tart cherry:	fruit set	
Highland:		
Apple (McIntosh, Ginger Gold):	fruit 10mm	
Apple (Golden Delicious, Red Delicious):	80% petal fall	

CROP
HEAVY

THINNING APPLES

— 2007

(Steve Hoying,
Horticultural Sciences,
Highland)

❖❖ It is a risky thing to make statements about thinning in writing, but I do want to alert growers to conditions that they should be aware of for thinning apples in New York in 2007. Of course, every region and location is different, and careful scouting for set and fruit size should be done before a final decision is made regarding thinning.

There appears to be a very strong set this year with almost every variety showing the potential for much more than a full crop. This appears to be the on-year for biennial bearing varieties such as Honeycrisp, Fuji, Golden Delicious, Cameo, and others. Obviously, for apples to size and mature, a sizeable proportion of the crop must be removed. These varieties in particular must have 2/3 of the clusters without fruit in order to return with enough bloom to set a crop the following year. Clusters also need to be thinned down to 1 or 2 fruits, according to variety, to boost fruit size. A multi-step thinning approach is recommended, starting with a bloom and/or petal fall application, followed by the traditional timing of 8–13mm fruit diameter. This multi-step approach can remove a larger percentage of fruit safely. This approach gives you several chances to reduce the crop to proper levels, rather than having only the single chance.

Empire, Gala, and Jonamac also have an extremely heavy set this year and should also have additional thinning in the form of a petal fall application, using both Sevin and NAA, followed at the traditional time with traditional rates. We have a lot of research showing that the petal fall thinning application is mild and has never been solely responsible for over-thinning in any of our trials.

Our experience shows that it is better to wait for ideal weather than to thin when the fruit is in the ideal size class, even if this means that the fruit are rather large (12–14mm). Early thinning (8mm fruit diameter) during cool conditions with NAA or BA is most often ineffective. In addition, research over the past 5 years has shown that thinning IS more effective in cool seasons with the larger sized apples (12–14mm).

Temperatures at thinning time have a huge effect on the performance of thinners. Any time temperatures exceed 80°F during thinning, you must use caution, especially with any of the BA materials. Your strategy should be to reduce rates somewhat, but certainly not completely, especially this year with such a strong set.

Materials for fruit thinning are well known and are covered well in the Cornell Pest Management Guidelines. Just a couple of suggestions about materials. Use the 6- Benzyl Adenine materials (Maxcel, RiteWay, Exilis Plus) on small-fruited varieties such as Empire, Jonamac, and Gala, or ones that will pygmy such as Fuji and Delicious. Naphthalene acetic acid can be used on the small-fruited varieties, but will not have the size enhancing properties of the 6BA.

Read the label and study the Guidelines. It appears that this year will require aggressive thinning to prevent excess summer hand thinning. ❖❖

ON
THE
SPOT

CONTROLLING
FABRAEA FRUIT AND
LEAF SPOT ON PEARS
(Dave Rosenberger, Plant
Pathology, Highland and
Peter Jentsch,
Entomology, Highland)

❖❖ 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. 1) and fruit (Fig. 2). Severe infections usually result in premature defoliation of affected trees (Fig. 3).

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.

Epidemics usually occur as a result of primary infections that become established during



Fig 1: Fabraea lesions on leaves. The grayish-white spots in lesions (Fig. 1A) are spores that ooze from fruit structures during wet weather. Lesions may coalesce on severely affected leaves (Fig. 1B).



Fig 1B

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.

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Fig 2: Bosc pear fruit with a few *Fabraea* lesions (Fig. 2A) and a severely infected Seckel fruit (Fig. 2B).

The mancozeb fungicides are the most effective for controlling *Fabraea*, but their use is restricted by their 77-day pre-harvest interval. In a fungicide trial conducted at the Hudson Valley Lab in 2004 (Rosenberger et al. 2005), we achieved excellent control of *Fabraea* in a high inoculum orchard by using weekly applications of mancozeb fungicide at 3 lb/A. Prior to that trial, we suggested that *Fabraea* could be controlled by using mancozeb on a 10–14 day spray interval, but we now believe that a shorter 7-day spray interval is essential in high inoculum orchards, especially in wet seasons.

The amount of mancozeb that can be applied is limited by both the yearly maximum of 21 lb/A and by the 77-day pre-harvest interval specified on mancozeb labels. During summer, continued *Fabraea* control can be achieved by using Sovran, Flint, and Topsin M plus Ziram (Rosenberger et al. 2004). Although Sovran and Flint are effective for controlling *Fabraea*, they do not control the sooty mold on Bartlett fruit that develop where pear

psylla honeydew was present, whereas Topsin M is very effective for preventing blackening of the fruit where pear psylla are present.

A pear psylla trial in 2006 yielded suggested new options for controlling *Fabraea* leaf spot. Psylla treatments were applied to replicated plots during the growing season. In late September, we noted dramatic differences in *Fabraea*-related defoliation in the various plots. Initially we assumed that the differences in severity of *Fabraea* leaf spot were attributable to differences in insect populations because we know that insects and mites can help to spread the sticky *Fabraea* spores and thereby contribute to *Fabraea* epidemics. However, detailed plot evaluations revealed that two treatments had resulted in nearly identical psylla control throughout the season, but one of the treatments had much less *Fabraea*. As shown in Table 1, plots that received three applications of Damoil after bloom still retained most of their leaves on 28 September, whereas plots treated with Agrimek were defoliated, despite having similar psylla pop-

continued...



Fig. 2B



Fig 3: Fabraea can cause trees to lose leaves before harvest as shown on this photo taken on 10 September.

ulations. All of the plots, including the controls, received the following airblast fungicide applications: Dithane 75DF 3 lb/A on 19 April, 3, 10 May, 22 June, Dithane DF 3 lb/A +Nova 40WP 4 oz/A on 8 June; Ziram 3 lb/A on 20 July.

Results from the 2006 trial suggest that summer oil sprays might help to control Fabraea fruit and leaf spot in high inoculum orchards. We do not know if the oil controlled Fabraea directly by interfering with infection and/or spore dissemination, or whether the oil applied on 6 and 21 June interacted with the mancozeb fungicide applications that were made on 8 and 22 June. We hope to answer some of these questions in our 2007 field trials.

Given our results in 2006, growers who have had difficulty controlling Fabraea in the past may wish to try combinations of mancozeb plus 1% oil at weekly intervals during late May and early June. Repeated applications of oil may result in enlarged lenticels on Bartlett pears, and that slightly roughened appearance may be undesirable for some markets. For Bosc pears, however, the combination of mancozeb plus oil may result in improved control of Fabraea compared with applications of mancozeb alone. Even where the mancozeb plus oil treatment is used, we recommend that growers maintain fungicide coverage through July and August by applying Sovran, Flint, or Topsin M. Topsin M can be applied alone or in combinations with Ziram. ❖❖

Table 1. Effects of two treatments on populations of pear psylla on Bartlett and severity of Fabraea leaf spot on Bosc as observed in a pear trial at the Hudson Valley Lab, Highland, NY, in 2006.

Treatment and rate of formulated product/100 gal ¹	Dates ²	<u>No. of psylla nymphs per Bartlett leaf</u>				<u>% Bosc terminal leaves</u>	
		2 Jun	12 Jun	26 Jun	5 July	defoliated 28 Sep	infected 3 Oct
Control	-	1.3 b ³	7.8 b	6.1 b	1.5 b	70.6 b	96.6 b
Damoil 2 gal	30 Mar						
AgriMek 2.5 oz							
+ Damoil 2 qt	23 May	0.3 a	0.8 a	2.4 a	0.2 a	56.8 b	87.9 b
Surround 12.5 lb	30 Mar						
Damoil 2 gal	23 May						
Damoil 1 gal.	6 & 21 Jun	0.5 a	1.2 a	1.3 a	0.3 a	6.7 a	56.8 a

¹ Rate of product per 100 gal of dilute spray applied with a handgun to four replicated plots, with each replicate containing two Bartlett and two Bosc trees.

² Growth stages were 30 March (swollen bud), 23 May (10 days after petal fall), 6 June (2nd cover), 21 June (3rd cover)

³ Mean separations by Fishers Protected LSD ($P \leq 0.05$). Treatment means followed by the same letter are not significantly different.

INSECT TRAP CATCHES (Number/Trap/Day)						
Geneva, NY				Highland, NY		
	<u>5/14</u>	<u>5/17</u>	<u>5/21</u>		<u>5/14</u>	<u>5/21</u>
Green fruitworm	0.0	0.0	0.0	Green fruitworm	0.0	0.0
Redbanded leafroller	2.8	2.3	0.1	Spotted tentiform leafminer	42.5	2.9
Spotted tentiform leafminer	6.4	7.5	2.6	Oriental fruit moth	9.8	1.1
Oriental fruit moth	0.6	2.2	0.4	Codling moth	0.1*	0.4
Codling moth	0.0	0.2*	0.0	Lesser appleworm	0.0	0.6*
Lesser appleworm	0.0	0.0	0.0			
American plum borer	0.0	0.0	0.3*			

* first catch

UPCOMING PEST EVENTS		
	<u>43°F</u>	<u>50°F</u>
Current DD accumulations (Geneva 1/1–5/21/07):	468	240
(Geneva 1/1–5/21/2006):	542	256
(Geneva "Normal"):	536	300
(Geneva 1/1–5/28/2007, Predicted):	608	336
(Highland 3/1–5/21/07):	446	244
<u>Coming Events:</u>	<u>Ranges(Normal±StDev):</u>	
McIntosh at fruit set	467–648	266–330
Red Delicious at petal fall	474–760	253–321
Red Delicious at fruit set	502–673	264–348
American plum borer 1st catch	194–567	141–279
Spotted tentiform leafminer 1st flight peak	180–544	114–208
Oriental fruit moth first flight peak	259–700	159–285
Lesser appleworm 1st catch	135–687	112–302
Lesser appleworm 1st flight peak	372–1125	180–436
Mullein bug 90% hatch	438–668	240–322
Mullein bug hatch complete	467–720	252–350
Plum curculio oviposition scars present	450–606	256–310
San Jose scale 1st catch	189–704	188–326
Spotted tentiform leafminer sap-feeders present	295–628	165–317
Lesser peachtree borer 1st catch	224–946	222–406
Pear psylla hardshells present	463–651	271–361

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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