scaffolds Update on Pest Management and Crop Development
FRUIT JOURNAL

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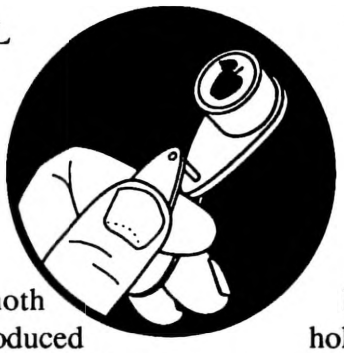
INSECTS

SOME ARE FUN

PEACH PATROL
(Art Agnello, Entomology, Geneva)



❖❖ The oriental fruit moth (OFM), native to China, was introduced into the United States from Japan about 1913 on infested nursery stock. The OFM is now found in all regions of North America where peaches are grown. Although it is most important as a pest of peach, the OFM has an extensive host range that includes apple, quince, pear, plum, cherry, apricot, nectarine, and some rosaceous ornamentals. In the northeastern United States, the OFM has three generations (flights) per year. In areas with a longer growing season, it may have up to five generations per year.

On peach, the OFM feeds in both vegetative growth and fruit. The first generation, which is feeding when terminals are succulent and tender, develops almost exclusively in the vegetative growth. The larvae often enter the terminal at the base of a young leaf, and tunnel toward the base of the shoot. Infested terminals wilt and die back to the margin of feeding, and are commonly called "strikes" or "flagged shoots". Heavy twig infestations of nursery stock can adversely affect the shape of the tree. Axillary buds often begin to grow when the terminal shoot is killed, causing the tree to have a bushy appearance.

Fruit that are infested when very small often drop. Early infested peaches that do not drop have obvious entrance holes with frass and gum exuding from them. Larvae attacking nearly ripe peaches usually enter the fruit near the stem, leaving only a very small, inconspicuous entrance hole. The larvae tunnel in the fruit, and frequently excavate cavities near the pit.

Terminal feeding on apple is similar to that on peach. Infested apples have a collection of frass at the exit hole of the insect's feeding tunnel, or at the calyx end. It is difficult to distinguish between OFM damage and codling moth damage. OFM larvae feed randomly in the apple, and usually do not feed on the seeds, while codling moth larvae usually tunnel directly to the core of the apple and feed on the seeds. Later instar larvae of the two species may be distinguished by the presence or absence of the anal comb at the tip of the abdomen. The anal comb is present in the OFM and absent in the codling moth.

More than 130 species of parasitoids have been reported attacking OFM; however, parasitism probably plays a very minor role in OFM control in today's commercial orchards because of the sensitivity of many parasitoids to commonly used insecticides. Before the advent of the organochlorines, attempts were made to supplement naturally occurring biological control of the OFM. Inundative releases of the braconid wasp, *Macrocentrus ancilivorus*, provided an average 50% reduction in number of infested fruit. However, because of the large pest complex on apple, biological control of one pest is difficult to achieve, since broad-spectrum insecticides are still needed for other pests.

Research on mating disruption of OFM has shown that if a synthetic sex pheromone is re-

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leased in high concentrations during bloom, male Oriental fruit moths cannot locate a female to mate. However, this approach is economically justified in N.Y. only if 2–3 sprays are normally applied to control this pest, and if no other insecticide sprays are routinely needed after shuck split. For most commercial blocks, where 2nd brood larvae threaten fruits as they ripen, an application of carbaryl (Sevin) is recommended 2 weeks before harvest or, for those depending on scouting results, when larval numbers reach 1 per 10 terminals. In recent years, some tolerance or resistance tendencies have been noted in local populations, so this is a case where rotation to alternative chemical classes would be recommended; other choices would include Lorsban, Lannate, or a pyrethroid. (Adapted from Oriental Fruit Moth Fact Sheet #17, by A. J. Seaman and H. Riedl).

Peachtree Borers

For those on a seasonal program to control these borers in their peaches, next week will be the time for another trunk and scaffold spray of a suitable material, such as Lorsban, Thiodan, Asana, Penncap-M, Ambush or Pounce. Be sure to note PHI's and spray number restrictions.❖❖

DOG DAYS DREADS

TAN, DON'T BRONZE

❖❖ Regardless of how attentively you have watched the numbers of in your specific orchards up to this point, a careful examination of at least the traditional trouble spots is recommended at this time, for a number of reasons. First, we are past the period of effectiveness of early season applications of oil, and even the small percentage of survivors from the most successful pre-bloom control programs could start to increase to problematic levels by now. Also, this is normally the time when we see a big jump in numbers of motile forms because the first crop of European red mite summer eggs has completed their hatch. The hot weather we are experiencing has been ideal for mite growth, so even though the ERM threshold goes up to 5 per leaf in July, the mites tend to increase exponentially now, so it's no contest for all that new growth the trees have been putting on recently. Because of their early start this year, ERM could easily squeeze in an entire extra generation before the summer's out. This may not be evident just yet, but that extra flush of motile forms at the end of August will seem like the coup de grace if they weren't properly attended to when they pole-vaulted past threshold two months before.

This type of weather is also much favored by twospotted spider mites. Recall that the TSSM overwinters as an inactive adult female beneath bark scales or under debris on the orchard floor. Occasionally, when winter temperatures are warm enough, the mites remain active and maintain a low population on weed hosts or cover plants in the orchard. As summer approaches and temperatures rise, mite populations increase and they begin to move up the tree trunks to the foliage. Lower portions and canopy centers are

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attacked first, then the mites spread to the outside of the trees as their population increases. Feeding on pear leaves causes a unique browning or blackening of the foliage. It is not uncommon to have a colony of only 2–3 mites near the midrib of a leaf, and as a result of their feeding there is a blackening of large sections of leaf from the midrib to the margin. A low number of TSSM is more damaging than a similar count of ERM, and foliar blackening may appear after the mites have been controlled, brought about by a period of hot weather shortly after an effective spray has been applied.

Check your foliage; if you miss the chance to control either of these species now, there may be no recovering before some significant damage is done to this very susceptible stage of the trees and fruit.

WOOLLY APPLE APHID

We have already begun noticing infestations of the wild woollies in western N.Y. orchards. The woolly apple aphid (WAA), *Eriosoma lanigerum*, colonizes both aboveground parts of the apple tree and the roots, and commonly overwinters on the roots. In the spring, nymphs crawl up on apple trees from the roots to initiate aerial colonies. Most nymphs are born alive to unmated females on apple trees during the summer. Colonies initially build up on the inside of the canopy on sites such as wounds or pruning scars and later become numerous in the outer portion of the tree canopy, usually during late July to early August. Their (somewhat limited) presence now can serve as an indication of potential trouble spots later on.

Aerial colonies occur most frequently on succulent tissue such as the current season's growth, water sprouts, unhealed pruning wounds, or cankers. Heavy infestations cause honeydew and sooty mold on the fruit and galls on the plant parts. Severe root infestations can stunt or kill young trees but usually do not damage mature trees. Large numbers of colonies on trees may leave sooty mold on the fruit, which annoys pickers because red sticky residues from crushed WAA colonies may accumulate on their hands and clothing.

Water sprouts, pruning wounds, and scars on the inside of the tree canopy should be examined for WAA nymphs. Starting sometime in early July, new growth around the outside of the canopy should be examined for WAA colonies. No economic threshold has been determined for treatment of WAA. *Aphelinus mali*, a tiny wasp, frequently parasitizes WAA but is very susceptible to insecticides and thus does not provide adequate control in regularly sprayed commercial orchards. Different rootstocks vary in their susceptibility to WAA. Resistant rootstocks such as MM.106, MM.111, and Robusta are the only means of controlling underground infestations of WAA on apple roots. WAA is difficult to control with insecticides because of its waxy outer covering and tendency to form dense colonies that are impenetrable to sprays. WAA is resistant to the commonly used organophosphates, but other insecticides that are effective include Lorsban, Thiodan, and Penncap-M.❖❖

PEST FOCUS

Geneva:
1st **obliquebanded leafroller** trap catch in Western N.Y. = 5/29. DD (base 43 °F) since 1st catch = 480. **Spotted tentiform leafminer** 2nd flight began 6/11. DD (base 43 °F) since then = 275. 1st **apple maggot** caught on baited red sphere trap.
1st **obliquebanded leafroller** summer larvae hatched 6/18.

Highland:
1st **obliquebanded leafroller** trap catch in Highland N.Y. = 5/26. DD (base 43 °F) since 1st catch =614. 1st catch of ***sparganothis fruitworm***. 1st **apple maggot** caught on baited red sphere trap.

MANY MOTHS TO FEED

BUT WHO'S COUNTING?

❖❖ Obliquebanded leafroller larvae should be evident in most parts of the state by now, although as of this writing no reports have been received. Our highly contentious model predicts the start of egg hatch at around 360 DD (base 43F) after the first moth catch, 25% (peak) hatch by 450 DD, and 50% hatch by 630 DD. Following are the developmental totals we've calculated for various locations in the state, as cued by the first moth catches at those sites. Interested counters should note their local temperature readings this week and add appropriate DD's to the numbers obtained as of this morning, 6/22:

SITE	FIRST CATCH	DD(43) TOTAL
Highland	May 26	614
Geneva	May 29	480
Lyndonville	May 29	375(6/20)
Williamson	June 1	430
Albion	June 2	421

Research Update

Growers in western N.Y. are well aware that their OBLR populations are generally resistant (by a 10–30x factor) to common OP's such as Guthion. This is generally attributed to the long history of exposure these populations have had to such compounds, and helps explain why OBLR started being a serious pest in the mid-70's. The fact that OBLR has not so far become a widespread problem in other parts of the state was traditionally explained by citing one of two potential causes:

1. Differences in its distribution—it didn't seem to occur very commonly in eastern or central N.Y. growing regions.

2. Susceptibility differences in populations located in other parts of the state — it's been there all along, but never developed resistance.

In recent years, the once-sporadic reports of problem infestations in those areas have become more common. After much painstaking work, Harvey Reissig has been able to establish lab colonies of populations taken from some different regions where OBLR problems have cropped up. He has assayed newly hatched larvae from populations in the Hudson Valley (Clintondale) and central N.Y. (Lafayette), and preliminary results indicate that these populations are essentially as resistant to Guthion as are the larvae from our venerable OBLR hotspots in Orleans Co. This would mean that OBLR probably *have* been less common in other regions in the past, but the populations are indeed spreading somehow, and it seems their resistance tendencies are similar to the ones in western N.Y. This could be providing an unwelcome preview of what to expect in the future if, as they say, current trends continue.❖❖

ROTTIN' WEATHER

DISEASE UPDATE
(Dave Rosenberger, Plant Pathology, Highland)

DISEASES

Apple Scab

❖❖ Secondary spread of apple scab is still a concern in orchards where apple scab is active. With extensive rains and lengthy wetting periods during the past week, no one has the perfect answer for how to time sprays to prevent secondary spread of scab. Cover sprays applied early last week were quickly compromised by heavy thunderstorms that deposited nearly two inches of additional rainfall. Humid, cloudy, and foggy conditions through the remainder of last week certainly did nothing to slow the development and spread of apple scab.

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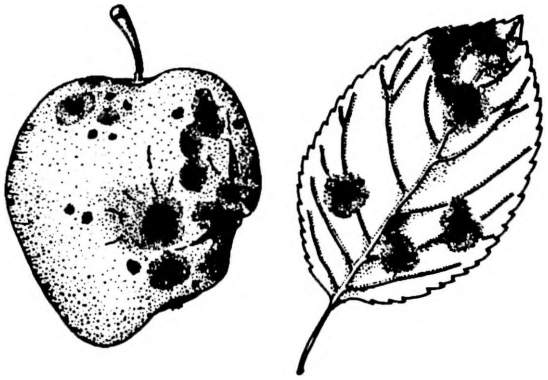
In blocks where scab is still active, apple growers should continue applying captan on a tight schedule (7–14 days) to prevent secondary infections of apple fruit. The SI fungicides (Nova, Rubigan, Procure) are not very effective for protecting fruit and not recommended for summer applications. Dodine (Syllit) may help to slow secondary spread of apple scab in orchards where dodine-resistant strains of apple scab are not present. However, dodine resistance is so widespread within the state that effectiveness of dodine is always questionable. If dodine is applied to help arrest a scab epidemic, it should always be applied in combination with at least 3 lb/A of Captan 50W or 1.9 lb of Captan 80W. Where captan is applied alone, the higher labeled rates of captan may be needed to get acceptable control of fruit scab where an abundance of secondary inoculum is still present in orchards.

In an earlier issue of *Scaffolds*, I noted that the effectiveness of captan against apple scab seems to increase as temperatures rise above 80°F. This statement was based on field observations of scab epidemics that were arrested very quickly when captan applications were followed by a series of hot days. I did not mean to imply that captan should be *applied* in hot weather. In fact, pesticide applications should *NOT* be made when outdoor temperatures are above 80–85°F because the potential for injury to fruit and foliage is much higher when pesticides are applied in hot weather.



Calyx-End Rot of Apples

Calyx-end rot (also known as blossom-end rot) is appearing on apple fruit in some orchards in eastern N.Y. On affected fruit, a black or dark brown lesion originates from the calyx and spreads toward one side of the fruit, thereby creating an off-center lesion that is most evident when the fruit is viewed from the calyx end. The fruit surface at the edge of the lesion is sometimes bright red, especially if the lesion is still expanding. However, infections usually stop expanding and dry out by the time lesions reach 5 to 15 mm in diameter. Most affected fruit will ripen prematurely beginning in late July. Affected fruit usually drop from the tree before harvest.

Most of the calyx-end rot in N.Y. orchards is caused by *Sclerotinia sclerotiorum*, but two other fungi, *Botrytis cinerea* and *Botryosphaeria obtusa*, can cause similar infections. *S. sclerotiorum* grows on lower stems of infected weeds hosts in the ground cover (e.g., dandelion, wild clover). Ascospores are produced and released when the ground stays wet for 2–3 days (an event that has recurred several times this year). Apple fruit become infected when ascospores of *S. sclerotiorum* are blown from the infected plants in the groundcover to sepals on apple flowers or to the calyxes of small fruitlets.

Calyx-end rot will not spread from one infected fruit to another. No control measures are of any benefit after infections become visible. Applying Benlate or Topsin M at petal fall and first cover might have helped to prevent infection. Research on other crops has shown that the benzimidazole fungicides are effective for controlling *S. sclerotiorum*, but the other fungicides registered for apples are not very effective. Control measures for *S. sclerotiorum* on apples have not been developed because the disease occurs only sporadically (in years with lengthy wetting periods near petal fall). In most instances, less than one percent of fruit in an orchard are infected, so this disease has never merited much attention from apple researchers.❖❖

INSECT TRAP CATCHES (Number/Trap/Day)

Geneva, NY

	6/15	6/18	6/22
Spotted tentiform leafminer	561	998	477
Redbanded leafroller	0	0	0
Oriental fruit moth (apple)	0	0	0.1
Lesser appleworm	0.9	0	0.1
Codling moth	9.9	5.2	1.0
San Jose scale	0	0	0.1
American plum borer	0.3	0.2	0
Lesser peactree borer	1.3	4.3	2.6
Peachtree borer	0.1	0.8	0.5
Pandemis leafroller	1.5	0	0
Obliquebanded leafroller	0.5	0.3	0.1
Apple maggot	-	0	0.1*

HVL, Highland, NY

	6/8	6/15	6/22
Spotted tentiform leafminer	3.3	22.9*	23.5
Redbanded leafroller	0	0	0.3
Oriental fruit moth	0	0.1	0.1
Lesser appleworm	0.1	0	0
Codling moth	0.1	1.6	1.4
Obliquebanded leafroller	0.4	0.4	0
Variegated leafroller	0.7	1.5	0.2
Tufted apple budmoth	2.0	5.4	0.9
Fruittree leafroller	0	0.1*	0.1
Sparganothis fruitworm	-	0	0.9*
Apple maggot	-	0	0.1*

* 1st catch

(Dick Straub, Peter Jentsch)

UPCOMING PEST EVENTS

	43°F	50°F
Current DD accumulations (Geneva 1/1- 6/22):	1380	861
(Geneva 1997 1/1-6/22):	976	565
(Geneva "Normal" 1/1-6/22):	1117	764
(Highland 1/1-6/22):	1611	1016

Coming Events(Geneva):	Ranges:	
OBLR summer larvae hatch	1076–1513	630–980
Cherry fruit fly 1st catch	650–1500	368–961
Apple maggot 1st oviposition punctures	1566–2200	1001–1575
American plum borer 2nd flight begins	906–1876	973–1337
Comstock mealybug adult 1st catch	1270–1673	756–1105
Lesser appleworm 2nd flight begins	1152–2302	778–1531
Lesser peachtree borer flight peak	733–2330	392–1526
Peachtree borer flight peak	864–2241	506–1494
OBLR 1st flight subsides	1420–2452	899–1790
Oriental fruit moth 2nd flight begins	1152–1819	772–1215
Redbanded leafroller 2nd flight begins	1096–2029	656–1381
San Jose scale 2nd fllight begins	1449–1975	893–1407

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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