# scaffolds Update on Pest Management and Crop Development

## FRUIT JOURNAL

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INSECTS

## MINOR MINER?

APPLE LEAFMINER (Dick Straub, Entomology, Highland)

❖❖ During the last couple of weeks, I have received numerous inquiries from Hudson Valley growers regarding considerable foliar damage by a leafminer. The pest is neither the spotted tentiform leafminer nor the apple blotch leafminer—gracillariid species that are commonly found in this region. The culprit, apple leafminer (*Lyonetia speculella* Clemens), has been occurring sporadically here in isolated orchards since 1987.

Female moths oviposit in tender new foliage by piercing the undersides of leaves and depositing single eggs inside the leaf tissue. The hatched larvae form serpentine mines, which are visible as wavy brown lines on the tops of leaves. As the larvae grow, they enlarge their mines into brown blotches, within which they consume all of the tissue between the upper and lower epidermis. Unlike other leafminers of apple, *L. speculella* is characterized by frass (small black pellets) that is constantly expelled on a silken thread from the mine by the feeding larvae. Just prior to pupation, larvae spin cocoons, which are suspended by threads and resemble a hammock. Apple leafminer probably has 4 to 6 generations per year in southeastern New York.

Moreover, unlike our other leafminers, larval damage is confined to the youngest foliage, particularly terminal leaves of vigorously growing shoots. Root initials or water sprouts that are partially shaded are the preferred sites for feeding and pupation. Severely mined leaves turn brown and die; most such leaves drop off prematurely, thereby decreasing the number of the most photosynthetically active leaves. The potential for damage is greater in young orchards than in mature ones, and vigorous trees usually sustain higher infestations than do less vigorous trees.

Populations normally do not achieve high abundance or cause critical damage until the beginning of the harvest period of our earliest cultivars. Insecticidal control of larvae or adults at this time may not be a reasonable tactic because of the pre-harvest interval of most materials; and just as importantly, because infestations do not damage fruit or cause premature drop of fruit. Broad-spectrum insecticides typically used in cover sprays (OP's) are unlikely to provide significant control of adults or larvae. The optimum control tactic would be 1 or 2 sprays of either methomyl, oxamyl, endosulfan or a pyrethroid at petal fall or 1st cover. Undoubtedly, imidacloprid at the same timing would also do some good. We consider that sprays are necessary only on non-bearing trees where vigor is essential, or on bearing trees that had high infestations the previous season.❖❖

## INSECT BITES

THE WHITES OF THEIR EYES
(Art Agnello, Entomology, Geneva)

❖❖ As we approach the middle of July, the gathering summer heat sets the clock on all of the major apple arthropod pests, and determines not only how serious a problem they will be, but also the details of their life history that we use to assess their levels in specific orchards. Last week was warm in N.Y., and this week looks a little cooler, but pest development seems to be proceeding normally; here are our views on the major players at this point.

**Obliquebanded Leafroller**

Egg hatch and the appearance of neonate larvae were reported as early as June 27 in some western N.Y. locales, to no one's surprise about 10 days after the 1st moths were caught. Although they are tiny, early stage larvae can already be found in shoot terminals; for those who are waiting for the 600 DD (base 43°F) mark to begin scouting for treatment decisions, our current (7/7) readings follow:

| SITE | FIRST CATCH | DD TOTAL |
|---|---|---|
| Highland | June 9 | 804 |
| Knowlesville | June 16 | 598 (Waterport) |
| Geneva | June 17 | 537 |
| Wolcott | June 19 | 462 (Sodus) |

Check pp. 83, 91–92, 95 and 100 in the 1997 Recommends for guidelines on sampling procedures.

**Spotted Tentiform Leafminer**

We haven't seen too many problems from 1st brood miners in commercial orchards, but one research orchard in Geneva had terrible populations, and the second generation moths are nearing peak levels this week. The injury caused by the second and third generations is identical to that caused by the first, but second-generation injury is most damaging to the tree. Third-generation STLM is usually not a problem if the second generation was controlled properly. Proper timing is essential for both the assessment of STLM densities and control, if required. Sampling for sap-feeding mines should be done at approximately 690 degree-days (base 43°F) after the start of the flight of the second generation. The second-generation flight began on June 16 in the Hudson Valley (current DD tally from 6/27 is 615), and on June 23 in Geneva (which puts the DD tally at 408). Sampling guidelines can be found on pp. 84, 92–93, and 101 in the Recommends. A decision regarding the third generation is generally not required unless the density of the second brood exceeded two mines per leaf. In recent years, approximately 8% of sampled orchards have required a treatment for second-generation STLM.

Several insecticides are effective against second-generation STLM, including Provado, Vydate, Lannate, and Asana. All of these products except for Provado are detrimental to predatory mites. Depending on the product chosen, application can be made anytime from initial egg deposition until larvae enter the tissue-feeding stages. Sampling is, of course, recommended before any spray is applied. If Provado is chosen, the manufacturer recommends aiming for the

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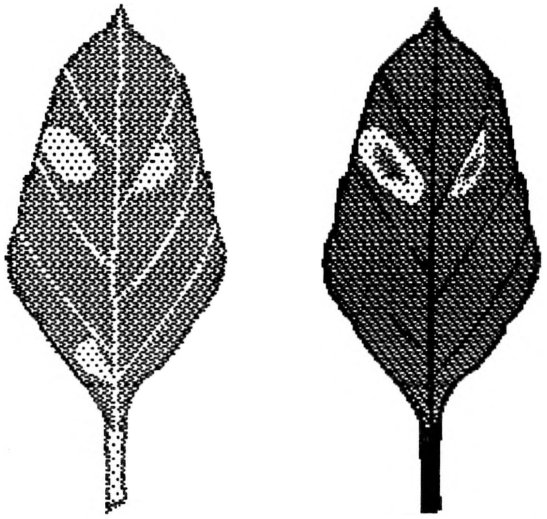
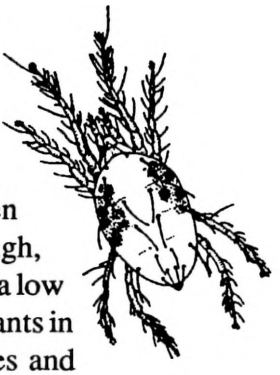


period 10–14 days after the flight starts. Unfortunately, if mines haven't yet begun to show up, this approach requires you to predict the need for a treatment based on either moth numbers or past field history, neither of which has been shown to be a very reliable indicator of actual pressure. According to our experience with this material, waiting until the appearance of early sap-feeding mines will give a better picture of problem blocks, and is still timely enough to effectively manage economic populations.

**European Red Mite**

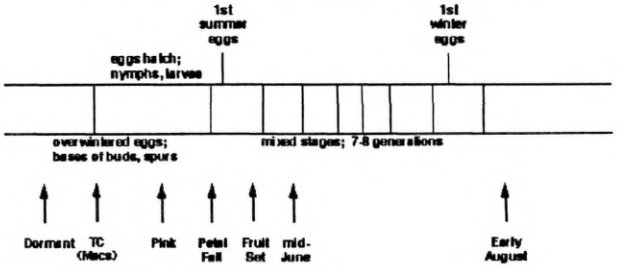
Regardless of how attentively you have watched the numbers in your specific orchards up to this point, a careful examination of at least the traditional trouble spots is recommended at this time, for a number of reasons. First, we are past the period of effectiveness of early season applications of oil, and even the small percentage of survivors from the most successful pre-bloom control programs can be expected to increase to problematic levels by early July. 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 and dry weather of late has been ideal for mite growth, so even though the ERM threshold goes up to 5 per leaf in July, the mites' rate of increase tends to turn exponential under these conditions.



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 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.

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.

**EUROPEAN RED MITE LIFE HISTORY**

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**Apple Maggot**

The first maggot adults were caught in research plantings at the Geneva Station last Thursday, 7/3, also pretty much on schedule. Of course, this doesn't say anything about the potential need for protective sprays in specific blocks around the state other than the fact that they've definitely emerged. Hang red sphere traps in your own orchards as advised in issue No. 12 (June 9), and check them at least twice a week to stay on top of their status and any need for treatment.

**Potato Leafhopper**

This is generally a more serious problem in the Hudson Valley than in western N.Y. or the Champlain Valley; however, Deb Breth reports seeing some true problem populations (adults and nymphs) in Niagara Co. last week, so this is one more reason to stroll through a few orchards now. PLH does not overwinter in the northeast but instead migrates on thermals (warm air masses) from the South. Because PLH migrate constantly during the season, there are no distinct broods or generations and the pest may be present continuously in orchards from June through harvest.

PLH feeds on tender young terminal leaves. Initially, injured leaves turn yellow around the edges, then become chlorotic and deformed (cupping upward) and later turn brown or scorched. Damage is caused by a toxin injected by PLH while feeding. PLH also occasionally causes symptoms similar to the effects of growth regulators, such as excessive branching preceding or beyond the point of extensive feeding. PLH damage is often mistaken for injury caused by herbicides, nutrient deficiency, or overfertilization. PLH injury may not be serious on mature trees but can severely stunt the growth of young trees.

*Nymphs and adults* should be counted on 50–100 randomly selected terminal leaves in an orchard. Older trees should be sampled approximately every three weeks during the summer. Young trees should be sampled weekly through July. PLH nymphs are often described as moving sideways like crabs, whereas WALH generally move forward and back. No formal studies have been conducted in N.Y. to determine the economic injury level for PLH on apples, so we suggest a tentative threshold of an average of one nymph or adult PLH per leaf. Little is known about the natural enemies of PLH, but it is assumed that they cannot control this pest in commercial New York orchards.

Populations of all leafhopper species in New York are resistant to the conventional organophosphate materials. Moreover, many of the pesticides in other chemical classes that are effective against PLH are toxic to beneficial mites. Effective materials include Provado, Sevin, Thiodan, Carzol, Lannate, and Vydate.❖❖

## PEST FOCUS

**Geneva: Spotted tentiform leafminer** 2nd flight began 6/23. $DD_{43}$ = 408. First **apple maggot** trap catch 7/3 (1 fly in four traps). **Oriental fruit moth** 2nd flight began.

**Highland: Spotted tentiform leafminer** 2nd flight began 6/16. $DD_{43}$ = 615 (from 6/27). 2nd generation **rose leafhopper** nymphs observed on apple. **Rose leafhopper, potato leafhopper** and **white apple leafhopper** adults observed on apple.

## INSECT TRAP CATCHES (Number/Trap/Day)

### Geneva NY

| | 6/30 | 7/3 | 7/7 |
|---|---|---|---|
| Redbanded leafroller | 0 | 0.8 | 5.0 |
| Spotted tentiform leafminer | 406 | 570 | 463 |
| Lesser appleworm | 0 | 0.5 | 0.5 |
| Oriental fruit moth (apple) | 0.1 | 1.0 | 0.9 |
| Oriental fruit moth (peach) | 0 | 0 | 0.1 |
| San Jose scale | 0 | 0 | 0 |
| Codling moth | 0.8 | 1.3 | 1.3 |
| American plum borer | 0.6 | 0 | 0.5 |
| Lesser peachtree borer | 1.6 | 0.7 | 0.6 |
| Peachtree borer | 2.0 | 0.8 | 0.1 |
| Pandemis leafroller | 0.5 | 2.0 | 0.5 |
| Obliquebanded leafroller | 0.6 | 0.8 | 0.4 |
| Apple maggot | 0 | 0 | 0.06* |

### HVL, Highland NY

| | 6/27 | 7/7 |
|---|---|---|
| Redbanded Leafroller | 0.9 | 5.1 |
| Spotted tentiform leafminer | 39.4 | 85.3 |
| Oriental fruit moth | 0.9 | 1.3 |
| Lesser appleworm | 2.0 | 0.2 |
| Codling moth | 2.6 | 1.9 |
| Fruittree Leafroller | 0 | 0 |
| Tufted Apple Budmoth | 2.9 | 1.3 |
| Obliquebanded Leafroller | 0.3 | 0.6 |
| Sparganothis Fruitworm | 1.4 | 3.9 |
| Apple maggot | 0 | 0 |

* 1st catch

(Dick Straub, Peter Jentsch)

## UPCOMING PEST EVENTS

| | 43°F | 50°F |
|---|---|---|
| Current DD accumulations (Geneva 1/1– 7/7): | 1384 | 868 |
| (Highland 1/1–7/7): | 1678 | 1065 |

| Coming Events: | Ranges: | |
|---|---|---|
| Comstock mealybug 1st adult catch | 1270–1673 | 756–1105 |
| American plum borer 1st flight subsides | 848–1668 | 440–1205 |
| Codling moth 1st flight subsides | 1112–2118 | 673–1395 |
| Oriental fruit moth 2nd flight peaks | 1000–2908 | 577–2066 |
| OBLR 1st flight subsides | 1420–2452 | 899–1790 |
| Redbanded leafroller 2nd flight peaks | 1479–2443 | 952–1698 |
| STLM 2nd flight peak | 1295–2005 | 824–1355 |
| STLM 2nd gen. tissue feeders present | 1504–2086 | 952–1201 |
| San Jose scale 2nd flight begins | 1449–1975 | 893–1407 |
| Peachtree borer flight peaks | 864–2241 | 506–1494 |

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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