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Update on Pest Management  
and Crop Development

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

July 1, 1996

VOLUME 5

Geneva, NY

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## THREE CHEERS

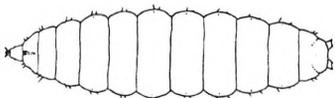
BENEFICIAL  
INSECTS  
(Art Agnello,  
Entomology,  
Geneva)



❖❖ There are many insects present in apple orchards that provide a benefit to growers by feeding on pest species. It is important that growers be able to recognize these beneficial insects, so that they are not mistaken for pests. The best way to conserve beneficial insects is to spray only when necessary, and to use materials that are less toxic to them (see Tables 8 & 12, pp. 37 and 43 of the 1996 Recommends). This brief review, taken from IPM Tree-Fruit Fact Sheet No. 18, covers the major beneficial insects that are likely to be seen in N. Y. orchards, concentrating on the most commonly seen life stages. Factsheet No. 23, "Predatory Mites", reviews mites that are important predators of leaf-feeding mites.

### CECIDOMYIID LARVAE (*Aphidoletes aphidimyza*)

This fly (Family Cecidomyiidae) is an aphid predator, and overwinters as a larva or pupa in a cocoon. Adults emerge from this cocoon, mate, and females lay eggs among aphid colonies. The adults are delicate, resembling mosquitoes, and are not likely to be seen. The eggs are very small (about 0.3 mm or 1/85 in. long) and orange. They hatch into small, brightly colored, orange larvae that can be found eating aphids on the leaf surface. These predacious larvae are present from mid-June throughout the summer. There are 3-6 generations per year. In addition to aphids, they also feed on soft-bodied scales and mealybugs.



### SYRPHID FLY LARVAE (Family Syrphidae)

The Family Syrphidae contains the "hover flies", so named because of the adults' flying behavior. They are brightly colored with yellow and black stripes, resembling bees.



Syrphids overwinter as pupae in the soil. In the spring, the adults emerge, mate, and lay single, long whitish eggs on foliage or bark, from early spring through mid-summer, usually among aphid colonies. One female lays several eggs. After hatching, the larvae feed on aphids by piercing their bodies and sucking the fluids, leaving shriveled, blackened aphid cadavers. These predacious larvae are shaped cylindrically and taper toward the head. There are 5-7 generations per year. Syrphid larvae feed on aphids, and may also feed on scales and caterpillars.



### LADYBIRD BEETLES (Family Coccinellidae)

• *Stethorus punctum* - This ladybird beetle is an important predator of European red mite in parts of the northeast, particularly in Pennsylvania, and has been observed intermittently in the Hudson Valley of N.Y., and occasionally in western N.Y. *Stethorus* overwinters as an adult in the "litter" and ground cover under trees, or in nearby protected places. The adults are rounded, oval, uniformly shiny black, and are about 1.3-1.5 mm (1/16 in.) long. Eggs are laid mostly on the undersides of the leaf, near the primary veins, at a density of 1-10 per leaf. They are small and pale white, and

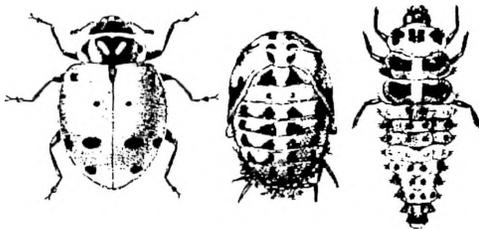


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about 0.3–0.4 mm (1/85 in.) long. Eggs turn black just prior to hatching. The larva is gray to blackish with numerous hairs, but becomes reddish as it matures, starting on the edges and completing the change just prior to pupation. There are 3 generations per year in south-central Pennsylvania, with peak periods of larval activity in mid-May, mid-June and mid-August. The pupa is uniformly black, small and flattened, and is attached to the leaf.



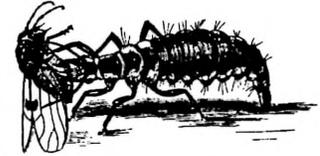
• Other Ladybird Beetles - Ladybird beetles are very efficient predators of aphids, scales and mites. Adults are generally hemisphere-shaped, and brightly colored or black, ranging in size from 0.8 to over 8 mm (0.03–0.3 in.). They overwinter in sheltered places and become active in the spring. Eggs are laid on the undersides of leaves, usually near aphid colonies, and are typically yellow, spindle-shaped, and stand on end. Females may lay hundreds of eggs. The larvae have well-developed legs and resemble miniature alligators, and are brightly colored, usually black with yellow. The pupal case can often be seen attached to a leaf or branch. There are usually 1–2 generations per year. One notable species that is evident now is *Coccinella septempunctata*, the seven-spotted lady beetle, often referred to as C-7. This insect, which is large and reddish-orange with seven distinct black spots, was intentionally released into N.Y. state beginning in 1977, and has become established as an efficient predator in most parts of the state.



#### LACEWINGS (Family Chrysopidae)

Adult lacewings are green or brown insects with net-like, delicate wings, long antennae, and prominent eyes. The larvae are narrowly oval with two sickle-shaped mouthparts, which are used to pierce the prey and extract fluids. Often the larvae are covered with “trash”, which is actually the bodies of

their prey and other debris. Lacewings overwinter as larvae in cocoons, inside bark cracks or in leaves on the ground. In the spring, adults become active and lay eggs on the trunks and branches. These whitish eggs are laid singly and can be seen connected to the leaf by a long, threadlike “stem”. Lacewings feed on aphids, leafhoppers, scales, mites, and eggs of Lepidoptera (butterflies and moths).



#### TRUE BUGS (Order Hemiptera)

There are many species of “true bugs” (Order Hemiptera) such as tarnished plant bug, that feed on plants, but a number of them are also predators of pest species. The ones most likely to be seen are “assassin bugs” or reduviids (Family Reduviidae), and “damsel bugs” or nabids (Family Nabidae). These types of predators typically have front legs that are efficient at grasping and holding their prey.



*Hyaliodes vitripennis*

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##### scaffolds FRUIT JOURNAL

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## PARASITOIDS

Parasitoids are insects that feed on or in the tissue of other insects, consuming all or most of their host and eventually killing it. They are typically small wasps (Order Hymenoptera), or flies (Order Diptera). Although the adult flies or wasps may be seen occasionally in an orchard, it is much more common to observe the eggs, larvae, or pupae in or on the parasitized pest insect. Eggs may be laid directly on a host such as the obliquebanded leafroller, or near the host, such as in the mine of a spotted tentiform leafminer. After the parasitoid consumes the pest, it is not unusual to find the parasitized larvae or eggs of a moth host, or aphids that have been parasitized ("mummies"). Exit holes can be seen where the parasitoid adult has emerged from the aphid mummy. ❖❖



A ROSE,  
IS A ROSE,  
IS A ROSE

## LEAFHOPPERS

(Harvey Reissig and Art Agnello, Entomology, Geneva)

❖❖ It was previously thought that the only leafhopper species present in N. Y. apples were white apple leafhopper, WALH (which exhibits two generations after petal fall and in mid- to late August), and potato leafhopper, PLH (which appears sporadically between these broods, depending on weather). Then, an apparent additional brood was noted in eastern N. Y. between July and early August. This brood tended to overlap the late August population, so that various stages of WALH were often found on leaves throughout the summer. Field observations showed that many of the leafhoppers seen in apples during midsummer are actually a closely related species, rose leafhopper (RLH). A study of the leafhopper species complex in the Hudson Valley showed that RLH completes its first generation on

weed hosts such as multiflora rose; adults begin ovipositing on apple in mid-June and nymphs appear by early July. From this time until harvest, both species are likely to be present on apple trees; usually one greatly predominates over the other, but the factors influencing the species mixture have yet to be determined.

WALH (or leafhopper species complex) appears to have two fairly distinct generations in western N. Y. Eggs from the single summer generation usually begin to hatch from late July to early August, continuing until mid- to late August. Adults appear in late August and are active until fruit harvest. Nymphs and adults feed on leaves during the summer, removing chlorophyll and causing white stippling. Excrement from nymphs and adults on fruit leaves small black spots that resemble the summer disease, flyspeck. During harvest, adults fly throughout the tree canopy, annoying pickers.

WALH nymphs and adults are usually most common on older fruit cluster leaves inside the tree. The number of WALH on a single older fruit cluster leaf should be counted on each of 10 clusters from 5–10 trees. Economic threshold levels for WALH feeding damage on apples have not been developed in N. Y., but the thresholds suggested in other states vary from an average of 0.25–2 WALH nymphs and adults per leaf. Treatment for second- or third-generation WALH (or RLH mixture) is recommended in N. Y. if an average of one or more nymphs and adults per leaf is detected. Several parasites, predators, and a fungus attack WALH, but because these natural enemies are normally destroyed by pesticides they cannot adequately control WALH in commercial orchards. Chemical control is usually most effective if treatments are applied primarily against nymphs after most eggs have hatched.

Potato leafhopper is generally a more serious problem in the Hudson Valley than in western N. Y. or the Champlain Valley. PLH does not overwinter in the Northeast but instead migrates on thermals

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(warm air masses) from the South. Adults usually reach the Hudson Valley by May or early June and are found from mid- to late June in western N.Y. 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. We are currently seeing PLH nymphs in a number of N.Y. orchards.

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 from early June through July. PLH nymphs are often characterized 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 N.Y. orchards.

Populations of all leafhopper species in N.Y. 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, Cygon, Thiodan, Carzol, Lannate, and Vydate.❖❖

## DRILL BITS

BORERS  
(Art Agnello)

❖❖ This is a suitable time to assess the need for control of the various fruittree borers in your orchards; most of the problem species are flying now and of course, laying eggs, so some well-directed trunk sprays might be advisable. The peachtree borers (both species) are well into their season's appearance, and now is a good time to make an application of Lorsban 4EC, Asana, Pounce or Ambush to the trunks (do not spray fruit) of cherry trees for lesser peachtree borer control; no spray is needed if Thiodan was used within the previous 30 days. For peaches, add Penncap-M and Thiodan (either formulation) to this list. Plums can also suffer from these pests, and Thiodan, Asana, and Penncap-M are labelled for use. American plum borer is now recognized as a common pest of tart and sweet cherry, and a Lorsban 4EC can be helpful before harvest (6-day PHI) and afterward, but the most effective period for treatment was at petal fall.

Dogwood borers should be laying eggs in susceptible apple orchards now (those with succulent burrknot tissue or suckers). The larva of this clearwing moth feeds on apple trees, primarily on burrknot tissue on clonal rootstocks. Burrknots are aggregations of root initials that can develop on the above-ground portion of the rootstock; all commercial dwarfing and semi-dwarfing rootstocks have a tendency to develop burrknots. Some chemicals with hormone effects, such as NAA, can increase the expression of burrknots, as will failure to keep the area around the trunk weed-free and open to sunlight. White latex paint brushed on the exposed portion of the rootstock will prevent new infestations of the borers, and also protect against southwest injury to the bark. Dilute trunk applications of an insecticide with good residual activity can provide control of established infestations. At this point in the season, a spray of Lorsban 50WP or Thiodan 50WP would be the most effective materials if applied anytime until Aug. 15, bearing in mind the specific pre-harvest intervals.❖❖

AND,  
THEY'RE  
OFF!

## MODEL PEST

❖❖ The seasonal warm-up during the past week resulted in enough accumulated heat units to warrant a control spray for OBLR in those orchards waiting for the first hatch. The OBLR developmental totals we've calculated as of this morning, 7/1, are given below; note that first hatch is predicted at approximately 360 DD (base 43°F), and peak hatch rate (25% of total) is predicted at 450 DD; 50% hatch comes at 630 DD:

Highland - 567

Albion - 485.3

Sodus - 470.4

Lyndonville (as of 6/29 only): - 331.0

Williamson - 368.9

Geneva - 343.0

Appleton - 350.2

❖❖

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

Geneva NY

HVL, Highland NY

	<u>6/24</u>	<u>6/27</u>	<u>7/1</u>		<u>6/17</u>	<u>6/24</u>	<u>7/1</u>
Redbanded leafroller	0	0	0.1	Redbanded leafroller	0	0.8	1.8
Spotted tentiform leafminer	69	282	670	Spotted tentiform leafminer	55.1	24.4	1.7
Oriental fruit moth	0	0	0.5	Oriental fruit moth	0	0.6	0.4
Lesser appleworm	0	0	0	Lesser appleworm	0.9	0.9	0
Codling moth	0.9	2.0	13.6	Codling moth	5.2	2.9	1.8
San Jose scale	0	0	0	Fruittree leafroller	0	0.1*	0
American plum borer	0.4	1.0	0.6	Tufted apple budmoth	0.8	1.6	1.0
Lesser peachtree borer (cherry)	0	0.2	0.1	Obliquebanded leafroller	4.9	1.8	2.4
Lesser peachtree borer (peach)	1.3	1.5	0.8	Sparganothis fruitworm	0.5	2.0	1.8
Peachtree borer	5.4	9.8	7.6	Apple maggot	-	0	0.2*
Pandemis leafroller	0.1	11.2	0.6				
Obliquebanded leafroller	0.3	0.2	0.1				
Apple maggot	0	0	0				

\*=1st catch

(Dick Straub, Peter Jentsch)

## UPCOMING PEST EVENTS

	<u>43°F</u>	<u>50°F</u>
Current DD accumulations (Geneva 1/1- 7/1):	1305	836
(Highland 1/1-7/1):	1671	1077

<u>Coming Events:</u>	<u>Ranges:</u>	
Apple maggot 1st catch	1045-1662	629-1078
OBLR summer larvae hatch	1076-1513	630-980
OBLR 1st flight subsides	1420-2277	899-1546
Oriental fruit moth 2nd flight begins	1152-1819	772-1215
American plum borer 1st flight subsides	848-1659	440-1098
Codling moth 1st flight subsides	1112-2118	673-1395
Lesser appleworm 2nd flight begins	1152-2302	778-1531
Peachtree borer flight peaks	864-2241	506-1494
San Jose scale 2nd flight begins	1449-1975	893-1407
STLM 2nd flight peaks	1295-2005	952-1201

## PEST FOCUS

Geneva: DD (base 43) since 1st catch of **Obliquebanded leafroller** (6/17 in Geneva) = 343. **STLM** 2nd flight started 6/20; DD (base 43) = 271. **Redbanded leafroller** 2nd flight beginning.

Highland: 1st catch of **Apple maggot** 6/27. 2nd generation **Rose leafhopper** nymphs on apple. DD (base 43) since 1st catch of **Obliquebanded leafroller** (6/10 in Highland) = 567. **STLM** 2nd flight started 6/17; DD (base 43) = 352.



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.

### scaffolds

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