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Update on Pest Management  
and Crop Development

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

June 23, 1997

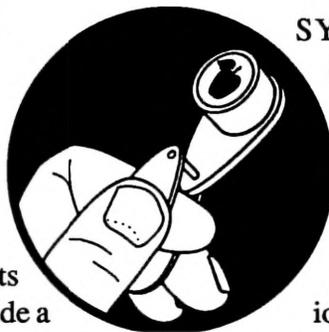
VOLUME 6, No. 14

Geneva, NY

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## OUR HEROES

WHITE HATS  
(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 1997 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*)



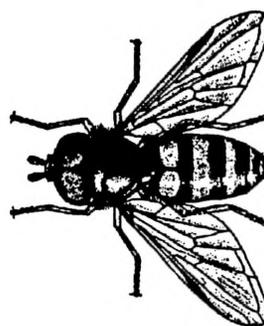
This fly (Family Cecidomyiidae) is an aphid predator, and overwinters as a larva or pupa in a cocoon. Adults emerge from this cocoon, mate, and females lay eggs among aphid colonies. The adults are delicate, resembling mosquitoes, and are not likely to be seen. The eggs are very small (about 0.3 mm or 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 sev-

eral 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)

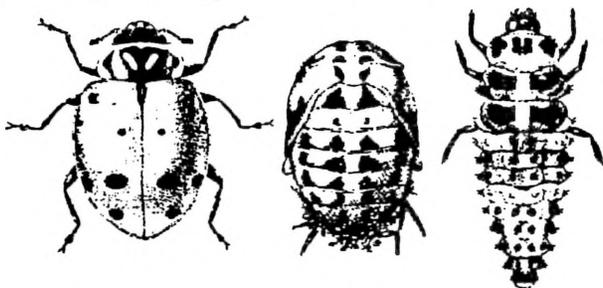
• *Stethorus punctum* - This ladybird beetle is an important predator of European red mite in parts of the northeast, particularly in Pennsylvania, and has been observed intermittently in the Hudson Valley of N.Y., and occasionally in western N.Y. *Stethorus* overwinters as an adult in the "litter" and 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.)



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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 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.

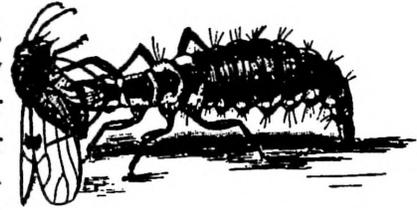
• **Other Ladybird Beetles** - Ladybird beetles are very efficient predators of aphids, scales and mites. Adults are generally hemisphere-shaped, and brightly colored or black, ranging in size from 0.8 to over 8 mm (0.03–0.3 in.). They overwinter in sheltered places and become active in the spring. Eggs 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 sevenspotted 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

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is published weekly from March to September by Cornell University—NYS Agricultural Experiment Station (Geneva) and Ithaca—with the assistance of Cornell Cooperative Extension. New York field reports welcomed. Send submissions by 3 pm Monday to:

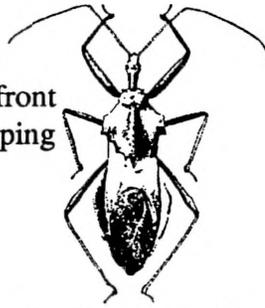
scaffolds FRUIT JOURNAL  
Dept. of Entomology  
NYSAES, Barton Laboratory  
Geneva, NY 14456-0462

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This newsletter available on CENET at: [news://newsstand.cce.cornell.edu/cce.ag.tree-fruit](mailto:news://newsstand.cce.cornell.edu/cce.ag.tree-fruit)  
and on the World Wide Web at:  
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(Family Nabidae). These types of predators typically have front legs that are efficient at grasping and holding their prey.



## 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. ❖❖



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*

ON  
STRIKE!

## SAVE THE PEACHES

❖❖ The oriental fruit moth (OFM), native to China, was introduced to 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

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*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 released 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 before as they ripen, an application of carbaryl (Sevin) is recommended 2 weeks before harvest larval numbers reach 1 per 10 terminals. (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. ❖❖

number of first catches, but we haven't yet accumulated enough heat units to reach the first hatch (which is predicted at approximately 360 DD<sub>43°F</sub>), except in the Hudson Valley. Growers waiting for this event to either make an application or else determine the need for treatment should note their local temperature readings this week and add appropriate DD's to the OBLR developmental totals we've calculated as of this morning, 6/23:

<u>SITE</u>	<u>FIRST CATCH</u>	<u>DD TOTAL</u>
Highland	June 9	392
Knowlesville	June 16	189 (Waterport)
Geneva	June 17	159
Wolcott	June 19	106 (Sodus)

❖❖



NEXT  
UP

#### MODEL BUILDING

❖❖ Codling moth development in the state has progressed beyond the appropriate point for control of the 1st generation larvae; we will begin advising of the second brood management window when it approaches later in the season.

Although we haven't yet seen any, obliquebanded leafroller egg masses are being laid and we've therefore been keeping track of their presumed development in various locations, as cued by the first moth catches at those sites. The past week saw a

#### PEST FOCUS

**Geneva:** 1st obliquebanded leafroller trap catch 6/17.

**Highland:** European corn borer terminal feeding observed on apple 6/18. **Potato leafhopper** nymphs observed on apple. **White apple leafhopper** and **rose leafhopper** adults observed on apple.

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

Geneva NY

HVL, Highland NY

	<u>6/16</u>	<u>6/19</u>	<u>6/23</u>		<u>6/16</u>	<u>6/23</u>
Redbanded leafroller	0	0	0	Redbanded Leafroller	0	0
Spotted tentiform leafminer	8	6	28	Spotted tentiform leafminer	7.4	74.0
Lesser appleworm	1.4	2.0	0.4	Oriental fruit moth	1.4	0.3
Oriental fruit moth (apple)	1.0	1.2	0.4	Lesser appleworm	1.3	0.4
Oriental fruit moth (peach)	0.1	0	0	Codling moth	1.6	5.6
San Jose scale	0.1	0.3	0.4	Fruittree Leafroller	0	0
Codling moth	6.0	5.2	2.5	Tufted Apple Budmoth	2.0	1.3
American plum borer	2.4	1.2	1.1	Obliquebanded Leafroller	1.8	0.9
Lesser peachtree borer	3.4	0.8	2.6	Sparganothis Fruitworm	0	1.3
Peachtree borer	2.0	1.2	3.9			
Pandemis leafroller	0.8*	0.7	1.4			
Obliquebanded leafroller	0	0.5*	3.3			
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- 6/16):	1005	587
(Highland 1/1-6/16):	1266	751

**Coming Events:****Ranges:**

American plum borer 1st flight subsides	848-1668	440-1205
Codling moth 1st flight subsides	1112-2118	673-1395
Lesser appleworm 1st flight subsides	818-1548	444-999
Oriental fruit moth 1st flight subsides	781-1574	442-1026
Obliquebanded leafroller 1st flight peak	869-1548	506-987
Apple maggot 1st catch	1045-1671	629-1078
San Jose scale 1st gen. crawlers present	987-1249	569-784
STLM 2nd flight starts	795-1379	449-880

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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**scaffolds**

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