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Update on Pest Management
and Crop Development

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

July 14, 2003

VOLUME 12, No. 18

Geneva, NY

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FLYING
OBJECTS

ORCHARD
RADAR
DIGEST



Spotted Tentiform Leafminer

Rough guess of when 2nd generation
sap-feeding mines begin showing:
July 10.

Optimum first sample date for 2nd
generation STLM sapfeeding
mines: July 17.

Geneva Predictions:

Roundheaded Appletree Borer

Peak egglaying period roughly: July 3 to July 16.

Codling Moth

2nd generation 7% CM egg hatch: August 7
(rain-adjusted first spray date where multiple
sprays needed to control 2nd generation CM).

Lesser Appleworm

2nd LAW flight begins around: July 14.

Obliquebanded Leafroller

If using BT insecticide, optimum date to begin 2
to 4 weekly low-rate applications for small OBLR
larvae is roughly: July 2.

Optimum first sample date for summer genera-
tion OBLR larvae: July 9.

If first OBLR larvae sample is below threshold,
date for confirmation follow-up sample: July 13.

Oriental Fruit Moth

2nd generation OFM flight begins around: July 6.
Optimum 2nd generation - first treatment date, if
needed: July 11.

Optimum 2nd generation - second treatment
date, if needed: July 24.

Redbanded Leafroller

2nd RBLR flight begins: July 7.
Peak catch and approximate start of egg
hatch: July 18.

Highland Predictions:

Roundheaded Appletree Borer

Peak egglaying period roughly: July 1 to July 14.

Codling Moth

2nd generation 7% CM egg hatch: August 2
(rain-adjusted first spray date where multiple
sprays needed to control 2nd generation CM).

Lesser Appleworm

2nd LAW flight begins around: July 12.

continued...

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- ❖ Beneficial insects

GENERAL INFO

- ❖ Hudson Valley Fruit tour/show/BBQ

UPCOMING PEST EVENTS

PEST FOCUS

INSECT TRAP CATCHES

Obliquebanded Leafroller

If using BT insecticide, optimum date to begin 2 to 4 weekly low-rate applications for small OBLR larvae is roughly: June 30.

Optimum first sample date for summer generation OBLR larvae: July 7.

If first OBLR larvae sample is below threshold, date for confirmation follow-up sample: July 11.

Oriental Fruit Moth

2nd generation OFM flight begins around: July 4.

Optimum 2nd generation - first treatment date, if needed: July 6.

Optimum 2nd generation - second treatment date, if needed: July 17.

Redbanded Leafroller

2nd RBLR flight begins: July 5.

Peak catch and approximate start of egg hatch: July 16.

Spotted Tentiform Leafminer

Rough guess of when 2nd generation sap-feeding mines begin showing: July 7.

Optimum first sample date for 2nd generation STLM sapfeeding mines: July 15.

mark (on 7/10), and the Williamson site stands at only 68 DD past 1st catch as of today, 7/14, so the initial spray should not be necessary until more toward the end of this week. For the record, our numbers from the season's first biofix as of 7/14 are:

SITE	BIOFIX	CUM DD-45
Highland	4/21	1560
Geneva	5/1	1264
Lyndonville	5/4	1261
N. Appleton	5/6	1148
Williamson	5/8	1154
Albion	5/5	1219

Codling Moth. The first application against the 2nd brood of this species is not advised until 1260 DD (base 50°F) after the season's first biofix, and no site in the state has reached 1000 yet.

Obliquebanded Leafroller. Sites on a Spintor program should be between the 1st and 2nd applications against the first summer brood; the next spray would not be advised until near the end of the month.



MODEL BUILDING

BY
DESIGN

❖❖ **Oriental Fruit Moth.** The 2nd brood flight started in Geneva on 7/3, and in Harvey Reissig's research plots in Williamson on 7/10, so most western NY sites should have followed suit by now. Although the provisional PA model would have recommended beginning sprays for this brood already, our delayed developmental trend suggests that the susceptible 10% hatch point (at 1115 DD-45) won't actually occur until approximately 175-200 DD after the first catch of the 2nd flight. Accordingly, only the Geneva site has reached this

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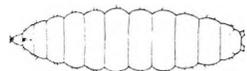
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FRONT
LINE

ORCHARD PATRIOTS
(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 and orchard managers be able to recognize these natural enemies, 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 5 & 12, pp. 54 and 61 of the 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.



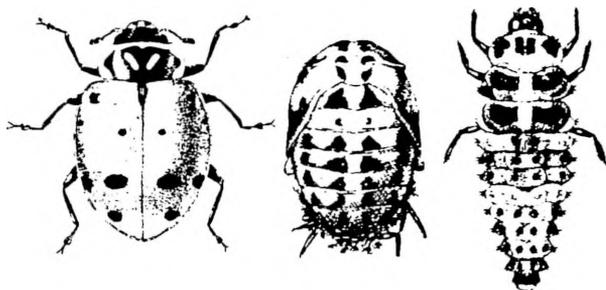
LADYBIRD BEETLES (Family Coccinellidae)

- *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 leaves, 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

continued...

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.

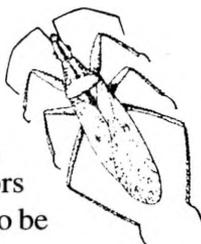


LACEWINGS (Family Chrysopidae)

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)

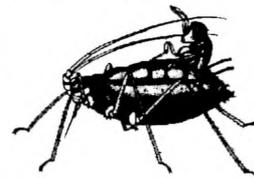
There are many species of “true bugs” (Order Hemiptera) such as tarnished plant bug, that feed on plants, but a number of them are also predators of pest species. The ones most likely to be



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.

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.



GENERALIST PREDATORS

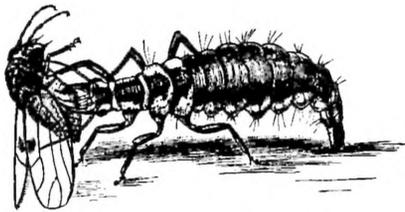
There is a diversity of other beneficial species to be found in apple orchards, most of which are rarely seen, but whose feeding habits make them valuable additions to any crop system. The use of more selective pesticides helps to maintain their numbers and contributes to the level of natural control attainable in commercial fruit plantings. Among these beneficials are:

- Spiders (Order Araneae): All spiders are predaceous and feed mainly on insects. The prey is usually killed by the poison injected into it by the spider’s bite. Different spiders capture their prey in different ways; wolf spiders and jumping spiders forage for and pounce on their prey, the crab spiders lie in wait for their prey on flowers, and the majority of spiders capture their prey in nets or webs.

continued...

• **Ants (Family Formicidae):** The feeding habits of ants are rather varied. Some are carnivorous, feeding on other animals or insects (living or dead), some feed on plants, some on fungi, and many feed on sap, nectar, honeydew, and similar substances. Recent research done in Washington has shown certain species (*Formica* spp.) of ants to be effective predators of pear psylla.

• **Earwigs (Family Forficulidae):** Although these insects may sometimes attack fruit and vegetable crops, those found in apple orchards are probably more likely to be scavengers that feed on a variety of small insects. ❖❖



PEST FOCUS

Geneva:

1st **apple maggot** caught on baited red sphere trap. **American plum borer** 2nd flight beginning. **Spotted tentiform leafminer** 2nd flight began 6/23. The first sample of sap-feeding mines should be taken at 690 degree days (base 43°F) following this event. DD43°F since then = 593. **Obliquebanded leafroller** flight began 6/17. Sampling should take place at approx. 600 degree days (base 43°F) following this event. DD43°F since then = 709.

Highland:

Tent caterpillar observed in apple. 1st–3rd **obliquebanded leafroller** larvae observed in apple foliage. **Potato leafhopper** damage observed. **Spotted tentiform leafminer** 2nd flight began 6/16. Degree days (base 43°F) since then = 803. **Obliquebanded leafroller** flight began 6/10 in Milton. Degree days (base 43°F) since then = 956.

INSECT TRAP CATCHES (Number/Trap/Day)

	Geneva, NY			Highland, NY		
	7/7	7/10	7/14	7/7	7/14	
Redbanded leafroller	1.5	1.5	1.3	1.1	2.3	
Spotted tentiform leafminer	375	240	333	198	116	
Oriental fruit moth	5.4	1.2	3.5	1.0	1.1	
Lesser appleworm	0.0	0.0	0.5	1.6	0.6	
San Jose scale	0.0	0.0	0.0	1.0	1.1	
Codling moth	0.9	0.3	0.6	Obliquebanded leafroller	6.0	4.5
Obliquebanded leafroller	0.6	0.3	0.6	Apple maggot	0.0	–
Pandemis leafroller	0.1	0.0	0.0	Fruittree leafroller	0.8	0.1
American plum borer	0.3	0.0	0.8*	Sarganthis fruitworm	1.3	3.4
Lesser peachtree borer	0.8	0.5	0.0	Tufted apple budmoth	0.9	0.3
Peachtree borer	0.0	0.0	0.0	Variiegated leafroller	1.7	0.6
Dogwood borer (N. Huron)	0.1*	0.2	–	Dogwood borer	0.4	0.9
Apple maggot	0.0	0.0	0.1*			

* first catch

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**FIELD
 DAY**

**HUDSON VALLEY
 TOUR, SHOW, AND
 BBQ**
 (Mike Fargione,
 Cornell Coop Ext -
 Ulster Co., Highland)

❖❖ Cornell's Hudson Valley Laboratory, CCE Hudson Valley Regional Fruit Program, and the NYS Horticultural Society will hold a field tour, spray technology demonstration, trade show and barbecue on July 23, 2003. Anyone interested in attending can find more information at <http://www.cce.cornell.edu/hvfruit/calendar.html#HVSummerTour> ❖❖

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UPCOMING PEST EVENTS

	43°F	50°F
Current DD accumulations (Geneva 1/1-7/14):	1603	994
(Geneva 1/1-7/14/2002):	1768	1161
(Geneva "Normal"):	1728	1162
(Geneva 7/21 Predicted):	1799	1141
(Highland 7/14):	1951	1283

Coming Events:	Ranges:	
Apple maggot 1st oviposition punctures	1566-2200	1001-1575
Comstock mealybug 1st flight peak	1327-1782	824-1185
Codling moth 1st flight subsides	1112-2124	673-1412
Lesser appleworm 2nd flight begins	1152-2302	778-1531
Spotted tentiform leafminer 2nd flight peak	1219-2005	701-1355
Dogwood borer flight peak	1551-1952	986-1306
Oriental fruit moth 2nd flight peak	1000-2908	577-2066
Redbanded leafroller 2nd flight peak	1479-2443	952-1698
San Jose scale 2nd flight begins	1449-1975	893-1407
STLM 2nd generation tissue feeders present	1504-2086	952-1201

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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