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v. 15
no 17

scaffolds

Update on Pest Management
and Crop Development

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

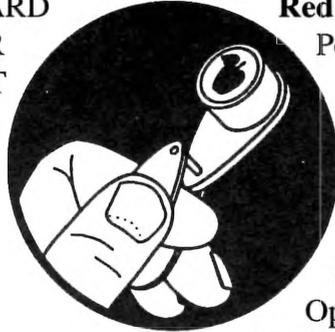
July 10, 2006

VOLUME 15, No. 17

Geneva, NY

FIREWORKS

ORCHARD
RADAR
DIGEST



Redbanded Leafroller

Peak catch and approximate start of
egg hatch: July 13.

Spotted Tentiform Leafminer

Rough guess of when 2nd gen-
eration sap-feeding mines begin
showing: July 6.

Optimum first sample date for 2nd gen-
eration STLM sap-feeding mines: July 13.

Geneva Predictions:

Roundheaded Appletree Borer

RAB peak egg-laying period roughly: June 27
to July 10.

Peak hatch roughly: July 12 to July 230.

Dogwood Borer

Peak Dogwood borer egg hatch roughly:
August 1.

Codling Moth

Codling moth development as of July 10: 2nd
generation adult emergence at 2% and 1st gen-
eration egg hatch at 99%.

2nd generation 7% CM egg hatch: July 24 (= target date for first spray where multiple sprays needed to control 2nd generation CM).

Obliquebanded Leafroller

Where waiting to sample late instar OBLR lar-
vae is not an option (OBLR is known to be a
problem, and will be managed with insecticide
application against young larvae):

If first OBLR late instar larvae sample is be-
low threshold, date for confirmation follow-up:
July 8.

Oriental Fruit Moth

2nd generation first treatment date, if needed:
July 7.

2nd generation second treatment date, if need-
ed: July 17.



MODEL BUILDING:

Insect model degree day accumulations:
DD43 since 1st Obliquebanded Leafroller
catch (50% larval hatch @ 630, 1st occurrence
of 4th instars @ 720, 90% hatch @ 810):

GENEVA: 672 (ERRATUM: last week's
reading of 676 was incorrect; it
should have read 517 — sorry)

HIGHLAND: 803

DD45 since 1st Oriental Fruit Moth 2nd gen-
eration catch, July 5 (approximate start of egg
hatch @ 175-200):

APPLETON: 128

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INSECTS

- ◆ Orchard Radar Digest
- ◆ Model building
- ◆ Beneficial insects

PEST FOCUS

INSECT TRAP CATCHES

UPCOMING PEST EVENTS

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ALBION: 129
SODUS: 113
WILLIAMSON: 120

[NOTE: Consult our mini expert system for arthropod pest management, the Apple Pest Degree Day Calculator

<http://www.nysaes.cornell.edu/ipm/specware/newa/appledd.php>

Find accumulated degree days between dates with the Degree Day Calculator

<http://www.nysaes.cornell.edu/ipm/specware/newa/>

Powered by the NYS IPM Program's NEWA weather data and the Baskerville-Emin formula]❖❖

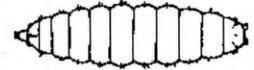
HERE THEY ARE,
THE (PREDATOR)
BEATLES

WITH A LITTLE
HELP FROM
YOUR FRIENDS
(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. 66 and 74 of the Recommends). This brief review, taken from IPM Tree-Fruit Fact Sheet No. 18 (available online at: <http://www.nysipm.cornell.edu/factsheets/treefruit/pests/ben/ben.asp>), 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" (online: <http://www.nysipm.cornell.edu/factsheets/treefruit/pests/pm/pm.asp>), reviews mites that are important predators of leaf-feeding mites.

CECIDOMYIID LARVAE (*Aphidoletes aphidimyza*)

These gall midge flies (Family Cecidomyiidae) are aphid predators, and overwinter as larvae or pupae 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 midsum-

continued...

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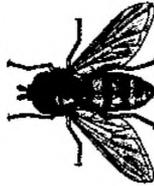
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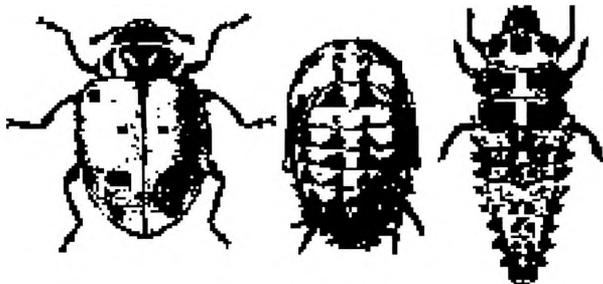
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mer, usually among aphid colonies. One female lays several eggs. After hatching, the larvae feed on aphids by piercing their bodies and sucking the fluids, leaving shriveled, blackened aphid cadavers. These predacious larvae are shaped cylindrically 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 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).



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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; e.g., families Ichneumonidae, Braconidae, Chalcididae), or flies (Order Diptera; e.g., family Tachinidae). 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 Araneida): 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; crab spiders (Thomisidae and Philodromidae) and jumping spiders (Salticidae) forage for and pounce on their prey — the crab spiders lie in wait for their prey on flowers — and web-building spiders (e.g., Araneidae, Theridiidae, and Dictynidae) capture their prey in nets or webs.

- 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. 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:

Redbanded leafroller, oriental fruit moth and **San Jose scale** 2nd flights beginning. **Pandemis leafroller** flight has subsided.

Highland:

2nd generation **pear psylla** nymphs above threshold levels; sooty mold evident. **Potato leafhopper** and **rose leafhopper** nymphs reaching threshold in apples.

INSECT TRAP CATCHES (Number/Trap/Day)

Geneva, NY

Highland, NY

	<u>7/3</u>	<u>7/6</u>	<u>7/10</u>		<u>6/26</u>	<u>7/10</u>
Redbanded leafroller	0.0	0.0	0.3*	Spotted tentiform leafminer	86.1	–
Spotted tentiform leafminer	41.9	97.7	76.3	Oriental fruit moth	1.2	1.4
Lesser appleworm	0.1	0.0	0.0	Codling moth	2.1	0.4
Oriental fruit moth	0.0	0.0	0.1	Obliquebanded leafroller	0.5	0.1
Codling moth	0.0	0.0	0.0	Fruit tree leafroller	0.2	0.0
San Jose scale	0.0	0.0	0.1	Tufted apple budmoth	0.0	0.0
American plum borer	0.0	0.0	0.1	Variegated leafroller	0.4	0.1
Lesser peachtree borer	0.6	0.7	0.6	Lesser peachtree borer	1.1	0.5
Dogwood borer	2.7	–	1.9	Dogwood borer	0.2	0.3
Pandemis leafroller	0.1	0.0	0.0	Lesser appleworm	2.2	0.4
Obliquebanded leafroller	0.1	0.0	0.1	Apple maggot	0.0	0.1
Peachtree borer	0.0	0.2	0.8			
Apple maggot	0.0	0.0	0.0			

* first catch

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UPCOMING PEST EVENTS

	43°F	50°F
Current DD accumulations (Geneva 1/1–7/10/06):	1704	1083
(Geneva 1/1–7/10/2005):	1672	1088
(Geneva "Normal"):	1642	1048
(Geneva 1/1–7/17 Predicted):	1944	1274
(Highland 3/1–7/10/06):	1734	1116

<u>Coming Events:</u>	<u>Ranges(Normal±StDev):</u>	
Spotted tentiform leafminer 2nd flight peak	1377–1841	861–1217
STLM 2nd gen. tissue feeders present	1378–2035	913–1182
Lesser appleworm 2nd flight begins	1365–1979	889–1305
American plum borer 2nd flight begins	1411–1893	1020–1232
Comstock mealybug 1st flight peak	1505–1731	931–1143
Redbanded leafroller 2nd flight peak	1524–2018	965–1353
Codling moth 1st flight subsides	1296–1946	808–1252
Codling moth 2nd flight begins	1555–2283	999–1529
Apple maggot 1st oviposition punctures	1528–2078	1021–1495
Obliquebanded leafroller 1st flight subsides	1618–2130	1038–1434
Oriental fruit moth 2nd flight peak	1378–2086	865–1415

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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