

scaffolds

Update on Pest Management
and Crop Development

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

July 9, 2007

VOLUME 16, No. 17

Geneva, NY

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FLIGHT
PLAN

ORCHARD
RADAR
DIGEST



Spotted Tentiform Leafminer

Optimum first sample date for 2nd generation sap-feeding mines is: July 8.

Second optimized sample date for 2nd generation sap-feeding mines, if needed: July 14.



Geneva Predictions:

Roundheaded Appletree Borer and Dogwood Borer

RAB peak egg hatch roughly: July 5 to July 25.

Codling Moth

Codling moth development as of July 8: 2nd generation adult emergence at 2% and 1st generation egg hatch at 99%.

Lesser Appleworm

2nd flight begins around: July 6.

Obliquebanded Leafroller

Where waiting to sample late instar OBLR larvae to determine need for treatment is an option, or to check on results from earlier sprays:

Optimum sample date for late-instar summer generation OBLR larvae: July 4.

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

Oriental Fruit Moth

2nd generation first treatment date, if needed: July 5.

2nd generation second treatment date, if needed: July 15

Redbanded Leafroller

2nd generation peak catch and approximate start of egg hatch: July 10.

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MODEL BUILDING

Oriental Fruit Moth (First treatment targeting earliest egg hatch of 2nd generation larvae between 175–200 DD base 45°F after biofix):

Location	Biofix	DD (as of 7/6)
Albion	6/30 (est'd)	134
Sodus	6/30 (est'd)	110
Williamson	6/30 (est'd)	126
Geneva	6/28	179
Ithaca	6/30 (est'd)	111

Insect model degree day accumulations:

Codling Moth (Treatment period for the 2nd generation starts at 1260 DD base 50°F after biofix):

Location	Biofix	DD (as of 7/6)
Highland	May 14	
Clintondale	May 14	871
Geneva	May 17	815
Sodus	May 17	717
Ithaca	May 24	691
Lansing	May 24	758
Albion	May 25	798
Williamson	May 25	722
Appleton (South)	May 25	772
Appleton (North)	May 25	734
Waterport	May 28	794

Obliquebanded Leafroller (% estimated egg hatch in DD base 43°F after biofix: 50% hatch — 630 DD; “halfway point” in development of earliest emerging larvae — 720 DD; 90% hatch — 810 DD):

Location	Biofix	DD (as of 7/6)
Highland	6/1	
Clintondale	6/4	767
Albion	6/7 (est'd)	783
Sodus	6/9	613
Appleton (South)	6/10 (est'd)	684
Williamson	6/10 (est'd)	650
Geneva	6/11	651
Lansing	6/11	629
Ithaca	6/11	578

[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]

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This newsletter is available on the World Wide Web at: <http://www.nysaes.cornell.edu/ent/scaffolds/>

INSECT
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INSECT

MEAN AND GREEN
(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. 58 and 64 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 be-

havior. 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 midsummer, 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

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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.

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.

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• 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. ❖❖

Cornell Fruit Field Day

❖❖ Cornell University will host the 2007 Fruit Field Day and Equipment Show at the New York State Agricultural Experiment Station in Geneva, NY, on Wednesday, July 25, from 8:00 a.m. to 5:00 p.m. This is one of several events that commemorates the 125th anniversary of the Experiment Station, which opened its doors on March 1, 1882.

Fruit growers, consultants, and industry personnel are invited to tour field plots and laboratories and learn about the latest research and extension efforts being carried out by researchers on the Geneva, Highland and Ithaca campuses. The focus will be on all commodities key to New York's \$300 million fruit industry: apples, grapes, raspberries, strawberries, peaches, pears and cherries.

During lunch, equipment dealers will showcase the latest techniques to improve sprayer deposition and reducing drift. Representatives from various companies will advise growers on the latest technologies.

The event will be held on the Experiment Station's Fruit and Vegetable Research Farm South, 1097 County Road No. 4, 1 mile west of Pre-emption Rd. in Geneva, NY. Signs will be posted. Attendees will be able to select from tours of apples, stone fruits, small fruits, and grapes, as well as a tour of the Experiment Station's labs and greenhouses. Admission is free and lunch is provided courtesy of industry sponsors. Pre-registration is requested (see form.)

For sponsorship and exhibitor information, contact Debbie Breth at 585-798-4265 or dib1@cornell.edu. More information will be posted to <http://www.nysaes.cornell.edu/hort/fieldday/> in the very near future.

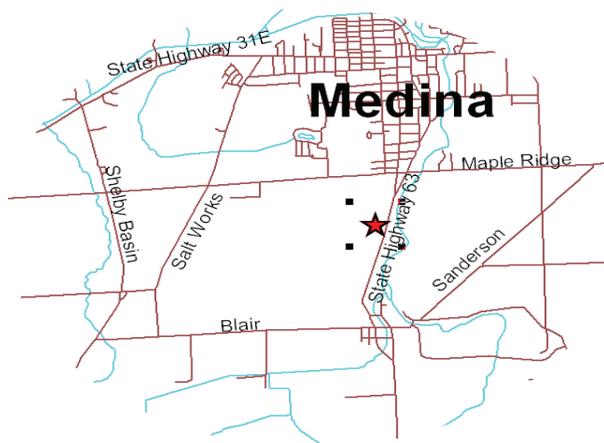
For additional information, contact Nancy Long at 315-787-2288 or NPL1@cornell.edu. Register on line at: <http://www.nysaes.cornell.edu/hort/fieldday/index.html> ❖❖

LEST YOU
FORGET

EVENT LINEUP

Sprayer Demo

❖❖ The next in the series of extension demonstrations that have been organized about using sensor-controlled precision spray systems with tower orchard sprayers will take place at Ledgerrock Farms, on Route 63 (just south of Medina, see map) on July 11 at 2:00 pm. Growers are encouraged to attend, to view the latest technology at work and to hear about the potential savings in pesticide used.❖❖





Come see the latest research and extension advances

CORNELL FRUIT FIELD DAYS and EQUIPMENT SHOW 2007

NYS Agricultural Experiment Station, Geneva, NY

July 25 from 8 am - 5 pm

FOR MORE INFORMATION:
CONTACT NANCY LONG BY CALLING:
315-787-2288 or NPL1@cornell.edu

ADVANCE REGISTRATION IS
REQUESTED

Please mail this registration form by July 20 to:
Nancy Long, NYS Agricultural Experiment Station
630 W. North Street, Geneva, NY 14456;
or fax your registration to Nancy at:
315-787-2488 by July 20 or register on line at:
<http://www.nysaes.cornell.edu/hort/fieldday/>

Name _____

Address _____

City _____ State _____ Zip _____

Phone: _____ Email: _____

1. Main Campus
2. Crittenden farm-North
3. Darrow A Farm
6. Denton Farm
7. Fruit & Vegetable Research Farm- South
8. Loomis Farm
9. Lucey Farm
10. McCarthy Farm (PGRU)-South
11. Robbins Farm
12. McCarthy-North
13. South Crittenden Farm
14. Tricker Farm
15. Fruit & Vegetable Research Farm- North
16. Wellington Farm (PGRU)
17. Gates East & West

PEST FOCUS

Geneva:
Dogwood borer and **apple maggot** 1st catch 7/5. **San Jose scale** 2nd flight beginning.

Highland:
Japanese beetle feeding on apple foliage observed. **Plum curculio** summer-feeding on apple fruit observed.
 Degree day forecast for hatch of second gen. **spotted tentiform leafminer** = 7/7.
 Degree day forecast for hatch of second gen. **codling moth** = 7/17.
 Degree day forecast for insecticide application against second gen. **San Jose scale** crawlers = 7/18.

INSECT TRAP CATCHES (Number/Trap/Day)

Geneva, NY			Highland, NY				
	<u>7/2</u>	<u>7/5</u>	<u>7/9</u>		<u>6/25</u>	<u>7/2</u>	<u>7/9</u>
Redbanded leafroller	0.0	0.0	0.0	Redbanded leafroller	1.6*	2.0	3.9
Spotted tentiform leafminer	11.3	19.3	24.3	Spotted tentiform leafminer	21.8	36.8	62.3
Oriental fruit moth	0.3	0.7	0.1	Oriental fruit moth	4.0	2.6	6.6
Lesser appleworm	0.3	1.0	0.5	Codling moth	0.7	0.4	1.4
San Jose scale	0.0	0.0	7.4*	Lesser appleworm	2.7	0.1	0.9
American plum borer	0.0	0.0	0.0	Obliquebanded leafroller	0.7	0.9	0.1
Lesser peachtree borer	1.6	0.8	0.8	Variiegated leafroller	0.3	0.1	0.0
Pandemis leafroller	0.0	0.0	0.0	Apple maggot	0.1*	0.1	0.2
Obliquebanded leafroller	0.0	0.0	0.1				
Dogwood borer	-	0.5*	-				
Peachtree borer	0.0	0.7	0.1				
Apple maggot	-	0.2*	0.0				

* first catch

UPCOMING PEST EVENTS

	<u>43°F</u>	<u>50°F</u>
Current DD accumulations (Geneva 1/1–7/9/07):	1638	1067
(Geneva 1/1–7/9/2006):	1675	1061
(Geneva "Normal"):	1630	1038
(Geneva 1/1–7/16/2007, Predicted):	1855	1235
(Highland 3/1-7/9/07):	1814	1260
<u>Coming Events:</u>	<u>Ranges (Normal±StDev):</u>	
Comstock mealybug 1st flight peak	1327–1782	931–1143
Codling moth 1st flight subsides	1296–1946	808–1252
Redbanded leafroller 2nd flight begins	1096–2029	775–1077
Redbanded leafroller 2nd flight peak	1479–2443	974–1368
Spotted tentiform leafminer 2nd flight peak	1381–1837	863–1213
STLM 2nd gen. tissue feeders present	1504–2086	913–1182
Apple maggot 1st oviposition punctures	1566–2200	1021–1495
American plum borer 2nd flight begins	906–2128	1020–1250
Dogwood borer flight peak	1516–2248	976–1376
Lesser appleworm 2nd flight begins	1152–2302	903–1323
Obliquebanded leafroller 1st flight subsides	1420–2452	1037–1429

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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