

scaffolds

Update on Pest Management
and Crop Development

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

July 11, 2016

VOLUME 25, No. 17

Geneva, NY

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FREQUENT FLIERS

ORCHARD
RADAR
DIGEST



HOME TOWN
HEROES

(Art Agnello,
Entomology,
Geneva; ama4@cornell.edu)

LOCALLY
SOURCED

❖❖ Geneva Predictions:

Roundheaded Appletree Borer

Peak RAB egg hatch roughly: July 8-27.

Dogwood Borer

Peak DWB egg hatch roughly: July 27.

Codling Moth

Codling moth development as of July 11: 2nd generation adult emergence at 2% and 1st generation egg hatch at 99%.

Lesser Appleworm

2nd LAW flight begins around: July 10.

Oriental Fruit Moth

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

Redbanded Leafroller

Peak catch and approximate start of egg hatch: July 10.

Insect model predictions for

Highland[H] / Geneva[G]

[Source:

NEWA Apple Insect Models, <http://newa.cornell.edu/index.php?page=apple-insects>]

Obliquebanded Leafroller

Obliquebanded Leafroller 90% hatch @810 DD43; 100% hatch @950 DD43 (currently @ 1176[H] / 1008[G]).

❖❖ 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 6.1.2 & 7.1.2, pp. 56 and 65 of the Recommends). This brief review, taken from IPM Tree-Fruit

continued...

PEST FOCUS

Geneva: 1st Apple Maggot trap capture 7/8.
Highland: 1st Apple Maggot trap capture 7/11.
Potato Leafhopper injury noted.
Japanese Beetle feeding to Ginger Gold fruit, foliage.
Pear Psylla nymphs above threshold in untreated Bartlett.

IN THIS ISSUE...

INSECTS

- ❖ Orchard Radar Digest
- ❖ Beneficial insects

GENERAL INFO

- ❖ Cornell Fruit Field Day 2016

PEST FOCUS

UPCOMING PEST EVENTS

TRAP CATCHES

Fact Sheet No. 18 (available online at: <http://hdl.handle.net/1813/43074>), 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://hdl.handle.net/1813/43122>), reviews mites that are important predators of leaf-feeding mites. Photos and biological information on these and other beneficial species can also be found using the online (hosted by MSU) search engine version of the "Tree Fruit Field Guide to Insect, Mite, and Disease Pests and Natural Enemies of Eastern North America": <http://www.ipm.msu.edu/search>. A hard copy of the Tree Fruit Field Guide (formerly NRAES-169) can be purchased from Plant and Life Sciences Publishing in Ithaca; a link to the site can be found at the Cornell Fruit Page: http://www.fruit.cornell.edu/tree_fruit/IPMGeneral.html

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 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

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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, thread-like "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

continued...

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. ❖❖

NOW'S THE TIME

The Cornell Fruit Field Day will be held in Geneva on Wednesday, July 20. This event, being organized by Cornell University, the NYS Agric. Experiment Station, CALS Fruit Program Work Team, and Cornell Cooperative Extension, will feature ongoing research in berries, hops, grapes, and tree fruit. All interested persons are invited to learn about the fruit research under way at Cornell University. Attendees will be able to select from tours of different fruit commodities. It will be based at the NYSAES Fruit and Vegetable Research Farm South, 1097 County Road No. 4, 1 mile west of Pre-emption Rd. in Geneva, NY. Admission is \$50/person (\$40 for additional attendees from the same farm or business). Lunch is provided, including **beer tastings** by **War Horse Brewing AND Nedloh Brewing**.

NOTE: Pre-registration is required; Deadline is **Friday, July 15 at noon**. In order to ensure adequate bus transportation and lunch availability, **NO** walk-ins will be admitted on the day of the event. Please use the registration link below to register via credit card:

<http://events.cals.cornell.edu/ffd2016>

CORNELL AND CCE EMPLOYEES get free admission, but please pre-register using the same link; there's a **Cornell Staff** tab at the top of the home page, which will take you to a page to pre-register and select a lunch option.

To participate as a sponsor, see the website page or contact Shelly Cowles (315-787-2274; mw69@cornell.edu).

2016 Cornell Fruit Field Day – Program Presentation List**Tree Fruits (AM)**

- 1 - Jaume Lordan, Poliana Francescato - Strategies to control bitter pit
- 2 - Lailiang Cheng, Mario Miranda Sazo - Bitter pit of Honeycrisp: Physiological causes & mitigation strategies
- 3 - Poliana Francescato, Terence Robinson - Precision chemical thinning – A useful and practical guide for apple growers
- 4 - Jaume Lordan, Poliana Francescato, Terence Robinson - 2010 NC-140 Honeycrisp apple rootstock trial
- 5 - Andrew Landers, Tomas Palleja - Precision spraying the orchard
- 6 - Jaume Lordan, Poliana Francescato, Terence Robinson - 2013 NC-140 Pear systems and rootstock trial
- 7 - Amelia Zhao, Kerik Cox - Fire blight management using biological control, SARs, and antibiotics
- 8 - Matthew Boucher, Kerik Cox, Greg Loeb - The role of insects in spreading fire blight in apples

Tree Fruits (PM)

- 1 - Susan Brown, Kevin Maloney - Cornell apple breeding and genetic studies
- 2 - Betsy Bihn - FSMA Produce Safety Rule
- 3 - Katrin Ayer, Kerik Cox - Chemical management of apple scab and powdery mildew
- 4 - Kenong Xu - Apple genomics studies
- 5 - Amy Tabb - A robotic system for 3D tree architecture phenotyping
- 6 - Jaume Lordan, Poliana Francescato, Terence Robinson - 2010 NC-140 Cherry systems and rootstock trial
- 7 - Juliet Carroll, Terence Robinson, Thomas Burr, Steve Hoying, Kerik Cox - Bacterial canker of sweet cherries
- 8 - Thomas Chao, Gregory Peck - *Malus* selections for potential use in cider production
- 9 - Art Agnello - Ambrosia beetle management trials

Berries (AM)

- 1 - Courtney Weber - High Density Training for High Tunnel Black Raspberry Production
- 2 - Amara Dunn, Kerik Cox - Management of multi-fungicide resistance in *Botrytis cinerea* of strawberry
- 3 - Greg Loeb, Dale Ila Riggs, Laura McDermott, Stephen Hesler - A potential push/pull strategy for managing spotted wing drosophila in red raspberry
- 4 - Stephen Hesler, Greg Loeb, Dong Cha, Peter Jentsch, Faruque Zaman, Juliet Carroll, Jan Nyrop - Monitoring spotted wing drosophila for management decisions in summer raspberry and blueberry crops
- 5 - Anna Wallingford, Greg Loeb - A potential push/pull strategy for managing spotted wing drosophila in red raspberry
- 6 - Julie Carroll - Spotted wing drosophila update; hummingbird use, monitoring network
- 7 - Heather Grab, Katja Poveda, Bryan Danforth, Greg Loeb - Managing farms and landscapes for both biological control and pollination services
- 8 - Marvin Pritts, Kaspar Kuehn - Day-neutral strawberries/low tunnel production

continued...

Grapes & Hops (PM)

- 1 - David Gadoury - Management of powdery and downy mildew in hops
- 2 - Tim Weigle - Hops weed management; mite biocontrol
- 3 - Gary Bergstrom - Update on malting barley research
- 4 - Tim Martinson, Chrislyn Particka - Early leaf removal on Rieslings for manipulating cluster size at bloom
- 5 - Bruce Reisch - The *VitisGen* project: Impact on the development of new grape varieties
- 6 - Greg Loeb, Marc Fuchs, Miguel Gomez - Managing the spread of leafroll virus in *Vinifera* grape using insecticides and vine removal
- 7 - Andrew Landers, Tomas Palleja - Precision spraying in the vineyard

ROLLING
THE DICE...

WAYNE COUNTY
FRUITGROWER
TOUR

Wednesday, August 3, from 9:00 am

Registration and 1st stop at MackQuinLe Farms, Norris Rd/Rte 104, North Rose, NY (GPS: N 43.204284, W 76.933619)

Sponsored by agr.assistance, this large, informative and entertaining tour is in its 18th year, and will feature presentations on Gala production (orchard fertility & PGR use), fireblight control, weed control, crop nutrient and biostimulant programs for new apple plantings and processing apple varieties, apple scab alerts, plus much more. Door prizes, lunch, some droll humor, a BBQ/clambake dinner with a live band, growers and industry representatives from NY and surrounding states — always a great way to spend a midsummer day. Free attendance.

Contact Lindsay LaMora (585-734-8904; lindsaylamora@agrassistance.com) for RSVP pre-registration and tour information.



UPCOMING PEST EVENTS

	<u>43°F</u>	<u>50°F</u>
Current DD accumulations (Geneva 1/1-7/11/16):	1684.3	1088.8
(Geneva 1/1-7/11/2015):	1603.1	1056.1
(Geneva "Normal"):	1720.2	1122.1
(Geneva 1/1-7/18, predicted):	1907.3	1262.8
(Highland 1/1-7/11/16):	2095.7	1371.1

<u>Coming Events:</u>	<u>Ranges (Normal ±StDev):</u>	
Apple maggot 1st oviposition punctures	1605-2157	1144-1544
American plum borer 2nd flight start	1560-2140	1028-1434
Codling moth 2nd flight start	1571-2245	1027-1507
Comstock mealybug 1st flight subside	1818-2132	1216-1418
Lesser appleworm 2nd flight start	1412-2090	912-1392
Obliquebanded leafroller 1st flight subsides	1619-2045	1051-1379
Oriental fruit moth 2nd flight peak	1444-1960	920-1316
Redbanded leafroller 2nd flight peak	1528-1986	981-1331
San Jose scale 2nd flight start	1629-1979	1058-1336
STLM 2nd gen tissue feeding mines present	1378-2035	913-1182

all DDs Baskerville-Emin, B.E.

INSECT TRAP CATCHES (Number/Trap)

	Geneva, NY				Highland, NY	
	<u>7/5</u>	<u>7/8</u>	<u>7/11</u>		<u>7/5</u>	<u>7/11</u>
Redbanded leafroller	8.0	6.5	2.5	Redbanded leafroller	45.0	21.5
Spotted Tentiform Leafminer	158.0	182.5	42.5	Spotted Tentiform Leafminer	214.5	119.5
Oriental Fruit Moth	1.0	2.5	3.5	Oriental Fruit Moth	4.5	10.0
Codling Moth	3.5	1.0	0.0	Lesser Appleworm	25.0	10.0
American Plum Borer	0.0	0.0	0.0	San Jose Scale	1.5	2.5
Lesser Peachtree Borer	0.5	0.0	0.0	Codling Moth	7.5	32.5
Obliquebanded Leafroller	0.0	3.0	0.5	Obliquebanded Leafroller	22.0	11.0
Pandemis Leafroller	1.0	0.0	0.0	Dogwood Borer	9.5	5.0
Dogwood Borer	23.5	8.0	8.0	Brown Marmorated Stink Bug	0.0	0.0
Peachtree Borer	3.0	9.5	3.0	Apple Maggot	0.0	2.8*
Apple Maggot	0.0	0.3*	0.0			

* = 1st catch

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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