scaffolds

Update on Pest Management and Crop Development

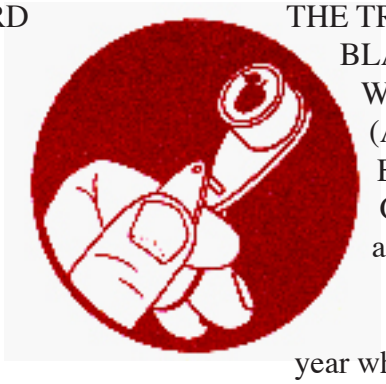
F R U I T J O U R N A L

June 17, 2013 VOLUME 22, No. 13 Geneva, NY

INSECTS

INSECT HEADING

ORCHARD RADAR DIGEST



THE TRUTH IN BLACK AND WHITE

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

FLY BOYS

Geneva Predictions:

Roundheaded Appletree Borer
Peak egglaying period roughly: June 25 to July 10.
First RATB eggs hatch roughly: June 17.

Dogwood Borer
First DWB egg hatch roughly: June 25.

Codling Moth
Codling moth development as of June 17: 1st generation adult emergence at 80% and 1st generation egg hatch at 30%.
1st generation 20% CM egg hatch: June 14, = target date where one spray needed to control 1st generation CM.

Obliquebanded Leafroller
Early egg hatch and optimum date for initial application of B.t., Delegate, Proclaim, Intrepid, Rimon, Altacor, Belt, or other insecticide effective against OBLR: June 24.

San Jose Scale
1st generation SJS crawlers appear: June 19.

Spotted Tentiform Leafminer
2nd STLM flight begins around: June 16.

❖❖ It is once again the time of year when we expect the first appearance of apple maggot (AM) flies in wild apple trees and abandoned orchards, particularly in eastern N.Y.; western N.Y. could be about a week later, depending on what kind of temperatures and rainfall we get over the next week or so. Crop scouts and consultants have used traps to monitor AM populations for a long time, but this approach, useful as it is, nevertheless is not recommended in all cases. Some orchards have such high or such low AM populations that monitoring for them is not time-efficient. That is, in some blocks, sprays are necessary

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IN THIS ISSUE…

every season, often on a calendar basis; however, in some blocks the populations are so low that they are rarely needed at all. However, most commercial N.Y. orchards have moderate or variable pressure from this pest, so monitoring to determine when damaging numbers of them are present allows growers to apply only the number of sprays necessary to protect the fruit from infestation.

Sticky yellow panels have been in use for over 50 years, and these can be very helpful in determining when AM flies are present. These insects emerge from their hibernation sites in the soil from mid-June to early July in New York, and spend the first 7–10 days of their adult life feeding on substances such as aphid honeydew until they are sexually mature. Because honeydew is most likely to be found on foliage, and because the flies see the yellow panel as a "super leaf", they are naturally attracted to it during this early adult stage. A few of these panels hung in such an orchard can serve as an early warning device for growers if there is a likely AM emergence site nearby.

Many flies pass this period outside of the orchard, however, and then begin searching for fruit only when they are ready to mate and lay eggs. That means that growers don't always have the advantage of this advance warning, in which case the catch of a single (sexually mature) fly indicates that a spray is necessary immediately to adequately protect the fruit. This can translate into an undesirable risk if the traps are not being checked daily and are used to signal an immediate response, something that's not always possible during a busy summer.

To regain this time advantage, traps have been developed in the form of a "super apple" — large, round, deep red, and often accompanied by the scent of a ripe apple — in an attempt to catch that first AM fly in the orchard. Because this kind of trap is so much more efficient at detecting AM flies when they are still at relatively low levels in the orchard, the traps can usually be checked twice a week to allow a 1–2-day response period (before spraying) after a catch is recorded, without incurring any risk to the fruit. Research done in Geneva over a number of years indicates that some of these traps work so well that it is possible to use a higher threshold than the old "1 fly and spray" guidelines recommended for the panel traps. Specifically, it has been found that sphere-type traps baited with a lure that emits apple volatiles attract AM flies so efficiently that an insecticide cover spray is not required until a threshold of 5 flies per trap is reached.

The recommended practice is to hang three volatile-baited sphere traps in a 10- to 15-acre orchard, on the outside row facing the most probable direction of AM migration (towards woods or abandoned apple trees, or else on the south-facing side). Then, the traps are periodically checked to get a total number of flies caught; dividing this by 3 gives the average catch per trap, and a spray is advised when the result is 5 or more. Be sure you know how to distinguish AM flies from others that will be collected by the inviting-looking sphere. There are good photos for identifying the adults on the Apple Maggot IPM Fact Sheet (No. 102GFSTF-I8); check the web version at: http://www.nysipm.cornell.edu/factsheets/treefruit/pests/am/am.asp.

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In home apple plantings, these traps can be used to "trap out" local populations of AM flies by attracting any adult female in the tree's vicinity to the sticky surface of the red sphere before it can lay eggs in the fruit. Research done in Massachusetts suggests that this strategy can protect the fruit moderately well if one trap is used for every 100–150 apples normally produced by the tree (i.e., a maximum of three to four traps per tree in most cases), a density that makes this strategy fairly impractical on the commercial level.

A variety of traps and lures are currently available from commercial suppliers; among them: permanent sphere traps made of wood or stiff plastic, disposable sphere traps made of flexible plastic, and sphere-plus-panel ("Ladd") traps. The disposable traps are cheaper than the others, of course, but only last one season. Ladd traps are very effective at catching flies, but are harder to keep clean, and performed no better than any other sphere trap in our field tests. Brush-on stickum is available to facilitate trap setup in the orchard. Apple volatile lures are available for use in combination with any of these traps. These tools are available from a number of orchard pest monitoring suppliers, among them:

• Gempler's Inc., 100 Countryside Dr., PO Box 328, Belleville, WI 53508; 1-800-382-8473, Fax, 1-800-551-1128 <http://www.gemplers.com/>

• Great Lakes IPM, 10220 Church Rd. NE, Vestaburg, MI 48891; 800-235-0285, Fax 989-268-5311 <http://www.greatlakesipm.com>

• Ladd Research Industries Inc., 83 Holly Court, Williston, VT 05495; 800-451-3406, Fax 802-660-8859 <http://www.laddresearch.com>

By preparing now for the apple maggot season, you can simplify the decisions required to get your apples through the summer in good shape for harvest. ❖❖

THE HEAVIES

WEIGHING IN ON SCALE, CODLING MOTH AND LEP MANAGEMENT IN THE HUDSON VALLEY

(Peter Jentsch, Entomology, Highland; pjj5@cornell.edu)

❖❖ Insect issues of primary concern this upcoming week include San Jose scale damage in orchards where the insect was observed on fruit at packout; the first emergence of the obliquebanded Leafroller; internal lep complex larvae, including the later emergence period of codling moth larvae, along with oriental fruit moth, and European corn borer larvae in newly planted trees.

San Jose Scale

We are presently seeing live crawlers of San Jose scale, *Quadraspidiotus perniciosus* (Comstock) (SJS) under the overwintered adult females on apple trees, with emergence predicted for later this week. The SJS has become a primary fruit-feeding pest in many orchards across the region over the past 10 years, as older chemistries such as Penncap-M and Lorsban, which once held this insect in check, have been removed from the pest management toolbox. With little in the way of residual insecticide in the orchard after the threat of plum curculio has passed, there is little to keep this insect from gaining a foothold in tree fruit blocks, which invariably leads to severe economic injury if left unmanaged. Many producers I have spoken to lately find this insect very difficult to eradicate. Multiple applications targeting all three generations using products with different modes of action appear to work best. The pheromone-based model we now use targets the adult flight as a biofix, predicting SJS crawler emergence at 380-400 DD (base 50°F). This year, the first adults were observed in traps on 23 May, accumulating 340 DD to date. Looking at the 7-day forecast, we are expected to reach 380 DD or the onset of crawler emergence in about 3–4 days.

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We are quite fortunate to have a group of effective insecticides to assist us in managing this insect during key timing windows of the growing season. However, the window of opportunity for using materials such as Lorsban, Supracide 25WP and Movento for this generation has passed. Our options now include oil, contact insecticides, or insect growth regulators that will target the emerging crawlers.

The use of oil at 1% has been quite effective when used alone against SJS if complete coverage is acheived. However, your fungicide program will dictate the use of oil. The fungicide Captan may cause phytotoxicity to foliage and fruit if penetrants such as oil are used in tank mixes or in close application schedules with oil. Centaur 0.7WDG, working as an insect growth regulator (IGR; IRAC Class 16), acts to inhibit the synthesis of chitin. Esteem 35WP, also an IGR (Class 7), functions as a juvenile hormone mimic, inhibiting metamorphosis from one stage to another. These insecticides are most effective when directed against the first appearance of crawlers, yet have no contact toxicity and tend to act very slowly. Assail (Class 4) is a broad-spectrum neonicotinoid that is one of the more effective insecticides when directed against emerging crawlers. The efficacy of these materials is improved by the addition of oil; however, Esteem 35WP and Assail can be used effectively without the use of oil, whereas Centaur requires oil to be effective. Remember, rotating classes of insecticides for each generation will delay the onset of resistance. Making multiple applications of the same class or same insecticide at a 14-day interval for the same generation is recommended. (see http://ipmguidelines.org/TreeFruits/Chapters/CH11/default-5-8.aspx for Management Options).

Obliquebanded Leafroller (OBLR)

OBLR, *Choristoneura rosaceana* (Harris), outbreaks in New York have been somewhat less prevalent than we experienced 10 years ago, yet continue to result in severe damage to apple, peach, and pear fruit in many Hudson Valley orchards where timing of first hatch is delayed. Our management strategies have included directed applications during three periods of the growing season, targeting the overwintering generation during late pre-bloom and early post-bloom, the summer generation, and, if populations warrant, the second generation in Mid-August.

Management of the summer generation will begin this week. Degree-day calculations to predict the first hatch of OBLR larvae forecast the first emergence to begin in the Hudson Valley on the 19th of June. Applications should be made shortly after this date. To delay the possibility of resistance, you should use different classes of insecticide for each generation. For example, If you used Altacor 35WDG for OBLR overwintered larval control, you should not use Belt 4SC (or vice versa), as they share the same target site, so genetic modification could induce population-level shifts leading to insecticide resistance. Newly hatched larvae of the first summer brood tend to move to and feed on tender growing terminals, water sprouts, or developing fruit. As these larvae mature, they increasingly transition from foliar- to fruit-feeding. OBLR larvae feed on the surface of developing fruit, similar to the type of feeding caused by several other species of leafrollers such as tufted apple bud moth, variegated leafroller (*Platynota flavedana*) and Sparganothis fruitworm (*Sparganothis sulfureana*). All of these insects have been captured in pheromone traps this season. Fruit damage caused by this first summer brood's larvae is usually more serious than spring feeding by overwintered larvae, as more of the fruit injured later in the season remains on the tree at harvest. (click http://ipmguidelines.org/TreeFruits/Chapters/CH11/default-5-8.aspx for Management Options).

Codling moth (CM)

Larvae have been hatching since 2 June. Many of the insecticides used to control plum curculio would have controlled the first emergence of CM. Adult CM continue to fly, with egg laying and

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hatch being relatively heavy during this period. The majority of eggs are likely to hatch over the next few weeks, so control is critical, especially if internal lepidopteran injury was noted last season. If OP or pyrethroid use in 2012 allowed economic injury, especially in high-pressure blocks, it would be wise to choose an alternate insecticide with internal lep activity. (click http://ipmguidelines.org/TreeFruits/Chapters/CH11/default-5-8.aspx for Management Options)

European corn borer (ECB)

Adults are on the wing, with the first pheromone trap captures in New Paltz ocurring in mid-May. Extension growth of newly planted young trees is susceptible to ECB infestations, especially if tall weeds and grasses in tree rows are present. Although infestations of ECB are unpredictable, infestations can cause serious damage in blocks with no prior incidence of injury. ECB injury is most often seen in young or newly planted orchards that receive low levels of insect pest management. Injury to newly planted trees by larval tunneling occurs in the current season's growth, resulting in terminal leaf discoloration. Continued larval feeding will eventually kill the terminal shoot, causing dieback and malformation of the tree. Corn borer attack on young trees can occur from June through August. Two "broods" exist in NY, which includes the "Z race", which has one generation per season, and the "E & Z Race", which have two generations. Over the past few years, trap captures of one or both races have been shown to linger into late July throughout the mid-Hudson Valley. Fruit feeding can also occur late in the season through harvest. Delegate 25WG and Dipel 10.3DF are labed for ECB management and, when used for OBLR management, will also control ECB infestations at the onset of hatch and feeding. ❖❖

PEST FOCUS

Highland: **San Jose scale** crawlers observed under overwintering females. Emergence will occur toward the latter part of this week. **Obliquebanded leafroller** 350DD43F model hatch prediction approximate date is June 19. OBLR control should begin this Wednesday, June 19.

GENERAL INFO

OUT STANDING

EVENT ANNOUNCEMENTS

CORNELL FRUIT FIELD DAY

❖❖ Cornell University will host the 2013 Fruit Field Day at the New York State Agricultural Experiment Station in Geneva, NY, on Thursday, August 1, from 8:00 a.m. to 5:00 p.m. The field day will be composed of two concurrent day-long tours, one of tree fruit presentations and another tour of grapes, hops and small fruit presentations. Fruit growers, consultants, and industry personnel are invited to tour field plots and learn about the latest research and extension efforts being carried out by Cornell researchers in Geneva and Ithaca and on commercial farms around the state. The event will focus on all commodities of key importance to New York's $350 million fruit industry: apples, grapes, cherries, raspberries, strawberries, blueberries and other berry crops, plus hops. During lunch, equipment dealers and representatives from various companies will showcase their latest products and technologies to improve fruit crop production and protection.

The list of presentations will include the following topics:

Tree Fruit Tour

- Apple breeding at Cornell and new varieties in the pipeline
- Precision apple thinning
- Apple mechanization
- Tall Spindle management in years 1-6
- Spray volume for Tall Spindles
- Precision spraying in the orchard
- Fruit russet control on NY1
- CG rootstocks
- Nutrient removal by fruit harvest and maintenance application of fertilizers
- Impacts of glyphosate on apple tree health
- Evaluation of bactericide programs for fire blight management
- Persistent NY nematodes for plum curculio biocontrol
- Peach rootstocks
- Rain protection in cherries
- Pear systems and rootstocks
- Organic apple production trials
- Apple scab management in a fungicide-resistant orchard

Berries/Grapes/Hops Tour

Soil and root factors in improved blueberry productivity
- Mass trapping and exclusion tactics to control Spotted Wing Drosophila in organic blueberries
- Limiting bird damage to small fruit crops
- SWD trap network in NY
- Day-neutral strawberries and low tunnel production
- SWD, a new threat to strawberries and raspberries in NY
- Enhancing pollination and biological conrol in strawberries
- Training systems for Arandell
- New hops variety trial and pest management trials
- Biology and control of sour rot in grapes
- Precision spraying in the vineyard
- High tunnel raspberry and blackberry production
- A fixed-spray system for SWD control in high tunnel raspberries

The event will be held on the Experiment Station's Fruit and Vegetable Research Farm South, 1097 County Road No. 4, one mile west of Pre-emption Road in Geneva, NY. Signs will be posted. Attendees will travel by bus to the research plots to hear presentations by researchers on the work being conducted. The cost of registration is $30 per person ($40 for walk-ins) for all-day attendance. Lunch will be provided.

Pre-registration is required for the $30 rate, register online at: http://is.gd/ffd2013
For sponsorship and exhibitor information, contact Debbie Breth at 585-798-4265 or dib1@cornell.edu.

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CORNELL UNIVERSITY STORAGE WORKSHOP

This year's workshop, slated for August 6 in Ithaca, will feature an international, national and statewide cast. Our guest speakers include Dr. Angelo Zanella, who heads the post-harvest research group at Laimburg Agriculture Research Centre in Italy, and who will be presenting their work on DCA and ILOS, as well as their experiences with DPA. Other presentations will include Honeycrisp, and Empire and Gala browning by Jim Mattheis (USDA, Washington), Jennifer DeEll (Ontario Ministry of Agriculture and Food, Canada), as well as the Cornell team of Chris Watkins and David Rosenberger. Industry presentations include DECCO, PACE and Storage Control Systems. Registration materials will be available shortly.
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INSECT TRAP CATCHES (Number/Trap/Day)

Geneva, NY

	6/3	6/10	6/17
Redbanded leafroller	0.0	0.0	0.0
Spotted tentiform leafminer	0.0	0.0	0.2
Oriental fruit moth	0.0	0.0	0.3
San Jose scale	0.1	0.1	0.0
Codling moth	0.3	0.3	0.3
American plum borer	0.0	0.0	0.1
Lesser peachtree borer	0.8	0.6	0.5
Pandemis leafroller	0.3*	0.3	1.4
Obliquebanded leafroller	0.0	0.1*	1.8
Dogwood borer	1.6*	1.0	1.4

* first catch

Highland, NY

	6/10	6/17
Redbanded leafroller	0.1	0.0
Spotted tentiform leafminer	6.2	19.7
Oriental fruit moth	0.4	0.2
Lesser appleworm	0.7	0.6
Codling moth	0.2	0.9
Obliquebanded leafroller	0.6*	0.4
San Jose scale	–	0.0

UPCOMING PEST EVENTS

	43°F	50°F
Current DD accumulations (Geneva 1/1–6/17/13):	1021	629
(Geneva 1/1–6/17/2012):	1363	857
(Geneva "Normal"):	1080	646
(Geneva 1/1–6/24 predicted):	1197	756
(Highland 1/1–6/17/2013):	1212	740

Coming Events:	Ranges (Normal ±StDev):	
Spotted tentiform leafminer 2nd flight begins	990–1162	588–724
Pear psylla 2nd brood hatch	967–1185	584–750
Obliquebanded leafroller 1st flight peak	826–1208	479–755
Obliquebanded leafroller summer larvae hatch	1038–1460	625–957
Pandemis leafroller flight peak	866–1172	496–716
Oriental fruit moth 1st flight subsides	837–1123	489–697
Peachtree borer 1st catch	789–1341	453–827
San Jose scale 1st flight subsides	851–1233	506–764
San Jose scale 1st generation crawlers present	1033–1215	619–757
Lesser appleworm 1st flight subsides	990–1466	604–932

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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