

scaffolds

Update on Pest Management
and Crop Development

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

September 8, 2015

VOLUME 24, No. 24

Geneva, NY

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WHAT IT WAS

PACKOUT
(Art Agnello &
Dave Kain,
Entomology,
Geneva)



KEY = GFW - Green Fruitworm; RBLR - Redbanded Leafroller; STLM - Spotted Tentiform Leafminer; OFM - Oriental Fruit Moth (in apples); LAW - Lesser Appleworm; CM - Codling Moth; APB - American Plum Borer (in peach); LPTB - Lesser Peachtree Borer (in peach); DWB - Dogwood Borer; PL - Pandemis Leafroller; OBLR - Obliquebanded Leafroller; PTB - Peachtree Borer; AM - Apple Maggot; * - first catch of the generation.

❖❖ With this issue, Scaffolds ceases publication for the season; we expect to start up again next March. In February, as usual, we'll send out an email to all current subscribers to verify addresses for next year's mailing list. Our thanks to all of you who have sent comments, suggestions, and articles our way, a practice we hope you'll continue. As a wrap-up, here's our annual summary of the year's pheromone trap results and an Index of Volume 24, 2015 of Scaffolds Fruit Journal.

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continued...



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INSECTS

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- ❖ End of season disease management in apples

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- ❖ 2015 Scaffolds Index

INSECT TRAP CATCHES

UPCOMING PEST EVENTS

Geneva Pest Trapping Results - Avg/Trap/Day

DATE	GFW	RBLR	STLM	OFM	LAW	CM	APB	LPTB	PTB	DWB	PL	OBLR
4/13	0.4*											
4/16	0.3											
4/20	0.9											
4/23	2.2											
4/27	0.1	0.1										
4/30	0.0	7.3*	0.2*									
5/4	0.3	12.8	2.8	0.3*								
5/8	0.1	11.3	14.4	17.8								
5/11	0.5	17.2	24.3	29.8	0.5*	0.0	0.0	0.0				
5/13	0.0	5.0	2.5	2.8	0.6	0.3*	0.0	0.0				
5/18	0.0	3.0	4.5	3.0	0.5	1.2	0.1*	2.1*				
5/22		2.8	1.1	1.0	0.0	0.8	0.4	2.4				
5/26		4.4	2.0	2.1	0.4	1.4	0.0	3.5				
5/29		1.7	0.5	0.7	0.2	1.5	0.3	2.8	0.0	0.2*		
6/1		0.2	0.2	0.2	0.0	0.7	0.0	0.5	0.0	0.3	1.3*	0.5*

DATE	RBLR	STLM	OFM	LAW	CM	APB	LPTB	PTB	DWB	PL	OBLR	AM
6/4	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.3	0.2	0.0	
6/8	0.0	0.0	0.0	0.1	0.9	0.0	0.1	0.2*	1.0	4.1	2.6	
6/11	0.0	0.0	0.5	0.0	1.2	0.0	0.2	0.0	0.8	6.3	3.3	
6/15	0.0	1.1*	0.1	0.5	0.6	0.0	1.6	0.0	3.1	5.3	1.6	
6/19	0.1	6.0	0.3	0.0	0.1	0.0	0.9	0.0	2.1	2.0	1.1	
6/22	1.2*	15.3	0.0	0.0	0.7	0.0	0.5	0.0	5.3	6.5	0.8	
6/25	2.3	13.0	1.5*	0.0	0.3	0.0	1.3	0.0	8.2	2.0	2.7	
6/29	1.4	13.8	4.4	0.0	0.0	0.0	0.4	0.0	4.8	0.0	0.6	0.0
7/2	3.3	14.7	2.1	0.0	0.0	0.0	0.5	0.2	17.7	0.5	1.3	0.3*
7/6	1.9	26.5	4.8	0.0	0.0	0.0	1.1	0.3	19.9	0.1	1.3	0.5
7/10	2.0	15.3	3.9	0.0	0.0	0.0	0.5	0.2	19.0	0.2	1.0	0.2
7/13	1.7	12.0	1.7	0.2	0.0	0.0	1.0	0.0	—	0.0	0.4	0.3
7/16	1.8	10.5	0.7	0.0	0.0	0.0	0.0	0.2	7.8	0.0	0.2	0.3
7/20	0.9	8.5	2.0	0.3	0.0	0.0	0.3	0.1	5.4	0.0	0.1	0.5
7/24	1.8	5.1	0.0	0.0	0.6*	0.0	0.4	0.0	6.6	0.0	0.0	0.2
7/27	0.2	2.7	0.8	0.0	0.5	0.0	0.2	0.0	1.3	0.0	0.0	0.8
7/30	0.0	4.0	0.2	0.0	1.0	0.0	0.7	0.0	2.7		0.3*	0.3
8/3	0.0	2.9	1.1*	0.0	1.0	0.0	0.5	0.0	0.8		0.6	0.4
8/6	0.5*	17.2*	1.0	0.0	0.8	0.0	0.2	0.0	0.5		0.5	2.5
8/10	0.0	20.5	1.6	0.0	0.0	0.0	1.1	0.0	0.0		0.1	1.3
8/13	0.8	4.2	1.7	0.0	2.0	0.2*	0.5	0.0	0.0		0.0	2.2
8/17	1.5	23.6	0.4	0.0	0.5	0.0	0.4	0.0	1.1		0.0	1.8
8/24	6.1	13.9	1.6	0.0	0.5	0.0	0.8	0.0	0.3		0.3	2.3
8/27	4.8	5.5	0.8	0.0	0.7	0.0	0.0	0.0	1.0		0.3	2.2
8/31	1.9	8.6	2.3	0.0	0.1	0.0	0.4	0.0	2.8		0.0	2.6
9/3	0.7	9.8	1.2	0.0	0.0	0.0	0.2	0.0	3.3		0.0	1.2
9/8	4.9	6.4	1.4	0.0	1.5	0.0	0.1	0.0	1.6		0.4	0.8

HUDSON VALLEY INSECT KEY = GFW - Green Fruitworm; RBLR - Redbanded Leafroller; STLM - Spotted Tentiform Leafminer; OFM - Oriental Fruit Moth (in apples); LAW - Lesser Appleworm; CM - Codling Moth; SJS - San Jose scale; DWB - Dogwood borer; OBLR - Obliquebanded Leafroller; TABM - Tufted Apple Budmoth; SPAR - Sparganothis Fruitworm; AM - Apple Maggot; * - first catch of the generation.

Hudson Valley (Highland) Pest Trapping Results - Avg/Trap/Day

DATE	GFW	RBLR	STLM	OFM	LAW	CM	SJS	DWB	OBLR	TABM	SPAR	AM
4/6	0.2											
4/13	1.0											
4/20	0.4	2.5*										
4/27	0.9	1.4										
5/4	0.6	18.5		0.1*	0.4*	0.0						
5/11	0.1	18.9	32.4	2.6	0.0	0.4*	4.7*					
5/18	0.0	5.1	7.7	1.4	1.1	4.7	19.9	0.7*				
5/26	0.0	0.6	0.4	1.3	0.6	5.1	2.3	1.4				
6/1	0.1	0.0	0.1	1.6	0.2	4.6	0.0	1.0	7.8*			
6/8	0.1	0.0	5.3	1.6	0.0	5.0	0.0	2.4	10.0			
6/15	0.0	0.0	39.9	0.4	0.0	6.8	0.0	1.6	12.6			
6/29		0.0	31.1	0.9	0.0	2.1	0.0	1.7	4.1			
7/6		0.0	41.1	1.0	0.4	0.8	0.1	0.9	0.7			
7/13		0.0	26.2	0.5	0.2	1.7	33.9	1.7	0.4	0.0		0.1*
7/20		0.0	17.2	0.8	2.8	6.1	61.4	3.9	0.1	0.0	0.1*	0.1
7/27		19.1*	24.5	0.6	0.7	2.5	74.2	1.9	0.2	0.4	0.0	0.1
8/3		0.0	35.6	1.6	0.6	5.4	67.8	4.4	0.9	0.7	0.0	0.1
8/10		0.0	10.8	0.2	1.0	8.6	25.6	1.2	1.3	0.7	0.1	0.2
8/17		1.1	11.4	0.6	1.3	4.2	16.8	0.9	0.0	0.1	0.1	0.3
8/24		4.4	12.7	1.8	2.0	5.5	1.3	1.1	0.3	0.1	0.1	0.3
8/31		1.5	11.1	1.5	1.1	4.8	0.0	0.8	0.1	0.1	0.1	0.5
9/8		4.2	25.1	0.1	4.3	0.6	285.3	0.2	0.4	0.8	0.0	0.1

BAG 'EM

WHAT TO DO ABOUT
SWD-INFESTED FRUIT?
(Julie Carroll, NYS IPM
Program, Geneva; jec3@cornell.edu)

❖❖ The SWD monitoring network counties are all positive for SWD as of last week, August 28, 2015. A lot of SWD are being caught in traps in research sites now with population numbers expected to climb into the thousands before frost knocks them back and forces them into winter diapause.

Reports are coming in of severely infested fall raspberries. This fall will be especially challenging for fall harvest of susceptible fruits. Blackberries and raspberries are particularly vulnerable and will require intensive management with sanitation and insecticide protection. One sanitation strategy used in California for berries is for workers to crush any fruit that has fallen to the ground, reducing the chance of larvae surviving to grow into egg-laying adults. For insecticides, maintaining good coverage is essential, so keep track of rain events that can wash off insecticide (>0.5 inch) and reapply at the appropriate interval listed on the labels.

Late season blueberries, peaches, plums and grapes are vulnerable to infestation, and though not as susceptible as brambles, it will be wise to examine the crop for infestation. Fruit that is softer than it should be, with dull sunken areas and tiny drops of sap may be infested. Hold marketable fruit samples on white paper towels for a day or so and rotate it to see if it is leaking from tiny pinholes indicative of larval breathing sites. Use salt flotation to float out larvae and assess the relative abundance of larval infestation and severity of the problem. Place 50 ripe, marketable fruit in a plastic bag, cover with salt solution (1 Tbsp salt/cup water) and examine in 15–30 minutes for emerging larvae. Larvae are small 1–3 mm or 1/16–2/16 inch long. More on checking fruit for infestation is in the blog [Do my fruit have SWD?](#)

Infestations can contribute to sour rot in grapes and fruit decays in other fruit crops. Severely infested raspberries will appear to melt off the plants. If fruit is still ripening and ripe fruit is infested, clean pick all ripe and overripe fruit and discard it to remove the developing SWD populations from the planting. After clean picking and sanitation, apply an effective insecticide to protect the ripening fruit. Discard infested fruit in clear plastic bags held in the sun to solarize and kill larvae or freeze it. Holding culled fruit in tightly closed plastic bags will prevent SWD adults from emerging from the infested fruit into the environment.

High temperature will dissuade SWD, but hot days this past week in NY have been followed by cool nights, which has likely allowed SWD adults to escape the impact of the heat. High humidity is conducive to SWD development, so that factor will also weigh in to make management difficult this fall. The microclimate in the fruit planting can be altered with pruning practices, so plan now to prune for a more open plant canopy in 2016. ❖❖



Photo: J. Carroll

BEFORE
THE
FALLEND OF SEASON
DISEASE
MANAGEMENT IN
APPLES

(Kerik Cox & Dave
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ogy, Geneva & Highland;
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Late season disease problems

❖❖ While the threats of fire blight, powdery mildew, and apple scab are waning, several other diseases can emerge just before harvest or in storage, to ruin an otherwise excellent crop. In NY, there is a common set of pre-/post-harvest summer diseases that sometimes cause problems. These diseases include flyspeck, sooty blotch, bitter rot, black rot, and white rot. The key to managing these diseases is regular cover applications of effective fungicides. Cover sprays for summer diseases should have been applied at 14–21 days or more frequently, depending on rainfall and other production concerns. Poor selection of fungicides, reliance on biological controls, and long intervals between summer fungicide sprays can lead to the development of one or more of the diseases mentioned above.

In addition to new infections that may occur in late summer, latent infections are possible with many of the summer disease pathogens. Latent infections may have occurred earlier in season but they remain quiescent or dormant until the fruit begin ripening and accumulating sugars. Inoculum for summer diseases may be released as early as May and may not lead to visible infections until July or later. Moreover, if apples are harvested for storage, latent infections may not manifest until apples are in cold storage.

There was considerable rainfall in June with many production areas receiving more than 4" of rain. In those areas, it may be a tough season for summer diseases if latent in-

fections became established during intervals when rains removed fungicide protection. In areas with high rainfall, even the best fungicide programs with excellent coverage could still have been overcome and latent infections may have occurred. If late season diseases appear or have already emerged, it will be important to protect the rest of the crop against additional secondary infections right up until harvest. Below are additional details about the key late season diseases and their management using fungicides.

Sooty Blotch and Flyspeck

Sooty blotch and flyspeck are a complex of several fungal species that produce either a sooty deposit or spots composed of clusters of black stroma a little larger than pepper grains. These diseases are initiated from ascospores that are released from nearby woodlots after petal fall in late May. These fungi require approximately 200 hours of accumulated wetting as measured with electronic sensors (270 hr with the old string-activated wetness meters) from the time that spores land on fruit until symptoms emerge on the surface of fruit. Hence, the first cover applications in late May to June target ascospores and later cover sprays in early to mid-July and in mid-August protect fruit against additional infections from newly emerging inoculum. Several fungicides are effective against sooty blotch and flyspeck. The most effective fungicides include Inspire Super, Pristine, Merivon, Topsin M, and Flint, all of which are usually mixed with Captan to enhance protection. Captan mixed with a phosphorous acid fungicide is also effective, but Captan alone does not provide satisfactory control in high inoculum orchards near woodlots or in the warmer more southern portions of the state.

Bitter rot

Bitter rot is a soft fruit rot with sunken concentric lesions that may emerge pre-harvest during warm wet seasons or in storage if latent infection were present at harvest and fruit are cooled slowly due to lack of refrigeration capacity in rooms that are filled quickly. The fungi that cause bitter

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rot belong to one of two genera of fungi. Extension scientists are still debating the taxonomy and symptomology of the diseases caused by these fungi and you may hear different common names with slightly different symptomologies, particularly in regards to leaf spots. Regardless, the fungi are similar enough to be affected similarly by most fungicides and management practices. Plantings in warmer areas of the state are generally at higher risk, especially if hot wet weather precedes harvest. 'Honeycrisp' seems to be particularly susceptible to bitter rot.

In the current season, there have been some severe outbreaks of bitter rot, but in these specific instances, growers weren't using highly effective fungicides during the rains in June. In terms of fungicides, trials on apple in the eastern United States indicate that Captan (especially at high label rates), Pristine, Merivon, and Flint are effective. Merivon has roughly the same activity as the closely related Pristine.

Black and White rot

Like bitter rot, black and white rot may show up pre-harvest in wet seasons, but are generally less damaging than bitter rot. Black rot results in rigid leathery convex lesions that may look like discolored brown sunscald. Black rot lesions may also manifest as small purplish lenticel infections, particularly when infections are partially controlled. By comparison, white rot is a soft rot and lesions are soft to the point of bursting, especially when the rot develops during hot weather. Over time, the entire apple may dissolve inside the skin, causing it to appear like a hanging bag of applesauce. Black and white rots are caused by two species of fungi in the genus *Botryosphaeria*. *Botryosphaeria* typically overwinters in thinning mummies, in older hardwoods in nearby woodlots, and in apple wood that may have suffered mild injury to the bark from cold or from herbicides like glyphosate. On shoots killed by fire blight or in wet summers, it is not uncommon to see *Botryosphaeria* invading the dying tissues, where it generates fruiting bodies that release spores during rains. The black fruiting

bodies may be confused with those of other fungi such as *Nectria* twig blight. In regards to chemical management, the fungicides applied to control bitter rot are also be effective against these diseases. Although not effective against bitter rot, Topsin M is very effective against black rot and white rot.

Miscellaneous fruit rots

In apples produced in semi-arid climates where fungicide covers are not applied on 14–21-day intervals, other miscellaneous fungal pathogens may cause pre- and post-harvest fruit rots. These include fungi in the genus *Neofabraea*, which cause bull's eye rot. While there are reports of fruit rots in New York being caused by *Neofabraea* and other species of fungi that are more common in the Pacific Northwest, such diseases are unlikely to become problems in New York because of the summer spray programs that are needed to control the other diseases mentioned previously in this article. Bull's eye rot fungi are susceptible to benzimidazole fungicides. Hence, a combination of Topsin mixed with Captan as applied to control black and white rot would also help protect against fruit infection.

Pinpoint apple scab?

As suggested in the opening statement, the threat of primary and secondary apple scab is indeed waning. However, pinpoint scab could still be a problem if there is a rainy harvest season and leaf scab in a given orchard. Pinpoint scab consists of small (1–2 mm in diameter), black, discrete apple scab lesions on fruit and similarly sized fuzzy brown lesions on the undersides of mature leaves. Pinpoint lesions can develop on fruit after late season rains, either before harvest in high inoculum blocks, or in storage when temperatures are cool and relative humidity is high enough to allow quiescent infections to develop. Overall, this has been a fairly mild summer and there may not have been enough hot weather to kill off apple scab inoculum on lesions in the centers of the tree canopies. If there are heavy fall rains nearing harvest and there is leaf scab inoculum in the orchard, it may

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be wise to treat the situation as a legitimate apple scab infection. In the test blocks at Geneva, there has been some success reducing pinpoint scab in the field with late season applications of Luna Sensation (not labeled in NY), Pristine, and Inspire Super. However, such results were only based on two seasons of field data.

Summary

If the summer diseases are beginning to show and wet weather is predicted, you may need to tighten the cover spray interval to 10–15 days to minimize spread of disease, especially on cultivars like 'Golden Delicious', 'Honeycrisp', and other rot-prone cultivars. If any of the brewing tropical storms are expected to bring rainy weather to NY, an additional fungicide cover spray may also be needed to protect the fruit. In these last sprays, it will be important to apply the premium single-site fun-

gicides mentioned above. In particular, Merivon and Pristine have a zero-day PHI. Hence, it may be prudent make one last application of Pristine or Merivon the day before or the day of harvest. Based on three years of trials in Geneva, such an application greatly reduced the incidence of post harvest diseases in fruit that were held up to 120 days in cold air storage.

Finally, if you have a packing operation, applications of post-harvest fungicides like Scholar (fludioxonil), Penbotec, or Mertect (benzimidazole) in drenches or by fogging, can greatly reduce the incidence of blue mold or gray mold in storage, although postharvest treatments will have little if any impact on latent infections that originated in the field. Fungicide applications are expensive, but harvest is the last chance to clean up anything that was missed in the summer. ❖❖

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❖ New year of Scaffolds Intro

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❖ Fungicide considerations for tree fruits in 2015

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❖ Product registration update

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❖ European red mite

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❖ Early signs of Fire Blight?

No. 3, April 13

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❖ Early-season oil strategies

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❖ Merivon label info correction

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❖ Prebloom insect considerations

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❖ Orchard Radar Digest

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❖ Disease management in stone fruit

❖ Controlling early-season apple diseases in organic orchards

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❖ Orchard Radar Digest

❖ Pink pests

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❖ Guidelines for managing fire blight in 2015

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- ❖ Orchard Radar Digest
- ❖ Internal lep mating disruption

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- ❖ Organic apple workshop

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- ❖ Orchard Radar Digest
- ❖ Petal fall pests

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- ❖ Organic apple workshop

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INSECTS

- ❖ Orchard Radar Digest
- ❖ Summer pests

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- ❖ Organic apple workshop

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- ❖ Orchard Radar Digest
- ❖ Woolly apple aphid

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- ❖ Organic apple workshop

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- ❖ Orchard Radar Digest
- ❖ San Jose scale

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- ❖ Organic apple workshop

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- ❖ Orchard Radar Digest
- ❖ Potato leafhopper
- ❖ Mite management

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- ❖ Looking for strep resistant fire blight in NYS

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- ❖ Orchard Radar Digest
- ❖ Summer insects

No. 14, June 29

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- ❖ Orchard Radar Digest
- ❖ Apple maggot

No. 15, July 6

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- ❖ Orchard Radar Digest
- ❖ Summer insects
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- ❖ Orchard Radar Digest
- ❖ Insect natural enemies

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- ❖ Wayne Co. summer fruit tour

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- ❖ Orchard Radar Digest
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- ❖ Wayne Co. summer fruit tour
- ❖ Bird Damage Management Workshop

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- ❖ Orchard Radar Digest
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- ❖ Wayne Co. summer fruit tour
- ❖ Bird Damage Management Workshop

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- ❖ Dock sawfly
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- ❖ Wayne Co. summer fruit tour
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- ❖ Apple maggot

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- ❖ Bifenthrin Sec. 18 for stinkbug

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- ❖ Bird Damage Management Workshop
- ❖ Cornell Fruit Pest Control Field Days

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- ❖ End of season pest concerns

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- ❖ Comparison of pest events 2015 to the calculated "Norm"

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- ❖ Resistance management urged for Dow's Entrust insecticide

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- ❖ Cornell Fruit Pest Control Field Days

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- ❖ 2015 Tree fruit arthropod pest review

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- ❖ Trac Software online download
- ❖ Cornell Fruit Pest Control Field Days

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- ❖ 2015 Insect trap catch summary

- ❖ What to do with SWD-infested fruit

DISEASES

- ❖ End of season disease management in apples

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- ❖ Index of Scaffolds Volume 24, 2015

INSECT TRAP CATCHES (Number/Trap/Day)

Geneva, NY

Highland, NY

	<u>8/31</u>	<u>9/3</u>	<u>9/8</u>		<u>8/31</u>	<u>9/8</u>
Redbanded leafroller	1.9	0.7	4.9	Redbanded leafroller	1.5	4.2
Spotted tentiform leafminer	8.6	9.8	6.4	Lesser appleworm	1.1	4.3
Oriental fruit moth	2.3	1.2	1.4	Oriental fruit moth	1.5	0.1
Codling moth	0.1	0.0	1.5	Codling moth	4.8	0.6
American plum borer	0.0	0.0	0.0	Spotted tentiform leafminer	11.1	25.1
Lesser peachtree borer	0.4	0.2	0.1	San Jose scale	0.0	285.3
Peachtree borer	0.0	0.0	0.0	Dogwood borer	0.8	0.2
Dogwood borer	2.8	3.3	1.6	Obliquebanded leafroller	0.1	0.4
Obliquebanded leafroller	0.0	0.0	0.4	Tufted apple budmoth	0.1	0.8
Apple maggot	2.6	1.2	0.8	Apple maggot	0.5	0.1
				Sparganothis fruitworm	0.1	0.0

* first catch

UPCOMING PEST EVENTS

	<u>43°F</u>	<u>50°F</u>
Current DD* accumulations (Geneva 1/1–9/8/15):	3149	2189
(Geneva 1/1–9/8/2014):	3097	2123
(Geneva "Normal"):	3293	2195
(Geneva 1/1–9/15, predicted):	3316	2314
(Highland 1/1–9/8/15):	3766	2728

<u>Coming Events</u>	<u>Ranges (Normal ±StDev):</u>	
American plum borer 2nd flight subsides	2927–3353	2018–2372
Codling moth 2nd flight subsides	2846–3462	1923–2447
Redbanded leafroller 3rd flight subsides	3124–3436	2142–2422
Spotted tentiform leafminer 3rd flight subsides	3244–3480	2258–2462
Apple maggot flight subsides	2772–3258	1907–2283
Obliquebanded leafroller 2nd flight subsides	3108–3468	2126–2448
Lesser appleworm 2nd flight subsides	2794–3488	1918–2422
Oriental fruit moth 3rd flight peak	2645–3209	1818–2222
Oriental fruit moth 3rd flight subsides	2928–3412	1978–2310
Lesser peachtree borer flight subsides	2996–3446	2017–2433

*[all DDs are Baskerville-Emin (B.E.)]

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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