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Update on Pest Management and Crop Development

July 6, 2015

COMING EVENTS

	43°F	50°F
Current DD* accumulations		
(Geneva 1/1-7/6):	1484	972
(Geneva 1/1-7/6/2014):	1544	1017
(Geneva "Normal"):	1589	965
(Geneva 1/1-7/13, predicted):	1688	1127
(Highland 1/1-7/6/15):	1811	1219

Upcoming Pest Events – Ranges (Normal +/- Std Dev):

American plum borer

1st flight subsides.....1200-1488 745-967

Codling moth

1st flight subsides.....1262-1838 798-1212

Comstock mealybug

1st adult catch.....1308-1554 809-1015

Comstock mealybug

1st flight peak.....1505-1731 931-1143

Dogwood borer flight peak.....1477-1895 925-1257

Lesser appleworm

1st flight subsides.....992-1528 603-983

Lesser appleworm

2nd flight begins.....1408-2104 909-1401

Oriental fruit moth

2nd flight peak1451-1969 925-1323

Pandemis leafroller

flight subsides1428-1690 891-1099

Redbanded leafroller

2nd flight peak1553-1993 997-1337

Spotted tentiform leafminer

2nd flight peak1382-1794 866-1196

STLM 2nd generation

tissue feeders present.....1378-2035 913-1182

*[all DDs Baskerville-Emin, B.E.]

Pest Focus

Geneva: Apple Maggot flight began 7/1.

Highland: Lesser Appleworm 2nd flight beginning.

Obliquebanded Leafroller fruit damage
observed.

Insect model predictions for Highland/Geneva:

Obliquebanded Leafroller 90% hatch point @ 810

DD43, 100% hatch point @ 950 DD43 (currently @ 916

[H]/767 [G]).

TRAP CATCHES (Number/trap/day)

Geneva

	6/25	6/29	7/2	7/6
Redbanded Leafroller	2.3	1.4	3.3	1.9
Spotted Tentiform LM	13.0	13.8	14.7	26.5
Oriental Fruit Moth	1.5*	4.4	2.1	4.8
Lesser Appleworm	0.0	0.0	0.0	0.0
Codling Moth	0.3	0.0	0.0	0.0
American Plum Borer	0.0	0.0	0.0	0.0
Lesser Peachtree Borer	1.3	0.4	0.5	1.1
Peachtree Borer	0.0	0.0	0.2	0.3
Dogwood Borer	8.2	4.8	17.7	19.9
Pandemis Leafroller	2.0	0.0	0.5	0.1
Obliquebanded Leafroller	2.7	0.6	1.3	1.3
Apple Maggot	--	0.0	0.3*	0.5

Highland (Peter Jentsch)

	6/15	6/22	6/29	7/6
Redbanded Leafroller	0.0	0.0	0.0	0.0
Spotted Tentiform LM	39.9	35.4	31.3	41.1
Lesser Appleworm	0.0	0.4	0.0	0.4
Oriental Fruit Moth	0.4	0.0	0.9	1.0
Codling Moth	6.8	6.4	2.1	0.8
San Jose Scale	0.0	0.0	0.0	0.1
Dogwood Borer	1.6	0.9	1.7	0.9
Obliquebanded Leafroller	12.6	6.2	4.1	0.7

* = 1st capture

ORCHARD RADAR DIGEST

[Box Text: HOT FLASH]

[H = Highland; G = Geneva]:

Roundheaded Appletree Borer

Peak RAB egg hatch roughly: July 4 to July 23 (H)/July 7 to July 29 (G).

Dogwood Borer

Peak DWB egg hatch roughly: July 24 (H)/July 29 (G).

Codling Moth

Codling moth development as of July 6:

1st generation adult emergence at 85% (H)/77% (G)
and 1st generation egg hatch at 40% (H)/ 25% (G).

Lesser Appleworm

2nd LAW flight begins around: July 4 (H)/July 10 (G).

Oriental Fruit Moth

2nd generation, second treatment date, if needed:
July 11 (H)/July 17 (G).

Redbanded Leafroller

Peak RBLR catch and approximate start of egg hatch:
July 6 (H)/July 12 (G).

Spotted Tentiform Leafminer

Optimum first sample date for 2nd generation STLM
sapfeeding mines is July 5 (H)/July 11 (G).

[Section: INSECTS]

GLUB

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

[Box Text: SUN DEVILS]

Now that we have gotten a very soggy June behind us, it just might be possible to begin seeing some actual summer weather without constantly looking out for daily pop-up thunderstorms. The near-term forecast features highs in the 80s, which (following the previous wet conditions) will tend to benefit some insect pests more than others. The following is a brief rundown of some items to keep near the top of your "scramble" list, just to help prevent anything from getting out of hand.

Internal Leps

We are still generally in between the first and second flights for both codling moth and oriental fruit moth. The first brood CM flight has tapered off and we're only about halfway through the hatch period, although we have been increasingly noticing a secondary spike in the trap capture numbers for this flight (known as a "B peak" to us lep nerds), so most sites with traditionally heavy pressure from these pests should still be subject to first generation larval control needs. If you aren't

actually inspecting the young fruitlets for signs of fresh infestation, it would be prudent at least to consider the need for a(nother) protective spray if weekly adult numbers surpass 5 per trap; Delegate, Altacor, Belt, and newly labeled Exirel are the top-ranked options.

Additionally, we'll be looking for increasing captures of the 2nd flight of oriental fruit moth (time management sprays for when catches exceed 10/trap/week), and should note a definite uptick in trap numbers within the next 7–10 days, especially if the temperatures maintain typical July values.

Obliquebanded Leafroller

According to our developmental models, the first summer brood hatch should be anywhere from about 50-90% complete around the state this week. Orchards with historically high OBLR pressure should normally receive an application of a suitable material during the first part of July, so this week would be the latest possible time for such an application against the larvae of this brood if they haven't been attended to.

Delegate, Altacor, Belt, Rimon and Proclaim are appropriate choices, particularly in cases where the larvae are a bit larger, and a B.t. product such as Dipel, or else the IGR Intrepid are also options, but these tend to be more effective when applied against the earlier

stages. If you are applying Belt, Altacor or Delegate to control codling moth and oriental fruit moth, they will also be very effective against OBLR at this time.

Regardless, we have found that this specific spray is the most critical for preventing fruit-feeding damage at harvest, so put this at the top of your list of priorities if OBLR has distressed you in the past.

Apple Maggot

Adults made their first appearance in Geneva on 7/1, and should begin showing up in traditional high-pressure sites around the state soon. Stings and larval tunneling would first be detected in early and favored varieties such as Ginger Gold and Honeycrisp, particularly in the Hudson Valley. If you aren't monitoring in specific orchards and haven't yet made preparations for a protective spray against AM (and aren't using Delegate or Altacor for OBLR, both of which have some activity on AM), prudence would suggest attention to this pest. Hanging a few volatile-baited sphere traps on the edge of susceptible plantings can provide valuable insight on when (and whether) immigrating flies are posing a threat. Growers on a Delegate or Altacor program for leafrollers/internal leps should get some protection against moderate AM pressure. For those not using Imidan in their cover

sprays, Assail and will provide excellent control of apple maggot as well as internal leps.

Woolly Apple Aphid

Individual nymphs should have started to become noticeable as they make their way up into the canopies of infested trees, although no actual aerial colonies may have yet been seen. This would be a prudent time to begin a preventive spray program for this pest in blocks with historically high pressure. Quoting from the June 1 issue's overview of treatment options:

'WAA is resistant to the commonly used organophosphates, but other insecticides are effective against WAA, including Diazinon, Movento and Thionex, and some newer products such as Admire, Assail, or Beleaf may offer suppression. For Movento and Assail, addition of a non-ionic surfactant (e.g., LI-700 or Regulaid) or horticultural mineral oil will improve activity. Good coverage to soak through the insects' woolly coverings is integral to ensuring maximum efficacy. Additionally, a Lorsban trunk application for borers made at this time will effectively control any crawlers that might be contacted by these sprays.'

Spotted Wing Drosophila

Single first captures of female SWD have been recorded in various parts of the state already this season: in Orange Co. (June 22), Wayne Co. (June 24), and Cayuga Co. (July 2). Although berry fruit crops are considered to be most at risk for SWD infestation, cherries are also potential targets, so growers with either sweet or tart cherries that are not in the process of being harvested this week may want to consider using a protective spray to get them through the final days of maturation in sound shape. Labeled products such as Imidan (tarts only), Asana, Lambda-Cy, and Delegate (suppression only) are potential options. Asana and Lambda-Cy are 2(ee) labels; users must have a copy in their possession at time of application.

MID-SEASON BOREDOM

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

[Box text: BORERS]

Dogwood Borer

Dogwood borer larvae (DWB) (1) are now emerging from eggs laid in late June and early July, reaching peak emergence next week. If DWB are infesting young plantings and have not yet received control measures, now is a good window for borer management using a

directed trunk application, Lorsban being the most effective option.

It's hard to find a single orchard of slender spindle high-density apple on M-9 rootstock free of dogwood borer (DWB), *Synanthedon scitula*. It's not only present throughout the Hudson to the Champlain Valley and eastern shores of Vermont's Lake Champlain, but it's reducing the productivity of young plantings, adding to tree stress that puts the planting at risk for secondary infection from disease and insects such as the black stem borer.

However, it's rare to find dogwood borer on healthy trees, free of rooting initials, scaling bark or pruning wounds in apple trees. The adult prefers to lay eggs on burrknot tissue of rootstock varieties that promote root initials, and ultimately DWB adult egg laying and larval feeding within this susceptible area of the tree. The M.9 rootstock is quite susceptible to burrknots, very sensitive to fireblight, and its shallow root system makes it drought-sensitive. Its close relative, Bud.9, is much less prone to burrknot initials, having greater resistance to fireblight and *Phytophthora*, and is quite cold-hardy. A detailed publication of the NC140

rootstock trial provides descriptions of rootstock and interstem selection strengths and weaknesses (2).

Given the "slender" size of the rootstock, it's likely that DWB infestations will reduce vigor and yield, increase stress and disease in young plantings on M;9 if DWB is left unmanaged. Telltale signs of infestation will be found within and along the edge of burrknots growing on the exposed portion of clonal rootstocks. Pupal cases protrude from the rootstock well after the adults have emerged. Reddish frass from larvae feeding, often accompanied by ooze within 'wet' areas of the burrknot, are often inhabited by larvae in May, with the onset of pupation beginning in June and a summer generation of new larvae in July.

My concern this season is not just the presence of DWB in rootstock, but what appear to be sites of disease, likely established last season, where DWB are actively present. Phytophthora are fungus-like organisms that are favored by wet conditions and can cause crown, collar and root rot on fruit trees. At the research station in Highland, NY, between the 1st of June to the 5th of July (2015), we received 7.68" of rain, with Willsboro receiving 11.3" and South Burlington, VT 10.9" during the same period. If trees were

predisposed to DWB injury on M.9, it may have been a period in some sites for *Phytophthora blight* to spread and move into surface wounds, such as those created by DWB. We have seen this in the Champlain and Mid-Hudson Valley regions over the past few years, with associated trunk bark flaking, dieback and crown, collar and root rotting on M.9.

American Plum Borer

American plum borer larvae (APB), *Euzophera semifuneralis* (Walker), are also found on apple in habitats similar to those preferred by the dogwood borer. Borers can be monitored by checking under tree guards in the spring to locate active infestations, as guards applied to newly planted trees encourage adult egg laying and larval presence. The larval size in the two species are similar. DWB larvae are white to cream-colored, with one row of crochets (small hooks) on the abdominal prolegs, while the APB larva is dusky purple to gray in color, and has two rows of crochets on the prolegs. Pheromone traps can be used to estimate the timing of peak flight in the Northeast. Adult emergence of APB begins in early June and continues into early September, peaking in mid-July. Traps should be placed 4 feet above the ground for optimum capture.

If DWB larvae are found in burrknots of young trees, a trunk application of Lorsban (only one permitted per season) should be applied using a coarse, directed application to tree trunks at the earliest opportunity, to reduce the larval population present. Further infestation by adult egg laying and larval emergence may be reduced with directed applications of Assail over the next two weeks.

European corn borer: We observed our first trap captures of the adult European corn borer on the 25th of May in New Paltz, with increasing numbers of the "Z" strain over the past week. Populations will continue to climb, and scouting in newly planted trees should be ongoing through the end of the season. Female ECB moths will begin laying egg masses on the underside of apple leaves, and larval feeding, if ECB is present, should become evident in newly developing apple shoots. It is likely that fruit trees with ECB injury will have higher damage levels along the perimeter and where tall broadleaf weeds are present.

The Eastern strain of European corn borer has a wide host range, attacking robust herbaceous plants with a stem large enough for the larvae to enter. Some of the

common weeds infested include barnyardgrass, *Echinochoa crus-galli*; beggarticks, *Bidens* spp.; cocklebur, *Xanthium* spp.; dock, *Rumex* spp.; jimsonweed, *Datura* spp.; panic grass, *Panicum* spp.; pigweed, *Amaranthus* spp.; smartweed, *Polygonum* spp.; and others.

There are reports that weather influences European corn borer survival. Heavy precipitation during egg hatch is sometimes an important mortality factor. Low humidity, low nighttime temperatures, and heavy rain and wind are detrimental to moth survival and oviposition. However, like most insect pests, they have seemed to thrive during unlikely weather scenarios in years past. High temperatures during pyrethroid applications will reduce the efficacy of applications against the ECB. The pyrethroid class of chemistry is more easily detoxified in higher temperatures than other classes of insecticides (3) Typical ECB feeding on apple is similar to that of oriental fruit moth, with frass and entry holes under the petiole or side shoot of new shoots.

Black Stem Borer

Black Stem Borer (*Xylosandrus germanus*) (BSB) has been found infesting 3–5-year old slender spindle trees

(variety Zestar) in a second site in Columbia County (observed by Dan Donahue, CCE ENY Horticulture Team - Tree Fruit Specialist). Tree decline, discolored bark, 1-mm entry holes and frass "toothpicks" provide indicators of BSB infestation that growers and scouts should be looking for this week.

Infested trees should be removed and burned. Treatments directed at the trees post-infection have not been shown to kill the developing larvae; however, management measures will reduce subsequent infestations in the remaining trees. There are presently no recommendations for management other than the use of labeled insecticides, such as Lorsban or Lambda-cyhalothrin for "tree borer species". The ornamental nursery industry has relied on a 2-week schedule of pyrethroid sprays for control; however, not even this approach is always effective.

The troubling aspect of this particular find is that infestation occurred 160 cm above the soil line, in lower scaffold limbs, and 3" below the graft union (Image: Root Gallery Rootstock). Unlike Dogwood Borer management, in which applications are made above the graft union and below the scaffold limbs, treatment of BSB will require graft union drench and canopy

applications to limit the adult infestation during emergence. Thus far, BSB adults have been found throughout ENY, with trees found dying and in decline from this insect this spring in Ulster and Columbia Counties.

Deb Breth and Art Agnello first brought this insect to our attention in the Volume 23 No. 17 (July 14, 2014) Scaffolds article on black stem borer. As they have been monitoring populations over the past two years, they have found increasing numbers of WNY orchards with BSB infestations. Results have shown tree decline and significant loss of trees in locations where standing water and, conversely, lack of water in non-irrigated blocks, may have contributed to tree stress and BSB infestation.

Induced tree stress, especially from wet soils, causes trees to undergo anaerobic respiration. This process produces ethanol, which is highly attractive to the family of ambrosia beetle to which BSB belong. Tree stress reduces tree defense, which promotes the beetles' survival and reproduction. Once the female beetle bores through the bark cambium into the wood, she creates a gallery, bringing in fungal spores that develop, eventually plugging vascular tissues and

causing tree decline. Adults lay their eggs, and larvae hatch, feeding on the fungus as they mature. Females will leave the gallery to plug the entry hole with their body and die in place there.

Anna Wallis, ENY Horticulture Team Tree Fruit Specialist, has found BSB in 14 of the 16 northern commercial farm sites where she is trapping. All of the captures have been confirmed as BSB. Traps indicate adults are along the wooded edge and orchard interior. However, infested trees have not been found in these locations. (Images A. Wallis, Traps Edge & In Orchard)

References

1.

<http://nysipm.cornell.edu/factsheets/treefruit/pests/dwb/dwb.asp>

2.

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3. Musser, Fred R and Anthony M Shelton. The influence of post-exposure temperature on the toxicity of insecticides to *Ostrinia nubilalis* (Lepidoptera: Crambidae). Pest Management Science Volume 61, Issue 5, pages 508–510, May 2005.

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