scaffolds

Update on Pest Management and Crop Development

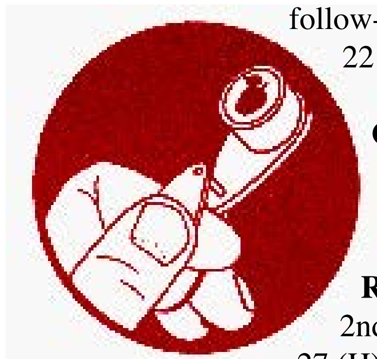
F R U I T J O U R N A L

June 16, 2014 VOLUME 23, No. 13 Geneva, NY

INSECTS

SOME 'R' FUN

ORCHARD RADAR DIGEST



[H = Highland; G = Geneva]:

Roundheaded Appletree Borer
RAB egglaying begins: June 5 (H)/June 8 (G);. Peak egglaying period roughly: June 23 to July 7 (H)/June 27 to July 11 (G).

Dogwood Borer
First DWB egg hatch roughly: June 23 (H)/June 27 (G).

Codling Moth
Codling moth development as of June 16: 1st generation adult emergence at 83% (H)/73% (G) and 1st generation egg hatch at 35% (H)/20% (G).
1st generation 20% CM egg hatch: June 13 (H)/June 16 (G) = target date where one spray needed to control 1st generation CM.

Lesser Appleworm
2nd generation LAW flight begins around: July 8 (H)/July 12 (G).

Obliquebanded Leafroller
Where waiting to sample late instar OBLR larvae is not an option (= where OBLR is known to be a problem, and will be managed with insecticides against young larvae): early egg hatch and optimum date for initial application of an insecticide effective against OBLR (with follow-up applications as needed): June 22 (H)/June 26 (G).

Oriental Fruit Moth
2nd generation OFM flight begins around: June 26 (H)/June 30 (G).

Redbanded Leafroller
2nd RBLR flight begins around: June 27 (H)/July 1 (G).

San Jose Scale
1st generation SJS crawlers appear: June 17 (H)/June 20 (G).

Spotted Tentiform Leafminer
2nd STLM flight begins around: June 15 (H)/ June 18 (G).

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IN THIS ISSUE…

SOME 'R' NOT

SUMMER DROP-INS

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

❖❖ Potato leafhopper (PLH) does not overwinter in the northeast but instead migrates on thermals (warm air masses) from the south. It is generally a more serious problem in the Hudson Valley than in western N.Y. or the Champlain Valley; however, weather fronts such as those resulting from the recent unrest occurring in the middle states and subsequently in our region provide ample opportunity for most of the region to share the wealth, so it doesn't hurt to tour observantly through a few orchards now. Because PLH comes in constantly during the season, there are no distinct broods or generations and the pest may be present continuously in orchards from June through harvest.

PLH feeds on tender young terminal leaves. Initially, injured leaves turn yellow around the edges, then become chlorotic and deformed (cupping upward) and later turn brown or scorched. Damage is caused by a toxin injected by PLH while feeding. PLH also occasionally causes symptoms similar to the effects of growth regulators, such as excessive branching preceding or beyond the point of extensive feeding. PLH damage is often mistaken for injury caused by herbicides, nutrient deficiency, or over-fertilization. PLH injury may not be serious on mature trees but can severely stunt the growth of young trees.

Nymphs and adults should be counted on 50–100 randomly selected terminal leaves in an orchard. Older trees should be sampled approximately every three weeks during the summer. Young trees should be sampled weekly through July. PLH nymphs are often described as moving sideways like crabs, whereas WALH generally move forward and back. No formal studies have been conducted in N.Y. to determine the economic injury level for PLH on apples, so we suggest a tentative threshold of an average of one PLH (nymph or adult) per leaf. Little is known about the natural enemies of PLH, but it is assumed that they cannot effectively prevent damage by this pest in commercial New York orchards.

Damage by this migratory pest is usually worse when it shows up early. PLH can cause significant damage to newly planted trees that are not yet established. When PLH, white apple leafhopper (WALH), rose leafhopper (RLH) and aphids are present, control measures are often warranted.

Field trials were conducted some years ago in the Hudson Valley to evaluate reduced rates of Provado against all three species of leafhoppers. Provado was applied in combinations at a full rate (2 oz/100 gal) and a quarter rate (0.5 oz/100 gal), at varying intervals (3rd–5th cover). Nymphs of PLH, WALH, and RLH were sampled and leaf damage by PLH was monitored.

Because of Provado's translaminar activity, all rates and schedules produced excellent control of

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WALH/RLH nymphs (however, reduced rates will not control leafminer). Against PLH nymphs, the number of applications was shown to be more important than rate; i.e., better protection of new foliage. Considering the percentage of leaves with PLH damage, the number of applications again appeared to be more important than application rate.

Admire Pro, the currently available imidacloprid formulation from Bayer, is also an excellent aphicide, and the same principle would hold as for PLH — maintaining coverage of new growth is more important than the rate. Moreover, reduced rates are likely to increase the survival of cecidomyiid and syrphid predators that are common and effective biological control agents. Other management options for this complex of leaf feeding bugs can be found in the "Additional Summer Sprays" section starting on p. 131 in the Recommends. Check Table 7.1.2 (p. 65) for impacts of any of these products on beneficials.❖❖

WITHOUT ACARI?

MITES IN SIGHT
(Art Agnello, Entomology, Geneva)

❖❖ The encroaching hot temperatures that we should begin seeing with some regularity soon can potentially result in rapid buildups of European red mite populations in various sites. Now that we are entering another mite control season, it doesn't hurt to quickly go over some basics for maximizing the effectiveness of the tools we have for keeping them under control. Mite management can be considered to be a 2-phase process: 1) An early season program, against the overwintering generation; and 2) A summer program, directed against new populations.

Usually, a preventive approach (i.e., without the need to sample) is advised for early season, depending on the previous year's pressure. Among the options available for this task are (were): delayed dormant oil, an ovicide-larvacide (Apollo/Savey/Onager/Zeal) applied prebloom or (adding Agri-Mek to the list) after petal fall. For summer populations, scouting and sampling is advised to pick up rapid mite increases on new foliage, especially during early summer, when trees are most susceptible. During this phase, thresholds increase as the summer goes on and the trees become more tolerant of mite feeding. When the numbers of motiles (everything but eggs) reach or approach threshold, a "rescue" material can be recommended, among them are: Acramite, Apollo, Kanemite, Nexter, Onager, Portal, Savey, Vendex, and Zeal.

Because mites have many generations per year, they have a high potential to develop resistance. Some major differences between resistance management programs for fungicides vs. insecticides and miticides are:

1 - Insect and mite resistance is not promoted by using low dosages of materials; i.e., it doesn't cause a population shift in their susceptibility, as can occur with pathogens.

2 - Frequent applications of high rates usually will not prevent or slow down the development of insect and mite resistance.

3 - Usually, high dosages are not toxic to resistant insects or mites, but they do kill a greater number of susceptible individuals.

Recall that resistant mites are theoretically "less fit" or weaker than susceptible individuals. They have shorter lives, are physically smaller or weaker, produce fewer offspring, take longer to develop, and their mating success is lower. In the absence of competition from susceptible individuals, resistant pests rapidly multiply.

The key to management of resistance to insecticides and miticides is to reduce selection pressure that favors the survival of resistant individuals. Some tactics for doing this are:

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• Treat different generations with materials of different chemical classes.

• Use nonchemical control tactics where possible (e.g., biological control by encouraging predators).

• Use good miticide stewardship: apply only when necessary; use correct dosages, obtain adequate coverage, and optimize your timing.

Back in the good old 90s, our miticide choices were not very numerous: oil, Morestan (prebloom), Vydate, Omite, Carzol, and Kelthane. We have many more options today, but it's important to keep in mind how they may (OR may not) differ:

[12B] Vendex: disrupts ATP formation
[6] Agri-Mek/Proclaim: GABA (neurotransmitter) site; affects chlorine ion channel, inhibits nerve transmissions
[25] Acramite: GABA (neurotransmitter) site (probably); contact activity
[10A] Apollo/Savey/Onager: growth inhibitors
[10B] Zeal: growth inhibitor
[20B] Kanemite: METI (mitochondrial electron transport inhibitor), Site II
[21] Nexter/Portal: METI (mitochondrial electron transport inhibitor), Site I

These numbers, which are listed just before the product names in the TF Guidelines spray tables, are assigned by IRAC (Insecticide Resistance Action Committee). This is an international organization of researchers and scientists committed to prolonging the effectiveness of pesticides at risk for resistance development. The number codes represent Mode of Action Classification Groups. An arthropod population is more likely to exhibit cross-resistance to materials within the same group, so if you're seeing (or anticipating) reduced efficacy from a miticide that may have been effective in the past, it would be advisable to switch to a material that's in a different IRAC grouping.
For more information on this effort, see: http://www.irac-online.org/
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STINK BUG SURVEY CLOSING SOON

❖❖ Got stink bugs? We need your help! We're surveying growers to assess the impact of BMSB on crops and gather information that will help us defeat this pest. Receive a free Guide to Stink Bugs* if you complete the 10-minute BMSB survey (https://cornell.qualtrics.com/SE/?SID=SV_5ssnjXLNhvp6v1H). Your participation will help us to help you Stop BMSB! The survey will be available until June 30th.

—The Outreach Team for "StopBMSB," a project focused on the biology, ecology, and management of the brown marmorated stink bug.
For more info: StopBMSB.org
[* see it at https://pubs.ext.vt.edu/444/444-356/444-356_pdf.pdf]
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PEST FOCUS

Highland:
Obliquebanded leafroller 1st catch 6/8.
2nd generation **pear psylla** nymphs above threshold.

DISEASES

THE BLAZE OF SUMMER

DEALING WITH FIRE BLIGHT IN JUNE

(Dave Rosenberger, Plant Pathology, Highland)

❖❖ Various sources are reporting that fire blight is now evident in orchards across a broad swath of the mid-Atlantic and Northeastern region, both in older trees and in newly planted orchards. Dealing with fire blight at this time of year is always difficult because there is no single recommendation that fits all situations. Furthermore, strategies for newly planted orchards are somewhat different than for established orchards.

However, before panicking about fire blight, it is important to determine that dying shoots really are being caused by fire blight and not by other factors. In the Hudson Valley, two other causes of twig die-back are evident this year. First, the egg-laying scars from 17-yr cicada that emerged last year have weakened some twigs that are now either breaking in windstorms or being girdled by secondary canker fungi. The egg-laying scars are evident as a series of slits in twigs, often on the bottom side of the twig.

Other shoots are being killed by Nectria twig blight, which is caused by *Nectria cinnabarina*. Nectria twig blight is most common on Rome Beauty, but it can occur in many cultivars in a year when trees were cold damaged (as occurred last winter). Nectria twig blight usually originates at stem scars from last year's crop or where a stem from last year's crop was left on the tree (i.e., at pulled stems, Fig. 1). *N. cinnabarina* can also invade cicada egg-laying scars. In all of these cases, the defining characteristics will be that infection originates in last year's wood and moves outward to the new shoot rather than originating with this year's flowers or shoot tips as occurs with fire blight.

Fig 1.

Individual leaves on shoots killed by Nectria twig blight all wilt and turn brown at about the same time and they won't show the blackened leaf vein and half-dead leaves that are often visible as fire blight moves upward or downward in new shoots. *N. cinnabarina* will not spread during summer and need not be removed until winter pruning. The tissues where infections began may eventually develop an orange cast and orange fruiting structures will appear on the bark (Fig. 2)

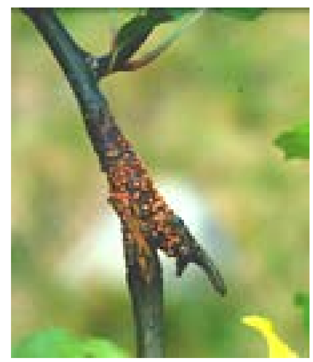

Fig 2.

Blight in established orchards

The first rule for controlling fire blight in June is that streptomycin should NOT be applied unless the orchard experienced a major storm (high winds and/or hail) within the past 24 hours. Repeated applications of streptomycin during summer will almost certainly lead to development of strep resistance. We know that is the case because that scenario was used in all of the locations that already have strep resistance: CA, OR, WA, MO, MI, and western NY. Once strep resistance is established in an orchard or region, costs for controlling fire blight will more than double and effective control will be much more difficult.

Last week, Dr. Kari Peter at Penn State's Biglerville station published an excellent article summarizing options for managing fire blight at this time of year (see http://extension.psu.edu/plants/tree-fruit/news/2014/disease-update-the-fire-blight-saga). Of particular interest is her comment that Dr. Keith Yoder found that

continued...

applications of Double Nickel plus Cueva (a copper product) helped to arrest spread of fire blight during summer in a test he conducted last year in Virginia and reported in Plant Disease Management Reports. Dr. Yoder applied Double Nickel at 8 fl oz/100 gal of dilute spray plus Cueva at 2 qt/100 gal. He made those applications at roughly monthly intervals and reported better blight control and less fruit injury than where he applied Cueva alone. This work needs to be repeated before we can be certain of its reliability, but it provides a tantalizing indicator about a potential new option for controlling spread of fire blight during summer.

Despite that published report, I'm still a bit leery of applying any copper during summer to fresh market apples because of the risk of fruit injury. However, we have few options for slowing the spread of fire blight during summer, so this option may be worth considering if one is willing to risk some fruit injury. In most cases where fire blight is on a rampage, the potential losses due to fruit injury may be a minor consideration when compared with losses and headaches caused by the continued spread of fire blight to new shoots.

Although I have no experience with the combination of Cueva and Double Nickel, general recommendations for reducing phytotoxicity of copper sprays include the following:

1. Apply copper sprays only when leaves are dry.
2. Make applications under fast-drying conditions.
3. Use concentrate sprays (e.g., 50–80 gal/A) so as to avoid any run-off or formation of large droplets on the fruit and to allow rapid drying. Rewetting of copper residues on the trees is generally less likely to cause phytotoxicity than the initial wetting from the spray.

Finally, in the trial in Virginia last year, Dr. Yoder did NOT apply Captan in the same tank with Cueva and Double Nickel. (He alternated the Cueva/Double Nickel sprays with Captan instead). I don't know if tank-mixing with Captan would have changed the results, but there is at least a small possibility that microscopic injury to just a few cells caused by copper could allow enhanced uptake of Captan, thereby resulting in more fruit injury than would occur in the absence of such tank mixes.

Blight in newly planted orchards

We have had several reports of severe fire blight outbreaks in large blocks of trees that were just planted this spring, and this raises concerns about whether the fire blight inoculum came with the trees or originated from local sources. If inoculum came with the trees, then an added risk is that the trees may be carrying strep-resistant fire blight.

It is very difficult to determine the source of blight inoculum. However, on newly planted trees, if growing shoot tips that had no blossoms begin to collapse from fire blight and if no infected flower clusters are evident lower on that tree, then it is very possible that the blight came with the nursery stock, especially if there is no evidence of fire blight in other blocks surrounding the new planting. Absent those conditions, it is quite possible that the blight was brought into the new planting by wind-blown rain and/or pollinating insects.

With newly planted trees, it is usually best to entirely remove trees that show blight symptoms so as to minimize the risks of leaving any blight inoculum in the orchard, and this is especially true if there is any suspicion that the blight originated with the nursery stock. Orchards that start showing blight symptoms should be monitored three times per week so that trees with early symptoms can be removed before the blighted shoots reach their maximum of inoculum production.

Newly planted orchards showing any fire blight at all should be sprayed weekly with low rates of copper (e.g., Cueva as described above or 4–8 oz/100 gal of one of the conventional copper hydroxide products. Repeated applications of copper will be needed to protect new shoots and kill newly emerging inoculum until either no new fire blight strikes are found or until trees set terminal buds. Because newly planted trees will not carry a crop, copper can be applied to these trees without concern about potential negative impacts on fruit. ❖❖

INSECT TRAP CATCHES (Number/Trap/Day)

Geneva, NY

	6/9	6/13	6/16
Redbanded leafroller	0.0	0.0	0.0
Spotted tentiform leafminer	0.0	0.1	0.8
Oriental fruit moth	0.8	0.9	0.2
Codling moth	1.6	2.6	0.8
Lesser appleworm	1.9	0.4	1.3
San Jose scale	0.0	0.0	0.3
American plum borer	0.3	0.0	0.0
Lesser peachtree borer	1.6	0.0	0.2
Pandemis leafroller	1.9	4.5	5.2
Obliquebanded leafroller	0.1*	0.5	0.8
Dogwood borer	1.0*	0.9	0.0
Peachtree borer	–	0.0	0.0

Highland, NY

	6/9	6/16
Redbanded leafroller	0.0	0.0
Spotted tentiform leafminer	0.9	14.6
Oriental fruit moth	1.9	1.5
Codling moth	3.5	1.4
Lesser appleworm	0.3	0.4
Variegated leafroller	3.9	2.5
Tufted apple budmoth	3.2	1.8
Sparganothis fruitworm	0.1*	0.9
Obliquebanded leafroller	–	1.7

* first catch

UPCOMING PEST EVENTS

	43°F	50°F
Current DD accumulations (Geneva 1/1–6/16/14):	1001	613
(Geneva 1/1–6/16/2013):	997	612
(Geneva "Normal"):	1079	622
(Geneva 1/1–6/23/14, predicted):	1196	760
(Highland 1/1–6/16/2014):	1200	735

Coming Events:	Ranges (Normal ±StDev):	
American plum borer 1st flight peak	590–970	321–589
Codling moth 1st flight peak	561–991	306–586
San Jose scale 1st flight subsides	855–1227	508–760
Pandemis leafroller flight peak	874–1170	503–717
Obliquebanded leafroller 1st flight peak	830–1204	483–753
Obliquebanded leafroller summer larvae hatch	1038–1460	625–957
Cherry fruit fly 1st catch	755–1289	424–806
European red mite summer eggs hatch	737–923	424–572
Rose leafhopper adults on apple	809–1053	440–622
Spotted tentiform leafminer 2nd flight begins	992–1166	590–728
Oriental fruit moth 1st flight subsides	835–1117	489–693
Peachtree borer 1st catch	797–1341	459–829
Lesser appleworm 1st flight subsides	990–1466	604–932
Pear psylla 2nd brood eggs hatch	967–1185	584–750
San Jose scale 1st generation crawlers present	1033–1215	619–757

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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