scaffolds

Update on Pest Management
and Crop Development

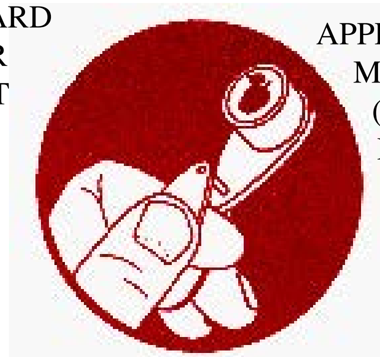
F R U I T J O U R N A L

August 11, 2014 | VOLUME 23, No. 21 | Geneva, NY

I N S E C T S

AUGUST AIRWAY

ORCHARD RADAR DIGEST



[H = Highland; G = Geneva]:

Codling Moth
Codling moth development as of August 10: 2nd generation adult emergence at 87% (H)/ 60% (G) and 2nd generation egg hatch at 56% (H)/ 21% (G).
2nd generation 30% CM egg hatch (Geneva only): August 13
= target date where one spray needed to control 2nd generation CM.

White Apple Leafhopper
2nd generation WALH found on apple foliage (Geneva only): August 10

❖❖

HIGH FLYING

APPLE MAGGOTS MASSING
(Art Agnello, Entomology, Geneva)

❖❖ Just a reminder that we are still observing peak apple maggot flight, at least in western NY, so if your blocks have not received a preventive spray against this pest in the last 10 days, this week would be optimal timing to ensure that the fruits are protected until the population pressure abates at the end of the month. ❖❖

PEST FOCUS

Geneva: **Obliquebanded leafroller** 2nd flight began Friday, 8/8. **Oriental fruit moth** and **spotted tentiform leafminer** 3rd flights beginning.

Highland: **Oriental fruit moth** 3rd flight beginning. Eggs from the second generation of **codling moth** have started to hatch. **Spotted tentiform leafminer** 2nd generation tissue feeding mines and pupae are present.

IN THIS ISSUE…

ARTFUL LODGERS

IN GALLERIES NOW
(Dave Kain & Art Agnello, Entomology, Geneva)

[We are reprinting this updated annual article on borer management because of its timeliness and applicability to dogwood borer infestations in many commercial orchards.]

❖❖ There is increasing concern throughout the Northeast about damage done to apple trees by borers. The species of primary concern is dogwood borer, but American plum borer can be prevalent in western New York apple orchards that are close to tart cherry and peach orchards. Additionally, this season has seen a surge in the detection of black stem borer around the state, an ambrosia beetle that has been responsible for hundreds of tree deaths so far. While we do not yet have a complete picture of the effects of all these borers on dwarf trees, we do know that they reduce vigor and can, in time, completely girdle and kill trees.

We tested a number of insecticides against dogwood and American plum borers over a number of growing seasons. Lorsban is very effective for this use, and we have urged growers to take advantage of it where needed. In 2001–2003, we compared some other materials, including white latex paint, endosulfan, Avaunt, Surround, Intrepid, Danitol, Imidan, Spintor and Esteem against Lorsban, with varying results. In short, only Avaunt, Danitol and, possibly Esteem, applied two or three times in midsummer, provided control comparable to one application of Lorsban. Assail and Altacor were effective when applied only once in midsummer but, obviously, will control only the summer generation.

Our tests have shown that borers can be controlled season-long by applying Lorsban at various times in the spring and summer. While a postbloom trunk application of Lorsban is still allowed, enabling growers to spray at the peak of the dogwood borer flight, applying this material prebloom as early as half-inch green works well, too, and may be more convenient. Fall also may be a good time to control dogwood borer. Results from 2002 indicated that Lorsban applied postharvest the previous year (sprays went on in October 2001) controlled both the overwintering and the summer generations of dogwood borer. An October 2002 application of Lorsban similarly provided season-long control of dogwood borer in 2003. Lorsban works when applied in the spring or fall because it infiltrates burrknot tissue and kills larvae concealed within. It is also very persistent in wood so it continues to work for a considerable time after it is applied (apparently 9–12 months in our trials). Fall application may offer growers a more convenient alternative for applying borer control sprays. Recall that Lorsban label restrictions now allow only ONE application of any chlorpyrifos product in apples, whether as a foliar or trunk spray, so these recommendations pertain only if no earlier applications have been made. Bear in mind that we also have a mating disruption option available, Isomate-DWB, which we have found to be very effective in interfering with these insects' pheromone communication process. Use of this product would be recommended as a tactic next June, before the first adult catch of the season.

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scaffolds
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In a survey we conducted in the mid-1990s, we observed some relationships between borer infestation and various orchard parameters such as the proportion of trees with burrknots, proximity to stone fruit orchards and presence of mouseguards. Conventional wisdom has held that borer problems are worse where mouseguards are in place. Mouseguards can contribute to increased expression of the burrknots that borers invade, and may shield borers from predators and insecticide sprays. This has led some growers to contemplate removing mouseguards under the premise that mice are easier to control than the borers. However, results of our survey indicate that dogwood borer larvae may be found as readily in trees without mouseguards as in those with them. (American plum borer may be a different story in orchards near tart cherry or peach trees.) A number of orchards in which we have conducted borer control trials have never had mouseguards and there is no shortage of dogwood borers in them. If mouseguards are deteriorated and no longer protect the tree, there may be some small advantage, in terms of borers, to removing them. But, in orchards where mouseguards still provide protection against rodents, removing them for the sake of borer control is probably not worth the risk. Instead, we would recommend the use of trunk sprays to control borers. Even with mouseguards on, insecticides will give adequate control if they are applied carefully (i.e., a coarse, low-pressure, soaking spray with a handgun).

Regarding black stem borer, as recounted in the July 14 issue of Scaffolds, we are still trying to educate ourselves about the best tactics to use for management of this pest, which it now seems has been here for some time, and is present in most apple growing areas where we have looked for them, including other states (e.g., MI and NJ, according to colleagues' reports). What we're recommending for the time being is at least a preventive spring spray (trunk application would be best) using some effective material, and it seems that Lorsban would be a good candidate to try, since it's labeled and we know its efficacy against other trunk boring species. We can only speculate on the value of a postharvest trunk spray against this species, but if you're planning to apply one against the other species, it could only help your BSB control efforts next season. No doubt there will be a lot of conversation amongst the fruit researchers about this problem during the fall and winter, so hopefully we'll arrive at some better details by the time spring rolls around.

Bottom line: as we go into fall, consider using Lorsban after harvest to control borers, and consider leaving mouseguards on trees where they still afford protection. ❖❖

DISEASES

EXTRA, EXTRA

MORE INFO ON PREHARVEST FUNGICIDE APPLICATIONS

(Dave Rosenberger, Plant Pathology, Highland)

❖❖ In the article on managing postharvest diseases with preharvest sprays that was published in the August 4 issue of Scaffolds, I noted that the Merivon label contains warnings about applying Merivon with horticultural oils. That warning, I suggested, means that caution is advised if one is considering applications of Merivon shortly before or after applications of Harvista, because the latter is formulated and/or applied with oil. I have since been advised by BASF that there should NOT be any negative interaction between summer oils and Merivon, although they still have concerns about combining Merivon with EC formulations of some pesticides. Thus, the BASF perspective is that Merivon is an option for late-season applications, even where Harvista may be applied.

In last week's article I should have also noted that, like Captan, sulfur is not compatible with oil and should not be applied shortly before or after Harvista sprays. Most growers use sulfur earlier in the season for mildew control, but I suppose that someone somewhere might still be using sulfur during late summer. ❖❖

WHAT'S IN STORE?

POSTHARVEST FUNGICIDE APPLICATIONS FOR APPLES?
(Dave Rosenberger, Plant Pathology, Highland)

❖❖ Fungicides labeled for postharvest use on apples include captan, thiabendazole (Mertect 340F), pyrimethanil (Penbotec), and fludioxonil (Scholar). Captan is of limited value for protecting fruit, but there is some evidence that it may act to kill spores that accumulate in recycling drenches, thereby reducing inoculum loads in the drench solutions. The other postharvest fungicides tend to arrest spore germination and/or growth, but spores exposed to the fungicides may still germinate if the fungicide residues are diluted or removed.

Populations of apple storage pathogens are mostly resistant to thiabendazole, so this product is of limited use in many (most?) apple storage operations today. No one has determined whether storage operators who use pyrimethanil and fludioxonil for five or 10 years will see a gradual reduction in the levels of thiabendazole resistance in the populations of *Penicillium expansum* that persist in their storages. However, until and unless research shows that thiabendazole resistance fades after periods of non-use, we must assume that thiabendazole is of little value for controlling *P. expansum*, the pathogen that causes most of the postharvest decays in apple storages.

Repeated and exclusive use of pyrimethanil in postharvest treatments has already led to populations of *P. expansum* that are resistant to pyrimethanil in both Washington State and in Pennsylvania. To preserve the activity of postharvest fungicides, storage operators should alternate between the two remaining effective products, using pyrimethanil to treat all fruit one year and using fludioxonil on all fruit the next year. This strategy will increase the likelihood that resident spores on bins will not be continuously exposed to the same fungicide year after year. Other resistance management strategies include using sanitation measures to keep spore populations on bins and in storage rooms as low as possible.

Following are five strategies to consider whether and how to apply postharvest fungicides for apples.

Option #1: Omit postharvest fungicide treatments. When fruit are moved to storage without postharvest drenching, the incidence of decay from *P. expansum* is usually quite low, especially if storage rooms have been sanitized as described in the Scaffolds article on July 28. However, gray mold caused by *Botrytis cinerea* may pose a risk for fruit that receive no postharvest treatment because this pathogen can be present as quiescent infections on fruit coming from the field. Observational evidence suggests that *B. cinerea* can infect the sepals or other calyx parts of apple fruit during late bloom or petal fall if wet weather at that time favors such infections. The infections remain quiescent until fruit have been moved into storage. We do not know if any of the fungicides applied between petal fall and harvest can eliminate these quiescent infections, but postharvest drenches and fogging treatments appear to be effective. In some years, up to five percent of fruit that receive no postharvest treatment may develop gray mold decay during long-term storage, although the incidence is usually much lower.

Option #2: Use preharvest sprays of Pristine or Merivon to suppress postharvest diseases, as discussed in the Scaffolds article last week. Preharvest sprays must be applied close to harvest to be effective.

Option #3: Use non-recycling bin-top treatments as described in a 2011 article in New York Fruit Quarterly (Rosenberger et al. 2011). Fungicides applied via bin-top sprays will not provide complete protection because not all fruit will be

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contacted by the bin-top treatments. Nevertheless, including a fungicide with DPA in bin-top treatments will provide some disease suppression and provides a less expensive alternative than Options 4 and 5. DPA applied via bin-top treatments is very effective for preventing storage scald and carbon dioxide injury because DPA volatiles protect the fruit surfaces that are not directly contacted by the solution applied over the tops of bins, but fungicides are not sufficiently volatile to protect fruit surfaces that are not directly contacted by the solution.

Option #4: Treat filled storage rooms by "fogging" with a fungicide. Service companies report good results with fogged-in treatments, but it is difficult to find comparisons with valid controls. Thus, the lack of decays in fogged rooms may result from low disease pressure in fruit that are not drenched after harvest. Long delays between harvest and the application of the fungicide fog may allow *P. expansum* to become so well established in wounds that fogging will not arrest the development of the decay. Thus, fogging will presumably work best in rooms that are filled rapidly and can be fogged within 4 to 5 days after the first fruit are placed in the room.

Option #5: Continue using traditional recycling drenches to apply fungicides and DPA. Recycling drenches still provide a time-tested and effective approach for controlling postharvest decays. However, this application method may be phased out in the future because of food safety concerns. The recycling solution could theoretically contaminate huge quantities of fruit if any toxic substance or organism were introduced into the solution. Postharvest treatment solutions that contain DPA cannot be sanitized with oxidants such as chlorine because DPA is an anti-oxidant that would be inactivated by any of the oxidizers that are used to sanitize flume water in packinghouses after fruit are removed from storage.

Conclusions: All of the treatment options described above have been used successfully in commercial storages. The decision of which option is preferable depends on objectives, risk tolerance, and prior experiences of both the apple grower and the apple storage operator. ❖❖

Literature cited

Rosenberger, D. A. 2011. Controlling postharvest diseases and disorders of apples with non-recycling drenches. N.Y. Fruit Quarterly 19(2): 21-24. On-line at http://www.nyshs.org/fq.php.

GENERAL INFO

FRUIT TOUR

EVENT ANNOUNCEMENTS

CORNELL FRUIT PEST CONTROL FIELD DAY

The Geneva Fruit Pest Control Field Day will take place during Labor Day week on Sept. 3 this year. Activities will commence with registration, coffee, etc., in the lobby of Barton Lab at 8:30 am. The tour will proceed to the orchards to view plots and preliminary data from field trials involving new fungicides, bactericides, miticides, and insecticides on tree fruits and grapes. It is anticipated that the tour of field plots will be completed by noon. Because of the recent retirements and personnel changes at the Hudson Valley Lab, there will be no corresponding Highland component this year. However, cooperators desiring one-on-one tours of their individual research plots can contact Peter Jentsch to make arrangements. No pre-registration is required for the Geneva tour.

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INSECT TRAP CATCHES
(Number/Trap/Day)

Geneva, NY

	8/4	8/7	8/11
Redbanded leafroller	0.0	0.0	0.0
Spotted tentiform leafminer	6.6	7.2	14.6*
Oriental fruit moth	0.0	0.3*	0.1
Codling moth	1.1	1.0	1.5
Lesser appleworm	0.0	0.0	0.1
San Jose scale	603	200	200
American plum borer	0.0	0.5	0.3
Lesser peachtree borer	0.1	0.2	0.1
Obliquebanded leafroller	0.1	0.0	0.5*
Dogwood borer	0.3	0.0	0.0
Peachtree borer	0.1	0.3	0.1
Apple maggot	12.9	5.0	4.8

* first catch

Highland, NY

	8/4	8/11
Redbanded leafroller	0.0	0.9
Spotted tentiform leafminer	52.5	50.2
Oriental fruit moth	1.6	2.2
Codling moth	5.6	2.2
Lesser appleworm	0.0	0.3
Variegated leafroller	0.1	0.6
Tufted apple budmoth	0.0	0.3
Sparganothis fruitworm	0.0	0.0
Obliquebanded leafroller	0.0	0.6
Apple maggot	0.0	0.2

UPCOMING PEST EVENTS

	43°F	50°F
Current DD accumulations (Geneva 1/1–8/11/14):	2435	1556
(Geneva 1/1–8/11/2013):	2526	1750
(Geneva "Normal"):	2612	1724
(Geneva 1/1–8/18/14, predicted):	2608	1780
(Highland 1/1–8/11/2014):	2778	1937

Coming Events:	Ranges (Normal ±StDev):	
American plum borer 2nd flight peak	2005–2575	1351–1777
Comstock mealybug 2nd gen. crawlers peak	2380–2625	1658–1737
Codling moth 2nd flight peak	1943–2727	1288–1888
Spotted tentiform leafminer 3rd flight peak	2568–3022	1748–2110
Apple maggot flight peak	2115–2665	1417–1845
Obliquebanded leafroller 2nd flight peak	2593–3011	1758–2098
Redbanded leafroller 2nd flight subsides	2182–2742	1471–1891
Lesser appleworm 2nd flight peak	2131–3105	1422–2156

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