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Update on Pest Management and Crop Development

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

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INSECTS

GETTING HAMMERED

NAILING THINGS DOWN (Art Agnello, Entomology, Geneva)

❖❖ I'm sure everyone is tired of observing just how abnormal / atypical / bizarre / unfair this season has been; certainly no one hopes to ever see another like it, and the only hopeful aspect might be that the trees seem to have weathered all the strange conditions and will presumably be back to business as usual next year. The normal insect and disease pests were present, of course, but most were regarded in a different light and with revised intent because of the tremendously reduced crop. Now, with harvest approaching, for whatever fruit can be harvested, there may be just a few remaining pest management duties.

Of greatest potential concern are the internal leps, which have been noticeable, as usual, but not overwhelming in the normal trouble spots; however, there are still oriental fruit moths and even some codling moths flying in problem sites. Therefore, to be cautious, we shouldn't rule out the possibility that blocks with a history of internal worm problems might need a last-minute application of an appropriate-length PHI material to help stave off the final feeding injury caused by young larvae. Before the harvest period begins in earnest, a fruit examination could help determine whether the last brood of any of the likely species needs a final deterrent before the sprayer is put away. Potential choices (and PHIs) include Altacor (5/10 days, pome/stone fruits, respectively), Assail (7 days), a B.t. (0 days), Belt (14/7 days, pome/stone fruits, respectively), Calypso (30 days), Delegate (1 day, peaches; 7 days, apples/pears/plums), a pyrethroid (PHI varies), or a sprayable pheromone (0 days), as applicable. Apple maggots are also continuing to emerge, although perhaps not heavily; possible late-season options include Assail (7 days), Calypso (30 days), Guthion (14/21 days, depending on rate), Imidan 7 days), and various pyrethroids.

A couple of less common last-minute pests can surfaced in certain cases. One is western flower thrips, particularly in nectarines growing in drought-stressed areas. Adults move from alternate weed or crop hosts to fruit just prior to and during harvest, feed on the fruit surface in protected sites, such as in the stem end, the

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suture, under leaves and branches, and between fruits. This results in silver stipling or patches; injury is particularly obvious on highly colored varieties. An application of Delegate immediately before the first harvest may prevent subsequent losses; however, an additional application may be needed if pressure is severe. The PHI varies from 1 day (nectarines) to 7 days (cherries, plums, and prunes) to 14 days (peaches and apricots).

Another season-end problem that may deserve consideration now is pearleaf blister mite, a sporadic pest of pears (for any that are out there this year) that shows up in a limited number of commercial pear orchards and is a fairly common problem in home plantings. The adults are very small and cannot be seen without a hand lens; the body is white and elongate oval in shape, like a tiny sausage. The mite causes three distinct types of damage. During winter, the feeding of the mites under the bud scales is believed to cause the bud to dry and fail to develop. This type of damage is similar to and may be confused with bud injury from insufficient winter chilling. Fruit damage is the most serious aspect of blister mite attack. It occurs as a result of mites feeding on the developing pears, from the green-tip stage through bloom, causing russet spots. These spots, which are often oval in shape, are usually depressed with a surrounding halo of clear tissue. They are 1/4–1/2 inch in diameter and frequently run together. A third type of injury is the blistering of leaves; blisters are 1/8–1/4 inch across and, if numerous, can blacken most of the leaf surface. Although defoliation does not occur, leaf function can be seriously impaired by a heavy infestation.

For those plantings that might be suffering from this errant pest, a fall spray is recommended sometime in early October, when there is no danger of frost for at least 24–48 hr after the spray. Use Sevin XLR Plus (1.5–3 qt/A) or 80S (1.88–3.75 lb/A), or 1–1.5% oil plus either Diazinon 50WP (1 lb/100 gal) or Thionex (50WP, 0.5–0.75 lb/100 gal; 3EC, 0.33–0.5 qt/100 gal). A second spray of oil plus Thionex, in the spring, just before the green tissue begins to show, will improve the control. ❖❖

DISEASES

OVER THE TOP

PRECAUTIONS FOR AVOIDING PHYTOTOXICITY WITH POSTHARVEST BIN-TOP TREATMENTS ON APPLES

(Dave Rosenberger, Plant Pathology, Highland)

❖❖ Many storage operators in New York have been successfully treating apples with DPA via non-recycling bin-top applications as described in a Spring 2011 article in N.Y. Fruit Quarterly (see http://www.nyshs.org/fq.php). An important caveat, however, is that this application method can result in fruit burn if the wrong products are included in the solution used for bin-top treatments. Last year some phytotoxicity was noted on Empire fruit that had received bin-top treatments of DPA, Mertect, Captec, and calcium chloride (Fig. 1). Since we previously tested combinations of DPA and captan (although not the Captec formulation)

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Figure 1: Phytotoxicity on Empire apples that received bin-top treatments that included DPA, Captec, Mertect, and calcium chloride. (Photo courtesy of Craig Kahlke)

without finding any phytotoxicity, we suspect that the injury in this case resulted either directly from the calcium chloride or from the combination of captan plus calcium chloride.

Some packinghouse operators have included calcium chloride in their traditional recycling postharvest drenches for many years without experiencing phytotoxicity problems on treated fruit. When calcium chloride is applied in a recycling drench with DPA, the high volume of solution applied ensures that all apple surfaces are uniformly wetted and the surfactants in the DPA solution (and perhaps in the calcium chloride solution as well) prevent large droplets of solution from remaining on the sides of treated fruit. However, when bin-top treatments are used, the solution tends to dry in streaks and larger droplets on the sides of fruit in the middle and bottoms of bins where fruit are not fully wetted by the limited volume of solution applied. Products in those streaks and droplets may cause injury to the apple skin under some conditions if the solution contains calcium chloride and captan, and perhaps where calcium chloride is used without captan. Thus, if a recycling drencher is being used to apply DPA + fungicide + calcium chloride, then solution from that drencher should be used for bin-top treatments of fruit that will not be run through the recycling drencher.

Storage operators who are still using traditional drenchers for treating some of their fruit should never dispose of solutions from recycling drenchers by using that solution for bin-top treatments. The DPA labels contain specific guidelines on the volume of fruit that can be treated with any given volume of DPA solution before the solutions must be changed. Those criteria are on the DPA labels because the DPA in recycling drenches can break down over time. Using spent drencher solutions for bin-top treatments may increase the risk of DPA injury even where calcium chloride is not included in the solution because, as described above, the bin-top treatments can result in streaks and large droplets that may concentrate the solution on more limited areas of the fruit surfaces. Furthermore, it is impossible to know the concentration and quality of the DPA left in recycling drenchers after the solution has been used to treat large quantities of fruit.

The bin-top treatments with DPA are effective only because DPA volatizes enough to protect fruit that are not directly contacted by the treatment solutions. Fungicides and calcium chloride are much less volatile, will not protect surface areas not directly contacted by postharvest treatment solutions, and therefore will provide little if any benefit when applied via bin-top treatments. Where calcium treatments are deemed essential, those treatments must still be applied either via preharvest sprays or via traditional recycling drenches after harvest. ❖❖

TOP TO BOTTOM

SANITIZE APPLE STORAGE ROOMS TO MINIMIZE POSTHARVEST DECAYS

(Dave Rosenberger, Plant Pathology, Highland)

` ❖❖ Apple storage rooms should be sanitized each sumApple storage rooms should be sanitized each summer before rooms are refilled with the fall crop. Sanitizing the rooms with a biocide will eliminate spores of decay pathogens that can persist on storage room floors and walls. In the absence of any sanitation treatment, those spores will become airborne again as soon as the cooling fans in the rooms are turned on. Spores blown into freshly harvested bins of fruit will initiate infections at any wound sites on the apples, and those apples will come out of storage with blue-mold decay (Fig. 1).

Figure 1: Blue mold decay that developed from a stem puncture.

The predominant postharvest pathogen of apples, *Penicillium expansum*, is especially adept at long-term survival under dry conditions. It survives quite well in empty storage rooms, even if the rooms are warm and dry during summer and no longer contain any fruit or debris. In spore trapping studies we conducted in 1999, we found that the density of airborne spores of *P. expansum* exceeded 85,000 per cubic foot in several empty, non-sanitized storage rooms when the spore trapping was done about 5 minutes after fans had been turned on and floors had been swept briefly to create turbulence as might occur with forklift traffic during room filling.

Washing storage room floors to remove debris and grime is a necessary step prior to sanitizing a room, but washing alone will not eliminate spores of *P. expansum.* Spores on the floors become airborne as soon as there is any activity that creates turbulence within a room, and the airborne spores will not be captured by water used to wash down floors.

Sanitation of storage rooms was less important in the past when most apples received postharvest drench treatments that contained diphenylamine (DPA) along with fungicides that protected fruit from storage decays. Now, however, many storage operators have abandoned recycling drenches and are instead applying DPA either via non-recycling bin-top applications (Rosenberger, 2011a) or via thermofogging or aerosol injections of DPA into storage rooms after they are filled. Experience suggests that postharvest fungicide treatments on apples are not necessary IF fruit are not exposed to recycling DPA or calcium drenches after harvest and IF storage rooms are sanitized to minimize exposure to airborne *Penicillium* spores during room filling. Thus, sanitation can often be substituted for postharvest fungicide treatments if fruit are move into storage without any drench treatments, although gray mold caused by *Botrytis cinerea* could be a problem in some years. For a more complete discussion of postharvest fungicide options and of risks involved in eliminating postharvest fungicides, see the Scaffolds article published last year (Rosenberger, 2011b).

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Storage rooms can be sanitized in several different ways. Quaternary ammonium sanitizers that are commercially available through most agrichemical supply houses can be sprayed on packinghouse floors and walls or fogged into rooms. The quaternary ammonium sanitizers, often called quats, do not have any of the irritating odors associated with pure ammonia but instead leave sanitized rooms with a faint but pleasant odor reminiscent (at least to me) of freshly harvested wheat. StorOx and peroxyacetic acid sanitizers can also be introduced by fogging rooms for several hours, but surface sprays of StorOx or peroxyacetic acids may be less effective than surface sprays using quats because StorOx and peroxyacetic sanitizers require a longer contact time prior to drying than do quaternary ammonium sanitizers. Chlorinated water sanitizers are not recommended for sanitizing hard surfaces such as storage room floors.

The benefits from sanitizing storage rooms can be compromised if adjoining rooms and/or connecting hallways or packing line areas are not sanitized at the same time because the spore load from non-sanitized areas can be drawn into and re-contaminate sanitized areas. None of the sanitizers have much residual activity after treated surfaces have dried, so the benefits of sanitizing a storage room can be negated to at least some extent if the storage room opens into an enclosed area that still contains a lot of airborne spores. When a series of rooms are sanitized over a period of days or weeks, the doors on sanitized rooms should be kept closed until all of the adjacent rooms and hallways have also been sanitized.❖❖

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. Online at http://www.nyshs.org/fq.php.

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FIELD DAYS

EVENT REMINDERS

GENERAL INFO

CORNELL FRUIT PEST CONTROL FIELD DAYS

❖❖ The N.Y. Fruit Pest Control Field Days will take place during Labor Day week on Sept. 5 and 6 this year, with the Geneva portion taking place first (Wednesday Sept. 5), and the Hudson Valley installment on the second day (Thursday Sept. 6). Activities will commence in Geneva on the 5th, 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. On the 6th, participants will register at the Hudson Valley Laboratory starting at 8:30, after which they will view and discuss results from field trials on apples and other fruit crops. No pre-registration is required for either event. ❖❖

FIELD NOTES

STATE'S INVADERS

HUDSON VALLEY PEST MANAGEMENT UPDATE (Peter Jentsch, Entomology, Highland, Mike Fargione, CCE, Hudson Valley Regional Fruit Program)

Spotted Wing Drosophila (SWD)

❖❖ We are seeing the spotted wing drosophila in 10 NYS counties across the state. (See map: http://hudsonvf.cce.cornell.edu/NY%20SWD%20Monitoring.html) In the Hudson Valley we observed a dramatic rise in the numbers of SWD over the past week. At the HVL research orchard we have seen peach trap captures rise to a weekly count of 129 on 13 August and 77 on 20 August with SWD depositing eggs in mid- to late season near ripe peach. Over the past two weeks we reared SWD adults from peaches in Warwick, NY. Although the first SWD trap detections occurred in small fruit on 23 July with fewer then 2 flies per trap, we have since observed a range of damage from 5% to 100% fruit injury, with significant injury beginning to show in peaches. With escalating populations it is likely we will see increased egg-laying in late peach as fruit near maturity. Effective insecticides for use against the SWD in peach include: Spinetoram [Delegate WG) (EPA # 62719-541) with 2(ee) Spinosad [Entrust, Entrust SC] (EPA # 62719-282, 62719-621) with 2(ee) Fenpropathrin [Danitol 2.4EC] (EPA # 59639-35) with 2(ee); 10 2/3 to 21 1/3 fl oz/A.

Stink Bug Complex

The activity of both the invasive brown marmorated stink bug (BMSB) and native green stink bug (*Acrosternum hilare*) in agricultural commodities continues to increase throughout the mid-Hudson Valley. Scouting for the presence of migrating BMSB adults should be conducted along the edges of peach, apple, grape, berry and vegetable plantings. The upper canopy of tree fruit will have the highest populations of BMSB, and subsequent feeding injury, whereas lower limbs are likely to harbor native stink bug, with greatest injury to fruit in the mid and lower canopy. Presently there are no established thresholds for BMSB and conservative measures should be taken when the adults or nymphs are observed.

Stink bugs have been seen feeding on peaches, grape and sunflower over the past few days. Economic injury has been documented in peach, wine grape, raspberry and pepper. Increasing numbers of 2nd generation nymphs have been emerging over the past two weeks, adding to existing populations. A segment of the BMSB adult populations are also beginning to move to urban overwintering sites with reports of attraction to house lights at night and adults on the exteriors of homes. Increasing numbers of 2nd generation nymphs have been observed moving to Tedders traps baited with methyl (E,E,Z)-2,4,6-decatrienoate along the borders of orchards. ❖❖

INSECT TRAP CATCHES (Number/Trap/Day)

Geneva, NY

	8/13	8/16	8/20
Redbanded leafroller	0.3	0.0	0.0
Spotted tentiform leafminer	21.5	11.7	3.0
Oriental fruit moth	0.1	0.0	0.0
American plum borer	0.8	0.0	0.3
Lesser appleworm	0.0	0.0	0.0
San Jose scale	4.3	6.0	6.1
Codling moth	0.1	0.0	0.0
Lesser peachtree borer	0.1	0.0	0.0
Peachtree borer	0.0	0.0	0.0
Obliquebanded leafroller	0.0	0.0	0.0
Apple maggot	0.3	1.2	0.6

Highland, NY

	8/13	8/20
Redbanded leafroller	4.3	3.8
Spotted tentiform leafminer	28.4	15.9
Oriental fruit moth	0.6	0.3
Codling moth	1.3	0.6
Lesser appleworm	8.6	3.5
Tufted apple budmoth	0.2	0.4
Fruittree leafroller	0.0	0.0
Variegated leafroller	1.0	0.7
Obliquebanded leafroller	0.2	0.1
San Jose scale	1.1	1.2
Sparganothis fruitworm	0.0	0.0
Apple maggot	1.4	0.6

* first catch

UPCOMING PEST EVENTS

	43°F	50°F
Current DD accumulations (Geneva 1/1–8/20/12):	3251	2297
(Geneva 1/1–8/20/2011):	2976	2108
(Geneva "Normal"):	2778	1895
(Geneva 1/1–8/27/12 predicted):	3425	2422
(Highland 1/1–8/20/12):	3465	2427
(Highland 1/1–8/20/11):	3152	2222

Coming Events:	Ranges (Normal ±StDev):	
Oriental fruit moth 3rd flight peak	2662–3236	1831–2243
Oriental fruit moth 3rd flight subsides	2928–3412	1978–2310
Apple maggot flight subsides	2772–3258	1907–2283
Redbanded leafroller 3rd flight peak	2717–3207	1881–2225
Redbanded leafroller 3rd flight subsides	3124–3436	2142–2422
Spotted tentiform leafminer 3rd flight subsides	3230–3444	2246–2432
Codling moth 2nd flight subsides	2845–3493	1922–2472
Obliquebanded leafroller 2nd flight subsides	3095–3473	2121–2457
Lesser appleworm 2nd flight subsides	2794–3488	1918–2422
San Jose scale 2nd flight subsides	2639–3349	1785–2371
American plum borer 2nd flight subsides	2927–3353	2018–2372
Lesser peachtree borer flight subsides	2996–3446	2017–2433

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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