scaffolds

Update on Pest Management and Crop Development

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

August 8, 2011 VOLUME 20, No. 21 Geneva, NY

INSECTS

TAIL-END CHARLIES

ORCHARD RADAR DIGEST

[M = Marlboro, Ulster Co.; G = Geneva]

Codling Moth

CM development as of August 8: 2nd gen adult emergence at 98% [M]/83% [G] and 2nd gen egg hatch at 85% [M]/50% [G].

White Apple Leafhopper

2nd generation WALH found on apple foliage: August 4 [G].

WE DON'T NEED...

NO STINKIN' BUGS (Art Agnello, Entomology, Geneva)

❖❖ Despite the reports of abundant Brown Marmorated Stink Bug detections and infestations of horticultural crops in Pennsylvania and points south, our search for BMSB in New York has so far turned up very little this season. Last week, a couple of adults were actually found in a light trap near a pepper planting in the Hudson Valley, but nothing has been captured in the two dozen pheromone traps around WNY, and there has been no crop damage reported by any of the substantial group of people who are cooperating with us in this effort.

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IN THIS ISSUE...

A number of imposters have been submitted to Cornell specialists for determination, and although a few have had some resemblance to Brown Marmorated Stink Bug, all of them turned out to be native species. One of the most commonly noted (and presented) stink bugs is actually the predacious spined soldier bug, *Podisus maculiventris*, which feeds on caterpillars and beetle larvae. Although these do have a sort of dark and light scalloping along the edges of their abdomen, like the BMSB, there are a few distinct differences (refer to photos for comparison):

• The BMSB is quite a bit larger, about 5/8" long by 5/16" wide (compared with 3/8" x 3/16" for the spined soldier bug — about 1 1/2 times the size)

• The spined soldier bug has distinct points or spines extending outward from each "shoulder"; also, the tips of their wings tend to extend well past the abdomen (less so in the BMSB).

• BMSB has dark bands on at least the last segment of the antennae, whereas the SSB antennae are lightish brown with no distinct banding. BMSB legs are also darker, with speckles or bands, and SSB legs are pale with no markings. ❖❖

Spined soldier bug adult (photo Univ. Tennessee Coop. Ext.)

Brown marmorated stinkbug adult

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http://www.scaffolds.entomology.cornell.edu/index.

DISEASES

BIN DRY

CRITICAL UPDATES FOR APPLE STORAGE OPERATORS
(Dave Rosenberger, Plant Pathology, Highland)

Correction:

I recently published an article in New York Fruit Quarterly (2011, Vol. 19, issue 2), wherein I described results from two years of research on using bin-top sprays as an alternative to the recirculating drenches traditionally used to apply postharvest treatments to apples. I also discussed that research last week at the August 2nd Apple Storage Workshop in Ithaca, where I stated that only one formulation of DPA had a label that would allow this method of application in New York State. I have since been informed that both the DECCO and the PACE formulations of DPA can legally be applied via bin-top sprays. I apologize for the confusion created by my initial interpretation of these labels.

To access the full research report on the bin-top spray method (i.e., non-recycling drench system), you will need a subscription to NY Fruit Quarterly or membership in the NY State Horticultural Society (see http://www.nyshs.org/fq.php). A preliminary report was published in the Aug 9, 2010 issue of Scaffolds that is available at http://www.nyshs.org/fq.php.

Sanitize apple storage rooms now!

❖❖ Many NY growers are opting to apply DPA via methods that no longer involve the high-volume recycling drenches that redistributed mold spores and exacerbated postharvest decay problems. Alternative methods for DPA applications include both the bin-top sprays mentioned above as well as thermofogging or aerosol injections of DPA into storage rooms after they are filled. Eliminating the recycling drenches also reduces the exposure of fruit to spores of *Penicillium expansum*, the cause of blue mold. Many storage operators are finding that they can safely eliminate postharvest fungicide treatments on apples if they do not wet the fruit via recycling drenches. However, *Penicillium* spores left in storage rooms from last year's crop can be blown onto fruit, enter wounds, and cause decays if no fungicides are applied. This risk can be minimized by sanitizing storage floors with a quaternary ammonium sanitizer during summer. (More information on postharvest fungicide options and potential risks incurred by omitting fungicides will be included in next week's issue of *Scaffolds*.)

Quaternary ammonium sanitizers can be introduced either as sprays to the floors and walls of storages or via fogging of empty rooms. Peroxyacetic acid sanitizers can also be introduced by fogging, but surface sprays of the peroxyacetic acids may be less effective because these sanitizers require a longer contact time prior to drying than quaternary ammonium sanitizers. Chlorinated water sanitizers generally are not recommended for sanitizing hard porous surfaces.

Sanitizing storage rooms during summer is always a good practice, but is especially important if the fruit to be stored will not receive any postharvest fungicide treatment.

Corrosion problems on stainless steel packing line equipment have been noted in some packinghouses where automated sodium hypochlorite injection systems are being used to maintain biocide levels in dump tanks and water flumes. The corrosion is showing up on stainless steel that has no direct contact with the sodium hypochlorite solutions, including sections of the packing line that are at the opposite ends of the building from the water flumes. In fact, the flumes that contain the chlorinated water do NOT show corrosion. The corrosion appears as "tea stains" or brown discoloration on the surfaces of the stainless steel components in the packing line. This stain will not rub off and can be removed only by grinding the surface,

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something that is not easy to do on many of these stainless components. More information on this phenomenon can be found by googling "stainless steel tea stain corrosion." I found useful information and some photos at http://www.assda.asn.au/technical-info/technical-alerts/tea-staining.

Packinghouse operators noted this corrosion only after they began using ORP-based automatic injection systems for maintaining appropriate pH and biocide levels in the dump tanks on their packing lines. (ORP = oxidation reduction potential, which is a measure of biocide effectiveness that can be monitored electronically.) Using a biocide in dump tanks is recommended or required by GAPs and other audit systems, but the corrosion noted in these packinghouses is unacceptable. We know that sodium hypochlorite is corrosive, but why is corrosion showing up on stainless in areas that have no direct contact with the hypochlorite solutions?

We do not know exactly why this problem is surfacing at this time, since the automated hypochlorite injection systems being used in NY have been used for many years on the west coast without any reports of similar problems. However, after observing this damage in one large packinghouse and discussing the issue at length with the packinghouse operators, I believe that the following factors may be involved:

1. The automated systems for maintaining hypochlorite levels ensure that the water flumes are always carrying the preset levels of hypochlorite, whereas the manual recharge system that was used in the past probably allowed many hours of operation with suboptimal hypochlorite levels. Thus, the new systems have resulted in more hypochlorite being used during each day than occurred with the manual recharge system, and more hypochlorite means more salts are being introduced into the packinghouse environment.

2. The evidence suggests that salts from the hypochlorite solutions are becoming airborne and are being disseminated throughout the packinghouse via airflow. Note that the googled article on tea-stain corrosion indicates that this usually occurs where stainless steel is used in outdoor settings in coastal areas. Thus, airborne salts are recognized as the cause of tea-stain corrosion in other settings.

3. The most logical source for a salt spray that could generate airborne salts in the packinghouse is the bed of rotating drying brushes that are used to dry fruit as they come out of the chlorinated dump tanks. These brushes may be generating a fine mist of droplets that quickly evaporate, leaving salt molecules in the air.

4. I initially thought that the problem might best be remedied by putting a Plexiglas cover over the drying brushes. However, apples and solution coming out of the dump tanks are cold and will cause localized cooling of the air flowing over them, and cold air sinks. Thus, I suspect that the air from the drying brushes moves downward to the floor of the packinghouse and then travels along the floor and deposits salts on all the equipment it encounters until it eventually warms and rises toward the ceiling. Given this scenario, the airflow in the upper part of the packinghouse (i.e., near the ceiling) may have relatively little effect on the distribution of cold air coming off of the drying brushes.

5. The problem may be getting worse because some new packing lines have the flow of fruit occurring five or six feet above the packinghouse floor, whereas older lines tended to have their brush beds within four feet of the floor. With the more elevated lines, there is more space for turbulence to pick up and distribute the airborne salts coming off the bottoms of the brush beds. Rotation speed and bristle length on the drying brushes may also affect how many fine droplets become airborne.

6. The problem is showing up in eastern packinghouses because we have higher relative humidity during much of the packing season than com-

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parable packinghouses in the arid west. Thus, the airborne salt that is deposited on stainless surfaces has enough moisture to begin the corrosion process.

Following are several suggested solutions that are based totally on my subjective logic, as there is no research to address these issues in packinghouses. First, incorporating a fresh water rinse to wash apples just as they emerge from the dump tank would presumably help to minimize the amount of sodium and chlorine salts that actually make it to the drying brushes.

Second, if one assumes that the drying brushes are the likely source of the salts that cause the corrosion, then enclosing the brush beds would be a logical next step. One might start by covering the tops of the brush beds with Plexiglas while at the same time enclosing the area below the brush bed, so as to contain the salty mist and/or airborne salts. The ideal option would be to vent the enclosed area beneath the brush beds to the outdoors by using a low-speed fan to keep air moving while minimizing the costs associated with expelling heated air. As noted earlier, however, the exhaust vent would probably work well only if it runs near the floor where the cold air will accumulate. I suspect that it will be difficult to pull the salt-laden cold air upwards. In most packinghouses, it will not be feasible to run a floor level exhaust vent to an exterior wall. An alternative might be to draw air from the enclosed brush bed through a burlap filter (or perhaps through several layers of fine window screening). The filters should trap some or most of the salts while the low-speed fan would maintain a positive airflow down through the brushes, thereby minimizing the escape of salts via the ends of the Plexiglas cover where apples enter and leave the brush beds. The burlap or window screen filters would need to be rinsed off daily to remove accumulated salts.

Corrosiveness of chlorine solutions can be minimized by using the lowest ORP setting that will still meet audit requirements and also by keeping the pH near 7. Sodium hypochlorite becomes more corrosive as the pH decreases, but it also loses its biocidal activity if the pH exceeds 7.5. The standard recommendation for maintaining an ORP of 800–850 was designed to generate a very quick kill of any microorganisms introduced into water flumes. However, I suspect that water sampling from flume tanks that are held at an ORP of 550 will still show no viable microorganisms in the water, and that concentration of hypochlorite may suffice if one does periodic sampling of the water to document its cleanliness. One can sample water for *E. coli* and other coliform bacteria by using premade Coliscan plates or similar products from other companies. For information on Coliscan plates, see http://www.micrologylabs.com/Home.

One might also reduce the corrosion problem by switching from sodium hypochlorite to less corrosive biocides. Options include calcium hypochlorite and peroxyacetic acid products (so long as they are labeled for fruit contact!). However, these options will prove more costly than sodium hypochlorite (unless, of course, you add the cost of packing line replacement into the operating costs for sodium hypochlorite). Ultimately, all biocides are corrosive to some degree because they are oxidizers, so the best option will still require minimizing the distribution of airborne biocide-laden droplets within the packinghouse.

The bottom line is that this corrosion problem is so new and so unexpected that we can provide no research-based analyses of causes and solutions. However, food safety standards will increasingly require a biocide in any water flumes that handle fresh produce, so don't expect to avoid the issue simply by omitting the biocide from your water flumes.

As always, I would welcome any alternative perspectives, ideas, or research that would help us get a better grasp on how to minimize corrosion on packing line equipment.❖❖

GENERAL INFO

EVENT REMINDERS

WAYNE COUNTY FRUITGROWER TOUR
Wednesday, August 10, from 10:00 am
Registration and 1st stop at Morgan Fruit Farms, Goosen Rd., Marion, NY

Sponsored by agr.assistance, this large, informative and entertaining tour is in its 13th year, and will feature presentations on apple storage; PGR, return bloom, improved fruit finish, rootstocks, wind and solar energy technologies, GAP compliance; updates on apple disease, insect, and deer control, herbicide programs; bitter pit; herbicide options, plus much more. Door prizes, lunch, some levity, a BBQ/clambake dinner with a live band, growers and industry representatives from NY and surrounding states — tough to beat on a midsummer day. Free attendance.
Contact Lindsay LaMora (585-734-8904; lindsay-lamora@agrassistance.com) for RSVP pre-registration and tour information.

CORNELL FRUIT PEST CONTROL FIELD DAYS

The N.Y. Fruit Pest Control Field Days will take place during Labor Day week on Sept. 7 and 8 this year, with the Geneva portion taking place first (Wednesday Sept. 7), and the Hudson Valley installment on the second day (Thursday Sept. 8). Activities will commence in Geneva on the 7th, 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 8th, 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.

INSECT TRAP CATCHES
(Number/Trap/Day)

Geneva, NY

	8/1	8/4	8/8
Redbanded leafroller	0.3	0.0	0.0
Spotted tentiform leafminer	4.8	2.8	3.9
San Jose scale	6.9	12.2	4.3
Oriental fruit moth	0.3	0.0	0.0
American plum borer	0.3	0.0	0.0
Obliquebanded leafroller	0.0	0.0	0.0
Apple maggot	1.0	2.0	4.5

Sodus Center trap catches	7/28	8/2	8/4
Oriental Fruit Moth	10.5	1.0	0.5
Lesser Appleworm	0.0	0.0	3.0
Codling Moth	1.0	1.5	0.0

* first catch

Highland, NY

	8/1	8/8
Redbanded leafroller	0.1	0.9
Spotted tentiform leafminer	19.5	30.1
Oriental fruit moth	0.4	1.1
Lesser appleworm	3.0	3.2
Codling moth	1.3	2.7
Obliquebanded leafroller	0.1	0.2
Apple maggot	0.6	2.1

UPCOMING PEST EVENTS

	43°F	50°F
Current DD accumulations (Geneva 1/1–8/8/11):	2660	1876
(Geneva 1/1–8/8/2010):	2794	1961
(Geneva "Normal"):	2448	1653
(Geneva 1/1–8/15 Predicted):	2847	2014
(Highland 1/1–8/8/11):	2829	1983

Coming Events:	Ranges (Normal ±StDev):	
Codling moth 2nd flight peak	1931–2735	1278–1892
Oriental fruit moth 3rd flight begins	2315–2735	1569–1889
Redbanded leafroller 3rd flight begins	2594–2976	1768–2070
Spotted tentiform leafminer 3rd flight begins	2246–2644	1502–1832
Spotted tentiform leafminer 3rd flight peak	2552–3010	1732–2094
Lesser appleworm 2nd flight peak	2131–3105	1422–2156
Obliquebanded leafroller 2nd flight begins	2255–2655	1516–1838
Obliquebanded leafroller 2nd flight peak	2593–3011	1758–2098

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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