Ohio
Fruit ICM News

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Calendar

August 24: Grape-Wine Workshop, Raven's Glenn Winery, West Lafayette. See issues 26 and 27 for more information.

September 20-22: Farm Science Review, Molly Caren Agricultural Center, London, OH. Details at: <http://fsr.osu.edu>.

October 14-15, 2005: Highbush Blueberry Council (USHBC) Fall Meeting, Amway Grand Plaza Hotel, 187 Monroe NW, Grand Rapids, Michigan. Call 616-885-2000 for more information.

November 15: Ohio Ag and Hort Human Resource Managers' Forum, Hilliard, OH. 10:00 am - 2:30 pm. Registration and fee requested by November 8. Contact Mid American Ag and Hort Services at 614-246-8286, or visit <www.midamservices.org>and click on 'Events' for registration form and details.

December 6-8, 2005: Great Lakes Fruit, Vegetable, and Farm Market EXPO, DeVos Place Convention Center, Grand Rapids, Michigan. For additional information, visit <www.glexpo.com>.

New Fungicide Options for Postharvest Decay Control

Source: Dave Rosenberger, Plant Pathology, Highland, Scaffolds Fruit Journal, Vol. 14, Issue 22, Aug. 15, 2005

The best option for minimizing blue mold decay in stored fruit involves using clean bins, avoiding drenches after harvest, and storing apples in sanitized storage rooms. This combination of sanitation practices will minimize exposure of fruit to spores of *Penicillium expansum*, the fungus that causes blue mold. Blue mold is the most common postharvest disease of apples and accounts for the majority of postharvest decays in most years, especially in fruit that receive postharvest drenches.

Although moving fruit into storage without any postharvest treatment can minimize exposure to Pencillium inoculum, postharvest treatments with diphenylamine (DPA) may be needed to control storage scald and/or carbon dioxide injury. Unusually hot weather this summer may predispose fruit to carbon dioxide injury this fall! A fungicide should ***always*** be included in the drench solution when DPA is applied after harvest.

Postharvest fungicide treatment may also be desired to control gray mold decay caused by *Botrytis cinerea*, a fungus that may infect fruit calyces in the field and then invade fruit during long-term storage. When fruit are moved into storage without a postharvest treatment, the incidence of blue mold is usually low, but the incidence of gray mold is often higher than in fruit that receives a postharvest fungicide treatment. After CA storage, fruit with gray mold are usually firm and light tan with a "baked apple" appearance, whereas decays caused by *P. expansum* are soft and watery.

Thiabendazole (trade name: Mertect 340F) and captan are still registered for postharvest treatment of apples. Captan is sometimes used in combination with Mertect 340F, but it should never be used as the sole fungicide in a postharvest treatment. Mertect 340F can be used as the sole fungicide in combination with a DPA treatment, or it can be applied with captan. Many storage operators report that the combination of Mertect 340F plus captan is more effective than Mertect 340F used alone, but we have not been able to verify this in controlled trials. In some storages, Mertect 340F is almost worthless because most of the Penicillium in these packing houses is resistant to Mertect 340F and the resistant spores cycle from year to year on contaminated field bins.

Two new fungicides will be available for postharvest treatment of apples this fall. Pyrimethanil (trade name: Penbotec) and fludioxonil (trade name: Scholar) are now registered for use in NY. Both of these new products are extremely effective for controlling blue mold and gray mold on apples. Both products are registered for use in drenches and in packinghouse line sprays. Both Penbotec and Scholar are fully compatible with DPA and calcium chloride. Both products are very stable and hold up well in postharvest drench solutions. There is no reason to include captan or any other fungicide in drenches where Penbotec or Scholar is used.

Warning: Residue tolerances for these new fungicides have not yet been established in many apple-importing countries. Before applying these fungicides to apples destined for export, packinghouse operators should verify that the importing country will accept product treated with the fungicide in question. A database of approved MRLs (maximum residue levels) for various commodities and countries can be found at the following web site: <http://mrldatabase.com>.

Packinghouse operators choosing to use these new fungicides should use Penbotec one year and Scholar the next year so that Penicillium spores that recycle on bins will not be repeatedly exposed to the same fungicide year after year. Penbotec and Scholar have different modes of action, and both of them are distinctly different from Mertect 340F. Alternating annually between Penbotec and Scholar should reduce selection pressure for resistance to both of these new fungicide chemistries.

Alternation of chemistries for fungicides applied in packinghouse line sprays is of less concern because the treated fruit are moved into the retail supply chain before any surviving infections can sporulate, thereby reducing or eliminating selection for fungicide resistance.

Because Honeycrisp apples are extremely susceptible to a variety of postharvest decays, Honeycrisp growers may wish to consider a third new option for postharvest decay control. The new fungicide Pristine is ***not*** registered for postharvest treatments, but there is some evidence that field sprays applied several days prior to harvest can reduce the incidence of decays that develop after harvest. Pristine not only controls P. expansum and B. cinerea, it is also very effective against black rot, white rot, and bitter rot. All three of those diseases can appear after harvest as a result of infections that were initiated in the field.

We do not yet know if a single application of Pristine during the week prior to harvest will be sufficient to suppress postharvest appearance of these summer fruit rots, or whether multiple preharvest applications (perhaps at 20-30 and 2-7 days before harvest) will be required for complete control of these diseases on Honeycrisp. Effectiveness of field sprays will definitely depend on spray coverage, and field sprays are unlikely to provide protection against blue mold and gray mold infections that are initiated at stem punctures incurred during harvest. Nevertheless, considering the high value of Honeycrisp apples, at least one preharvest application of Pristine would be justified.

If Honeycrisp apples are to be stored more than a month or two, then the preharvest spray of Pristine should be followed with a postharvest drench of Penbotec or Scholar. The combination of Pristine before harvest and Penbotec or Scholar after harvest should eliminate most of the postharvest decay in Honeycrisp, except in cases where chilling injury causes tissue damage. After investing in expensive new fungicides to protect fruit from postharvest decays, special care should be taken to store Honeycrisp at temperatures that will not cause chilling injury.

Suggestions for Improving Packinghouse Sanitation

Source: Dave Rosenberger, Plant Pathology, Highland, & Anne Rugh, *Scaffolds Fruit Journal, Volume 14, Issue 22, August 15, 2005* Good sanitation is essential both to reduce potential expenses/losses associated with postharvest apple decays and to eliminate possibilities that apples will become contaminated with human pathogens. Sanitation procedures and methods must be custom-tailored for each packinghouse, but some general principles are outlined below.

- **Chlorinate water dump tanks and flumes on apple packing lines**

All packinghouses should use chlorinated water (or some other water sanitizer) to kill bacteria and spores that accumulate in water flumes used to float apples onto the packing lines. In a 2005 survey of New York packinghouses, we found large populations of P. expansum spores in the water flumes that were not chlorinated, whereas flumes with detectable chlorine had no viable microorganisms. Apples run through non-chlorinated flumes that contain an abundance of Penicillium spores are likely to develop decays on the way to market if any of the apples have stem punctures.

Non-chlorinated water flumes may also contain coliform bacteria. Coliform bacteria, though not necessarily harmful themselves, provide an indication that human pathogens such as E. coli O157:H7 could survive in these water flumes. The scientific literature contains many reports documenting that E. coli O157:H7 can survive in apple wounds for extended periods of time.

If E. coli O157:H7 were introduced into a stem puncture on an apple, that contaminated fruit could conceivably carry the pathogen to a consumer. By chlorinating flume water on apple packing lines, packinghouse operators can minimize the possibility that apples will become contaminated with either human pathogens or with postharvest decay pathogens during the packing process.

The best approach for maintaining consistent chlorine and pH levels in water flumes involves installation of automated feed pumps that continuously monitor water pH and oxidant levels (i.e., free chorine in a chlorinated system). These systems automatically adjust chlorine and pH as needed, thereby ensuring that effective levels are maintained at all times. Automated systems can be purchased for about $5,000 and require minimal attention and maintenance once they are installed.

The advantage of these automated systems is that, because they add chlorine on demand, they can be set to maintain 40-50 ppm free chlorine rather than the 100 ppm free chlorine that is recommended when chlorine is added manually once or twice a day. The lower level of chlorine and the automatic adjustment of pH reduce the likelihood that off-gassing can occur due to low pH (i.e., reduces potential for a strong swimming pool odor). It also reduces the likelihood that pH will rise enough to make the chlorine ineffective.

Hypochlorite, the biologically active molecule in chlorinated water, reacts rapidly with organic matter, so hypochlorite is constantly consumed in flume water that contains organic debris. Centrifugal filters and/or sand filters connected to the water flumes and water dumps can remove organic debris and thereby minimize the need for constant additions of large amounts of chlorine.

This is especially critical in presize lines where water is changed relatively infrequently and constant additions of large amounts of chlorine can eventually result in phytotoxic salt levels in the water flumes. However, filtration is recommended even for smaller water dumps. Water that is filtered and chlorinated remains clean even after many bins of fruit have been processed. Fruit that consumers eat with minimal washing should be handled using clean water!

For more information on chlorination of flume water and on systems for monitoring chlorine concentrations, see the recent article on this subject that was posted on-line in the Cornell Fruit Handling and Storage Newsletter at: <http://www.hort.cornell.edu/watkins/Newsletter2004.pdf>.

- **Remove all decayed fruit from bins as the bins are emptied**

Decayed fruit do not float, and therefore must be manually removed from bins after they come out of water dumps. The only alternative to manual removal is an automated bin-washing system that inverts the bins while washing them with water jets. Decayed fruit left in the bin will harbor millions of spores that can then be carried into the postharvest drench water and packinghouse water flumes when bins are reused the following year.

Leaving decayed fruit in empty bins will create tremendous selection pressure for resistance to the new postharvest fungicides. Complete sanitizing of bins that contained decayed fruit is the best option, but removal of decayed fruit is essential, even where sanitizing bins may not be feasible.

Bins that contained large numbers of decayed fruit or bins that have visible blue stains due to contact of decays with bin walls should be sanitized by washing with a high-pressure sprayer. When bins are cleaned with a high-pressure sprayer, sanitizing can be accomplished by using steaming water (i.e., heat), quaternary ammonium, a chlorine dioxide foam, StorOx applied in a foam, or perhaps by using chlorinated water.

Chlorinated water is less effective than the other options because the bin surfaces may not remain wet long enough for the hypochlorite to kill all of the spores. However, the combination of high-pressure washing plus chlorinated water should still eliminate most of the spores because many spores will be washed away by the high-pressure jets of water, even if contact time with the hypochlorite is insufficient for a 100% kill of the spores.

Plastic bins are easier to sanitize and cause less bruising and less fruit injuries where fruit contact the sides of bins than is common with wooden bins. Plastic bins also remain free of the wood-decay fungi that are commonly found in older wooden bins and that may contribute to "storage odors" that sometimes develop when fruit are stored in wood bins. Plastic bins still need to be cleaned occasionally as described above, but thorough cleaning will be much easier than with wooden bins.

Growers should consider transitioning to plastic bins as rapidly as possible if they can afford to do so. The cost of plastic bins will probably continue to increase as petrochemical costs continue to increase over the next decade. Therefore, today's prices for plastic bins may look like a bargain in a year or two if fuel prices continue their steady rise.

- **Sanitize storage rooms at the end of each season**

Walls and floors of all storage rooms should be sanitized at the end of each season using either quaternary ammonium sprays or by applying a foam containing StorOx. Both methods will effectively kill spores and eliminate "storage odors." Chlorinated water is less effective than quaternary ammonium sanitizers or StorOx foam, so chlorinated water is not recommended for cleaning storages.

Using ReTain on Apples in Stress Years

Source: Philip Schwallier, Clarksville Horticultural Research Station Coordinator, MSUE Fruit Crop Advisory Team Alert, Volume 20, No. 15, August 9, 2005

ReTain is a very useful growth regulator on apples and has the following benefits.

- Delays fruit maturity of any variety
- Decreases fruit drop
- Improves the condition of treated fruit in storage

ReTain needs to be applied 30 days before anticipated harvest to achieve the best results and highest effectiveness of the material. Full rate ReTain will delay maturity of most varieties seven to ten days and some very sensitive varieties up to 21 days. Gala and Jonagold are very sensitive to ReTain. Honeycrisp appears to be moderately sensitive and other varieties are less sensitive but still respond to the ReTain treatment. Some growers will use half rate on Gala, Jonagold and Honeycrisp because of the sensitivity, but realize that this will also reduce the response.

ReTain will delay harvest, reduce fruit drop, improve storage condition life, and sometimes increase fruit size if the fruit hang long enough. The delayed maturity is very useful to pick-your-own operations. The delayed maturity extends when varieties are available for customers to pick in excellent condition.

Large growers can use ReTain to help program harvest. For example, if a grower has large acreages of one variety like Red Delicious, then a portion of the Reds can be treated with full rate Retain to reduce drop and delay maturity. Another portion of the Reds could be treated with half rate to only slightly delay maturity. This will allow the picking to be more orderly with less drop, and all the Reds will be picked in excellent condition.

ReTain is a helpful growth regulator with benefits to small and large growers. Time the applications 30 days ahead of anticipated normal harvest and plan on picking treated fruit later than normal.

Stressful years

Apple trees under stress do not respond well to ReTain treatments. Hot, dry years seem to reduce the ReTain response. In those situations where trees' stress is a factor, consider not applying ReTain or use the higher rate. One third and half rate will not provide good results on stressed trees. ReTain is also more effective closer to the 28 days before harvest timing rather that the 30 to 35 days before anticipated harvest.

Handling Your Food Safety Risk

By: Shari L. Plimpton, Ph.D., Food Safety Educator, Ohio and Indiana Specialty Crop Food Safety Initiative via John Wargowsky, Executive Director, Mid American Ag and Hort Services, Inc.

By now, most growers have heard of GAPs (Good Agricultural Practices), and even GMPs (Good Manufacturing Practices), yet, after a couple of years of speaking and consulting about GAPs and all of its related topics, I still get some blank stares when I mention GHPs (Good Handling Practices). What that tells me, of course, is that I haven't done a good enough job of providing useful information about GHPs, and I hope to rectify that now.

GHPs are all of those precautions you take from storage, through transportation, through warehousing to minimize the risk of foodborne illness. Our emphasis on preventing contamination in the GAPs program doesn't stop at the packing house. GHPs include chilling, storing, and transporting produce (and storage again if you are warehousing).

GHPs also overlap with GAPs in the areas of worker health and hygiene and water quality. Training and education in food safety is just as important for workers who are handling produce in storage and in the loading of trucks as it is for those in the fields and in the packing house. Water used post-packing (especially that used for ice) should meet potable standards.

Cleaning, sanitation, and temperature control are the focus for GHPs. In storage facilities, this means developing and implementing cleaning and sanitizing procedures prior to turning on the refrigeration units and filling your storage with produce. I want to emphasize cleaning and sanitizing as two separate activities and two separate procedures.

Cleaning is done first to remove debris and organic materials by using a cleanser designed for the job. After rinsing, a sanitizer is then used to inactivate any remaining microorganisms. If you are developing a food safety plan, you would describe in writing your Standard Operating Procedure (SOP) for cleaning, including the type of cleanser, the amount to use, and how to rinse. An SOP would also then be written separately for the sanitation procedure.

Cleaning and sanitizing are compromised if there are any cracks or crevices in which organic material, and therefore microorganisms, can hide. Inspect, replace, repair, and/or meticulously clean as appropriate the following:

Cracked hoses, damp insulation, hollow framework, rubber seals around doors, poorly-maintained filters, light switches, standing water, cleaning tools, open bearings, trash cans, porous surfaces (e.g. wood), ice makers, condensate; especially walls and pipes over packing lines.

If you are using ice, recognize that you are using a material that is a potential hazard if not handled properly. One microorganism that is well known for causing foodborne illness and is particularly tolerant of cooler temperatures is *Listeria monocytogenes*. This microorganism and others can be present in ice, ready to multiply and grow rapidly when the ice melts and temperatures increase. For this reason, the water and everything used in the manufacture, conveyance, and storage of ice must be clean and sanitized.

Using potable water is a must. After that, recognize that the ice house itself, and all conveyors and chutes, must be cleaned and sanitized on a regular basis. Porous surfaces such as wood should be replaced with cleanable surfaces wherever the surface comes in contact with the ice.

Maintain your storage temperatures. Keep storage facilities within the recommended temperature range for the produce you are storing. Monitor and document your storage temperatures on a regular schedule, so you can demonstrate that produce is handled safely while under your control. If produce is kept cool up front, microbial growth is minimized and your risk is minimized. Temperature abuse after produce has left your control is less likely to result in cases of foodborne illness if growth is prevented early on.

Finally, inspect trucks prior to loading to insure cleanliness and proper refrigeration. This is often the last thing a grower can control in their operation. Identify prior loads hauled in the truck. Trucks that have hauled raw animal products should be avoided due to the risk of cross contamination, so specify up front that you don't want trucks that are hauling raw animal products. From my own experience, it is often possible to tell if a truck has been properly cleaned by both appearance and smell.

Know where the closest truck cleaning station is so you can direct drivers to it if they come to you too dirty to load. As a part of your food safety program, document truck temperature, cleanliness, state of the product, and required shipping temperature range at time of shipment. Including your recommended temperature range on the bill of lading is a good way to communicate and easily document your expectations for the handling of your produce after it has left your control.

A complete food safety program includes GAPs, GMPs (if you have a packing house), and finally, GHPs. Be thorough, be prepared, and you will significantly reduce your risk for microbial contamination of fresh produce. The Ohio and Indiana Specialty Crop Food Safety Initiative offers growers a variety of tools to address pests and other food safety issues. It is presented in partnership with the USDA's Risk Management Agency.

Ohio and Indiana fruit and vegetable growers can get help with the development of a food safety program by contacting Mid American Ag and Hort Services by phone at 614-246-8286, fax at 614-246-8686, or email at maahs@ofbf.org. More information about the Ohio and Indiana Specialty Crop Food Safety Initiative may be found at <www.midamservices.org> by clicking on "Projects."

Mites: Friend and Foe

Source: Hannah Fraser, Entomology Leader, Horticulture, Ontario Ministry of Agriculture, Food and Rural Affairs

I know very few people who are terribly fond of counting mites on leaf samples. Nonetheless, determining numbers is a critical step in making pest management decisions! While making counts, it is important to distinguish between phytophagous (plant feeding) and predatory mites. Predatory mites and other beneficials can be very effective at keeping mite pest populations below threshold levels. Some of the most common predatory mites include *Amblyseius fallacis, Typhlodromus pyri, Zetzellia mali*, and several *Balaustium spp.* species. So . . . how can you readily tell which mites are feasting on the crop versus those beneficial ones coming in for a "kill"?

European red mite (ERM) males and females look quite different from one another, which can lead to some confusion in the uninitiated. The female is a deep brown-red, about 0.4 mm in length, and has 4 rows of raised "spines." The male is smaller (0.28 mm), lighter or more drab in color, with a pointed abdomen; legs are proportionately longer than that of the female. Immatures are typically reddish, but may appear green following molting. (The red color develops with feeding.) ERM eggs are red, slightly flattened (onion-shaped), and have a hair-like stalk protruding from the top.

Two-spotted spider mite (TSSM) adults and nymphs are white or pale straw-colored with two dark spots. Note that newly hatched larvae are colorless; the spots appear following feeding. (Mite developmental biology progresses from egg, to 6-legged larva, to eight-legged nymphal form, to adult.) Overwintering females usually turn reddish-orange. TSSM eggs are spherical, clear, and colorless when laid, becoming milky white over time.

Amblyseius fallacis and *T. pyri* (Phytoseiidae) are difficult to distinguish from one another. Both have broad abdomens (pear or tear-shaped), are about 0.30-0.35 mm in length (slightly smaller than ERM), and are very fast moving. They can be clear (pale yellow or translucent) or they may acquire the color of prey items on which they feed (European red mites, two spotted spider mites), such as a mottled brownish-red. Eggs of both phytoseiids are almost transparent, oval/pear-shaped and slightly larger than the rounded, reddish eggs of ERM.

Z. mali (Stigmaeidae) is bright yellow, somewhat diamond-shaped (pointed posterior) and slightly smaller than either prey items or *A. fallacis* and *T. pyri*; a reddish hue is associated with feeding. Eggs are round, about half the size of ERM eggs, and bright yellow. *Balaustium spp* (Erythraeidae) are large (1 mm or larger), velvety, dark red to bright red, and fast moving.

Looking for images and more information on the biology of both the good guys and the problematic mites? Here are a few sites to get you started:http://www.gov.on.ca/OMAFRA/english/crops/facts/beneficial.htm

http://www.gov.on.ca/OMAFRA/english/crops/facts/predbio.htm

http://www.nysipm.cornell.edu/factsheets/treefruit/pests/pm/predmites.html

http://www.nysipm.cornell.edu/factsheets/treefruit/pests/erm80/eredmite.html

http://www.gov.on.ca/OMAFRA/english/crops/facts/95-057.htm#Predator

Pest Phenology

Coming Events	**Degree Day Accum.** Base 50°F
Oriental fruit moth 3rd flight peak	1821-2257
Redbanded leafroller 3rd flight peak	1876-2342
Apple maggot flight subsides	1908-2368
Codling moth 2nd flight subsides	1944-2536
Lesser appleworm 2nd flight subsides	1973-2387
Oriental fruit moth 3rd flight subsides	2000-2288
Lesser peachtree borer flight subsides	2011-2425
Obliquebanded leafroller 2nd flight subsides	2022-2438
Redbanded leafroller 3rd flight subsides	2142-2422
Spotted tentiform leafminer 3rd flight subsides	2246-2432

Revised, thanks to *Scaffolds Fruit Journal* (Art Agnello)

Degree Day Accumulations for Ohio Sites

August 17, 2005

Ohio Location	**Degree Day Accumulations Base 50°**	
	Actual	**Normal**
Akron-Canton	2152	2028
Cincinnati	2687	2648
Cleveland	2217	1989
Columbus	2529	2272
Dayton	2356	2355
Kingsville	1969	1839
Mansfield	2085	2009
Norwalk	2194	1987
Piketon	2545	2569
Toledo	2259	1985
Wooster	2206	1988
Youngstown	1967	1841

Prices Set for Michigan Processing Apples

Source: <http://www.fruitgrowersnews.com>

The Michigan Processing Apple Growers Marketing Committee has negotiated the following minimum prices for Michigan processing apples for the 2005 apple crop:

Jonathan	2_" & up	$10.25/cwt.
Spy & Ida Red	2_" & up	$9.25/cwt.
Golden	2_" & up	$8.75/cwt.
Hard varieties (including Rome & Empire)	2_" & up	$8.25/cwt.
Soft varieties	2_" & up	$7.25/cwt.
Straight loads of apple juice		$4.25/cwt.
Under 2 _" peeler loads		$3.75/cwt.

Fruit Observations and Trap Reports

Site: Waterman Lab, Columbus
Dr. Celeste Welty, OSU Extension Entomologist, and Gretchen Sutton, Graduate Assistant

Apple: 8/11 to 8/17/05		
Redbanded leafroller	45	down from 57
Spotted tentiform leafminer	34	down from 48
San José scale	4	up from 3
Codling moth (3 trap mean)	5	down from 6
Lesser appleworm	13	up from 11
Tufted apple budmoth	15	down from 36
Variegated leafroller	7	down from 20
Obliquebanded leafroller	3	down from 10
Apple maggot (sum of 3 traps)	0	down from 1

Site: East District; Erie and Lorain Counties
Jim Mutchler, IPM Scout/Technician

Apple: 8/9 to 8/16/05		
Codling moth (3 trap mean)	3.3	down from 4.0
Oriental fruit moth	4.9	up from 3.3
Redbanded leafroller	12.4	up from 4.2
San Jose scale	16.3	down from 80.4
Lesser appleworm	5.5	up from 2.5
Apple maggot (sum of 3 traps)	5.1	up from 3.6

Beneficials found: lacewings eggs and adults, native lady beetles, brown lacewing adults

Peach: 8/9 to 8/16/05		
Redbanded leafroller	9.7	up from 3.3
Oriental fruit moth	1.0	up from 0.7
Lesser peachtree borer	18.7	up from 12.7
Peachtree borer	2.7	down from 3.7

Beneficials found: lacewing eggs and adults, native ladybeetle

Site: West District: Huron, Ottawa, Richland, and Sandusky Counties
Lowell Kreager, IPM Scout/Technician

Apple: 8/8 to 8/15/05		
Codling moth	0.5	down from 0.6
Oriental fruit moth	3.0	up from 1.3
Redbanded leafroller	6.8	up from 3.0
San Jose scale	0.0	same as last wk.
Spotted tentiform leafminer	413	down from 562
Lesser appleworm	11.8	up from 4.5
Apple maggot (sum of 3 traps)	0.0	same as last wk.

Beneficials found: lacewing adults. brown lacewing adults, banded thrips

Peach: 8/8 to 8/15/05		
Redbanded leafroller	8.0	down from 18.0
Oriental fruit moth	3.6	up from 3.0
Lesser peachtree borer	5.5	down from 5.9
Peachtree borer	1.0	down from 0.3