RUTGERS COOPERATIVE RESEARCH & EXTENSION AT THE NEW JERSEY AGRICULTURAL EXPERIMENT STATION

# PLANT & PEST ADVISORY

FRUIT EDITION $1.50 AUGUST 16, 2005

## INSIDE



## Suggestions for Improving Packinghouse Sanitation

*Dave Rosenberger Ph.D., Fruit Specialist in Plant Pathology, Cornell, Hudson Valley Lab, Highland NY and Anne Rugh, Cornell*

*Reprinted from SCAFFOLDS Fruit Journal, Geneva, NY Volume 14, No. 22, August 15, 2005, http://www.nysaes.cornell.edu/ent/scaffolds/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.

### #1: 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

*SEE PACKINGHOUSE SANITATION ON PAGE 2*

*Packinghouse Sanitation from page 1*
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.

## #2: 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 wood 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.

## #3: 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. ❑

# Apple Maturity Update for North-Central NJ

*Win Cowgill, Agricultural Agent*

This is the first week of the 2005 season apple maturity reports. Apple maturity appears to be at the historical norm for us in Northern New Jersey. Growers should be observant as we approach Gala and McIntosh harvest in North-Central Jersey. Macs are sized but need some cool nights to color, we have not had temps much below 68°F in Hunterdon County with most nights the past 2 weeks running in the low to mid 70's.

**Summer Apples**- at the Rutgers Snyder Farm in Hunterdon County we have picked in the following; Pristine 7/31 RedFree on 8/10, both are scab resistant cultivars from the Rutgers & PRI program. Sunrise was harvested on 8/5. It is one of the best red apples in this season. It has a sweeter taste while RedFree has more acid.

**Zestar** from the Minnesota program is starting to come along and may be ready in 7-10 days for us.

**Ginger Gold,** the first commercial yellow apple of significance on the east coast, is coming along. According to John Miller, Cerexagri, Inc., Ginger Gold harvest was well underway in Virginia last week. In Central New Jersey it is just about ready for harvest. The best maturity indicator for Ginger Gold is background color. When it starts to go from green to cream it is time to pick. Our Central New Jersey Ginger Golds are not quite ready for the best eating quality, but almost ready if they are to be stored.

**Location**

| Mercer-Princeton | Date | Pressure | Brix | Starch-Iodine |
|---|---|---|---|---|
| Ginger Gold | 08/15 | 21 | 10.6% | 1.0 |

| Hunterdon-Pittstown | Date | Pressure | Brix | Starch-Iodine |
|---|---|---|---|---|
| Ginger Gold | 08/15 | 20 | 10.2 | 1.0 |

**McIntosh g**rowers in Central and North Jersey should watch their Mac's closely for early maturity development and drop. The excessive heat and some resulting sunburn have caused one block of Rogers Red Mac to do have some early heavy drop. These were dwarf trees with a fairly open canopy.

**Note:** In last weeks Plant and Pest Advisory Fruit edition we discussed using Retain at 2 weeks before anticipated harvest for Macs and Galas. Watch your Macs closely for drop, this may be a heavy drop year for Macs *and we may need to go sooner with Retain* than the two weeks if any drop is noticed.

| Mercer-Princeton | Date | Pressure | Brix | Starch-Iodine |
|---|---|---|---|---|
| Morespur McIntosh | 8/15 | 18.2 | 10 | 2 |

| Hunterdon-Rutgers Snyder | Date | Pressure | Brix | Starch-Iodine |
|---|---|---|---|---|
| Rogers Red Mac (non Retain) | 8/16 | 19 | 10.5% | 2.5 |

**Gala** background color has historically been one of the best indicators of maturity for Gala. Fresh market Galas should be harvested when the background color is turning from a yellow to a cream color. SI index with the Gala Starch chart can be a guideline as well. Some strains are already showing good red color development but the size is way off (small) for the most part in Central New Jersey. Avoid any moisture stress in Gala until harvest.

| Mercer-Princeton | Date | Pressure | Brix | Starch-Iodine |
|---|---|---|---|---|
| Buckeye Gala (non Retain) | 8/15 | 23 | 9% | 1 |

| Hunterdon-Snyder Farm | Date | Pressure | Brix | Starch-Iodine |
|---|---|---|---|---|
| Buckeye Gala (non Retain) | 8/16 | 30 | 9.8% | 1 |

Gala strains traditionally come into maturity around Labor Day for North-Central New Jersey growers. Multiple pickings must be used on Gala to get consistent fruit quality and size.

# Wine Grape Information for the Region

*Mark Chien Wine Grape Agent, Penn State University Cooperative Extension*

*Reprinted from Penn State Cooperative Extension electronic newsletter, Aug. 11, 2005*

One vineyard reports Pinot Noir at about 50% color so veraison is upon us and should move forward quickly as the warm weather continues. For a season that got off 2-3 weeks late, we have managed to gain back most of that lost ground. If the weather cooperates, we are looking at a good harvest here but it's still too early to tell, we have another two months to deal with and NOAA says there will be more hurricanes and tropical storms to contend with this year.

Disease is still an issue and reports of powdery and downy are all around, especially aggravated by sometimes very heavy localized rainfalls and the high dew points we are experiencing every day and night. While clusters are now mostly resistant to infection from PM, DM and BR, leaves and bunch rots are still a concern. This is a good time for a botrytis application and remember to be rotating materials to avoid resistance acquisition. Because we had early botrytis infections in some vineyards, growers need to be vigilant, especially if the weather does not dry out. Late season spray programs should be planned, especially keeping in mind late DM outbreaks that can defoliate the vines.

Growers should be aware of the complex of secondary rot organisms that have plagued vineyards in 03/04 as they can very quickly compromise wine quality. These include opportunistic fungi, yeasts and bacteria like Aspergillus, Pennicillium, Colletoctrichum, Rhizopus, Cladosporium and Alternaria. They are all threats if bird and bee damage, diffuse powdery mildew, botrytis, Grape berry moth or other wounds occur to the grape berry skin. The vinegar smell is unmistakable in the vineyard and once you have it, start talking with the wine maker immediately about harvesting grapes. Contact fungicides like captan, sulfur and mancozeb may help but you have to watch PHI very closely on these materials. Keeping the canopy open, especially around the fruit zone will help to dry out the fruit faster from morning dew and rain but also open them to the birds, etc.

Grape berry moth and European Red Mites can be very active at this point so scouting for these pests will help. Use the NY/PA Pest Management Guidelines for Grapes: 2005 for specific control recommendations.

Bird control should be on everyone's mind especially if you have had problems in the past. Canopy management at this point is still a big concern and doing adequate hedging and leaf/lateral removal will still offer benefits to both fruit ripening and disease control. If it remains hot, avoid drastic leaf removal around the clusters to avoid sunburn - removal on the morning side may be the best compromise. Crop management is at the critical point and if you need to thin, now is the time to do it. After veraison, thinning will not yield any real ripening benefits; it only removes unripe fruit (still a good thing to do). Dr. Tim Martinson from Cornell Cooperative Extension in the Finger Lakes suggests that veraison may be a good time to apply foliar nitrogen, especially in supplementing yeast assimilating N (YAN) that can help wine fermentation and possibly deter atypical aging. He reports that it appears not to prolong or restart shoot growth or delay wood maturity when applied as urea at 10 lb/100 gal (5 lb actual N) and will not burn the foliage. If your vines are experiencing drought symptoms, you may want to consider this.

If you want to learn more about vine nutrition, I highly recommend that you attend the Pennsylvania Association of Winegrowers Annual Summer Walk Around at Clover Hill Vineyards and Winery next Wednesday, August 17 from 9 a.m. to 5:30 p.m. Dr. Paul Chu from A&L Eastern Labs in Richmond, VA will discuss general vine nutrition and how to take and read soil and tissues tests. The same Dr. Martinson mentioned above will be here to talk about research at Cornell on the effects of irrigation on vine nutrition and how fertilizing impacts atypical aging in delicate whites like Riesling. Jeff Peat and Chris Wilson from Helena Chemical Co. will talk about vine nutrition programs and products offered by Helena. The extension wine and grape team will bring you fully up to date on viticulture, pathology and enology issues at veraison on into harvest. But the best part is getting to see and learn about the beautiful vineyards and winery at Clover Hill, one of our very best winery operations. The Skrip family will host us and roll out the red carpet. As always fellowship and networking among growers and visiting with vendors is a very important part of the day. Registration fee includes breaks, lunch and handouts. You can find more information and registration at http://www.pawinegrowers.com/ or call Mark Chien at 717-394-6851. Please arrive early and dress according to the weather report.

Don't forget to mark on your calendar for the 05 Crush Workshop being offered at Crossing Vineyards in Bucks County. A wide range of winery and vineyard harvest and crush issues will be covered. You'll have a chance to see the gorgeous facilities at Crossing Vineyards and meet the Carrolls. Sigrid Gertsen-Briand from Lallemand is the guest speaker. The date is September 7th.

For independent vineyards, this is a good time for growers to get wine makers into the vineyard to look at crop load and fruit/vine condition and make sure everyone is on the same page for harvest. Plan now, avoid chaos later. Well, it will probably be chaotic no matter how much planning you do, but maybe a little less.

*Submitted by Jerome L. Frecon, Agricultural Agent.* ❑

# Fruit IPM

*Dean Polk, Fruit IPM Agent and David Schmitt and Eugene Rizio, Program Associates, Tree Fruit IPM*

*Note: Blueberry information is not available for this issue.*

## Peach

✔ **Tufted Apple Budmoth (TABM):** Timings are updated for this week in the following table:

| | TABM Timings - Application and Insecticide Type – Brood 2 | | |
|---|---|---|---|
| **County Area** | **OP's, Carbamates, Spintor, Pyrethroids (Conv.)** | | **Intrepid** |
| | **4 alt mid sprays** | **2 complete sprays** | **2 complete sprays** |
| Southern | 4th – 8/20-21 | 2nd – 8/16-19 | 2nd – 8/16-19 |
| Central | 3rd – 8/15-16; 4th – 8/21-22 | 2nd – 8/17-19 | 2nd – 8/17-19 |
| Northern | 3rd – 8/19-21; 4th – 8/25-27 | 2nd – 8/21-24 | 2nd – 8/21-24 |

✔ **Anthracnose; Fruit Rots: A**nthracnose infections are now appearing on susceptible varieties in the final stages of ripening. These infections occurred several weeks ago and nothing can be done at this point to prevent further infections in ripening blocks. Rhizopus and Brown Rots also have been seen in some blocks in very low numbers. Elite is the fungicide of choice where both rhizopus and brown rot are concerns.

✔ **Stink Bugs:** Stink bug populations have been increasing as they normally do this time of year. This is of particular concern for orchards located near grain crops, hayfields or woodlines. Imidan at the high rate, Asana, and Lannate are all effective for stink bugs. Imidan and Asana have a 14 day PHI. Lannate has a 4 day PHI.

## Apple

✔ **Tufted Apple Budmoth (TABM):** See Peach section above.

✔ **Stink Bugs:** Stink bug damage has become more prevalent in apples over the past few years, particular on late maturing varieties. Like peaches, stink bug is of particular concern if the orchard is located near grain crops, hayfields, or woodlines. Peter Shearer reports that Danitol is very effective for stink bug control. Even though Danitol is both a pyrethroid and a miticide, mite flare ups have been reported following its use. Intrepid or Spintor used for TABM control will not control stink bugs. Include an O.P. such as Guthion if using either of these products.

✔ **Codling Moth:** Although the degree day timing for this insect has past, orchards which have had problems should continue to use effective materials at labeled rates. If Codling Moth has been a problem and you are using Intrepid for TABM, the rate must be maintained at 16 ozs./ac. Problem orchards had trap captures above the 5 moth/trap threshold last week.

✔ **Sooty Blotch and Flyspeck:** High disease pressure remains so adequate coverage must be maintained. Infections are occurring daily. Consider solid sprays and increased volume for improved control in dense canopies or where these diseases have historically been a problem. Do not stretch solid applications more than 7-10 days. Most fungicides will need to be reapplied after 2″ of rain. If captan is being used alone, coverage should be renewed after 1″ of rain.

## Insect Trap Counts

**Tree Fruit Southern Counties**

| Week ending | STLM | TABM-A | CM | AM | OFM-A | DWB | OFM-P | TABM-P | LPTB | PTB |
|---|---|---|---|---|---|---|---|---|---|---|
| 7/15/05 | 235 | 1 | 0 | | 9 | 31 | 3 | 1 | 54 | 4 |
| 7/22/05 | 237 | 1 | 1 | | 8 | 14 | 4 | 4 | 63 | 6 |
| 7/29/05 | 584 | 3 | 1 | | 10 | 18 | 5 | 11 | 90 | 4 |
| 8/05/05 | 583 | 5 | 3 | | 6 | 0 | 7 | 11 | 81 | 18 |
| 8/12/05 | 725 | 5 | 1 | | 10 | 95 | 6 | 13 | 79 | 11 |

**Northern Counties**

| Week ending | STLM | TABM-A | CM | AM | OFM-A | DWB | OFM-P | TABM-P | LPTB | PTB |
|---|---|---|---|---|---|---|---|---|---|---|
| 7/15/05 | 90 | 3 | 0.5 | | | 19 | 3 | 3 | | |
| 7/22/05 | 67 | 3 | 2 | 0 | 0 | 17 | 5 | 5 | | |
| 7/29/05 | 185 | 2 | 3 | 0 | | 25 | 5 | 2 | | |
| 8/05/05 | 180 | 2 | 3 | 0 | 0 | 5 | 4 | 4 | | |
| 8/12/05 | 90 | 6 | 2 | 0 | 0 | 9 | 4 | 3 | 0 | 0 |

Key: STLM = Spotted Tentiform Leafminer, TABM = Tufted Apple Budmoth (A – apple, P – Peach), CM = Codling Moth, AM = Apple Maggot, OFM = Oriental Fruit Moth (A – apple, P – Peach), LPTB = Lesser Peachtree Borer, PTB = Peachtree Borer

NJ AGRICULTURAL EXPERIMENT STATION
RUTGERS
COOPERATIVE RESEARCH & EXTENSION
Plant & Pest Advisory
Rutgers' Cook College
18 College Farm Road
New Brunswick, N.J. 08901-8551

FIRST CLASS
POSTAGE PAID
PERMIT #576
MILLTOWN, NJ 08850

# PLANT & PEST ADVISORY

## FRUIT EDITION - CONTRIBUTORS

**Rutgers Cooperative Extension Specialists and Program Associate**
George Hamilton, Ph.D., Pest Management
Norman Lalancette, Ph.D., Plant Pathology
Bradley A. Majek, Ph.D., Weed Science
Peter W. Shearer, Ph.D., Entomology
Gail Lokaj, Program Associate in Pomology
**NJAES/Cook College**
Joseph Goffreda, Ph.D., Breeding
**Rutgers Cooperative Extension Agricultural Agents and Program Associates**
Atlantic County, Gary C. Pavlis, Ph.D. (609-625-0056)
Gloucester County, Jerome L. Frecon (856-307-6450)
Hunterdon County, Winfred P. Cowgill, Jr. (908-788-1338)
Morris County, Peter J. Nitzsche (973-285-8300)
Passaic, Elaine F. Barbour, Agric. Assistant (973-305-5740)
Warren County, William H. Tietjen (908-475-6505)
Fruit IPM, Dean Polk (609-758-7311)
Meredith Compton, Program Associate (908-788-1338)
Gene Rizio, Program Associate (856-566-2900)
David Schmitt, Program Associate (856-307-6450)
**Newsletter Production**
Jack Rabin, Associate Director for Farm Services, NJAES
Cindy Rovins, Agricultural Communications Editor

For back issues, visit our web site at: www.rce.rutgers.edu/pubs/plantandpestadvisory.

**Pesticide User Responsibility:** Use pesticides safely and follow instructions on labels. The pesticide user is reponsible for proper use, storage and disposal, residues on crops, and damage caused by drift. For specific labels, special local-needs label 24(c) registration, or section 18 exemption, contact RCRE in your County.

**Use of Trade Names:** No discrimination or endorsement is intended in the use of trade names in this publication. In some instances a compound may be sold under different trade names and may vary as to label clearances.