Preparing Your Farm Food Safety Plan
Part 7: Creating Logs to Document Compliance – Packinghouse
Meredith Melendez, Mercer County Senior Program Coordinator and Wesley Kline, Ph.D., Cumberland County Agricultural Agent

The USDA Good Agricultural Practices Third Party Audit requires that certain activities on the farm be documented. These logs should accurately reflect what you have done on the farm to ensure food safety. If you do not write your activities down, the auditor will assume that the activity never happened. This documentation may be new for many growers, so making it as easy as possible for you to comply will ensure that the documenting happens in a manner that is acceptable to an auditor. This is the seventh article in a series dedicated to preparing a farm food safety plan. For previous articles refer to earlier editions of the Plant and Pest Advisory, or visit the Rutgers Vegetable Crops blog at http://jerseyvegcropsagupdates.blogspot.com. Remember you may not need a third party audit; it depends on who is purchasing your produce. However, everyone should have a food safety plan.

What packinghouse logs will you need to have as a part of your farm food safety plan?

Produce Disinfection Log

Growers will need to document that the water used to clean, cool and move their produce is sufficiently treated to reduce microbial contamination. The following items should be included on the produce disinfection log:

- Date
- Time
- pH level recorded
- pH level adjusted? (Yes or No)
- Water temperature recorded
- Water temperature adjusted? (Yes or No)
- Number of minutes the produce came in contact with the water
- Was the time adjusted? (Yes or No)
- Employees initials
Bait Station Control Log
Auditors will be looking to see if measures are taken to exclude animals or pests from the packing and storage facilities. This includes an established pest control program for the facility. Bait stations should be located on each side of doors and approximately every 25 feet along solid walls of the packinghouse, and regular (approximately weekly) monitoring of these stations should be kept in a log. This log should include:

- Date checked
- Time checked
- Bait station number (each should have a unique number)
- Status of the bait station
- Corrective action that was needed, if any
- Date the corrective action was completed
- Employees initials

Packing House and Storage Facility-Inspection Logs
The packinghouse and storage facilities should be inspected on a regular basis. Three separate inspection logs should be kept for the facilities, a daily inspection log, a monthly inspection log and a quarterly inspection log. The following items are examples to include in the inspection logs:

Daily log
- Date inspection occurred
- Floors – checked and if needed cleaned
- Drains and trenches – checked and if needed cleaned
- Break room and rest room – checked and if needed cleaned
- Hand washing facilities – checked and if needed cleaned
- Food contact surfaces – checked and if needed cleaned and sanitized
- Waste dumpster area – checked and if needed cleaned
- Employee name

Monthly log
- Date inspection occurred
- Walls – checked and if needed cleaned
- Ceiling – checked and if needed cleaned
- Overhead pipes and beams – checked and if needed cleaned
- Coolers – checked and if needed cleaned
- Maintenance area – checked and if needed cleaned
- Employee name

Quarterly log
- Date inspection occurred
- Light fixtures – checked and if needed cleaned
- Hoist – checked and if needed cleaned
- Box storage area – checked and if needed cleaned

Next week: Logs – Storage and Transportation

IPM Update
Kristian Holmstrom, Research Project Coordinator II, Vegetable IPM Program

Sweet Corn

European corn borer (ECB) adult catches have increased slightly in blacklight traps in southern and central NJ over the past week. The most consistent catches are in the Mercer/Middlesex and Cumberland/Salem County areas (see ECB Map). Adult females are abundant in whorl stage fields throughout much of the state now. Feeding is present in all parts of the state, with many of the first and second plantings exceeding the action threshold. Consider treating if 12% or more plants exhibit the characteristic “shot-hole” type feeding on leaves and/or droppings or ECB larvae in emerging tassels. Remember to make a full-tassel application to control ECB larvae as they leave the tassel and travel down the stalk to re-enter the plant near the ear shank. This last application is often critical to controlling ear infestations from ECB. Consider weekly applications through the silk stage unless local corn earworm catches dictate a tighter schedule. This will help prevent ear infestations resulting from eggs laid on or near the developing ear.

The highest nightly ECB catches for the previous week are as follows:
Shiloh 8 Lawrenceville 3 East Vineland 2
Shirley 8 RAREC 3 Little York 2
Milltown 4 Cedarville 2 Port Colden 2
Crosswicks 3 Centerton 2 Princeton 2

Corn earworm moths (CEW) have been captured in greater numbers this past week. The most consistent catches are occurring along the Delaware Bay shore and up through southwestern NJ (see CEW Map). Additionally, pheromone catches near the Camden/Atlantic County border have increased dramatically. These moths represent a threat to the earliest sweet corn plantings now in the silk stage. As silks begin to appear, pay close attention to CEW catches in local blacklight traps, and treat silking plantings accordingly.

The highest nightly CEW catches for the previous week are as follows:
Cedarville 2 Downer 1 Shirley 1
Chester 1 East Vineland 1 Tabernacle 1
Cinnaminson 1 RAREC 1
Denville 1 Shiloh 1

Silking Spray Schedules*:
South – 4-5 days
Central – 6 days
*Note: These are general recommendations. Local trap catches may indicate some variation in the frequency of insecticide applications to silking corn.

See IPM on page 3
Cole Crops

Heavy egg laying by imported cabbage butterflies (ICW), and diamondback moth (DBM) continues. Cabbage looper (CL) larvae are present to lesser degrees as well. Infestations of these pests have been found throughout the state. Scout plantings weekly. Check 5 consecutive plants each in 10 random locations throughout the planting, paying particular attention to the innermost leaves where ICW often feed. Consider treating if caterpillars are found on 10% or more plants that are in the 0-9 true leaf stage. From 9-leaf to the early head stage (in broccoli, cauliflower and cabbage) infestations up to 20% may be tolerated. Once heads begin to form, a 5% threshold should be observed to protect the marketable portion of the plant. For leafy greens such as collards and kale, 10% plants infested is the threshold throughout.

Crucifer flea beetle is active on many plantings, particularly when conditions are warm. When scouting cole crops for caterpillar pests, check for the presence of flea beetles. Consider treating if flea beetles are present on 50% or more plants, and feeding injury is evident on the plants. Be sure to monitor newly emerged or transplanted fields for the presence of this pest. In general, plants like arugula and mustard (those with a “hotter” flavor) are more favorable to flea beetles.

Peppers

Pepper transplants are now going into fields. At the same time, the first ECB flight is increasing. Be sure to scout fields regularly for the presence of ECB egg masses. If two or more egg masses are found in a 50 plant (two leaves/plant) sample, consider treating even if no fruit are present. In the absence of fruit, ECB larvae will bore into the central stem, topping the plant. This will result in the loss of crown fruit on infested plants. Generally, where blacklight trap catches average one or more ECB per night (shaded and crosshatched areas on the map, and blue and green areas on the web version, found at: http://www.pestmanagement.rutgers.edu/IPM/Vegetable/Pest%20Maps/maparchive.htm) and fruit are greater than ½” in diameter, insecticides are warranted. See the 2012 Commercial Vegetable Production Recommendations for materials useful in controlling ECB. Beet armyworms (BAW) were found feeding on corn in the Hammonton by IPM personnel. This pest is typically a threat to peppers, and as new plantings become established, growers should be on the alert for this pest. BAW larvae feed on leaves near the growing points on plants. This feeding can result in significant defoliation and ultimately fruit damage, as the larvae begin to feed there as they grow. BAW is another of our southern invaders that has shown up much earlier than expected. Like FAW, BAW can be difficult to control with older materials. See the 2012 Commercial Vegetable Production Recommendations for newer materials useful in controlling BAW.

Brown Marmorated Stinkbug (BMSB)

BMSB adults have begun to appear in blacklight traps in greater numbers over the past week. As yet, there is no clear “hot zone” for this pest. We expect this increase to continue for some time. At present, the weekly averages do not exceed 5 per night in any trap. As such, no map image is included in this edition. As adult captures increase, maps will be produced to show where activity is highest. BMSB has shown a preference for peppers in the past. Growers should pay close attention to activity from local traps to determine when to initiate field monitoring of this pest.

The highest nightly BMSB catches for the previous week are as follows:

- Centerton: 7
- Pedricktown: 5
- Woodstown: 4
- Farmingdale: 6
- Medford: 4
- Downer: 3
- Hammonton: 6
- Phillipsburg: 4
- Georgetown: 3
- Clinton: 5
- Princeton: 4
- East Vineland: 2

Note: Joe Ingerson-Mahar and Kris Holmstrom would like to acknowledge and thank the following IPM technicians for their efforts in gathering insect and disease information from around the state. Without their help, much of the information in this newsletter would be unobtainable in a timely fashion:

Kim Davis
Bernadette Eichinger
Michael Monzon
Andrew Schmucker
Ryan Tirrell
David Wallace

See ECB and CEW Maps on page 4
Vegetable Diseases of the Week

Andy Wyenandt, Ph.D., Specialist in Vegetable Pathology

Cucurbit powdery mildew on pumpkin leaf.

Bacterial leaf spot on pepper.
**Vegetable Disease Update**

*Andy Wyenandt, Ph.D., Specialist in Vegetable Pathology and Wesley Kline, Ph.D., Cumberland County Agricultural Agent*

☑ **Cucurbits – Powdery mildew** - Symptoms typically begin on older, lower leaves and can spread rapidly under dry, humid conditions. Control of Powdery mildew begins with regular scouting for symptoms and weekly fungicide applications. Begin a fungicide program when one lesion is found on the underside of 45 leaves. For control of cucurbit Powdery mildew in:

**Pumpkin and Winter Squash fields:**

Alternate:
- Quintec 6.0 fl oz 2.08 SC/A plus chlorothalonil 2.0-3.0 pt 6F/A
- *With:*
  - Pristine -- 12.5-18.5 oz 38WG/A plus chlorothalonil -- 2.0-3.0 pts 6F/A, or
  - Procure -- 4.0-8.0 oz 50WS/A plus chlorothalonil -- 2.0-3.0 pt 6F/A, or
  - Rally -- 5.0 oz 40WSP/A plus chlorothalonil -- 2.0-3.0 pt 6F/A, or
  - Folicur -- 4.0-6.0 fl oz 3.6F/A plus chlorothalonil -- 2.0-3.0 pt 6F/A, or
  - Inspire Super -- 20.0 fl oz 2.8 F/A plus 2.0-3.0 pt 6 F/A

*With:*
- Micronized Wettable Sulfur -- 4.0 lb 80W/A. Sulfur may injure plants, especially at high temperatures. Certain varieties can be more sensitive. Consult label for precautions.

If Powdery mildew has become well established in the mid- to late part of the season, only apply protectant fungicides such as chlorothalonil or sulfur.

**In Summer Squash and Cucumber:**

Alternate:
- Procure -- 4.0-8.0 oz 50WS/A plus chlorothalonil -- 2.0-3.0 pt 6F/A, or
- Rally -- 5.0 oz 40WSP/A plus chlorothalonil -- 2.0-3.0 pt 6F/A, or
- Folicur -- 4.0-6.0 fl oz 3.6F/A plus chlorothalonil -- 2.0-3.0 pt 6F/A, or
- Inspire Super -- 16.0-20.0 fl oz 2.8 F/A plus chlorothalonil -- 2.0-3.0 pt 6F/A

*With:*
- a tank mix containing Pristine -- 12.5-18.5 oz 38WG/A plus chlorothalonil -- 2.0-3.0 pt 6F/A

**In Muskmelon and Watermelon:**

Alternate:
- Quintec -- 6.0 fl oz 2.08SC plus chlorothalonil, or

*With:*
- Procure -- 4.0-8.0 oz 50WS/A plus chlorothalonil 2.0-3.0 pt 6 F/A, or
- Rally -- 5.0 oz 40WSP/A plus chlorothalonil 2.0-3.0 pt 6 F/A, or
- Folicur -- 4.0-6.0 fl oz 3.6F/A plus chlorothalonil 2.0-3.0 pt 6 F/A

*or one of the following:*
- Pristine -- 12.5-18.5 oz 38WG/A plus chlorothalonil 2.0-3.0 pt 6 F/A, or
- Inspire Super 20.0 fl oz/A plus chlorothalonil 2.0-3.0 pt 6 F/A

**Disease Briefs**

*Andy Wyenandt, Ph.D., Specialist in Vegetable Pathology*

- **Late blight** has been confirmed on potato in on Long Island this week. There have been no new reports of Late blight in New Jersey.
- **Cucurbit powdery mildew** has been found in southern New Jersey. Cucurbit growers should adjust fungicide programs accordingly.
- **Cucurbit downy mildew** - There have been no new reports in the recent week. Cucurbit downy mildew has been reported as far north as central North Carolina.
- **Spinach downy mildew** has been confirmed in New Jersey. All spinach growers should take precautionary action and add a downy mildew specific fungicide to weekly program.
- **Phytophthora blight** has been found in some summer squash fields.
- **Cabbage downy mildew** has also been reported.

Want the most up-to-date information fast, please sign up for the Jersey Vegetable Crop Ag Updates at:

http://jerseyvegcropsagupdates.blogspot.com

See Disease Update on page 6
Getting Tunnel Temperature Right for Tomatoes

Reprinted from Vegetable Notes, UMass Extension, May 25, 2012 and adapted Vegetable Crops Hotline, No. 549, April 9, 2012, Purdue University

Managing temperature in unheated and manually vented tunnels is one of the key challenges of growing tomatoes in tunnels. This article reviews tomato responses to temperature as summarized by J.M. Kinet and M.M. Peet in The Physiology of Vegetable Crops (H.C. Wien ed., 1997), and discusses implications for production in tunnels.

For tomato stems and leaves, the main effect of temperature is on rate of growth: the warmer it is, the faster the plant grows, up to an optimum of about 75°, as long as other conditions are satisfactory. Ideally tunnel temperatures would remain around 70-75° for best tomato growth. Below 50°, tomatoes will grow very little. And of course below 32°, depending on conditions, leaves or plants may be killed by freezing. At this time of year temperatures in a tunnel might be too hot or too cold (less likely in late May and June).

The temperature before tomato plants bloom can influence the number and timing of fruit as well as fruit quality. It is important to reduce exposure to temperatures over 90° by timely venting of tunnels and hoop-houses. Flowers and flower parts on many varieties do not develop properly at high temperatures, resulting in aborted buds or flowers or poor pollination and fruit set. Cloudy weather exacerbates the detrimental effects of high temperatures. These high temperatures are most damaging to flowers soon after the buds are visible. After flowers have opened, the high temperatures are also detrimental to pollination and fruit set.

At the other end of the mercury, cool temperatures about 4 to 5 weeks before flowers open, when flower development has begun but is too small to see, can lead to additional branching on a cluster, more locules inside the tomato fruit, and a higher percentage of catfaced fruit. While additional branches on a cluster may mean more tomatoes, it could also lead to a smaller average tomato size for that cluster. Closer to flowering, after buds are visible, temperatures below 50° can prevent proper pollen development. The result is poor pollination and fruit set.

Growers who manage temperatures in high tunnels to meet the needs of tomatoes will reap rewards of good yield, reduced crop stress, and better fruit quality. It is worth the effort.

Disease Update from page 5

Materials with different modes of action (FRAC codes) should always be alternated.

For more information on control of powdery mildew of cucurbits please see the 2012 New Jersey Commercial Vegetable Production Recommendations Guide.

✔ Cucumber/Pickles – Angular leaf spot - Symptoms are distinct and easily diagnosed. Small water-soaked lesions develop on leaves and expand until they are delimited by larger secondary veins in leaves resulting in angular lesions. After time these lesions turn brown and infected tissue drops-off resulting in ‘shot-holes’. Angular leaf spot can be spread by splashing rain, insects, on the hands of workers and on farm machinery. Working in the field when the foliage is wet favors the spread of the disease. The disease can also be spread by blowing wind and in irrigation water. Management of angular leaf spot begins with clean-seed and planting fields that has been out of cucurbit production for at least 2 years. Cultivating when foliage and soil are wet and irrigating with pond water should be avoided. There are cucumber varieties with resistance. Add label rate of fixed copper + mancozeb to fungicide maintenance program and repeat applications every 7 days.

✔ Spinach (White Rust and Downy Mildew) - Prior to symptom development, apply the following on a 7 to 10 day schedule: Quadris (azoxystrobin, 11) at 12.0 to 15.5 fl oz 2.08SC/A, or Cabrio (pyraclostrobin, 11) at 12.0 to 16.0 oz 20EG/A, or Reason (fenamidone, 11) at 5.5 to 8.2 fl oz 500SC/A, or Tanos (famoxodone + cymoxanil, 11 + 27 ) at 8.0 to 10.0 oz 50W/A. Rotate to one of the following fungicides: Ranman (cyazofamid, 21) at 2.75 fl oz 400F/A, Revus (mandipropamid, 40) at 8.0 fl oz 2.08F, or Presidio (fluopicolide, 43) at 3.0 to 4.0 fl oz 45SC/A, or Actigard (acibenzolar-S-methyl, P) at 0.50 to 0.75 oz 50WG/A, or Aliette (fosetyl Al, 33) at 3.0 lb 80WDG/A, or fixed copper (FRAC code M1) at labeled rates (Copper containing fungicides may cause some phytotoxicity), or Ridomil Gold Copper (mefenoxam + copper, 4 + M1) at 2.5 to 5.0 lb 61WP/A on a 7 day schedule.

✔ Tomato – Bacterial spot and speck – Tomato transplants with suspected symptoms can be treated with streptomycin (Agri-Mycin, Agri-Strep) at 1 lb/100 gallons, or 1.25 teaspoon per gallon every 4 to 5 days prior to transplanting. Additionally, Kocide 3000 (copper hydroxide, FRAC code M1) has a greenhouse label for speck and spot control in the greenhouse. Apply ½ to 1.5 TBSP per 1000 sq ft. every 5 to 10 days. Remember, phytotoxicity is an important issue when apply copper in enclosed structures, see label for cautions, restrictions and liabilities. After transplanting, apply Actigard at 0.33 oz 50WG/A (see label for use), or fixed copper (M1) at 1 lb a.i./A plus a mancozeb (Dithane, Manzate, Penncozeb, M3) at 1.5 lb 75DF or OLF, or ManKocide (M1 + M3) at 2.5 to 5.0 lb 61WP/A on a 7 day schedule.
Twilight Day-Neutral Strawberry Meeting in Southeastern Pennsylvania

Scott Guiser, Penn State Extension, Bucks County

Linvilla Orchards was awarded a Pennsylvania Specialty Crops Grant to investigate the feasibility of commercial scale production of day-neutral, also known as everbearing strawberries. You are invited to see more than 4 acres of production, including 3 acres of the variety Seascape established in the spring of 2012. Harvest should be in full swing at the meeting date of July 12. There is no charge for the meeting but please call Linvilla Orchards at 610-876-7116 before July 11 so we can get a head count for refreshments. Linvilla Orchards is located at 137 West Knowlton Rd, Media, PA, Delaware County.

Norm Shultz, orchard manager, will discuss management practices he has used and his vision for day-neutral strawberry production in Pennsylvania. Kathy Demchak, Penn State Extension small fruit specialist will be on hand to discuss her research experiences with strawberries. Pesticide credits will be provided.

The meeting will begin at 5:30 with light refreshments. We will head to the fields at 6:00. In addition to strawberries, Linvilla grows approximately 30 acres of apples, peaches, pears, blackberries and blueberries and market them at their farm market in Delaware County, southeastern Pennsylvania.

Don’t miss this opportunity to get a first-hand look at a new strawberry production system as well as a premier retail marketing operation at Linvilla Orchards.

Cost: FREE, but please call Linvilla Orchards at 610-876-7116 before July 11 so that they can get a head count.

Submitted by Pete Nitzsche, Morris County Agricultural Agent.

Note: There is no Weekly Weather Summary this week.
PLANT & PEST ADVISORY

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Pesticide User Responsibility: Use pesticides safely and follow instructions on labels. The pesticide user is responsible 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 RCE in your County.

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For back issues of the Plant & Pest Advisory: www.rce.rutgers.edu/pubs/plantandpestadvisory