Part 2 of your farm food safety plan addresses field harvest and field packing activities. Your plan should document your activities and your pre-harvest assessment log. Field harvest assessment should be made the day prior to starting to harvest to ensure everything is in place to reduce the chance for product contamination. We covered the specifics of the pre-harvest assessment log in article number 6 of this series. If a field is harvested over several days each morning the assessment is repeated.

✔ The following statements should be included in your Field Harvest and Field Packing Activities section:

✔ Pre-harvest assessments are made the day prior to harvest begins.
✔ Fields harvested for more than one day will be assessed each day.
✔ Employees take necessary precautions to avoid contamination of produce.

✔ The number, condition and placement of field sanitation units comply with OSHA and WPS safety requirements.*

✔ These field sanitation units are always located in a safe area that poses no potential risk for contamination.

✔ If there is a spill or leak from the field sanitation unit, a soil berm is constructed around the unit and the service company is immediately contacted.

✔ Indicate the method of harvest that is used on the farm.

✔ During harvest, all equipment and harvesting containers are kept clean and are sanitized before use in the spring.

✔ During the production season containers are checked and cleaned/sanitized as needed.

✔ If hand harvesting knives or clippers are used: Hand harvesting equipment is kept clean and sanitized daily with a chlorine solution.

✔ All equipment and harvesting machinery that comes in contact with the produce is kept in good repair.

See Food Safety on page 2
Food Safety from page 1

✔ All light bulbs and glass on the harvesting equipment are protected to ensure that contamination of the fields does not occur if the glass breaks.
✔ If glass does break, the contaminated area will not be harvested and any product that had been harvested from the area will be placed in plastic bags and removed from the field.
✔ If other products such as chemicals, petroleum, or pesticides contaminate the produce, the affected area and a five-foot buffer is not harvested.
✔ Harvest baskets and totes are used only for picking.
✔ Any container that is broken is either discarded or painted another color and marked not for harvesting.
✔ When field packing produce only new cartons are used.
✔ No water is applied to harvested product in the field. Note: water can be used, but it must be microbiologically safe.
✔ Wagons and trailers used at the farm are kept clean from dirt and debris before the loading process.
✔ Products moved from the field are always covered.

*The number of field sanitation units and rest rooms depends on the number of employees that you have working on a daily basis at that location. One unit is required per 20 employees.

This is the tenth 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.

Next week: House Packing Facility. 

Vegetable Disease Update

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

✔ Pepper - Bacterial leaf spot – Symptoms of bacterial leaf spot on pepper leaves include small, brown water-soaked lesions that turn brown and necrotic in the centers. Spots may coalesce and form large blighted areas on leaves and premature defoliation can occur. On fruit, brown lesions can form which have a roughened, cracked wart-like appearance. High temperatures, high relative humidity and rainfall favor Bacterial spot development. Loss from Bacterial spot can be reduced somewhat by maintaining high levels of fertility, which will stimulate new growth. Applying a fixed copper (M1) at labeled rates or may help suppress spread. Quintec (quinoxyfen, 13) at 6.0 fl. oz/A is now labeled for the suppression of bacterial leaf spot in pepper in the mid-Atlantic region. Please see the 2012 New Jersey Commercial Vegetable Production Recommendations Guide for more information.

✔ Pepper – Anthracnose - Symptoms of fruit infection include sunken, circular spots which develop blackish-tan to orange concentric rings as lesions develop. Lesions on stems and leaves appear as grayish-brown spots with dark margins and can easily be overlooked. Control of Anthracnose begins scouting on a regular basis and applying preventative fungicide applications before symptoms appear, especially in fields or areas of farm where you have had anthracnose problems in the past. Beginning at flowering and as small fruit begin to set, alternate chlorothalonil (M5) at 1.5 pt 6F/A or Manzate Pro-Stick at 1.6 to 3.2 lb 75DF/A with one of the following FRAC code 11 fungicides: azoxystrobin (Quadris at 6.0 to 15.5 fl oz 2.08F/A) or Cabrio (pyraclostrobin) 20EG. After harvesting, pepper fields should be disc and plowed under thoroughly to bury crop debris.

✔ Potato – Black Leg – Black leg is caused by Erwinia spp. which also cause 'soft rots’. The bacteria which lead to the aerial phase of Blackleg are soil-borne (originate from old crop debris) and spread by rainfall, overhead irrigation and wind. The aerial phase of Blackleg does not originate from decaying seed pieces. The bacterium can enter the plant through wounds created by cultivation or through stems damaged by blowing wind, sand or hail. Dense canopies, warm weather and prolonged periods of leaf wetness favor the spread of aerial Blackleg. Fortunately, the disease rarely extends below ground and only causes dieback of stems over time. Symptoms of the aerial phase of Blackleg first appear as an irregular, water-soaked ‘green’ decay on stems that turns light-brown to black over time. Hot, dry weather will cause infected areas to dry out and become brittle. Do any cultivating when plants are dry, cultivating in the presence of dew or wet plants may help to spread the bacterium around.

✔ Tomato – Bacterial spot, speck and canker – The reports of bacterial leaf spot have picked up this past week mostly in heirloom varieties which are notorious for harboring the pathogen in infested seed. 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. 

Page 2 Vol. 18 No. 13
**Disease Briefs**

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

- Reports of Bacterial leaf spot in tomatoes, particularly in heirloom varieties, has picked up this week. Heirloom tomatoes are notorious for harboring the pathogen in infested seed. As a rule, all heirloom seed should be hot water treated before use.

- It's hard to believe, but the cool night temperatures we had last week have caused some distortion/crimped leaves in the new growth in some pepper plantings. Symptoms often look like that of a mosaic virus and can often be present across the entire planting. The warm temperatures we are seeing this week should help plants grow out of it.

- Cucurbit downy mildew has already been reported on cucumber in New Jersey. Reports in cucumber have picked up this past week from around the state. All cucurbit growers should include a downy mildew specific fungicide in their weekly fungicide program. Please see the 2012 Commercial Vegetable Recommendations Guide for specific fungicide recommendations. To track the progress of cucurbit downy mildew please visit North Carolina State University's Cucurbit Downy Mildew Forecasting Center at [http://www.ces.ncsu.edu/depts/pp/cucurbit](http://www.ces.ncsu.edu/depts/pp/cucurbit).

- Cucurbit powdery mildew has been found in New Jersey. Cucurbit growers should adjust fungicide programs accordingly.

- Eggplant - Verticillium wilt has been found in eggplant.

- There have been no new reports of Late blight in New Jersey. To track the progress of Late blight in the US please visit: [http://usablight.org](http://usablight.org).

For the most up-to-date information fast, please sign up for the Jersey Vegetable Crop Ag Updates at: [http://jerseyvegcropsagupdates.blogspot.com](http://jerseyvegcropsagupdates.blogspot.com).

**IPM Update**

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

**Sweet Corn**

European corn borer (ECB) adult catches have decreased to zero in most blacklight traps. We are entering the period between flights. The most consistent catches at this time are in Sussex County and near the Cumberland-Cape May County border, but even these are quite low (see ECB Map). Plant injury is increasing dramatically in much of the state as adult numbers decline and their offspring begin feeding. Most of this feeding is currently on larger whorl and pre-tassel stage plantings. Whorl corn that is approximately 24” or lower is relatively free from ECB damage at this time. 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:

- Beemerville 1
- Downer 1
- Pedricktown 1
- Burlington 1
- Eldora 1
- Pennington 1
- Chester 1
- Little York 1
- Springdale 1
- Denville 1
- Oxford 1

**Corn earworm moths (CEW)** continue to appear in southern and central NJ blacklight traps. There are a few areas of higher activity near Vineland in the south, and Trenton in central New Jersey (see CEW Map). Pheromone catches near the Camden/Atlantic County border and in Salem County are getting moderately high catches. Larval infestations in corn tassels, while not particularly damaging, indicate that egg laying has occurred. 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:

- Allentown 1
- Farmingdale 1
- Pedricktown 1
- Clinton 1
- Jones Island 1
- Pennington 1
- Crosswicks 1
- Lawrenceville 1
- East Vineland 1
- New Egypt 1

**Silking Spray Schedules***:

- South – 4-5 days
- Central – 5-6 days
- North – 6-7 days

* Note: These are general recommendations. Local trap catches may indicate some variation in the frequency of insecticide applications to silking corn.

**Cole Crops**

Heavy egg laying by imported cabbage butterflies (ICW), and diamondback moth (DBM) continues. 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

For the most up-to-date information fast, please sign up for the Jersey Vegetable Crop Ag Updates at: [http://jerseyvegcropsagupdates.blogspot.com](http://jerseyvegcropsagupdates.blogspot.com).
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.

**Peppers**
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](http://www.pestmanagement.rutgers.edu/IPM/Vegetable/Pest%20Maps/maparchive.htm)) fruit and fruit are greater than ½” in diameter, insecticides are warranted. At this time, there is little adult ECB activity to warrant regular treatments for this pest. As the second flight commences, these applications may become necessary. See the 2012 Commercial Vegetable Production Recommendations for materials useful in controlling ECB. **Beet armyworm (BAW)** larval populations have been found on various crops in southern NJ. 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 adult catches are very low in blacklight traps, although Dr. George Hamilton reports adult activity and egg laying in peaches at the Cream Ridge Research Station on the Monmouth-Burlington County border. At present, the weekly averages do not exceed 5 per night in any trap. In fact, no trap registered a catch for the second half of the previous week. 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.

**Tomatoes**
**Bacterial leaf spot (BLS)** infections have appeared in several tomato (and pepper) plantings this week. Be aware that the practices of pruning and tying tomato plants in the field can spread bacterial pathogens if they are present on any of the plants. It is advisable to use latex gloves while pruning, and discard them at the end of each row. Using new gloves with each new row will help limit spread in the field. Additionally, tying wands may be dipped in a bleach solution at row end as well for the same reason. Bacterial infections (speck, spot and canker) typically appear first as very dark lesions on leaf edges or interior tissue. Foliation of any age may be affected. Be sure to work in younger plantings before older, potentially infected ones if tying or other activities are necessary in multiple plantings. This will lower the risk of spreading the pathogen to younger plants. Various chemical applications may also be used to help suppress bacterial infections in both tomatoes and peppers (see the 2012 Commercial Vegetable Production Recommendations), and these should be considered even in the absence of symptoms.

**Snap Beans**

**Potato leafhopper (PLH)** adults have appeared in snap beans in the northern counties this week, and should be considered present in all areas. So far, only adults have been present. This pest is a particular problem because it often goes unnoticed until foliar distortion and burn occurs. Once this damage appears, yields have already been compromised. It is critical that beans be monitored regularly for the presence of PLH. If a sweep net is available, consider treating if more than 100 nymphs and adults are present in 20 sweeps of pre-bloom stage plants. This threshold increases to 250 during bloom and to 500 per 20 sweeps during pod development. If no sweep net is available, check plants in 10 random field locations and consider treating if adults and nymphs are found throughout. Adults are pale green, and will fly out from foliage when disturbed and immediately fly back into the plant canopy. Nymphs are wingless and bright green and may be found on the underside of leaves.

**Pumpkins and Winter Squash**
These crops are now emerging in many areas. It is important to monitor frequently for the presence of striped and spotted cucumber beetles at this time, particularly if the seed was not purchased pre-treated with an insecticide for cucumber beetle. Check 5 consecutive plants each in 10 random locations. Examine upper and lower surface of seed leaves for the presence of beetles. Consider treating if beetles are found at 5 or more sites. Heavy, but local infestations may be spot treated. Management of these pests will limit the loss of plants to the bacterial wilt disease that the beetles transmit.

**Note:** No insect maps will appear in the next two additions of this newsletter. CEW, ECB and BMSB numbers will be present as well as analysis. Maps will resume in the July 11th edition, and maps from June 25, and July 4 will be available on the web at: [http://www.pestmanagement.rutgers.edu/IPM/Vegetable/Pest%20Maps/maparchive.htm](http://www.pestmanagement.rutgers.edu/IPM/Vegetable/Pest%20Maps/maparchive.htm)

**See ECB and CEW maps on page 5**
Weekly Weather Summary
Keith Arnesen, Ph.D., Agricultural Meteorologist

Temperatures averaged near normal north and below normal central and south, averaging 67 degrees north, 67 degrees central and 68 degrees south. Extremes were 86 degrees at Seabrook on the 12th, and 50 degrees at New Brunswick on the 18th. Weekly rainfall averaged 0.91 inches north, 1.27 inches central, and 1.79 inches south. The heaviest 24 hour total reported was 2.71 inches at Seabrook on the 12th to 13th. Estimated soil moisture, in percent of field capacity, this past week averaged 89 percent north, 85 percent central, and 82 percent south. Four inch soil temperatures averaged 68 degrees north, 69 degrees central and 70 degrees south.

<table>
<thead>
<tr>
<th>WEATHER STATIONS</th>
<th>R A I N F A L L</th>
<th>TEMPERATURE</th>
<th>GDD BASE50</th>
<th>MON %FC</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>WEEK</td>
<td>TOTAL</td>
<td>DEP</td>
<td>MX</td>
</tr>
<tr>
<td>BELVIDERE BRIDGE</td>
<td>1.03</td>
<td>12.18</td>
<td>-1.52</td>
<td>81</td>
</tr>
<tr>
<td>CANOE BROOK</td>
<td>1.13</td>
<td>10.40</td>
<td>-4.45</td>
<td>81</td>
</tr>
<tr>
<td>CHARLOTTEBURG</td>
<td>.77</td>
<td>11.85</td>
<td>-3.05</td>
<td>79</td>
</tr>
<tr>
<td>FLEMINGTON</td>
<td>1.22</td>
<td>12.40</td>
<td>-1.75</td>
<td>82</td>
</tr>
<tr>
<td>NEWTON</td>
<td>.41</td>
<td>9.25</td>
<td>-4.13</td>
<td>79</td>
</tr>
<tr>
<td>FREEHOLD</td>
<td>1.14</td>
<td>11.95</td>
<td>-2.01</td>
<td>79</td>
</tr>
<tr>
<td>LONG BRANCH</td>
<td>1.40</td>
<td>16.79</td>
<td>2.66</td>
<td>76</td>
</tr>
<tr>
<td>NEW BRUNSWICK</td>
<td>1.54</td>
<td>13.33</td>
<td>-3.4</td>
<td>81</td>
</tr>
<tr>
<td>TOMS RIVER</td>
<td>1.52</td>
<td>11.25</td>
<td>-2.64</td>
<td>76</td>
</tr>
<tr>
<td>TRENTON</td>
<td>.77</td>
<td>11.26</td>
<td>-1.41</td>
<td>80</td>
</tr>
<tr>
<td>CAPE MAY COURT HOUSE</td>
<td>1.12</td>
<td>9.31</td>
<td>-2.98</td>
<td>77</td>
</tr>
<tr>
<td>DOWNTOWN</td>
<td>1.46</td>
<td>9.06</td>
<td>-3.50</td>
<td>83</td>
</tr>
<tr>
<td>HAMMONTON</td>
<td>1.11</td>
<td>10.78</td>
<td>-2.39</td>
<td>80</td>
</tr>
<tr>
<td>POMONA</td>
<td>2.57</td>
<td>12.39</td>
<td>.32</td>
<td>79</td>
</tr>
<tr>
<td>SEABROOK</td>
<td>2.71</td>
<td>12.50</td>
<td>.60</td>
<td>86</td>
</tr>
<tr>
<td>SOUTH HARRISON</td>
<td>missing</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| WES KLINE -- GDD BASE 40 PINNEY HOLLOW LAST WEEK 216 (Ending 6/11/12) THIS WEEK 199 (Ending 6/18/12) TOTAL UNITS BASE 40 FOR FEBRUARY=55
PLANT & PEST ADVISORY
VEGETABLE CROPS EDITION CONTRIBUTORS

Rutgers NJAES Cooperative Extension Specialists
Gerald M. Ghidiu, Ph.D., Vegetable Entomology
George Hamilton, Ph.D., Pest Management
Joseph R. Heckman, Ph.D., Soil Fertility
Bradley A. Majek, Ph.D., Weed Science
Andy Wyenandt, Ph.D., Vegetable Pathology

Rutgers NJAES-CE County Agricultural Agents
Atlantic, Richard W. VanVranken (609-625-0056)
Burlington, Raymond J. Samulis (609-265-5050)
Cape May, Jenny Carleo (609-465-5115)
Cumberland, Wesley Kline, Ph.D. (856-451-2800)
Gloucester, Michelle Infante-Casella (856-307-6450)
Hunterdon, Winfred P. Cowgill, Jr. (908-788-1338)
Middlesex, William T. Hlubik (732-398-5260)
Monmouth, Bill Sciarappa, Ph.D. (732-431-7260)
Morris, Peter J. Nitzsche (973-285-8300)
Passaic, Elaine Fogerty, Agric. Assistant (973-305-5740)
Salem, William H. Tietjen (908-475-6505)
Vegetable IPM Program (732-932-9802)

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.

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.

Reproduction of Articles: RCE invites reproduction of individual articles, source cited with complete article name, author name, followed by Rutgers Cooperative Extension, Plant & Pest Advisory Newsletter.